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Green Finance in China: Overview, Experience and Outlook

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Abstract

Recently, China has made significant advancement in the development of green financial system through the introduction of green financial standards, disclosure requirements and a series of measures to spark innovation in green financial products. This report aims to provide an overview of green finance in China, its origin, development, status quo and outlook, with a focus on the market and relevant market players. The Chinese experience in developing green finance, through policy coordination, incentives and standard setting, can become a reference for other emerging economies that seek to develop their domestic green finance market[2].

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[2] *This report is prepared by the Research Center for Green Finance Development with support from GIZ.*

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研究报告

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清华大学国家金融研究院

中国绿色金融发展的历程、经验及展望

绿色金融发展研究中心

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【摘要】近年来，我国通过出台绿色金融标准、披露要求、激励绿色金融产品创新等一系列措施，逐渐建立了国内绿色金融市场体系。本报告将从绿色金融市场和市场参与者的角度出发，对我国绿色金融的起源、发展、现状和前景进行梳理，希望我国绿色金融在政策协调、政策激励和标准制定方面的经验为其他有意发展绿色金融市场的新兴经济体提供有益参考[4]。

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[4] 本报告的编写得到了德国国际合作机构（GIZ）的支持。

Contents

Foreword

In recent years, China made significant progress in developing its green financial system through a series of measures, such as introducing green finance standards (such as taxonomies) and disclosure requirements, innovating green financial products, and launching regional pilot programs. As of now, China has established one of the world's largest green financial markets, with the outstanding balance of green loans exceeding RMB10.6tn in 2019 and the total issuance of green bonds amounting to over RMB 1.1tn between 2016 and 2019.

Significant environmental and climate benefits have been achieved through the allocation of public and private capital to a vast number of green projects with themes on environmental remediation, renewable energies, energy efficiency, and green transportation. Also, China's regional pilot programs have demonstrated clearly that the deployment of green finance could boost economic and job growth at the same time while delivering cleaner air and water and reducing carbon emissions.

China has played a leading role in the area of green and sustainable finance and actively promoted international collaboration. Since 2016, China has co-chaired the G20 Green Finance Study Group (GFSG), co-founded the Network for Greening the Financial System (NGFS), launched the Green Investment Principles (GIP) with international partners, initiated the Global Green Finance Leadership Program (GFLP), actively participated in the International Platform for Sustainable Finance (IPSF), and developed various bilateral collaborative mechanisms with the UK, France and Europe.

China's experience is highly relevant to other countries, especially other developing countries. Over the past years, several hundred green finance specialists and officials from over 50 countries have visited China under the GFLP to exchange knowledge and best practices on green finance. Following these knowledge exchange programs; Mongolia established the country's first green finance taxonomy with technical assistance from Tsinghua Green Finance Center and China Green Finance Committee. Some other countries like Kazakhstan and Pakistan are also exploring similar measures.

Despite its significant progress, China still has a long way to go in meeting the vast and rapidly growing financing and investment demand from its green economy. China will need to develop on four aspects: a more complete set of green finance standards that cover all green financial products; mandatory requirements for environmental and climate information disclosure; stronger incentives for green investments; and institutional capacity to analyze environmental and climate risks in a forward-looking manner. Chinese President Xi Jingping's recent pledge that China would achieve carbon neutrality before 2060 will be a huge boost to both supply of and demand for green finance in China and will be translated into more specific actions by the financial regulators and financial institutions.

Tsinghua Green Finance Center was in close collaboration with the BCE Team at GIZ China in preparation of this report, which aims to provide an overview of China's efforts since 2016 in developing its domestic green financial system and some of the international initiatives to which China has made significant contributions. We believe that some of the lessons and experiences from China -- as summarized in this report -- especially in the area of policy coordination, incentives and standards, are highly valuable to other countries that intend to develop their own green financial markets.

1. Overview of Green Finance in China

The earliest labeled green financial products in China were green loans, which date back to 2012 when China Banking Regulatory Commission (CBRC) issued the guidelines for green loans[5] and later statistical system[6] in 2013. Prior to this initiative, environmental issues like air pollution, water pollution, and land contamination had already been a national concern for both the public and the government. The Ministry of Environmental Protection (now Ministry of Environment and Ecology, MEE) found it necessary to approach these issues from the financial side, in addition to their regulations on preventing and controlling pollutions. The guidelines for green loans learned from the International Finance Corporation's practices and methodologies on sustainable banking.

In 2014, air pollution was getting worse in urban China, especially around Beijing and Tianjin in Northern China, and the tightened environmental regulations had been ineffective. Some economists and experts found in their studies that the root cause for the severe environmental pollution originated in the economic structure (i.e. its reliance on high-emission heavy industry, road transport, and energy mix). To solve the environmental issues effectively, a mid-to-long term systemic approach would have to be taken, including to transform into service and consumption driven industries, to build railways and trains to replace road transport, and, most importantly, to reduce coal in the energy mix and increase the share of clean/renewable energy.

The blueprint was clear; however, the big question was how much does this transformation cost and where does the money could come from. In the book *The Economics of Air Pollution in China: Achieving Better and Cleaner Growth*, Dr. Ma Jun calculated that the financing demand for green transformation in China would be around RMB 4 Trillion (app. USD 563 billion) annually between 2016 and 2020, and that the public could only provide 10% to 15% of the funds needed. Most of the financing gap would have to be filled by the private sector.

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5 *http://www.cbrc.gov.cn/chinese/home/docDOC_ReadView/127DE230BC31468B9329EFB01AF78BD4.html*

6 *http://www.cbrc.gov.cn/chinese/home/docView/F0E89A3240984465BFEF1E3D01316D5B.html*

Inspired by international green bonds issuance and green projects finance experience, the People's Bank of China (PBOC) thought China could apply similar systems and therefore established the Green Finance Committee under the China Society for Financing and Banking. The committee was mandated to lead the research on the role of financial markets and the possibility of establishing a comprehensive green financial market. The Committee was chaired by Dr. Ma Jun, then Chief Economist of the Research Bureau of the PBOC. In 2014, the Committee provided a set of recommendations to promote green finance, most of which were accepted by the top Chinese decision makers in the Central Party Committee (CPC) and the State Council, and were included in the *Integrated Reform Plan for Promoting Ecological Progress*[7], released in 2015. In article 45 of this reform plan, "establishing a green financial system" was raised as a solution to promote ecological progress and a mandate to the PBOC for implementation.

In December 2015, the Committee released the *China Green Bond Endorsed Project Catalogue* (2015)[8], the taxonomy used for green bonds issued in China's interbank market by financial institutions (mainly banks) and in stock exchanges by listed companies. In 2016, China-based institutions issued 58 labeled green bonds in both domestic (53) and overseas (5) markets, with a total value of RMB 240 Billion (app. USD 34.5 Billion), accounting for more than 40% of the global issuance (USD 81 Billion). China became the world largest green bond market almost overnight. Since then, China has remained the top player in the world green bond market, with its financial institutions expanding their green bond issuances globally, especially in Europe. As of the end of 2019, the total value of green bonds issued by Chinese institutions, since 206, exceeds RMB 1.1 Trillion (USD 155 Billion).

With these green loans and green bonds issued, enormous environmental benefits have been realized through the green projects they've supported. Statistics from CBRC[9] showed that by end of June 2017, projects and services supported by green loans have abated 491 million tons of carbon

[7] http://english.www.gov.cn/policies/latest_releases/2015/09/22/content_281475195492066.htm

[8] http://www.greenfinance.org.cn/displaynews.php?id=468

[9] *This is the latest data we could find from the official website of the CBRC.* http://www.cbrc.gov.cn/chinese/home/docView/DE802BF64F754BBE8168B85ECBF629A3.html

emission, which equates to the total emissions of 70,000 taxis running in Beijing for 336 years. At the same time, the Non-Performing Loans (NPL) ratio of these green loans stood at 0.37%, much lower than the average level of 1.69%. By the end of 2019, the outstanding volume from 21 major banks totaled more than RMB 10 Trillion (USD 1.4 Trillion), accounting for more than 10% of total loans on their balance sheet.

As the environmental benefits became visible and the air quality in major Chinese cities improved, both the government and the financial sector realized that green finance was contributing to these positive outcomes and should be further encouraged. Against this background, the PBOC worked with six other ministries and jointly released the *Guidelines for Establishing the Green Financial System*[10] in 2016, when China was the G20 President. This adds a more comprehensive policy framework to the existing mandate for green finance in China. Many corresponding policies and products were introduced subsequently, including the environmental disclosure requirement, green insurance, green funds, and the pilot zone for promoting green finance in local governments.

China has built an inducive environment for international collaboration in green finance by supporting the international climate agenda and adhering to its commitments in reducing carbon emissions. The main causes of climate change - human activities, overreliance on fossil fuels, etc. - are also the main contributors to China's environmental issues. When addressing air pollution issues, China is actually also addressing climate change. In turn, any best practices for climate change mitigation and adaptation can also be beneficial to addressing environmental issues in China. Therefore, China has been very active in international collaboration in both climate change and environmental issues, such as the Network for Greening the Financial System (NGFS), the International Platform for Sustainable Finance (IPSF), Paris Agreement, UN Sustainable Development Goals (SDGs), ISO, etc.

Against this backdrop, there is tremendous potential for China, Germany, and the EU to work together to tackle common challenges. This report will present in more detail progress and updates to the green financial markets in China, the ecological civilization, as well as the policy framework and its stakeholders. The latter part of this report will dig more deeply on other topics and issues, including international collaboration.

[10] http://www.pbc.gov.cn/english/130721/3133045/index.html

1.1 Green Financial Products and Market

This section of the report provides an overview of the development of green financial products and markets in China, including green credits/loans, green bonds, green insurance, green funds, and other emerging products to support green and sustainable projects or services.

Green Credits

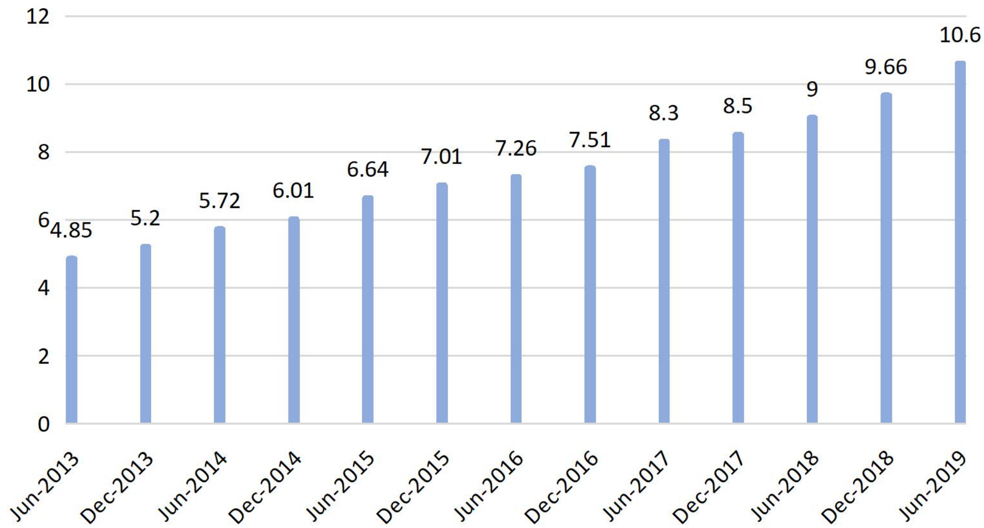
Since the introduction of the Guidelines for Green Credits in 2012 and the statistical system in 2013, green credits have been growing very fast among banking institutions. Statistics from the CBIRC show that the outstanding balance of green credits from the largest 21 banks[11] in China more than doubled from RMB 4.85 Trillion (USD 675 Billion) in June 2013 to more than 10.6 Trillion (USD 1.5 Trillion) in 2019. With an average annual growth rate of 14%, green credits grow much faster than the average loans.

In the meantime, the quality of green credits remains high despite their fast growth. From 2013 to 2018, the NPL ratio of green credits in these banks were 0.32%, 0.20%, 0.42%, 0.49%, 0.37% and 0.42%, respectively, well below the NPL ratio of all loans in the same period.[12]

Table 1.1 Green credit balance of 21 largest commercial banks in China (Trillion RMB)

[11] It is important to note that the CBIRC is only asking these banks to report statistics on green credits as they account for over 80% of all Chinese banks' assets and are more capable of implementing these guidelines. The 21 largest banks, also defined as 21 national commercial banks, are listed below: China Development Bank, the Export-Import Bank of China, Agricultural Development Bank of China, Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, Bank of Communications, China Citic Bank, China Everbright Bank, Huaxia Bank, China Guangfa Bank, Ping An Bank, China Merchants Bank, Shanghai Pudong Development Bank, Industrial Bank, China Minsheng Bank, Hengfeng Bank, China Zheshang Bank, China Bohai Bank, and Postal Savings Bank of China. Other smaller and regional banks are also open to do their own statistics but are not included in the national data.

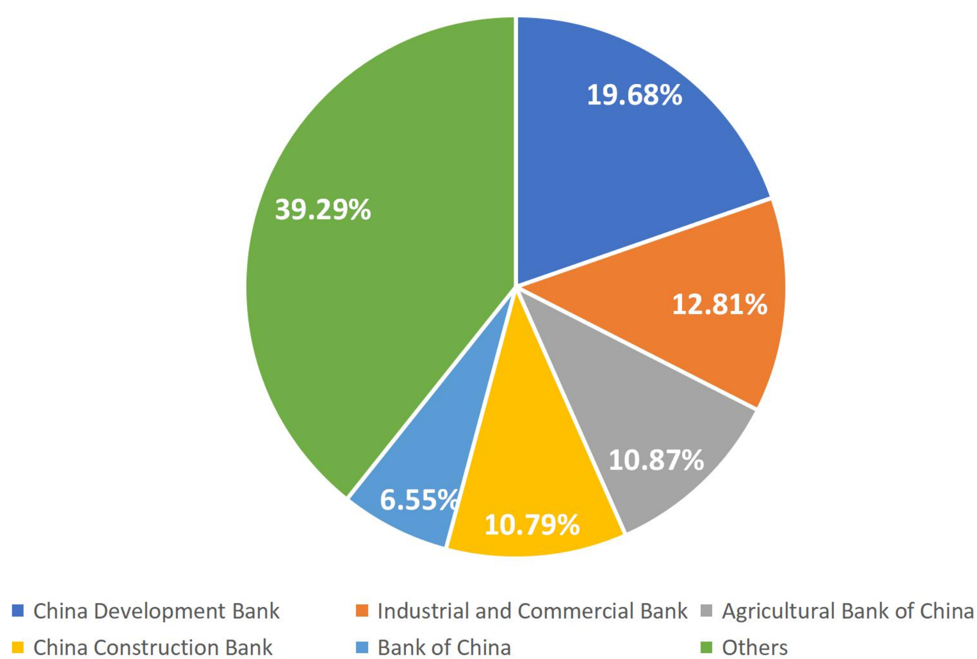
[12] Wang Xin et al., Progress Report on China's Green Finance Development[R]Beijing: China Financial Publishing House. 2019: 76



Source: CBIRC

Among the 21 banks, China Development Bank, Industrial and Commercial Bank, Agricultural Bank of China, China Construction Bank, and Bank of China are the most active green credit issuers, accounted for over 60% of the total green credit balance in 2018.

Table 1.2 Green Credit Balance at 2018 end, by banks



Source: CBIRC and CSMAR

To encourage the development of green credits by banks, the central bank, local governments, and commercial banks have introduced various supporting factors. For example, the PBOC included the performance of green finance into macro-prudential assessment (MPA) system, where banks with a higher ratio of green credits on its balance sheet and a recent record of issuing green bonds would gain extra points in the MPA assessment. If a bank performs well on other indicators as well, it will enjoy a higher interest rate for deposits with the PBOC.

Local governments such as the Huzhou government introduced subsidies for green loans based on greenness. For example, a 12% subsidy of the interest will be provided to the loan for a dark green project (e.g. the government subsidizes 60pbs for a loan extended at 5% (12%*5%) to a dark green project). The subsidies for average green and light green projects are 9% and 6%, respectively.

Many commercial banks also introduced internal policies and strategies to promote green credits. These include the creation of a standalone green finance department, allocation of more resources to support green finance, innovation in green financial products, and embedding more Environmental, Social and Corporate Governance (ESG) elements into the decision-making process, among other things..

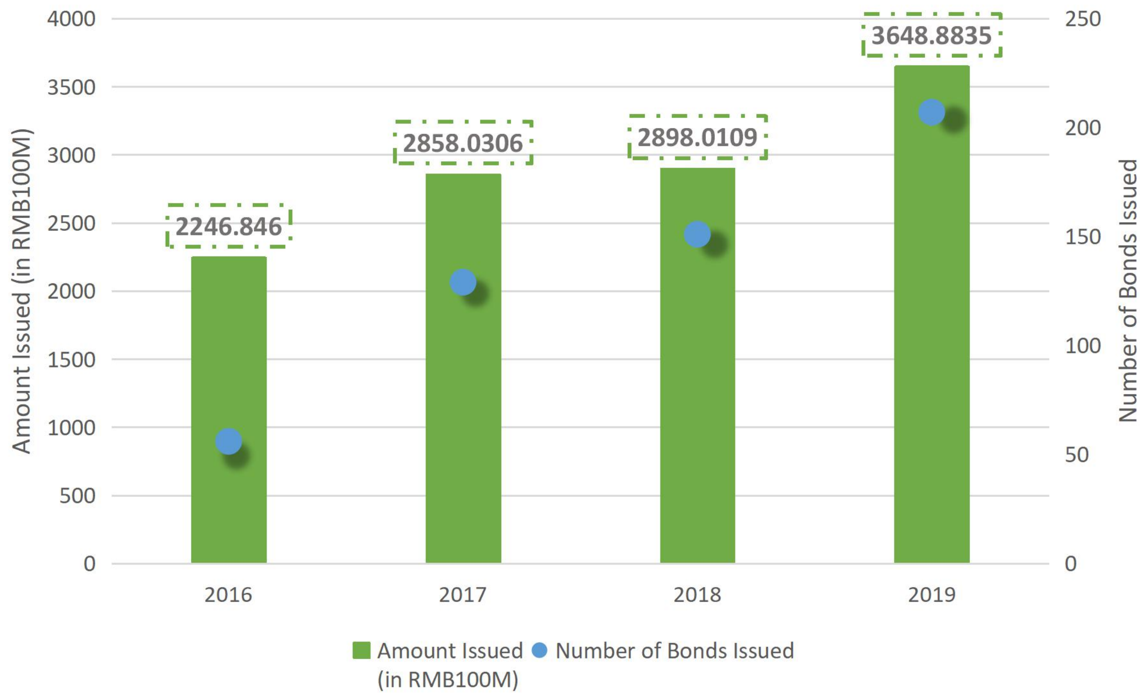
Green Bonds

The green bond market in China started in 2016 after the introduction of the taxonomy by China Green Finance Committee in the year prior. In the first year, 29 institutions issued 53 green bonds with a total value of RMB 240 Billion (USD 34.5 Billion), accounting for more than 40% of the global issuance (USD 81 Billion). Among the issuers, commercial banks were the largest by issuing RMB 150 Billion (USD 21.5 Billion), accounting for 62.5%. Most of the funds raised were used to support projects in renewable energy and pollution prevention.

Overnight, China became the world's largest green bond market and has remained as a top player in the world, accounting for more than 20% of total global issuance. In the meantime, many Chinese financial institutions issued green bonds in European financial markets. The total value of green bonds issued by Chinese institutions exceeded RMB 1.1 Trillion (USD 155 Billion) between 2016 and 2019, including those issued in domestic and overseas markets. A steady uptrend can be seen in both the annual amount and the number of green bonds issued by Chinese institutions, showing increasing activities in the Chinese green bond market (Table 1.3).

Most of the green bonds are traded on 3 markets: Shanghai Exchange, Shenzhen exchange, and the Interbank market. All green financial bonds are issued and traded via the interbank market, while all the green corporate bonds are issued and traded in either Shanghai Exchange or Shenzhen Exchange. Green corporate bonds issued by State Owned Enterprises (SOEs), however, are mostly issued and traded on two markets simultaneously: the interbank market and one of the exchanges.

Table 1.3 Amount and Number of green bonds issued by Chinese institutions since 2016



Source: CBI and Xinhua Green Bond Database

To encourage green bonds issuing, some local governments in China introduced policy incentives to cover verification costs or coupon rates. For example, Jiangsu Province introduced an incentive scheme in 2018 by covering 30% of green bonds facial interests with a cap of RMB 2 Million (USD 280,000) for issuers based in the province[13]. The PBOC also included the performance of banking institutions in the MPA assessment framework (i.e. issuance of green bonds during the assessment period).

[13] http://czt.jiangsu.gov.cn/art/2018/10/10/art_51172_7836535.html

Of the green bonds issued in the domestic market, the vast majority (more than 85%) received third-party verification followed by reports on the use of proceeds. This trend continued growing as more issuers understood that investors would want to confirm that their funds were used to support green projects. Large verifiers include E&Y, Lianhe Equator, China Bond, and CECEP; these verifiers covered nearly 60% of certified green bonds in China.

There are a few questions concerning the market in green bonds. One question is that China has more than one taxonomy for green bonds, including the green catalogue issued by China Green Finance Committee (GFC) and the one developed by the National Development and Reform Commission (NDRC), which could give rise to to green-washing risks. Though the risks exist, they are, in our opinion, minimal, as the vast majority (95%) of green bonds issued in the domestic market followed the GFC catalogue while only 5% adopted the NDRC's definition.

The other question is about the difference between the GFC's green bond standards and international standards, including the Green Bond Principles, the Climate Bond Standards, and the rules used by Multilateral Development Banks (MDBs). The difference primarily lies in the recognition of the clean utilization of fossil fuels, especially coal, in the GFC's catalogue. The GFC's catalogue included clean coal projects, because its original purpose was three-fold: addressing environmental pollution, climate change adaptation and mitigation, as well as improving energy efficiency. Clean coal technology was able to significantly reduce the emissions of pollutants such as SOx, CO, NOx, and dusts, but the carbon emissions remained, as a result many have argued that clean coal needs to be excluded.

As the green bond market continues to develop, both the market and policy makers realized the importance of harmonizing green bond taxonomies in China to avoid misunderstanding and mitigate the risks of green-washing. To attract international investors, China also needs to align domestic standards with international practice. In late May 2020, the PBOC released an updated version of the *China Green Bond Endorsed Project Catalogue (2020)* for public consultation. This update excluded coal and fossil fuels from the list of eligible projects for green bonds in the domestic market and harmonized the standards from the GFC and NDRC. At the same time, with the support from the GFC, the PBOC has been working with the DG FISMA through the International Platform for Sustainable Finance (IPSF)[14], to compare and harmonize the standards between China and the EU to facilitate international green capital flows.

Green Insurance

China has been piloting environmental pollution liability insurance in some high-risk industries since 2008. By the end of July 2019, there were 31 environmental pollution liability insurance pilot provinces (autonomous regions and municipalities), involving over 20 high-environmental-risk industries.[15] In 2018, the environmental pollution liability insurance realized a premium income of RMB 0.309 Billion, and provided a risk protection of RMB 326.58 Trillion. Significant progress has been made but the insurance penetration is still at a very low level. Therefore, the Chinese government passed the *Compulsory Environmental Pollution Liability Insurance (CEPLI) Regulation*[16] in May 2018.

The Regulation requires any business to buy CEPLI if it is involved in hazardous waste, tailing reservoirs, petroleum products, coal mining, metal ores, chemical raw materials, chemical products, and other industries defined by the government to represent major environmental risk. If a business fails to comply after a certain period, the government will publish the names of these enterprises and penalize them. In terms of the scope of coverage, CEPLI covers third-party bodily injury, third-party property damage, ecological environment damage, emergency handling, and clean up expenses.

Innovations in green insurance products have occurred in the past few years, where local governments and insurance companies play a proactive role. In 2018, the West Coast New District Government of Qingdao, Shandong province took out a public area environmental pollution cleanup expense insurance for a 13.05km^2 industrial enterprise cluster area within its jurisdiction through public bidding. This insurance helped the government make early compensation for third-party soil and water harmless treatment incurred by environmental pollution events, third-party property losses and expenses incurred by emergency rescues. The CPIC stood out from the four

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14 https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200325-international-platform-sustainable-finance-factsheet_en.pdf

15 Research Bureau of PBOC, China Green Finance Progress Report 2018 [R]Beijing: China Financial Publishing House. 2019: 175

16 http://www.mee.gov.cn/xxgk2018/xxgk/xxgk15/201805/t20180507_630147.html companies in the public bidding, offering the insurance at a premium of RMB 450,000 per year. The total insured amount is RMB 20 Million (USD 2.8 Million), including RMB 6 Million (USD 0.8 Million) for the seawater. CPIC, as the insurance service provider, would conduct overall tracking analysis to the area and evaluate the area's safety. CPIC would also implement 2-3 times of on-site risk management, spot potential risks and propose correction suggestions to assist government departments routine regulatory work.

To facilitate the development of the green building market in China and transform green designs to operations of green buildings, Beijing signed with PICC China's first green insurance contract in March 2019[17] for an industrial upgrading project in Chaoyang District as a pilot project to ensure green performance of a commercial building. Through this insurance contract, PICC will ensure green performance of this building as designed and attract private investors on market-based conditions. Less than two weeks later, another green insurance contract was signed in Qingdao, Shandong Province, for securing ultra-low energy performance of eight residential buildings in the Sino-Germany Eco Park[18].

Green Funds

In China, government-supported investment fund are playing a leading role in the country's capital market development. By the end of 2018, there were 16 government-funded green industrial investment funds registered in the Credit Information Registration System of National Government-Funded Industrial Investment Funds. These funds have a target of raising RMB 29.64 Billion (USD 4.2 Billion) and an actual capital contribution of RMB 9.16 Billion (USD 1.3 Billion). These funds are mainly distributed in Beijing, Shanghai, Shanxi, Inner Mongolia, Hebei, Anhui, and Yunnan, and primarily invest in ecological governance, energy conservation and environmental protection, clean energy, culture-oriented tourism, green industries, etc.

Green-themed projects are prioritized in governments' development agenda. Therefore, many local governments have established green industry investment funds. In terms of the three main operation modes, there are parent-subsidiary fund, follow-up investment, and direct investment. Exiting the investment can be implemented by either maturity liquidation or equity

[17] http://bj.people.com.cn/n2/2019/0328/c82840-32784518.html
[18] http://www.sgep.cn/index.htm

transfer. For the invested green projects, investors can withdraw from the market through equity transfer, equity repurchase or equity convertible bonds.

Box 1 The Silk Road Green Industry Fund

The Silk Road Green Industry Fund, originated from Xi'an Chanba Ecoregion, is a typical case of government-supported green industry investment fund. As the first national ecoregion in Northwestern China, Xi'an Chanba Ecoregion has continuously promoted green and low-carbon development; green industries are core productivity and competitiveness for Chanba. In May 2016, Chanba established the Xi'an Financial Holdings Co., Ltd to build up a green finance business platform. In 2017, with the strong support from Xi'an Chanba Ecoregion, Xi'an Financial Holdings set up the Silk Road Green Industry Fund (hereinafter "the Silk Road Fund") with a total asset under management of RMB 10 Billion (USD 1.4 Billion). The initial raised funds, amounting to RMB 3 Billion (USD 424 Million), by government financial contribution, green bonds issuances, and follow-up investments, aim to guide social capital into green fundraising. The fund targeted mainly at green and environmental protection, high-tech industries and modern service industries, and operates in two ways: sub-funds and direct investment. The fund could establish limited partnership industry sub-funds with other social capital and financial institutions, which is called a marketization mode; or directly invest into equities of major green industries projects within Xi'an Chanba Ecoregion. Multiple methods could be used to withdraw from the fund, including M&A, IPO, buybacks, equity transfer, etc.

Apart from these, the Silk Road Fund also explored a new investment mode of green funds. In December 2018, the Silk Road Fund, as a limited partner, invested in the KKP Global Impact Fund established by the world's leading private equity investor- Kohlberg Kravis Roberts & Co. (KKR). Different from traditional funds which only focus on the financial benefits of projects, this fund assesses the environmental and social impacts of the project as the key criterion for investment decision-making. These investments also primarily focus on industries helpful to solve current environmental and social problems, such as industrial solutions, environmental management, next generation energy, production and consumption improvement, development of learning resources and human resources. This fund is the first ESG themed fund of KKR.

At the market level, in 2018, CSRC has approved 10 public funds to be listed in the market, they are themed with green, low carbon, environmental protection, new energy, etc. By the end of 2018, there are 1,872 private funds invested in environmental protection equipment, engineering, and service industries, with the fund scale of RMB 810.45 Billion (USD 114.4 Billion). There are four "social responsibility" investment funds that can be counted (ETF and its feeder fund are deemed as one), with total Assets Under Management (AUM) of RMB 7.52 Billion (USD 1.06 Billion). There are 48 funds whose name has such words as low-carbon, environmental protection, green, new energy, beautiful China, and sustainable, with total AUM of RMB 24.49 Billion (USD 3.46 Billion).

Most recently, China's National Green Development Fund has been established[19] in July 2020, with a total registered capital of RMB 88.5 billion (about USD 12.66 billion). Jointly launched by the Ministry of Finance, the Ministry of Ecology and Environment and Shanghai Municipality, the fund will raise capital for investment fields such as pollution control, ecological restoration, afforestation of national land, conservation of energy and resources, green transportation, and clean energy. This Fund will be operated as a fund of funds and the investment priorities at early stage will be along the Yangtze River.

1.2 Green Finance and Ecological Civilization

Over the past few decades, China's pollution issues, especially air pollution, have brought severe health and economic consequences, making governments realize the unsustainability of its old economic growth, and begin to raise green development to a national strategic level. In April 2015, the CPC Central Committee and the State Council deliberated the Opinions on Accelerating the Ecological Civilization Construction20, pointing out the need to "collectively promote new-type of industrialization, application of information technologies, urbanization, agricultural modernization and greening" and putting forward the concept of "greening" for the first time. In October of the same year, the CPC Central Committee's Proposal for Formulating the 13th Five-Year Plan for National Economic and Social Development (2016-2020) was approved, elevating green development to unprecedented importance as one of the five core development concepts: "innovation-driven development, balanced development, green development, open development, and development for all." Since then, green development and environmental protection have been a top priority of China's economic development.

To fundamentally address the environmental problems, the government needs to establish a series of incentives and regulatory mechanisms to reallocate resources, including the capital, technology, human resources, and others, into clean and green industries from polluting ones. During this process of resource reallocation, green finance plays a vital role since other

[19] http://www.xinhuanet.com/english/2020-07/16/c_139215364.htm
[20] http://www.gov.cn/xinwen/2015-05/05/content_2857363.htm

resources will follow the capital into green industries. As shown in the study by CCICED, China's green investment demand was assessed to be around RMB 3-4 Trillion per year between 2015-2020[21]. It was also estimated that up to 15% of the green investment demand can be met by public funds, and more than 85% of the green investment demand must rely on market-based financing. Consequently, calls for the government to establish a green finance policy framework that enables the financial market to mobilize more social capital into green industries intensified. In September 2015, The CPC Central Committee and the State Council issued the Integrated Reform Plan for Ecological Progress, which, for the first time, explicitly stated that China should establish a green financial system including developing green credit, green bonds, green development funds, and so on.

Box 2 Beijing to Build the International Green Finance Center

In February 2019, the State Council authorized the Pilot Program to further Open-up the Service Sector of Beijing Municipality, including the plan to build an international green finance center. The Plan encourages the reform and innovation of green finance, the development of green financial instruments, environmental rights transactions such as emission rights, water rights, and energy rights, and support foreign investors to participate in green finance activities[22].

To implement this plan, the Beijing Government has developed an ambitious agenda to build institutional capacity and upgrade its infrastructure for green development. In a recent move showing the significance of this agenda, Beijing is transforming its local carbon exchange to China's first green asset exchange to attract domestic and international capital to engage in trading of green assets such as green bonds, green asset-backed securities (ABS), green project financing, carbon emission rights, etc.[23]

As one of the institutional arrangements to support the international green finance center, the Beijing Institute of Finance and Sustainability (BIFS) has been established in April 2020. BIFS aims to make substantive contributions to the United Nations Sustainable Development Goals and the Paris Agreement as the leading China-owned institute, as well as an effort to support the ambition of Beijing's International Green Finance Center. The mission of IFS is to harness Chinese expertise in green finance and sustainable development to contribute to the collective effort for green and low-carbon development in the rest of the world, especially along the Belt and Road.

1.3 Policy Framework and Stakeholders

[21] https://www.iisd.org/sites/default/files/publications/CCICED/economics/2015/green-finance-reform-and-transformation.pdf
[22] http://www.gov.cn/zhengce/content/2019-02/22/content_5367708.htm
[23] https://www.paulsoninstitute.org/green-finance/green-scene/beijing-poised-to-be-first-international-green-finance-center-in-china/

In August 2016, with the approval of the State Council, the PBOC and six other ministries and commissions jointly issued the Guidelines for Establishing the Green Financial System (hereafter as Guidelines (2016)), which represented the initial formation of China's green financial policy system and was also the world first complete national policy framework to support green finance. In 2017, the PBOC, along with other relevant ministries and commissions, agreed on the division of labor to implement these actions set out in the Guidelines (2016) and made a timetable and roadmap for establishing the green finance system. Gradually, issue-specific policies were formulated, such as policies on green credits, green bonds, environmental information disclosure, green funds, green insurance, and environmental rights trading markets.

In the following sections, the green financial policies introduced in China will be presented for each green financial product, including green credits, green bonds, green insurance, green funds, and others, together with information on stakeholders involved in the process.

Green Credits

The beginning of China's green credit policies can be traced back to 2007, when the green credit policy was jointly issued by the Ministry of Environmental Protection (now MEE), PBOC, and CBRC (now CBIRC). It initially set out that the bank lending should flow towards green projects and away from polluting and energy-intensive projects. Since 2012, as the banking regulator, the CBRC has performed a key role in developing and enforcing a policy package of green credits: the Guidelines on Green Credit in 2012 elevated the green credits to a strategic height by requiring the board of directors or the supervisory board of banks to assume the responsibilities of its green credit development strategy; The birth of Green Credit Statistics System[24] in 2013 and the Key Performance Indicators[25] in 2014 meant CBRC's green credit system moved into a phase where the green credit performance of banks was measurable and supervised.

After the Guidelines (2016) was issued, the PBOC has taken on a larger role in establishing incentives and the monitoring and evaluation system for green credits. As the central bank, the PBOC has taken steps to combine

[24] http://www.cbrc.gov.cn/chinese/files/2014/501344F75C984C158551B648F971B241.pdf
[25] http://zfs.mee.gov.cn/hjjj/gjfbdjjzcx/lsxdzc/201507/t20150716_306812.shtml

green finance with macro-prudential and monetary policies. In 2017, the PBOC incorporated green credits and green bonds of major national financial institutions into the macro-prudential assessment (MPA). In June 2018, the PBOC decided to include high-quality green loans as collaterals in the medium-term lending facility (MLF). As for monitoring and evaluation, in 2018, the PBOC refined the evaluation criteria for the green credit performance of banks[26] and expanded the scope for all banking financial institutions in China[27].

As the main regulatory bodies of the Chinese banking sector, both the PBOC and CBRC play crucial roles in regulating green credits. As the central bank responsible for financial stability, the PBOC has a leading role in developing incentives for green credits linked with MPA and monetary policies and in establishing a banking evaluation system for green credits. The CBRC is responsible for formulating the rules and regulations governing the banking and insurance sectors in China[28], including the regulations of green credits for banking institutions. Table 1.4 illustrates the main stakeholders and their responsibilities in green credit policies.

Table 1.4 Key Stakeholders in green credit policies

Type of stakeholders	Main Stakeholders	Roles and Responsibilities
Regulators	PBOC	Establishing green credit monitoring and evaluation systems, and designing MPA and monetary policies incorporated with green finance.
	CBRC	Establishing and supervising the green credit system for the banking sector.
Market Participants	Commercial	Providing green credit products for borrowers.

[26] *http://www.pbc.gov.cn/tiaofasi/144941/3581332/3730193/2018122910413376572.pdf*

[27] *PBOC is responsible for the performance evaluation of green credit for 24 major deposit financial institutions in the banking industry; and its Shanghai headquarters, branches, operation offices and branches in the capital cities of provinces are responsible for the performance evaluation of green credit for deposit financial institutions within its jurisdiction.*

[28] *CBIRC also conducts examinations and oversight of banks and insurers, collects and publishes statistics on the banking system, approves the establishment or expansion of banks, and resolves potential liquidity, solvency, or other problems that might emerge at individual banks.*

	Banks[29]	
Third-party participants	Assurance firms	Verifying banks' environmental and social risks.

Green Bonds

Since the first issuance of green bonds in 2015, China has become a key player in the global green bonds market and is currently one of the world's largest issuers[30]. Officially, the promulgation of three national regulatory documents on green bonds, namely Announcement on issues related to the issuance of green finance bonds (PBOC)(hereafter as Green Bond Notice 2015)[31], the Green Bond Issuance Guidelines (NDRC)[32], and Guiding Opinions on Supporting the Development of Green Bonds (CSRC), are the foundations for China's green bond market[33].

Among them, Green Bond Notice 2015 of PBOC is the first green bonds guidance in China. As the regulator of the inter-bank bond market, PBOC drafted this document for green financial bonds, with details on definitions, issuers' supervision, administration and disclosure requirements, and the eligibility criteria for green projects[34].

The Green Bond Issuance Guidelines from NDRC contained detailed requirements of issuance and key supporting areas for green enterprise bonds. It also streamlined the approval procedures and encouraged local governments to offer incentives.

After conducting pilot programs of green corporate bonds in the Shanghai and Shenzhen Stock Exchanges, the CSRC finally issued the official guiding opinions, Guiding Opinions on Supporting the Development of Green Bonds, which provided an overarching regulatory framework for green bonds trading through the stock exchanges. Shortly after the enforcement of CSRC's guiding opinions, the National Association of Financial Market

[29] *Commercial banks in China generally refer to state-controlled banks, joint-stock commercial banks, city commercial banks, rural commercial banks, rural cooperative banks, urban credit cooperatives, rural credit cooperatives, village banks and foreign funded banks.*

[30] *https://www.climatebonds.net/files/reports/china-sotm_cbi_ccdc_final_en260219.pdf*

[31] *http://www.gov.cn/xinwen/2015-12/22/content_5026636.htm*

[32] *https://www.ndrc.gov.cn/xxgk/zcfb/tz/201601/t20160108_963561.html*

[33] *http://www.csrc.gov.cn/pub/newsite/flb/flfg/bmgf/fx/gszj/201805/t20180515_338154.html*

[34] *Green Bond Endorsed Project Catalogue (2015)*

Institutional Investors (NAFMII) issued guidelines on the green note of non-financial enterprises[35]. A gradually enabling regulatory environment for green bonds has thus been created by these governmental bodies.

As summarized in table 1.5, different products are traded in different markets under different regulators. The PBOC and CSRC are the regulators of the inter-bank bond market and exchange-traded bond market, respectively. With the scale-up of China's green bond market, the need for professional services from third-party agencies is also increasing. To encourage these agencies' participation, in October 2017, the PBOC and the CSRC jointly issued the Guidelines for the Conduct of Assessment and Certification of Green Bonds[36], which standardized the qualification, business undertaking, contents of the evaluation and certification, and the management of the third-party certification firms.

Table 1.5 A summary of China's bond market structure

	Inter-Bank Bond Market	Exchange-Traded Bond Market
Major types of bond products traded	China treasury bonds, bonds issued by PBOC, policy bank bonds, financial bonds, enterprise bonds, commercial papers, medium term notes, local government bonds, and asset-backed securities	Treasury bonds, local government bonds, enterprise bonds, corporate bonds and convertible bonds
Key market participants	Commercial banks, insurance companies, mutual funds, security companies, foreign investors with Renminbi Qualified Institutional Investor (RQFII) status	Commercial banks, insurance companies, mutual funds, security companies, foreign investors with Qualified Institutional Investor (QFII) or RQFII status, corporations and individual investors
Regulators	PBOC	CSRC
Types of debt instruments commonly seen and the	• China treasury bonds: issued by Ministry of Finance • Central Bank Bonds: issued by PBOC • Policy bank bonds: issued by	• Treasury bonds: issued by Ministry of Finance • Local government bonds: issued by local provinces or cities

35 http://www.nafmii.org.cn/ggtz/gg/201703/t20170322_60431.html

36 http://www.csrc.gov.cn/pub/newsite/gszqjgb/gzdtgszj/201712/P020171225392695761548.pdf

issuers	China policy banks • Financial bonds: issued by commercial banks and other financial institutions • Non-financial credit bonds: issued by state-owned or state-held entities and corporates • Local government bonds: issued by local provinces or cities • Foreign bonds: issued by foreign entities	• Enterprise bonds: issued by government-related, state-owned or state-held entities • Corporate bonds: issued by listed companies • Convertible bonds: issued by listed companies

Source: China's Bond Market, CSOP Asset Management[37]

Environmental Information Disclosure

In the Guidelines (2016), the division of disclosure plan also has been made clear: China must establish a mandatory environmental information disclosure system for listed companies in three gradual steps: require disclosure for major emission companies (2017); require semi-mandatory disclosure for all listed companies (2018); and expand mandatory requirements to all listed companies (2020).

The implementation of this disclosure plan has been carried out as scheduled. In 2017, the MEE established the list of key polluting companies and required these companies and their subsidiaries to disclose their environmental information[38]. In the same year, the CSRC revised the disclosure requirements of annual reports and semi-annual reports for listed companies[39]. It requires listed companies on the list of key polluting units to disclose their environmental information and other listed companies to follow the principle of "comply or explain". In September 2018, the CSRC revised the Code of Corporate Governance for Listed Companies[40], which pointed out the listed companies should disclose corporate social responsibility (CSR) information, including environmental information. Furthermore, the mandatory requirements for all listed companies to disclose environmental information are estimated to come out by the end of 2020,

[37] http://www.csopasset.com/en/education/china_bond
[38] http://www.mee.gov.cn/gkml/hbb/bgt/201712/t20171201_427287.htm
[39] http://www.sse.com.cn/lawandrules/regulations/csrcannoun/c/4444089.pdf
[40] http://www.csrc.gov.cn/pub/csrc_en/laws/rfdm/DepartmentRules/201904/P020190415336431477120.pdf

signaling the initial establishment of a mandatory system. Table 1.6 summarizes the major stakeholders and their responsibilities in environmental information disclosure.

Table 1.6 Key Stakeholders in environmental information disclosure policies

Type of Stakeholders	Main Stakeholders	Roles and Responsibilities
Regulators	CSRC	Designing disclosure standards for listed companies.
	MEE	Establishing the list of key polluting companies and monitoring their environmental activities.
Market participants	Listed companies	Disclosing environmental information in public.
Third-party participants	Assurance firms	Verifying listed companies' financial and environmental (non-financial) information disclosure.

Green Funds

Based on government involvement, green funds can be classified into three types: government-backed green funds, PPP (Public-Private Partnership) green funds, and purely market-based green funds (including private green funds and public green funds). As emphasized in the previous section, government-backed green funds, now playing an active role in the capital market, have been vigorously developed by the Chinese government. In 2011, the State Council has issued guidelines to encourage the development of green industrial funds. Since then, several regional or industry-specific green funds have been set up by governments, such as the Eco-City Construction Fund of Tianjin and New Energy Industry Fund. In July 2020, supported by the Ministry of Finance, the Ministry of Ecology and Environment and Shanghai Municipality, China's National Green Development Fund was put into operation. The establishment of the fund, which aims to focus on key areas of green development along the Yangtze River Economic Belt, will inject new impetus into the country's ecological progress.

Regarding green PPP, as early as 2015, the Ministry of Finance, NDRC, and PBOC jointly promulgated guidance on promoting the PPP model in the field of public service[41], wherein environment protection and energy efficiency are parts of public service areas. In 2017, these three departments then issued a circular to regulate and promote asset securitization of PPP projects further[42]. For market-based green funds, in November 2018, the Asset Management Association of China (AMAC) formulated Green Investment Guidelines[43] to establish basic principles and standards for green investment methodologies, strategies, regulations, benchmarks, and evaluations. Nevertheless, the guidelines are merely voluntary for green investment practices. Table 1.7 presents significant stakeholders and their responsibilities in green fund policies.

Table 1.7 Key stakeholders in green fund policies

Type of stakeholders	Main Stakeholders	Roles and Responsibilities
Regulators	Ministry of Finance	Establishing and regulating the governmental green development fund system.
	NDRC	
Industrial association	Asset Management Association of China （AMAC）	Providing voluntary guidelines for green investments.
Governmental investors	Central and local governments	Establishing and operating central or local green development funds
Market investors	Institutional and non-institutional investors (e.g., asset managers)	Investing public or private green fund products.

Green Insurance

Under the narrow definition, green insurance refers to environmental pollution liability insurance (EPLI)[44]. Under the broad definition, there are also many innovations in green insurance, such as the public area environmental pollution cleanup expense insurance and green building

41 http://www.gov.cn/zhengce/content/2015-05/22/content_9797.htm
42 http://www.csrc.gov.cn/pub/newsite/gszqjgb/gzdtgszj/201706/t20170627_319194.html
43 http://www.amac.org.cn/industrydynamics/guoNeiJiaoLiuDongTai/jjhywhjs/esg/202001/P020200120441036297434.pdf
44 Environmental pollution liability insurance covers the economic compensation liabilities arising from the personal injuries, fatalities or property losses caused to third persons by corporate pollution incidents (PBOC&UNEP, 2015).

insurance discussed in the previous section. In the past decade, China's green insurance policies are primarily focused on EPLI. As early as 2007, China began to explore the establishment of a policy system for EPLI[45] and later launched pilot programs. More regulations have been enforced to improve this policy system and regulate pilot programs since then[46]. After years of effort, these pilot programs have made progress but remain in the initial stage of development with problems and challenges. These challenges include a lack of legal support at a national level, low cost of pollution violations due to weak law enforcement for infringement liabilities, inconsistent standards for indemnities for environmental pollution damages, and inadequate incentive mechanism for environmental pollution liability insurance. In this context, there was a need to develop a system of compulsory environmental pollution liability insurance (CEPLI).

Both the Overall Reform Plan for the Ecological Civilization Progress (2015) and the Guidelines (2016) stated the goal of establishing a CEPLI system. In 2018, the CIRC, together with the Ministry of Environmental Protection, passed the Compulsory Environmental Pollution Liability Insurance Regulation[47]. This regulation required any business to buy CEPLI if involved in industries contains major environmental risks as defined by the government. Otherwise, it would receive a penalty[48]. However, since that the Environmental Protection Law of the People's Republic of China stipulates that, "the State encourages participation in environment pollution liability insurance," the regulation still has limited enforceability until now. Table 1.8 presents some major stakeholders and their responsibilities in green insurance policies.

Table 1.8 Key stakeholders in green insurance policies

Type of stakeholders	Stakeholders	Roles and Responsibilities
Regulators	MEE	Regulating the green insurance

[45] *The document here refers to the Guiding Opinions on Environmental Pollution Liability Insurance, jointly promulgated by the former State Administration of Environmental Protection and the CIRC in 2007.*

[46] *For example, the Ministry of Environmental Protection and the CIRC jointly promulgated Guiding Opinions on Implementing the Pilot Programs of Compulsory Environmental Pollution Liability (MEP [2013] No.10 Document) in early 2013.*

[47] http://www.gov.cn/xinwen/2018-05/08/content_5289087.htm

[48] *The government will publish the names of these enterprises that fail to apply CEPLI after a certain period and penalize them with a fine of up to CNY 30,000.*

	CBIRC	system.
Market Participants	Insurance firms	Providing green insurance products

Environmental Rights Trading Market[49]

In 2011, the State Council issued the Work Plan for Controlling Greenhouse Gas Emissions during the 12th Five-Year Plan Period, which called for "exploring the establishment of a carbon emission trading market". In the same year, the NDRC agreed to carry out pilot schemes of emission trading markets in Guangdong and Hubei provinces and five cities (Beijing, Tianjin, Shanghai, Chongqing, and Shenzhen). These pilot schemes have similarities but vary in their approach to issues, such as the sector coverage, allowance allocation, price uncertainty and market stabilization, the potential market power of dominated players, offset usages, and enforcement and compliance (Zhang, 2015)50. After years of practice, the pilot carbon markets have accumulated some experiences in technology and capacity but also identified shortcomings, such as a lack of sufficient supporting mechanisms for pilot carbon trading systems, immature and inflexible carbon quota allocation schemes, and a lack of market liquidity and inadequate carbon pricing.

Based on the experiences and lessons learned from pilot programs, in December 2017, the NDRC issued Program for the Establishment of a National Carbon Emissions Trading Market (Power Generation Industry)51, signaling the completion of China's overall design of carbon market and the initiation of its national carbon emission trading system (ETS). The power generation industry became the ground zero of the national ETS. The NDRC also outlined a three-stage roadmap for the development of a national-level carbon market: stage one is a one-year preliminary consultation period for the development of laws and regulations on the management of the national

[49] *The environmental rights trading market refers to the carbon emission trading market in this report.*
[50] *Source: Zhongxiang Zhang (2015) Carbon emissions trading in China: the evolution from pilots to a nationwide scheme, Climate Policy, 15:sup1, S104-S126, DOI: 10.1080/14693062.2015.1096231*
[51] *https://www.ndrc.gov.cn/xxgk/zcfb/ghxwj/201712/t20171220_960930.html*

ETS[52]; stage two is a one-year simulated operation period; stage three is the period of perfection.

After the release of the roadmap, regulators accelerated the process to build the market infrastructure. For example, in April 2019, the MEE issued and conducted the public consultation[53] of "Measures for the Administration of Carbon Emission Trading,"[54] the first legislative document on ETS after the launch of China's national carbon market. Other regulatory documents in areas such as quota allocation and carbon accounting also gradually came into effect[55]. Table 1.9 summarizes major stakeholders and their responsibilities in China's ETS system.

Table 1.9 Key stakeholders in environmental rights trading market

Types of stakeholders	Main Stakeholders	Roles and Responsibilities
Regulators	Ministry of Ecology and Environment	Establishing the national carbon trading market system[56].
	Ministry of Finance	Regulating accounting standards for carbon trading.
Market participants	Enterprises with high environmental risks	Buying and selling permits and credits to emit carbon dioxide.
Third-party participants	Verification firms	Offer consulting and verifying services in the process of Measurement, Reporting and Verification (MRV).

[52] *In this stage, four supporting systems are planned to establish: the national carbon emission registration system, the national data reporting system, the national trading system and the national settlement system.*

[53] *The process of soliciting public opinions is a prerequisite for the State Council's relevant legislative procedure.*

[54] *http://www.mee.gov.cn/hdjl/yjzj/wqzj_1/201904/t20190403_698483.shtml*

[55] *For example, the MEE set the list of key pollutant-discharging units in the power generation industry and drafted trail quota allocation schemes for power generation industry in 2019. The Ministry of Finance issued the Notice of Issuing the Interim Provisions on the Accounting Treatment Regarding Carbon Emissions Right Trading to provide carbon accounting treatment guidelines in December 2019.*

[56] *The State Council transferred the major tasks of establishing the carbon trading market system from the NDRC to the MEE due to the restructuring of government departments in 2018.*

Besides the listed policies, regulators are still improving green finance policies in these mentioned aspects and exploring green finance within new areas. This report will continue to track new developments and trends of green financial policies and keep updated.

2. *National Taxonomies for Green Financial Assets*

2.1 Guidelines for Green Credits and Statistics

The earliest green banking policy in China was from 1995[57], however, the comprehensive development of green banking policy framework only started in 2012. Since then, green banking has grown rapidly in China, mostly thanks to its "top-down" approach. The key to this success is the banking regulator's all-round top-level plan, in which all key elements are included, from guidelines and classification standards, to statistics, performance evaluation, monitoring, and incentive policies.

In 2012, the CBRC issued "Guidelines on Green Credit" as a programmatic document for green banking. The "Guidelines on Green Credit," for the first time, proposed three key frameworks of green credit, namely environmental and social risk management, green financial products innovation, and environmental footprints of the banks. Meanwhile, the "Guidelines on Green Credit" divided the implementation scheme into five modules: organization and management, policy systems, capacity building, process management, internal control and information disclosure, and monitoring and supervision, giving clear and actionable requirements for banking institutions to follow.[58]

In 2017, Chen Yulu, Deputy Governor of the People's Bank of China, pointed out that to promote the development of green finance, it is needed to "increase the transparency of green financial market, strengthen information disclosure requirements, establish public environmental data platform, raise the green financial product standards, improve green rating and certification, and build environmental stress testing system, so as to break the bottleneck of green investment and financing caused by information asymmetry, effectively restrict polluting investment, and prevent 'green washing' risk."[59]

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[57] *PBOC, "Notification on Strengthening Environmental Protection in Credit Business", February 1995.* *http://www.pkulaw.cn/fulltext_form.aspx?Db=chl&Gid=057dbd5f63dfccb6bdfb&keyword=%E4%B8%AD%E5%9B%BD%E4%BA%BA%E6%B0%91%E9%93%B6%E8%A1%8C%E5%85%B3%E4%BA%8E%E8%B4%AF%E5%BD%BB%E4%BF%A1%E8%B4%B7%E6%94%BF%E7%AD%96%E4%B8%8E%E5%8A%A0%E5%BC%BA%E7%8E%AF%E5%A2%83%E4%BF%9D&EncodingName=&Search_Mode=accurate&Search_IsTitle=0*

[58] *YE Yanfei et al., Thoughts on Global Green Credit Development Trend[J]. China Banking. 2017(1): 26-28.*

[59] *GFC, Chen Yulu: five aspects to enhance the attractiveness of green financial market, April 2017,* *http://www.greenfinance.org.cn/displaynews.php?id=843*

In terms of green banking classification standards, the CBIRC and PBOC confirmed unified green credit standards in 2013 and 2018, that green credits would support the manufacturing loans for three strategic emerging industries (energy saving and environmental protection, new energy, and new energy automobile), and supported loans for 12 types of energy saving and environmental protection projects and services (Figure 2.1).[60] In 2019, after the issuance of "Guiding Catalogue of Green Industries (2019)" with seven ministries including the NDRC, the PBOC and CBIRC adjusted the green credit classification standards and issued consultation paper on revisions to their respective green credit statistical system to establish more scientific and dynamic credit classification standards

The CBIRC green credit taxonomy started from 2013 to promote energy saving and emissions reductions. The PBOC green credit started in 2018 to support the "Guidelines for Establishing the Green Financial System." The CBIRC green credit taxonomy requires 21 major commercial banks to report their green credit data every six months, and the statistical indicators mainly include green credit balance, change in balance, 5-categories loan classification (Normal, concerned, subprime, doubtful, loss), energy savings, and emissions reductions. The PBOC green credit taxonomy required major deposit-taking financial institutions to report their green credit data on a seasonal basis, and the statistical indicators focus on green loans, which are energy saving and environmental protection projects and services loan, and loans from enterprises with great environmental and safety risks.

Figure 2.1 China's Green Credit Taxonomy

[60] *CBRC, "Notification on Reporting Green Credit Statistics", July 2013.*

Source: China Banking and Insurance Regulatory Commission

The CBIRC provided environmental benefits calculation methods for various industries and corresponding calculation tools. The banks are required to calculate and report the environmental benefits for individual loans. On the PBOC side, the statistics department receives and analyzes the data and self-inspection report submitted by major banks, while local offices receive materials reported by corporate financial institutions in their jurisdictions. The data and reports are submitted quarterly, and the statistical indicators also consider loan usage, loan quality, and the industry of the loan. In the green finance pilot areas, the PBOC uses a credit management information system to identify and document green loan businesses, making the data and records traceable and verifiable, lowering green-washing risks with the help of Fintech.

Table 2.1 Environmental benefits of major banks in China

Reporting date	Volume of energy saving and emissions reduction (in tons)						
	standard ton of coal equivalent	CO2e	COD	NH3 - N	SO2	NOX	saved water
2017.6.30	215,095,946	490,563,965	2,834,517	267,643	4,645,253	3,131,057	715,006,525

Source: China Banking and Insurance Regulatory Commission

2.2 Catalogue of Green Bond Endorsed Projects

In December 2015, the Green Finance Committee (GFC) of China Society of Banking and Finance released the *Catalogue of Green Bond Endorsed Projects* (2015), which was then endorsed by the PBOC as the national taxonomy of green bond issued by financial firms. Shanghai and Shenzhen securities exchanges issued respective guidelines for corporate-issued green bonds in early 2016 by following the Green Bond Catalogue as well.

The Green Bond Catalogue accepted six eligible categories of green bonds, including: **Energy Saving, Pollution Prevention and Control, Resource Conservation and Recycling, Clean Transportation, Clean Energy, and Ecological Protection and Climate Change Adaption**.

The Green Bond Catalogue makes a number of important changes to the market, including:

1) Limit the proceeds of green financial bonds to green assets and projects;
2) Provide rules on proceeds allocation including ring-fencing, earmarking, and investments allowed before the allocation;
3) Require robust environmental information disclosure;
4) Encourage issuers to arrange an independent party to review or certify the bond in terms of its use of proceeds and environmental performance.

In May 2020, PBOC, CSRC and NDRC jointly published the updated Catalogue of Green Bond Endorsed Projects (2020)[61] (hereafter as Green Bond Catalogue (2020)) for public consultation. This updated Catalogue is based on the Green Industry Guidance Catalogue (2019) issued by NDRC.

[61] *China's top regulators announce they will exclude fossil fuels from their green bonds taxonomy, CIB, June 10, 2020. https://www.climatebonds.net/2020/06/chinas-top-regulators-announce-they-will-exclude-fossil-fuels-their-green-bonds-taxonomy-it*

The main update in the new taxonomy is the exclusion of coal and natural gas production and usage. It also adds hydrogen, sustainable agriculture, green consumer finance, green services and manufacturing among other environmentally conscious sectors. The updated taxonomy also harmonized all green bonds taxonomies in China, regardless of issuing entities.

2.3 Green Industry Guidance Catalogue

In March 2019, the Green Industry Guidance Catalogue[62] (hereafter as Catalogue 2019) was jointly issued by NDRC and other six ministries and commissions (Ministry of Industry and Information Technology, Ministry of Natural Resources, MEE, Ministry of Housing and Urban-Rural Development, PBOC, and National Energy Administration). NDRC was responsible for overall development planning and strategy setting and shall also be responsible for leading the planning for green economy.

The Catalogue (2019) aims to clarify the industry borders, so that the other six ministries and commissions can adjust current policies and incentives accordingly, and come up with investment, pricing, financial, and tax policies in their respective areas. The Catalogue (2019) will also help other 6 ministries and commissions design their own sub catalogues to further support green industry development. Meanwhile, the Catalogue (2019) calls on ministries and their local departments to exchange related working experiences with domestic and international peers, and promote mutual recognitions between the Catalogue (2019) and related international green standards.

The Catalogue (2019) identifies six categories as green industries and specifies industry segments for each category and serves as an important basis for subsequent policies for green development, including the convergence of other green taxonomies in China.

- Energy conservation and environmental protection
- Clean production
- Clean energy
- Eco-environment (3 second-level catalogues and 29 third-level catalogues),
- Green infrastructure and reconstruction, and
- Green services.

[62] *https://www.ndrc.gov.cn/fggz/hjyzy/stwmjs/201903/t20190305_1220625.html*

2.4 Harmonization of the standards

Harmonization of different standards and taxonomies has been under discussion both in China and internationally in the past few years. Domestically, prior to the introduction of the Green Bond Catalogue (2020), there had been two taxonomies for green bonds, including PBOC's Green Bond Catalogue (2015) and NDRC's Instructions for Issuing Green Bonds[63] from December 2015. Although most of the green bonds have been issued by financial institutions and listed companies who were following the PBOC's taxonomy, the market still needs a unified taxonomy for green bonds to reduce costs and enhance clarity. In the meantime, the taxonomy for green loans issued by CBIRC (formerly CBRC) in 2013 was also different from the green bond taxonomies, exacerbating the discrepancies in standards for green financial bonds.

In order to harmonize these different taxonomies issued by different regulators, the PBOC, CBIRC, CSRC, NDRC, and other relevant regulators and policy makers agreed to introduce the Green Industry Catalogue in March 2019 as an overarching catalogue that covers all green industries, activities, and products. However, this catalogue was not actually a taxonomy, but a comprehensive classification system that could work as the basis for future update and revisions of the existing green taxonomies that cover green credits and green bonds.

By the end of 2019, the PBOC and the CBIRC have incorporated the Catalogue (2019) into the revised taxonomy of green credits. The most recent update of the Green Bond Catalogue, issued in May 2020 for public consultation, also followed the Catalogue (2019). Once formally published, the taxonomies for green credits and green bonds in China will be harmonized.

In addition to the existing taxonomies and standards in China, there are some international taxonomies, or variations based on existing taxonomies. For example, some ASEAN countries adopted the GBP while altering a few elements to fit their local circumstances; Mongolia Sustainable Finance Association (MSFA) developed its national green taxonomy[64] with support from China; The EU has been working to develop a unified taxonomy for sustainable finance in the EU market, covering all financial products and

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[63] *http://fgw.beijing.gov.cn/zwxx_13613/zcfg/qtwj/201912/t20191223_1417228.htm*
[64] *https://www.ifc.org/wps/wcm/connect/fa534a1e-34a5-49ed-ac09-8fa8e143535f/EN+Framework.+Green+Taxonomy+Mongolia.pdf?MOD=AJPERES*

activities. The need for comparability and harmonization among these international taxonomies, especially between major markets like China and the EU, has been obvious in recent years to minimize green-washing or reputational risks while encouraging international green capital flow.

It is encouraging to see so many countries taking steps in developing local green bond markets, a pivotal step to mobilize private capital for green development. However, it is possible that too many definitions could be as problematic as too few. Differences and variations in green definitions and taxonomies would concern international investors, especially for cross-border green capital flows. It is important and necessary to compare and harmonize the different definitions and taxonomies.

The good news is that some major markets are already considering steps in this direction. For example, China and the EU established a working group under the IPSF to explore the possibility and pathway to compare and harmonize their taxonomies. Once completed, it would not only benefit market participants from China and the EU, but also bring assurance to other markets. Some open but smaller economies without all of the green industries can avoid developing a local green taxonomy by simply adopting the harmonized international taxonomy to minimize the costs of developing a taxonomy.

3. *Pilot Projects and Regulatory Policies for Green Finance*

3.1 Pilot Projects and Key Milestones for Green Finance

With the ambition to green the whole financial system and the experiences from introducing new policies through pilot projects, the Chinese government has taken steps to announce a few cities as the first batch of "Green Finance Pilot Zones". The main purpose is to explore the practical and replicable solutions that can help scale up green finance in a wider national market. Therefore, establishing pilot zones marks an important step toward the goal of building a robust green financial system.

3.1.1 First batch of green finance pilot zones in 2017

On June 14, 2017, the State Council launched pilot zones for green financial reform and innovation in eight cities in Zhejiang, Guangdong, Xinjiang, Guizhou, and Jiangxi provinces. The selection of cities for pilot zones considered geographical factors, stages of development, endowment for green development, and most importantly, willingness of local governments.

Soon after, the PBOC and other six ministries jointly issued the plan for implementation on June 23rd. The overall plan in the five provinces follow the same concepts, i.e. innovation, coordination, green, open, and shared development, as well as exploration of differentiated aspects and priorities of green finance with their respective characteristics.

Specifically, each pilot zone from the five provinces had the following characteristics:

- Zhejiang Province is the place where President Xi Jinping promoted the **concept of "clear waters and green mountains."** More importantly, it enjoys rich experiences in developing microfinance, inclusive finance in the past two decades. Huzhou and Quzhou are appointed as two green finance pilot zones in Zhejiang province that aim to improve water management and develop ecological and circular economy. With the mandate to **support transformation and upgrade industrial structures**, these two cities also seek to accelerate the reform and upgrade its long-established chemical industry through various green financial practice. Undoubtedly, among all green finance pilot zones, Huzhou city performed the best with fruitful outputs, with the construction a statistical system for green finance, an IT-based green financing platform, and a green finance evaluation standards and rating system applicable for green companies, projects, banks and services.

More impressively, as of Q1 2020, the green credit volume of Huzhou reached 18.75% of total financial credit issued by institutions in the city, above the national's average.

- In Guangdong Province, Guangzhou is a dynamic city with a complex economy and modern financial services. It was asked to explore a new development model, where green financial reform and economic growth coincide, with an enabling environment for green finance **to support advanced manufacturing and modern services**, **such as energy conservation, environmental protection, and new-energy vehicles.** Guangzhou has had a carbon trading platform dating back to 2012 and was appointed as a qualified Chinese Certified Emission Reduction (CCER) trading institution in 2013. Moreover, as Guangzhou is geographically close to Hong Kong and Macao, it is also given the task to develop green Fintech and green finance market in cooperation with HK and Macao capital markets.

- In Xinjiang region, Hami, Changji Prefectures and Karamay are important cities are at the center of the Silk and Road Economic Belt. They are encouraged to make the best of their comparative advantages in energy-related, high-end manufacturing and environment-related industries, and strengthen **financial support to clean energy and modern agriculture**. As of December 2019, the green credit volume reached an average 10.5% of total financial credit issued by institutions in Xinjiang region.

- In Guizhou Province, Gui'An New District has solid foundations for green industries, including superior natural environment and resources. Gui'An is to explore effective modes for green finance to support strategic new industries led by big data and promote the **integration of big data, the construction of ecological civilization,** and the development of green finance.

- Jiangxi Province is also one of the first national pilot zones for ecological civilization. Ganjiang New District is a state-level district with obvious geographical and ecologic resource advantages and has formed green industry clusters as an initial step. Ganjiang government is exploring ways for green finance to **support the development of ecological economy and green industry**.

Aside from the above-mentioned green finance pilot zones, a few other cities, such as Lanzhou in Gansu, Beijing, Shenzhen, Chongqing, and Suzhou, have also advocated for developing their local green financial markets.

Lanzhou from Gansu Province became an approved new green finance pilot zone at the end of December 2019. The local government attaches great importance on reforming and upgrading traditional industry and using various **green financial products to build the low-carbon circular economy.** Also, Lanzhou has also made a strategic partnership with the Industrial Bank for the next 5 years, focusing on supporting the development of green projects such as sponge city, water conservation and supply, and eco-tourism.

In 2019, Beijing Municipal government announced its plan to become the global sustainable research center, aiming to **build the international green and sustainable finance hub**. A crucial move in 2019, Beijing Environment Exchange became **China's first green assets exchange**, to attract domestic and international capital to participate in green assets trading, such as green bond, carbon permits, green asset-backed securities (ABS). In addition, as a deliverable for the 2019 UK-China Economic and Financial Dialogue, Beijing announced its plan to host the **Beijing-London Green Technology Innovation and Investment Center**. The key mandate of the center is to support a range of tech companies from China and the UK to facilitate green economy transition in both countries.

Shenzhen has also introduced a few policies and mechanisms to incentivize green development. In the last decade, Shenzhen has gained **rich experiences in emissions trading, as it consistently ranked first in market liquidity among the pilots**. Moreover, since China's State Council recently issued the Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area (GBA). **Green development with the aid of financial technology** is becoming a new trend. The Shenzhen Green Finance Committee is actively collaborating with Hong Kong and international partners to make efforts toward ecological conservation, green development, and sustainability main features in the plans for the GBA. Recently, Shenzhen's local government is attempting to legislate related laws and regulations to accelerate the development of green finance, in which is the first in the world.

Moreover, cities like Chongqing and Suzhou, although not candidates for pilot zones in the short term, have also sought to implement green and sustainable development.

3.1.2 Experiences gained for developing green finance in pilot zones

Since their formal launch in 2017, the pilot zones have been making progress on their main tasks as scheduled, and a number of replicable experiences have been gained and consolidated. The development of those green finance pilot zones basically follows the same model: first, having the consensus green finance development strategy at administrative level; second, using financial and non-financial incentives to encourage green financial product innovations.

Since the establishment of the green finance pilot zones, valuable experience can be categorized as the following:

1) **Consolidating infrastructure and institutional capacity is essential for developing green finance**, including human resources, capacity building, information system and etc. For example, to foster knowledge sharing and exchange among pilot zones, since July 2018, the PBOC has entrusted Huzhou Bank to lead and organize nine financial institutions from pilot zones to study and build green financial information management system. The main functions of the system include data analytics, environmental benefit measurement, off-site supervision, peer review, and information sharing.

2) **Innovative financial products and services are the most important in driving market-based sustainable development of green finance.** Among all progress that has been made in green finance, the issuance of green credit is a key indicator due to the importance role of banking in China's financial system. The following table is a demonstration on the scale of green loans. However, in the future, various financial innovation need to utilized to drive the development of green finance, such as green bonds, green ABS.

Table 3.1 Green credit volume in five pilots

Green Finance Pilots	Green Credit (As of Dec.2018)
Huzhou, Zhejiang Province	RMB 43 Billion (USD 60 Billion)
Quzhou, Zhejiang Province	RMB 59.66 Billion (USD 84.7 Billion)

Guangzhou, Guangdong Province	RMB 262.17 Billion (USD 370 Billion)
Ganjiang, Jiangxi Province	RMB 3.5 (USD 4.9 Billion)
Gui'an New Area, Guizhou Provicne	RMB 16.06 Billion (USD 2.27 Billion)
Xinjiang Region	RMB 34.3 Billion (USD 4.86 Billion)

Source: China Green Finance Progress Report, 2018

3) **Information platforms and self-regulatory mechanisms are the crucial to green rating and to avoid green-washing**; Public environmental information disclosure can help investors increase information transparency, minimize asymmetry, and facilitate transaction as a result. For example, Huzhou government's statistical system for green finance and IT-based green financing platform have proven to benefit financial institutions and public stakeholders by providing access to key information.

4) **Strong incentives and regulatory policies are needed to support the momentum of developing green finance**, including monetary, fiscal, and regulatory policies. For example, almost all pilot zones have introduced very strong incentive policies to support the innovation and reform of the green financial systems. In July 2018, Gui'An New District released "Policy Measures on Supporting the Development of Green Finance", allocating RMB 500 Million through green development special funds every year to support the development of green finance and the gathering of green industries[65]. To attract financial institutions, local government promised to provide up to RMB 20 Million to banks, securities companies, insurance companies, back-office service centers that settled in. To attract talents, senior green finance management members would enjoy 50% tax refund for 10 years. To encourage the development of green financial businesses, financial institutions would be granted by up to RMB 5 Million each year based on their performance in green credits, green bonds, green insurance, green funds, and other green financial products

5) **Selection of key areas for reform and innovation in green finance must consider local conditions**, like regional economic characteristics and local industrial development needs. For example, Guangdong used its geographic advantage and strengthened cooperation with Hong Kong

[65] *China Green Finance Progress Report (2018)*

and Macao in developing green finance. On July 4th, 2018, the Financial Work Bureau of Guangzhou Huadu District and the Hong Kong Quality Assurance Agency signed an MoU on green finance cooperation, through which they jointly released green project and green enterprise certification systems that met international standards and explored the formulation of a green financial development index.

3.1.3 Challenges ahead

Although significant progress has been made and valuable experiences gained from the pilot zones, the initiatives and local governments still face many challenges.

First, identify a clear mandate for each pilot zone. People need to better understand the mission of reform and innovation in pilot zones and encourage them to explore more deeply on how to innovate policies and systems to promote a sustainable growth model.

Second, require solid administrative foundation in facilitating green finance transactions. Supportive services and facilities for developing an operational and effective green financial market, such as green financial standards and information disclosure, must be strengthened.

Third, need a consensus among different governmental agencies. Efforts at implementation and policy levels among governmental agencies and market entities must to be better coordinated to collaboratively promote the in-depth development of green finance.

3.2 Regulatory and Incentive Policies for Green Finance

Regulatory incentives to some extend can overcome these challenges identified above and accelerate the progress of green finance development. With proper incentives in place, banks are more confident when administering green lending are project owners are willing to be more environmentally friendly. In the past decade, Chinese government and regulatory authorities have introduced a set of policies to regulate and incentivize banks and companies to support green projects.

Green policy incentives refer to the policies that are developed by public authorities (i.e. governments, central banks, financial regulators, and supervisors). These introduced policies will encourage capital allocation for green projects, and ultimately ensure environmental and climate sustainability. In this section, we further divided those policies into three categories, monetary policies, fiscal policies, and non-financial policies.

3.2.1 Monetary Policy

By definition, monetary policy in green finance refers to the changes in money supply made by the central bank to achieve macroeconomic goals that promote green and sustainable development. People's Bank of China (PBOC) is the central bank in China. It has been given three mandates: 1) plan and implement monetary policies; 2) ensure the overall stability of the financial system; and 3) provide financial services.

In China, the PBOC has played a leading and coordinating role among other governmental agencies to drive green finance development. In 2016, PBOC, together with other governmental agencies introduced ***"Guidelines for Establishing the Green Financial System",*** making China the world's first country to introduce an overarching green finance policy. Furthermore, PBOC also actively participate in international green finance cooperation. In the same year, during **China's Presidency in Hangzhou G20 Summit**, the topic on green finance was first raised in such a high-level international cooperation platform. Representatives from PBOC and Bank of England are selected as the **co-chairs for the G20 Green Finance Study Group**, and the research work continued for the subsequent two years in Germany and Argentina. In late 2017, the PBOC **joined the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) as one of eight founding members**. PBOC is chairing the first micro-prudential workstream, leading the charge on **drafting the world's most advanced environmental risk assessment (ERA)** for the world's financial institutions.

The PBOC's mandate is to ensure financial stability. As the banking sector makes up for about 91% of total underlying assets in China's financial system, to ensure the stable liquidity of banking sector is the key in achieving sustainable economic growth. China is a country with large population and huge energy demand. Fossil fuel is the predominate source of energy in China, with coal accounting for 70% of Chinese energy production. Most large-scale energy infrastructure projects are financed through bank loans. As climate policies strengthen and the public's climate awareness increase, investments in traditional energy sources is likely to gradually decrease at the global scale. Banks are likely to expose themselves to stranded assets and Non-Performing Loans (NPL) in the future it they continue to make high portions of lending to carbon-intensive projects.

In order to avoid systemic financial risks posed by climate change, PBOC has introduced a few monetary policy incentives to guide more capital flows into green projects in 4 aspects: re-lending facility, re-discounting facility, Macro-Prudential Assessment (MPA), and eligible collaterals range expansion.

Refinancing Facilities

Central Banks provide short-term liquidity to banks through open market operations. Re-financing tools include Repo financing, overnight loans, re-lending and re-discount facilities.

Globally, the PBOC is one of the pioneers in utilizing refinancing tools to drive green finance development. It encourages the use of **re-lending facility** to support small enterprise, agriculture firms, as well as green projects. For example, In July 2018, PBOC Changji branch issued its first green re-lending transaction in the Xinjiang region, with a total value of RMB 200 Million, to support projects that can reduce chemical fertilizer pollution and enhance land production efficiency.

On the other hand, **Re-discount Facility** also allows commercial banks to use green notes in exchange for loans from central banks when they act as the lender of last resort. For example, PBOC Karamay branch has made its first green re-discount transaction in June 2018. Green Notes make up about 35% of a totaled RMB 103 Million re-discount transactions.

Micro-Prudential Regulation

Micro-prudential regulation is mandated to ensure the stability of individual bank and its customers. As each financial institution is increasingly aware of the financial impacts stemming from environmental and climate issues, these issues may become a systemic risk if it not well mitigated in advance. Macro-prudential regulations aim to mitigate risks to the financial system as a whole. Accordingly, the PBOC decided to include green bonds and green credit loans into the Macro-prudential Assessment (MPA) system in 2016 and 2017[66]. Banks with high portion of green loans and issuance of green bonds get extra points and greater interest earnings as a result.

[66] *Sustainable Finance in Asia.*[*http://iigf.cufe.edu.cn/ueditor/php/upload/file/20190917/1568698155140132.pdf*](http://iigf.cufe.edu.cn/ueditor/php/upload/file/20190917/1568698155140132.pdf)

Expansion on the range of Green Collaterals

In 2018, the PBOC included qualified green loans and green bonds as eligible collaterals. Later, the PBOC further expanded the range of eligible collaterals to Medium-Term Lending Facility (MLF), Short-term Lending Facility (SLF), and Pledged Supplementary Lending (PSL)[67].

3.2.2 Fiscal Policy

In addition to the monetary incentives from the central bank, local governments have also provided a set of financial support for green project owners as well as green banks, including grants, subsidies, guarantee institutions, and government supported fund.

Grants

Grants are non-repayable funds disbursed or given by one party. They are a widely used approach for local governments to incentivize green enterprise. Grants have been instrumental in promoting green finance development. Using Huzhou as an example, green grants are allocated in two ways:1**) Enterprises are rewarded 1% of their actual financing amount by the government at the financing stage if they are recognized as green SME**. **2) A firm is rewarded up to RMB 500 Thousand if it has been selected as best practice in green finance**. **3) Corporate and insurance companies are subsidized if they are using green financial products**.

Interest subsidies

To encourage more companies to utilize green financial products in financing for and making investments in environmentally friendly products, governments at the local level can also provide interest subsides instead of delivering budget straight away. For example, Jiangsu government provided up to 30% of **interest subsidies for the non-financial corporations** who have successfully issued green bonds, with no singular bond exceeding the amount of RMB 2 Million each year. On the other hand, Huzhou government decided to provide **interest subsidies to the green banks directly**, banks that lend to green technology SME at a relative lower rate can be compensated by government at 1% interest rate.

Credit enhancement

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[67] *Sevil Acar, Erinc Yeldan ,(2019) ,Handbook of Green Economics*

Many green projects and involved companies are often perceived to have higher credit risk and lack qualified collaterals by financial institutions, hindering their access to capital as many of them are light in assets and might experience a longer time before having cash flows. In such cases, insurance and guarantee mechanisms are important to enhance credit ratings. A few local governments in China also introduced green credit enhancement mechanism to scale up green finance development. Huzhou government will cover up to 50%-70% premium for credit guarantee for the identified green entities.

Government-supported green fund

Compared with individual investment opportunities, a collective fund can benefit from a broader range of investment opportunities, greater management expertise, and lower fees. Green investment funds have the goal to meet investors' preferences in green projects. In China, government supported investment funds are playing an important role in its capital market. As of December 2018, government supported investment funds reached RMB 200 Billion68. Green projects are prioritized in governments' development agenda, and many local governments have established green industry investment funds. For example, Huzhou government committed to establish government industry fund to mobilize RMB 15 Billion from private sector to support green projects.

3.2.3 Non-financial incentives

Environmental Information Disclosure Guidelines

Adequate environmental information is needed to enable conscious decision making for stakeholders in the financial market. Regulators can play a vital role in environmental data sharing as they have the authority and credibility to acquire, summarize, and distribute data. In 2008, China launched the Green Securities Policy, the environmental disclosure regulation. An integral component of the policy, directs publicly traded Chinese companies in 14 highly polluting industries to report required environmental information. In the same year, the Shanghai and Shenzhen Stock Exchanges mandated certain listed companies to disclose ESG information starting in the fiscal year ending in December 2008. In 2018, China Securities Regulatory Commission (CSRC), in collaboration with China's Ministry of

[68] *China Green Finance Progress Report, 2018*

Environmental Protection, introduced new requirements that, by 2020, will mandate all listed companies and bond issuers to disclose environmental, social, and governance (ESG) risks associated with their operations. These policies function as guidelines to incentivize companies to more effectively disclose environmental information, facilitating investment transactions.

Efforts to Enhance Capacity

Although public awareness and willingness on developing green finance has increased a lot in the past few years, many stakeholders still lack sufficient capacity, mainly because most financial sector professionals are unfamiliar with the environmental risks and their applications to finance. Providing capacity building tools and trainings, green guidelines and standards can increase the feasibility of green finance in the market and should be convenient for stakeholders to apply in their practice. A few green finance capacity building programs have been initiated by academic institutions and consulting firms in the past few years, such as Global Green Finance Leadership Program (GFLP) and Syntao Green Finance. These capacity building programs largely provide an opportunity for government officials and financial professionals to understand green finance policies and the use of green financial products.

Table 3.2 Collection of most popular incentive policies

	Types of Incentives	**Examples**
Monetary Incentives	Re-lending	In July 2018, PBOC Changji branch issued green re-lending transaction with a total value of RMB 200 million
	Re-discounting	In June 2018, PBOC Karamay branch has made its first green notes re-discount transaction
	Macro-Prudential Assessment (MPA)	Green bond and green credit loans are written into the Macro-prudential Assessment (MPA) system in 2016 and 2017 respectively
	Expansion on collaterals	In 2018, the PBOC included qualified green loans and green bonds as eligible collaterals
Fiscal Incentives	Grants	Green SME in Huzhou can get 1% of its actual financing amount from the government
	Interest subsidies	Jiangsu government will cover up to 30% of interest subsidies for the non-financial corporates

		Huzhou government decided to provide interest subsidies to the green banks at 1% interest rate.
	Credit enhancement	Huzhou government can cover up to 50%-70% insurance fee
	Government-supported green fund	Huzhou government committed to establish a RMB 15Billion government industry fund
Non-Financial Incentives	Environmental Information Disclosure Guidelines	*Green Securities Policy* (2008) Shanghai Stock Exchange and Shenzhen Stock Exchange (2008) ESG disclosure requirments (2018) from CSRC and MEE
	Capacity Building	Green Finance Leadership Program (GFLP)

Source: GFLP, Synto Green Finance, 2019

4. International Initiatives and Collaboration

China has actively participated or even taken the lead in many global initiatives on green finance in recent years. Its strong presence of national, sub-national, and institutional players enables China to learn from world-leading practices and share the perspectives of a developing country that faces critical environmental and developmental challenges.

China led the creation of the G20 Green Finance Study Group and was the one of founding members of the Central Bank and Supervisor's Network for Greening the Financial System. China has incorporated green finance into bilateral economic cooperation as well as the Belt and Road Initiative.

4.1 Co-chairing the G20 Green Finance Study Group

In 2016, China initiated the Green Finance Study Group (GFSG) during its G20 Presidency. The group was co-chaired by the central banks of China and the UK, featuring green finance in the G20 agenda for the first time. The group sustained through 2017 and 2018, under the presidency of Germany and Argentina, while co-chaired by China and the UK.

In its first year, the GFSG took the stock of existing green financial tools, identified market and institutional barriers for the development of green finance, and proposed seven options for member countries to consider on voluntary basis, which covered green credits, green bonds, institutional investors, risk analysis, and measurement of progress. These recommendations were welcomed by G20 leaders at the Hangzhou Summit in September 2016 and written into a series of official documents, bringing green finance to wider international attention.

The momentum continued in the following two years under Germany and Argentina's G20 Presidencies. The topics in 2017 included Environmental Risk Analysis (ERA) and Publicly Available Environmental Data (PAED) that supports such risk analysis and informs decision-making. In 2018, the GFSG was renamed as Sustainable Finance Study Group (SFSG) to adhere to the framework of SDGs and put forward three main recommendations for the financial sector: creating sustainable assets for the capital market, developing sustainable PE/VC, and applying digital technology to sustainable finance[69].

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[69] *UNEP Inquiry. (2018). https://unepinquiry.org/g20greenfinancerepositoryeng/*

4.2 Participating in the NGFS as a Founding Member

The G20 GFSG is an important milestone for China's continuous engagement in the global dialogue. In December 2017, eight central banks and regulators, including the PBC, collectively formed the Network for Greening the Financial System (NGFS), a volunteer international coalition dedicated to enhancing the role of the financial system to manage risks and mobilizing capital for green and low-carbon investments for environmentally sustainable development[70]. As of May 2020, the NGFS has expanded to 66 members and 12 observers from 5 continents.

In April 2019, the NGFS published its first comprehensive report, underlining that climate- and environment-related risks can be sources of financial risk, and a strong consensus among members has been formed around the understanding. Some of them, such as the De Nederlandsche Bank and the Bank of England, have already started analyses on such risks and their impact on the financial system.

China is gradually catching up, with the PBOC increasingly emphasizing this issue. In December 2019, the Deputy Governor of the PBOC, Chen Yulu, announced in a public speech[71] at the Annual Meeting of the China Society for Finance and Banking that the PBC would focus on three issues in this area: "(1) the heterogeneous effects of climate change on the segments of the financial industry and respective policy responses; (2) the impact of climate change on micro and macro-prudential regulations and their transmission mechanism; (3) the feasibility and pathway of incorporating climate change factors into our two-pillar macro-management framework underpinned by monetary policy and macro-prudential policy." In May 2020, the PBC released a working paper that reviews the risks and their transmission mechanisms within the financial system and called for comprehensive tools to assess, manage, and regulate them.

Meanwhile, three workstreams have been launched under the NGFS to facilitate research and knowledge sharing on managing environmental risks, as well as scaling up green finance at the national level.

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[70] *Network for Greening the Financial System. (2020). https://www.banque-france.fr/en/financial-stability/international-role/network-greening-financial-system*

[71] *An unofficial transcript in English can be found at http://gflp.org.cn/index/index/newsdetail/id/47.html.*

Dr. Ma Jun, representing PBOC, chaired the Supervision Workstream, to enable central banks and supervisors to better understand and manage the environmental and climate-related financial risks. A collection of methodologies and tools for environmental risk analysis by financial firms is forthcoming in 2020. Chinese financial firms had contributed their experiences to the collection while learning from their international peers.

4.3 Greening Investments in the Belt and Road

China is not only looking at its domestic investments and market, but also making efforts to green the investments in other emerging economies, particularly in the Belt and Road region.

Launched in 2013, the BRI aims to improve the connectivity and foster trade and investment among countries along the Belt and Road. China has also incorporated a green perspective into the BRI and called for green investments, to promote green development in the region.

In November 2018, the China Green Finance Committee, in collaboration with the City of London, launched a set of voluntary principles named the *Green Investment Principles for the Belt and Road (GIP)*, for financial institutions and companies investing and operating in the region. The GIP aimed to incorporate low-carbon and sustainable development into the BRI by encouraging financial institutions and corporations involved and invested in B&R projects to sign up to a voluntary code of practice.

As a project first proposed in the 9th China-UK Economic and Financial Dialogue, the GIP was drafted by a group of organizations, including the Belt and Road Bankers Roundtable, IFC, PRI, Paulson Institute, and the World Economic Forum. The GIP includes seven principles at three different levels: strategy, operations, and innovation. It calls for top-down implementation of the incorporated strategy, communication among stakeholders, utilization of green financial instruments, and green supply chain practices, as well as knowledge sharing and capacity building.

Principles 1 and 2 are designed to encourage signatories to incorporate sustainability and ESG factors into corporate strategies and management systems, aiming to call for a top-down implementation process. Principles 3 and 4 focus on communication with stakeholders at the operational level. Specific measures that signatories could take to contain environmental and social risks include environmental risk analysis, information sharing, and conflict resolution mechanism. Principles 5 to 7 are set to encourage signatories to utilize cutting-edge green financial instruments and green supply chain practices, and to improve organizational capacity through knowledge sharing and collective actions.

On April 25, 2019, the GIP inaugural signing ceremony was held in Beijing as part of the Second Belt and Road Forum. As one of the forum's most important deliverables, GIP was referred to by Chinese President Xi Jinping in his keynote speech as an action point for green development in the BRI region.

As of May 2020, 37 global institutions from 14 countries and regions[72] have signed up to the GIP, including some of the largest banks in China and the world. These institutions have committed to incorporating sustainability and ESG factors into their management systems, strengthening stakeholder communication on environmental and climate risk information, and utilizing green financial instruments. Furthermore, accounting firms (the "Big Four"), financial service providers (Refinitiv), and non-governmental organizations have voiced their support for the GIP. The GIP have established thematic working groups to develop tools and methodologies for implementation, specifically on environmental risk analysis, information disclosure, and green product innovation.

4.4 Bilateral and Multilateral Cooperation

In addition to the GIP, China and the UK have fostered bilateral cooperation on information disclosure, ESG investing, and green tech incubator, under the framework of the China-UK Economic and Financial Dialogue[73]. In terms of information disclosure, a joint group was formed by Chinese and UK market players to pilot the recommendations of the Taskforce on Climate-related Financial Disclosure (TCFD). As of 2019, 13 institutions, including banks, asset managers, and insurance companies, have joined the group. In June 2019, the London-Beijing Green Technology Investment Gateway was launched in Beijing, to create an investment platform that introduces UK technology developers to emerging markets like China.

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[72] *A list of GIP members can be found at* *http://gipbr.net/Membership.aspx?type=12&m=2*

[73] *UK Government. "UK-China 10th Economic and Financial Dialogue: policy outcomes". https://www.gov.uk/government/publications/uk-china-10th-economic-and-financial-dialogue-policy-outcomes*

China and France also worked together on green finance under the China-France High-Level Economic and Financial Dialogue. The China Green Finance Committee and Finance for Tomorrow have hosted two joint meetings between 2018-2019[74], they touched upon a wide array of topics including adjustment of risk weights, harmonization of standards, etc.

In October 2019, the PBC joined the International Platform for Sustainable Finance (IPSF), an inter-governmental platform for cooperation on green and sustainable finance, together with authorities from the EU, Argentina, Chile, Canada, India, Morocco, and Kenya.

4.5 Capacity Building for Green Finance

With the mainstreaming of green finance, an increasing number of countries have endorsed green finance or at least began to consider it as an effective market-based tool to mobilize private capital for environmental and climate issues, deliver their NDCs, and realize sustainable growth. But not every one of them can do it entirely on their own, due to capacity concerns, and thus the demand for capacity building rose.

Acknowledging such huge demand, China has put great efforts into facilitating knowledge exchange through engaging in capacity-building events for the abovementioned initiatives and platforms, as well as many others, with the hope that by sharing the experiences, countries will bring about new insights into this issue.

One of the platforms is the Green Finance Leadership Program (GFLP), launched by Tsinghua University with the China Council for International Cooperation on Environment and Development (CCICED) and the IFC-supported Sustainable Banking Network (SBN) in 2018[75]. It invites global experts and representatives to share their expertise and experience in a seminar setting with a regional focus, where participants can have in-depth discussions with both the speakers and other guests.

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[74] *Official press releases can be found at https://financefortomorrow.com/en/actualites/china-france-green-finance-joint-conference/ and http://greenfinance.xinhua08.com/a/20191130/1900386.shtml?ulu-rcmd=0_comdf_rfill_5_cf3c615349644cb89a9ae7e9ca5bcea5 (in Chinese).*

[75] *Official press release for the inaugural event of the GFLP can be found at http://gflp.org.cn/index/index/newsdetail/id/12.html .*

As of September 2019, the GFLP has successfully held four events in China, Morocco, and Kazakhstan, with more than 600 participants from 60 countries and regions, including policy-makers, regulators, and practitioners from both the public and private sectors. In 2020, due to the COVID-19 pandemic, webinar became the major form of capacity building for GFLP. The first of its series, on information disclosure, has attracted over 2,000 participants from all over the world. More are forthcoming in the second half of the year.

5. Lessons and Outlook

China has outpaced many developing countries in building a green financial system. The rapid progress, though somewhat unique in a country context, can be attributed to five main factors: political consensus, top-down approach, proper division of labor, defined roles for market players, and regional innovation.

5.1 Lessons for mainstreaming green finance

First, China started its green finance agenda by building a political consensus. In many countries, green finance is promoted by one particular arm of the government or an industry body, such as a central bank, a financial regulator, an association, or an NGO. China backed green finance with a political push from the very top. In 2014, a 14-action roadmap for developing the green finance system was endorsed by the Central Leading Group for Financial and Economic Affairs. Most of these 14 actions were also included into the "Integrated Reform Plan for Promoting Ecological Progress" issued by the CPC Central Committee and the State Council, the highest decision-making body in China. The political backing of China's President and Premier carried enormous weight in mobilizing policies and resources and facilitating inter-departmental consensus on green finance.

Second, China's approach to designing the green financial system was top-down and not purely market-led. Successful development of green finance requires essential ingredients including:

- Green taxonomies and definition of green activities
- Environmental information disclosure by corporations and financial institutions
- Rules and standards for green finance products
- Incentives for corporations and financial institutions

Due to the many deficiencies of the market, such as its inability to account for environmental externalities, asymmetrical access to information, and market participants' lack of analytical capacities, the market, and the private sector are often unable to effectively organize or produce those essential ingredients, certainly not in a short period of time. For example, if developing green taxonomy is left to the market, financial institutions may produce many competing versions without a common language. Indeed, the lack of such a common language has constrained the development of green finance in many markets. Recognizing the need for the government or regulator to address the market's deficiencies, China took the top-down approach – its Guidelines on Establishing a Green Financial System (2016) spelled out 35 actions on how these ingredients should be developed and coordinated.

Third, coordination among key ministries, the division of labor and an implementation timetable are keys to success. China recognized at the policy-design stage that green finance was not merely the responsibility of the central bank or a financial regulator. Rather, it requires policy support and resources from many other government agencies and regulators, including fiscal support, environmental regulation, and industrial policies. That is why seven ministries, namely the PBOC, the Ministry of Finance, the National Development and Reform Commission, the Ministry of Environmental Protection (now Ministry of Ecology and Environment), the CSRC, the China Banking Regulatory Commission, and the China Insurance Regulatory Commission (now collectively known as China Banking and Insurance Regulatory Commission), jointly developed the green finance guidelines in 2016. More importantly, to ensure the policy documents receive more than just cursory note or lip service, these guidelines were followed by a policy document on "Division of Labor (DOL) for Implementing the Guidelines." This DOL laid out the specific tasks for each of the seven ministries and deadlines for delivering the several dozen specific policy actions promised in the guidelines. Due in part to this DOL, the implementation of the green finance guidelines has been one of the most effective undertaking compared to other policies.

Fourth, China defined roles of industrial bodies such as national and local Green Finance Committees. In 2015, the PBOC launched the Green Finance Committee of China Society for Finance and Banking. The GFC, with 240 financial institutions, environment-related companies, and research bodies as members, quickly became the main disseminator of green finance knowledge, the organizer of green finance product innovation, the key source of policy recommendations, and the coordinator for capacity-building and international collaboration. Each year, the GFC Annual Meeting recognizes nearly 20 innovations in green finance research, products or tools. The WeChat news portal maintained by GFC, with daily publications, is now the most important information platform for green finance policies, product innovations, and business opportunities. At the local level, about 20 regional GFCs play similar roles promoting green finance market development.

Fifth, China encourages regional innovation in green finance. Since China's economy has vast regional differences, it is imperative to encourage local players to innovate in their approaches accordingly. In June 2017, the State Council approved pilot programs on green finance reform and innovation in five provinces and eight cities. In the last two years, many valuable experiences and innovations were identified. For example, Huzhou, one of the pilot cities, launched a Green Credit Online Service Platform providing instant e-matching of green projects with green funds from banks (including over 100 green credit products) and investors. The PBOC organizes annual meetings of these pilot cities, summarizes the best practices and promotes them throughout the country.

In conclusion, green finance aims to use financial resources to address the market's salient failure to account for environmental and climate externalities in today's economy. The development of the green financial system itself can also be hindered by the limitations of the market. For example, the taxonomies, product guidelines, and disclosure requirements for green finance are largely public goods, and the technical capacities for analyzing environmental and climate risks are also semi-public goods in nature. These features of the green financial system imply that governments and regulators must take a proactive role in leading the design of the system and mobilize resources to develop the green finance market. A bottom-up approach with the government "hands-off", until recently preferred in many countries, may ultimately work as the private sector gains more environmental awareness and willingness to assume responsibilities.

5.2 Future priorities for scaling up green finance

Despite the notable progress that China has made in the past few years, the green finance capacity within its financial system remains grossly insufficient to meet the huge demand for green and low-carbon investment. According to a recent study we conducted for Chongqing, a provincial-level region with a population of 30 Million, its demand for green and low-carbon investment requires RMB 300 Billion per year. Applying this estimate to the entire country will mean that China needs to invest at least RMB 10 Trillion annually in green and low-carbon projects, three times the green finance demand that was estimated five years ago. China needs to, and will very likely, take more aggressive measures to further promote green finance in the following areas:

First, greening institutional investors. Many institutional investors have yet to develop strong preferences for green investments for the lack of both awareness and capacity. Regulators, research institutions, NGOs, and institutional investors should work together to raise the awareness of the benefits of ESG investing, encourage ESG disclosure on investments, develop ESG products, and educate investors.

Second, mainstreaming environmental risk analysis. The NGFS is planning to publish a handbook (with a collection of methodologies) to promote the use of Environmental Risk Analysis (ERA) by financial institutions. China should make full use of these technical resources and local research capacities to enable banks, asset managers and insurance companies to conduct stress tests and scenario analysis. The Chinese central bank and financial regulators, as well as the green finance committee, could play a key role in mainstreaming the ERA.

Third, introducing stronger incentives for green finance. Chinese regulators could encourage large Chinese banks, which are authorized to use internal risk models, to learn from Natixis' experience in introducing differentiated risk weights for green and brown assets (lower for green and higher for brown assets) without altering the overall regulatory risk weights. Once a few banks' pilot programs are proven successful and data issues are largely resolved, this practice could be applied to the rest of the Chinese banking system.

Fourth, greening investments under the Belt & Road Initiative. Since its formal launch in 2018, the GIP's working groups have been taking specific actions to promote environmental impact assessment tools, disclosure mechanisms, and innovative green finance products. Further, we suggest the Chinese authorities to consider setting up a "green light system" for outbound investments, such as introducing a mandatory requirement for environmental impact assessment for overseas investments.

Fifth, promoting the harmonization of green finance standards in China and Europe. Both China and the EU have developed their green or sustainable finance taxonomies, and the world's green finance community is concerned about the transaction costs and risks of greenwashing associated with a proliferation of inconsistent and incompatible taxonomies. Many smaller markets are mulling whether to develop their own taxonomies. We believe that China and the EU should take the lead in exploring ways to harmonize their taxonomies, initially for facilitating cross-board green capital flows. In the longer run, such collaboration may also serve as the basis for developing harmonized global standards.

Sixth, supporting green finance innovation across multiple sectors. In the past, most green finance activities took place in sectors such as renewable energy, waste treatment, and green transportation involving typically large banks and project owners. The vast potential of greening SMEs, consumption, agriculture, and buildings haven't been tapped into. Regulators, financial institutions, research bodies and NGOs should devote more resources to innovating green products in these areas. In particular, the application of digital technologies to labeling and verifying green consumer goods, green SMEs and sustainable agricultural products may significantly reduce the costs of offering green finance services and rapidly expand the market.

Annex 1: The Framework of the Chinese Green Financial System[76]

Priority Area	Provisions under the 2016 Guidelines
The Importance of Establishing the Green Financial System	1. Green finance refers to financial services provided for economic activities that are supportive of environment improvement, climate change mitigation and more efficient resource utilization. 2. The green financial system refers to the institutional arrangement that utilizes financial instruments such as green credit, green bonds, green stock indices and related products, green development funds, green insurance, and carbon finance, as well as relevant policy incentives to support the green transformation of the economy 3. The main purpose of establishing the green financial system is to mobilize and incentivize more social (private) capital to invest in green industries, and to more effectively control investments in polluting projects 4. The establishment of the green financial system requires the internalization of environmental externalities by appropriate incentives and restraints with the support of policies, laws and regulations in the financial, fiscal and environmental areas
Vigorously Develop Green Lending	5. Establish a policy framework to support green lending 6. Promote self-regulatory organizations in banking industry to gradually establish a green banking evaluation mechanism 7. Promote securitization of green loans 8. Explore ways to introduce lenders' environmental legal liability 9. Support and guide banks and other financial institutions to establish a credit management system that conforms to the characteristics of green enterprises and projects 10. Support banks and other financial institutions to treat environmental and social risks as important drivers in their stress tests for credit risks, and incorporate these test results into asset allocation and international pricing 11. Incorporate the enterprise environmental information including environmental violations into the financial credit information database
Enhance the Role of the Securities Market in Supporting Green Investment	12. Improve the rules and regulations for green bonds and unify the green bond definitions 13. Take measures to reduce the financing cost of green bonds 14. Explore ways to formulate standards for third party verification of green bonds and green credit rating 15. Actively support the qualified green enterprises to obtain financing via initial public offerings and secondary offerings 16. Support the development of green bond indices, green equity

[76] *http://usa.chinadaily.com.cn/business/2016-09/04/content_26692956.htm*

	indices and related products 17. Gradually establish and improve the mandatory environmental information disclosure system for listed enterprises and bond issuers 18. Guide institutional investors to invest in green assets
Launch Green Development Funds and Mobilize Social Capital through PPP	19. Support the establishment of all kinds of green development funds and their market-based operations 20. Local governments could support the projects invested by green development funds 21. Support the introduction of the PPP model in the green industry, encourage the bundling of energy saving and emission reduction projects, environment protection projects and other green projects with related higher-return projects, and establish a green service charge mechanism for projects with a "public goods" nature
Develop Green Insurance	22. Establish a compulsory environmental pollution liability insurance system in areas of high environmental risks 23. Encourage and support insurance institutions to innovate green insurance products and services 24. Encourage and support insurance institutions to participate in the development of the environmental risk control system
Improve Environmental Rights Trading Market and Develop Related Financing Instruments	25. Develop different kinds of carbon finance products 26. Promote the establishment of markets for pollutant emission rights, energy use rights, water rights and other environmental rights 27. Develop financing instruments based on carbon emission rights, pollutant emission rights, energy use rights, water rights and other environmental rights, with a view to expanding the green financing channels for enterprises
Support Local Government Initiatives to Develop Green Finance	28. Explore supportive measures to promote green finance at local level
Promote International Cooperation in Green Finance	29. Expand the scope of international cooperation in green finance 30. Promote the progressive, two-way opening of the green securities market 31. Enhance the "greenness" of China's outward investment
Prevent Financial Risks and Strengthen Implementation	32. Improve the supervision mechanism to prevent risks related to green finance 33. Government agencies should coordinate and join force in promoting the development of green finance 34. Each region should, taking into account local circumstances and priorities, actively promote the development of green finance 35. Intensify public communications on green finance

Annex 2: Supporting polices to Green Finance[77]

Priority Area	Supporting measures / policies / requirements / initiatives

Green Lending	(I) Micro-prudential policy
	• 1995, PBOC - *Notice on issues related to the implementation of credit policies and strengthening environmental protection*
	• 2007, CBRC – *Guiding Opinion on Credit for Energy Saving and Emission Reduction: Limit financing to high pollution and high energy consumption projects.*
	• 2012, CBRC – *Green Credit Guidelines*
	    o Defining three pillars of banking financial institutions in developing green loans. First, green loans were promoted from a strategic perspective to increase the support for green, low-carbon and circular economy. Second, emphasize shall be paid to the prevention of environmental and social risks. Third, banks shall improve their own environmental and social performance.
	    o For the first time, requirement on management of environment and social risks for Chinese banks operating overseas has been addressed in Article 21.
	• 2013, CBRC – *Green Credit Statistics System*
	    o Separating green loans into two categories. First, loans to support the manufacturing end of three strategic emerging industries. Second, loans to support energy conservation and environmental protection-related projects and services.
	• 11 Jul. 2018, PBOC - *Notice on launching green credit performance evaluation scheme for banking depository financial institutions* and *Green credit performance evaluation scheme for banking depository financial institutions*
	(II) Macro-prudential policies
	• Q3 2017, PBOC - *Evaluation Program of Green Loans Performance for Deposit-taking Financial Institutions (Draft)*
	• 2017, PBOC - established a special statistical scheme for green loans, requiring banking institutions to submit quarterly green loans statistics since 2018

Green Bond policies	(I) Issuance management
	1. Green finance bond
	    • 22 Dec. 2015, PBOC – *Announcement on issues related to the issuance of green finance bonds*
	    • 22 Dec. 2015, PBOC – *Green Bond Endorsed Projects Catalogue*
	2. Green enterprise bond

[77] Consolidated content from *China Green Finance Progress Report 2017* and *China Green Finance Progress Report 2018*

	• Dec. 2015, NDRC – *Green Bond Issuance Guidelines* 3. Green corporate bond • Mar. 2016, CSRC instructed Shanghai Stock Exchange – *Notice of Launching the Pilot Zone of Developing Green Corporate Bond (The supported project catalogue is the same to the Catalogue issued by the PBOC on 22 Dec. 2015)* • Mar. 2016, CSRC instructed Shenzhen Stock Exchange – *Notice of Launching the Pilot Zone of Developing Green Corporate Bond (The supported project catalogue is the same to the Catalogue issued by the PBOC on 22 Dec. 2015)* • Mar. 2017, CSRC - *Guidance on Supporting the Development of Green Bonds* 4. Green debt financing tools for non-financial enterprises • Mar. 2017, NAMFII – *Operational Guidelines for Green Debt Financing Tools of Non-financing Enterprises* 5. Green asset-backed securities • Apr. 2018, Shanghai Stock Exchange – *Vision and Action Plan to Serve Green Development and Promote Green Finance (2018-2020)* (II) Green bond assessment and certification • Dec. 2017, PBOC and CSRC – *Guidelines on Green Bond Assessment and Certification (Interim)*
Green funds and green PPP	(I) Green funds (II) Green PPP • 2015, MOF, NDRC, PBOC – *Circular on the Guidance of Promoting PPP Model in the Field of Public Service* • Jun. 2017, MOF, NDRC, PBOC - *Circular on Issues Related to Asset Securitization of PPP Projects*
Green insurance	(I) Environmental pollution liability insurance • 2007, MEE, CBRC - *Guidance on Environmental Pollution Liability Insurance* • 2013, MEE, CBRC - *Guidance on Pilot Work of Compulsory Liability Insurance for Environmental Pollution* • Jan. 2015, new Environmental Protection Law o "The state encourages the insurance against environmental pollution liability" • Apr. 2015, CPC Central Committee and the State Council - *Opinions to Accelerate the Construction of Ecological Civilization* o "Deepen the pilot work of environmental pollution liability insurance" • Sept. 2015, CPC Central Committee and the State Council - *Overall Reform Plan for the Ecological Civilization System* o put forward to establish the compulsory liability insurance system for environmental pollution in high-risk areas, and defined compulsory environmental pollution liability insurance

<table>
<tr><td></td><td>system as an important reform task
2016, MEE, CIRC – Measures for the Administration of Compulsory Liability Insurance for Environmental Pollution (Draft)
Dec. 2017, the General Office of the CPC Central Committee and the General Office of the State Council - Program of the Ecological Environmental Damage Compensation System
Jun. 2018, the CPC Central Committee and the State Council - Opinions on Comprehensively Strengthening Ecological Environment Protection and Resolutely Fighting the Pollution Prevention and Control
“Promote the development of environmental pollution liability insurance and establish an environmental pollution compulsory liability insurance system in high-risk areas”
Aug. 2018, MEE - Guiding Opinions on Further Deepening the "Release Management" Reform in the Field of Ecological Environment and Promoting High-Quality Economic Development
Dec. 2018, the General Office of the State Council - Pilot Work Plan for "Wasteless City" Construction
(II) Catastrophe insurance
May 2017, MOF – Measures for the Administration of Special Reserves for Earthquake Catastrophic Insurance for Urban and Rural Residence</td></tr>
<tr><td>Green factor market</td><td>29 Dec. 2017, NDRC – National Carbon Emission Trading Market Construction Plan (Power Generation Industry)
5 Jan. 2018, PBOC - Circular on Further Improving RMB Cross-border Business Policy to Promote Trade and Investment</td></tr>
<tr><td>Regional Green Finance Reform and Innovation Pilot Zones</td><td>14 Jun. 2017, the 176th executive meeting of the State Council - decided to launch pilot zones for green financial reform and innovation in five provinces (regions), i.e. Zhejiang, Guangdong, Xinjiang, Guizhou and Jiangxi
23 Jun. 2017, PBOC and other seven ministries - Overall plan for constructing green financial reform and innovation zones
The main green financial policy documents in the pilot area[78]
<table><tr><th>Region</th><th>Policy Document</th></tr><tr><td>Zhejiang</td><td>Implementation Opinions on Promoting Development of Green Finance in the Province
Huzhou Credit Policy Support Refinance Support Green Credit Management Measures</td></tr><tr><td>Jiangxi</td><td>Jiangxi Province's "Thirteenth Five-Year" Plan for Building a Green Financial System
Implementation Opinions of Jiangxi Provincial People's Government on Accelerating the Development of Green Finance</td></tr></table></td></tr>
</table>

[78] *Translated by Google Translate*

		• *Detailed Implementation Rules for the Construction of Green Finance Reform and Innovation Pilot Zone in Ganjiang New District* • *The key work of Ganjiang New District Green Finance Reform and Innovation Pilot Zone* • *Notice on Strengthening the Use of Monetary Policy Tools to Support the Construction of a Green Financial Reform Pilot Zone in the Ganjiang New District*
	Guangdong	• *Several measures to support green finance and green industry innovation development in Huadu District, Guangzhou* • *Notice on Strengthening the Use of Monetary Policy Tools to Support the Construction of Guangzhou Green Finance Reform and Innovation Pilot Zone*
	Guizhou	• *Notice regarding the issuance of the "Gui'an New District Green Finance Reform and Innovation Pilot Area Work Advancement Performance Evaluation Measures (Trial)"* • *Implementation Plan of Gui'an New District Construction of Green Finance Reform and Innovation Pilot Zone* • *Several policies on supporting Gui'an New District to build a green financial reform and innovation pilot zone* • *Guidance on supporting innovation in green credit products and collateral* • *Guidance on promoting the green transformation of traditional financial instruments* • *Detailed Rules for the Pledge of Credit Assets of Guiyang Center Sub-branch of the People's Bank of China (Trial)*
	Xinjiang	• *Measures and Evaluation Methods for the Construction and Development of the Green Finance Reform and Innovation Pilot Zones in Hami, Changji and Karamay, Xinjiang Uygur Autonomous Region (Trial)* • *Monetary Policy Tools Support Green Finance Reform and Innovation Pilot Zone Green Economy Development Implementation Rules (Provisional)*
International Cooperation on Green Finance	(I) Green Finance Cooperation Under BRI • Mar. 2015, NDRC, MFA, MOFCOM - *Vision and Action for Promoting the Joint-Construction of Silk Road Economic Belt and 21st Century Maritime Silk Road* a. Policy • Jan. 2017, CBRC - *Guiding Opinions on Regulating Banking Service Enterprises to Go Global and Strengthening Risk Prevention and*	

	Control • Apr. 2017, MEE, MFA and other ministries - *Guidelines on Promoting the Construction of Green "Belt and Road"* • May 2017, MEE - *Cooperation Plan on Ecological Environment Protection* • Sept. 2017, GFC with another 7 Ministry-supervised industrial associations - *Environmental Risk Management Initiative for China's Overseas Investment:* to improve environmental risk management and the adoption of responsible investment principles of Chinese banks and companies overseas. • 30 Nov. 2018, Green Finance Committee of China Society for Banking and Finance and the City of London - *Green Investment Principles for the Belt and Road* b. Market practice • 19 Jun. 2017, Shanghai Stock Exchange and China Securities Index - *the SSE Green Corporate Bond Index and SSE Green Bond Index were online in both Shanghai Stock Exchange and Luxembourg Stock Exchange* • Sept. 2017, ICBC – *Issued "Belt and Road" climate bond* c. Capacity building • China Development Bank, UNDP, Peking University - "*Belt and Road" Economic Development Report; Legal Risk Report for "Belt and Road" Countries* • Shenzhen Stock Exchange with Hong Kong Quality Assurance Agency and other green financial institutions - *seminars and serve the green development of "Belt and Road" through actively tapping the international resources of Hong Kong* (II) Green Finance Cooperation Under Bilateral and Multilateral Frameworks • G20 Green Finance Cooperation • Bilateral and Multilateral Financial Cooperation o China-UK economic and financial dialogue o During the 23rd UN Climate Change Conference (COP23), China and Europe issued White Paper on Green Finance Development in terms of the primary results of the research on green finance standard o Enterprises from China and the US established the US-China Green Fund through joint-venture to support green investments both in China and along the "Belt and Road" o Enterprises from China and the US established the US-China Green Fund through joint-venture to support green investments both in China and along the "Belt and Road". o Shanghai and Shenzhen joined in the "Global Financial Center Green Finance Alliance" o In December 2017, PBOC is one of 8 founding members of Central Banks and supervisions network for Greening Financial System (NGFS) which is in a bid to carry out joint researches

	on financial risks and opportunities related to climate changes and environmental factors o Shanghai Stock Exchange and Shenzhen Stock Exchange joined in United Nations Sustainable Stock Exchange Initiative and actively participate in relevant work of the Sustainable Work Group under World Federation of Exchanges (WFE) • Green Finance Cooperation with MDBs o ADB in Beijing-Tianjin-Hebei Air Pollution Control o AIIB and NDB to Improve Environmental and Social Policies and Support the Green Development in China (III) International Cooperation of Financial Institutions • CDB in the China-Pakistan Economic Corridor • HXB and World Bank to explore financing innovation in pollution prevention and control
Environment Information Disclosure	• Mar. 2018, PBOC - *Notice on Strengthening the Supervision and Administration of the Duration of Green Financial Bonds* and *Green financial bond duration information disclosure specifications* • The Ministry of Environmental Protection compulsorily requires key polluting companies to disclose environmental information (2017) • *Guidelines for Establishing the Green Financial System,* the division of disclosure plan has been made clear: China must establish a mandatory system for listed companies to disclose environmental information in steps: require disclosure by major emission companies (2017); semi-mandatory disclosure for all companies (2018); expand mandatory requirements to all listed companies (2020). ------ Jointly issued by the seven ministries and commissions such as the People's Bank of China and the Ministry of Finance (2016) • *Green Bond Evaluation and Certification Behavior Guidelines (Provisional) (2017):* The People's Bank of China and the China Securities Regulatory Commission require green bond issuers to disclose environmental information • The Sino-British Green Finance Working Group has organized 10 Sino-British financial institutions (including Industrial and Commercial Bank of China, Industrial Bank, Bank of Jiangsu, Huzhou Bank, Huaxia Fund, E Fund, and four British institutions) to carry out environmental information disclosure, and has announced three years of action plan. In the future, it is expected to form a template for environmental information disclosure of financial institutions. *The 9th China-UK Economic and Financial Dialogue (2017)*

Annex 3: Green Financial Products and Services in Pilot Zones

Product category	Pilot zones	Latest progress
Green Credit	Huzhou, Zhejiang	Compiled a list of green credit products. The 35 banking institutions in the city have developed a total of 114 innovative green financial products.
	Quzhou, Zhejiang	Launched 20 innovative green credit products, including green fund risk pool loans, five-water co-governance loans, pollution permit mortgage loans, forest right mortgage loans, energy conservation, water conservation and environmental protection loans, energy performing contracting loans, and "golden roof" photovoltaic loans, to promote the transformation and upgrade of traditional industries.
	Guangdong	Expanded mortgage financing of environmental rights and interests, as well as forestry carbon sink. Innovated carbon finance and mortgage financing of carbon emission and pollution permits. Huadu Sub-branch of China Construction Bank has created a double mortgage mode - "carbon emission permit mortgage + fixed asset mortgage" and provided a loan of 2 million yuan to a paper company.
	Guizhou	Launched "Tea Loan", "Kiwi Loan" and other green credit products to benefit farmers. The Guizhou Branch of Agricultural Development Bank issued loans for the development of high-standard farmland in underprivileged areas in Guizhou Province.
	Jiangxi	Launched exclusive green credit products such as "Green Channel for Tech Loan", "Clean Livestock and Poultry Loan", "Green Energy Saving Technical Innovation Loan", "Photovoltaic Poverty Alleviation Loan" and "Jinsui Sasanqua Loan". The BRICS New Development Bank has approved a US$ 200-million loan for Jiangxi's energy-saving projects, providing US$ 40 million to the first batch of 6 enterprises on industrial energy conservation, emission reduction, sewage treatment projects and others.
Green Bonds	Quzhou, Zhejiang	Quzhou State-owned Assets Management Co., Ltd issued 1 Billion yuan of green bonds for the construction of sponge city.
	Guangdong	Guangzhou Bank is preparing to issue 5 Billion yuan of green financial bonds, targeting green industry projects in Huadu District. Guangzhou Yuexiu Holding Limited has issued the country's first green bond financing instrument for the pulp and paper industry, with an amount of 3 Billion yuan.

	Guizhou	Guizhou Bank and Guiyang Bank have successfully issued 13 Billion yuan of green financial bonds, mainly to fund green projects such as urban waste treatment, water and energy conservation, etc.
	Jiangxi	Shangrao Bank and Ganzhou Bank are preparing to issue 3 Billion yuan of green financial bonds respectively. Jinkai Group of Ganjiang New Area has filed to issue 450 million yuan of green private placement convertible bonds, and has issued a total of 350 million yuan by the end of 2018, to raise funds for the construction of sewage network in the Jingkai Cluster of the new area. Jinkai Group is also preparing to issue 100 million yuan of ABN, to raise funds for the construction of the utility tunnel project of No.1 Rule Lake. Nanchang Rail Transit Group has successfully registered 2 Billion yuan of green medium-term notes in the inter-bank market.
	Xinjiang	The first green debt financing plan of 100 million yuan in the first phase of Xinte Energy, a subsidiary of TBEA, was successfully listed. The head office of China Construction Bank and Changji Zhundong Development and Construction Group Company signed a cooperation agreement of 200 million yuan for underwriting green asset-backed bills, of which 100 million yuan has entered the stage of asset securitization. This project is the first green asset securitization financing case in Xinjiang. Urumqi City Transportation Investment Co., Ltd. issued the first green corporate bond in Xinjiang, with a scale of 1.5 Billion yuan and an interest rate of 6.6%, the lowest market price among bonds of the same category in the same period.
Green enterprise Listing	Huzhou, Zhejiang	There are 2 new green listed companies, and the number of new listed companies ranks 3rd in the province.
Green stock index	Guangdong	China Emissions Exchange launched China's carbon market 100 index, targeting green, environmentally-friendly and low carbon listed companies, while tracking the industry of environmental protection.
Carbon Finance	Guangdong	Huadu District of Guangzhou has carried out afforestation and reforestation carbon sequestration projects, selling the carbon sequestration quota generated by these projects to enterprises to offset their domestic emission. Guangzhou successfully implemented the public welfare forest carbon inclusion project, organically combining carbon inclusion with carbon trading. China Emissions Exchange innovatively launched carbon emission quota repurchase, custody and forward transaction. By the end of 2018, the total amount of carbon emission quota repurchase has reached 13.4 million tons, with a transaction value of 140 million yuan. The carbon emission quota custody reached 15.88 million tons. Forward transaction of carbon

		emission quota reached 3.85 million tons, with a transaction value of 44.51 million yuan. The cross-border RMB settlement service for carbon emission trading has prompted an overseas investor to buy carbon quotas in China Emissions Exchange with RMB.
Green guarantee	Huzhou, Zhejiang	Set up a policy financing guarantee company with a registered capital of 170 million yuan, focusing on green SMEs.
	Quzhou, Zhejiang	Raised the registered capital of policy financing guarantee companies from 150 million yuan to 200 million yuan, to support the development of green SMEs.
	Jiangxi	Established Jiangxi Youth Venture Financing Guarantee Corporation, prioritizing green small and micro enterprises.
Green Insurance	Huzhou, Zhejiang	Introduced asparagus price index insurance, white tea low-temperature weather index insurance and waxberry harvest season rainfall index insurance. The inland river ship oil pollution damage liability insurance is launched with 77 ships insured, covering 43,500 yuan.
	Quzhou, Zhejiang	Piloted the pig insurance and harmless treatment mechanism, covering 2.07 million pigs, which achieved 100% insurance rate, harmless treatment rate of dead pigs and claim rate of dead pigs. Introduced a comprehensive liability insurance for electric bicycles, covering 600,000 electric bicycles in the city, and providing a risk guarantee of 25 Billion yuan.
	Guangdong	Huadu District of Guangzhou has launched the first "innovative drug replacement liability insurance" in the country, and has innovated and developed green insurance products such as " rainfall index insurance for vegetables", "green agricultural insurance+", "insurance for green agricultural product quality assurance traceability" and "green product food assurance liability insurance".
	Guizhou	In 2018, Guizhou's agricultural insurance premium income reached 1.19 Billion yuan, with a yoy increase of 44.1%.
	Jiangxi	PICC Property Insurance launched the first "Weather+Price" income comprehensive insurance for citrus and tea nationwide; cooperated with 3 agricultural cooperatives to develop "cost and price insurance for breeding feed". When the price of corn, soybean meal and other feed raw materials purchased by the specialized cooperatives surpasses the futures price of the designated period, PICC Ganjiang New Area branch will compensate for the difference.
Green Funds	Jiangxi	Jiangling New Energy Automobile Industry Fund with a scale of 10 Billion yuan has been established in Ganjiang New Area, and Yongxiu Group has established a Lvmai Green New Energy Investment Fund with a scale of 1.68 Billion yuan.

Annex 4: Green finance regulations/initiatives that apply to Chinese outbound investment/BRI

Regulations/initiatives	Date	Ministries	Goal	Link
Green Credit Guidelines	Feb 2012	China Banking Regulatory Commission	Require Chinese banks to concern and manage environment and social risks domestic and overseas lending and provide more specific guidance on both domestic and overseas lending. They emphasize the crucial role that financial institutions play in the development of a sustainable and environmentally friendly economy. They offer direction for green lending policies and require banks to "identify, measure, monitor, and control environmental and social risks" in their operations.	http://www.cbrc.gov.cn/govView_EE92ECB77DB049C095838BFCCA48EF50.html
Guiding Opinions on Regulating Banking Service Enterprises to Go Global and Strengthening Risk Prevention	Jan. 2017	China Banking Regulatory Commission	Requires banks to have throughout management on environmental and social risk, safeguard the rights and interests of local people, enhance the exchange and interaction with stakeholders, and strengthen information disclosure.	http://www.cbrc.gov.cn/chinese/home/docView/F8939136D6E6448FA02133740A3B83A8.html
The Belt and Road Ecological and Environmental Cooperation Plan	May 2017	Ministry of Environmental Protection	Strengthen cooperation on eco-environmental protection and enable eco-environmental protection to serve, support and guarantee the BRI towards environment-friendly routes.	https://www.yidaiyilu.gov.cn/wcm.files/upload/CMSydylgw/201705/201705140543014.pdf
Guidance on Promoting Green Belt and	May 2017	Ministry of Environmental Protection;	Build pragmatic and efficient eco-environment protection cooperation & exchange	https://www.yidaiyilu.gov.cn/wc

Road		Ministry of Foreign Affair; National Development and Reform Commission; Ministry of Commerce	systems, support and service platforms and industrial technological cooperation bases, formulate and execute a series of eco-environment risk prevention policies and measures and lay a solid foundation for green 'Belt and Road' Initiative within 3 to 5 years; Build a relatively complete eco-environment protection service, support and guarantee system, implement a cohort of key eco-environment protection projects and achieve favorable results within 5 to 10 years.	m.files/upload/CMSydylgw/201705/201705161104041.pdf
Environmental Risk Management Initiative for China's Overseas Investments	Sept, 2017	Green Finance Committee and 6 ministry-supervised associations and committees.	Guide Chinese financial institutions and non-financial enterprises to strengthen environmental risk management in the process of overseas investment	http://www.doc88.com/p-0992542878265.html
Green Investment Principles (GIP) for the Belt and Road	Nov, 2018	China Green Finance Committee; City of London's Green Finance Initiative	Incorporate low-carbon and sustainable development into the Belt and Road Initiative by encouraging financial institutions and corporates involved and invested in B&R projects to sign up to a voluntary code of practice	http://gipbr.net/SIC.aspx?id=170&m=2