Proceedings of the 2nd International Conference on Financial Technology and Business Analysis
DOI: 10.54254/2754-1169/92/20231070

China's Green Finance Development History and Trends

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Abstract: At present, the financial sector is observing the rise of green finance as a notable field of advancement. The rapid growth of the economy is accompanied with the adverse effects of environmental pollution and the concerning pace of species loss. The rise of China's green finance in recent years has been substantial, mostly propelled by the pursuit of the "double carbon" aim. At the same time, the Chinese government strongly supports banks in developing green credit and supporting enterprises that meet green development requirements. According to the latest research data, China ranks second in the world in terms of issuance scale of green bonds. Consequently, China has emerged as a prominent global participant in the domain of green finance. The main objective of this study is to examine the historical development and current state of green finance in China, while also aiming to suggest potential strategies for its future progress and explore possibilities for international collaboration. This report presents proposals aimed at facilitating the advancement of green finance within China, with the goal of accelerating its growth domestically.

Keywords: green finance, "dual carbon" targets, four-element reporting structure, green bonds.

1. Introduction

The impressive economic expansion of China since the implementation of its reform and opening programs in 1978 has elicited widespread global admiration. From 1978 to 2022, China witnessed a significant surge in its Gross Domestic Product (GDP), as its initial value of $149.54 billion expanded to a remarkable $17.96 trillion. The annual average rate of economic growth is 9.1%. At present, China has achieved the position of being the second-largest global economy, second only to the United States. China has experienced a substantial growth in per capita GDP from 1978 to 2022, with an increase from US$156.4 to US$12,720.2. Nevertheless, the notable economic progress has been accompanied with a multitude of challenges. Many regions in China have demonstrated a strong emphasis on economic development, with local governments implementing a strategy of prioritizing economic growth over environmental concerns. This strategy is distinguished by the sequential pattern of "polluting prior to treating, abandoning prior to protecting, and destroying prior to treating" when addressing environmental concerns [1]. The viewpoint has led to the pollution of the adjacent ecology. Moreover, one could contend that China's technological progress is comparatively insufficient, leading to a prevailing dependence on labor-intensive assembly and resource extraction throughout its industries.

Green finance encompasses economic endeavors that contribute to environmental enhancement, climate change mitigation, and the judicious utilization of resources [2]. Specifically, it pertains to financial services rendered for project investment, project operation, and risk management within the domains of environmental preservation, energy conservation, renewable energy, sustainable transportation, and eco-friendly construction. The advancement of green finance has the potential to foster innovation within the financial sector and offer more avenues for safeguarding and enhancing the environment. The inception of green finance on a worldwide scale may be traced back to 1974 when the Federal Republic of Germany established a bank with a specific focus on environmental issues and policy-driven goals. During a meeting held in London in 2002, the International Finance Corporation (IFC) under the World Bank and ABN AMRO Bank introduced a corporate lending guideline to a gathering of globally recognized commercial banks. The term "Equator Principles" is commonly used within the international banking sector. Financial institutions have a responsibility to conduct a comprehensive assessment of the potential environmental and social impacts of a project. They are also expected to leverage their financial leverage to promote positive environmental outcomes and ensure the equitable development of the surrounding community, as outlined in the Equator Principles. During the United Nations General Assembly in September 2020, Chinese President Xi Jinping put up a proposal that China should achieve carbon neutrality by the year 2060, with an interim target of carbon neutrality by 2030. This proposal is commonly referred to as "Carbon Neutral by 2060." Within the framework of the "dual carbon" approach, it is imperative for China's economy to undergo a swift and comprehensive transition towards sustainability. Central to this transformation is the greening of the financial sector, which plays a critical role in the reorganization of China's industries.

2. Development History of Green Finance in China

Prior to 2015, the state of green finance in China was characterized as being in its nascent phase. The concept of green finance was initially introduced in 1995 and subsequently gained traction in China, when Chinese financial institutions embarked on exploratory efforts and the Chinese government implemented legislation pertaining to energy conservation, emission reduction, and environmental protection. In 2005, the emergence of China's inaugural equatorial bank marked a significant development in the country's financial sector. Additionally, the Industrial Bank's introduction of the energy-saving emission reduction loan played a pioneering role in advancing the adoption of green financing within the banking industry. Subsequently, Industrial Bank has initiated the introduction of environmentally sustainable investment funds and many other financial products with a focus on promoting ecological conservation [3]. Since the initiation of the Chinese government's environmental protection program in 2013, there has been a concerted endeavor by 21 Chinese banks to augment their participation in green lending. The release of guidance by the China Banking and Insurance Regulatory Commission (CBIRC) and other relevant agencies has played a significant role in promoting green finance. The diversification of green finance products has also commenced. In the year 2014, a collaborative effort between the People's Bank of China (PBOC) and the United Nations Environment Programme (UNEP) Sustainable Financial System Exploration Programme (SFSEP) resulted in the establishment of the China Green Finance Working Group (CGFWG). This working group presented a total of fourteen recommendations aimed at facilitating the advancement of green finance within China.

China's green finance system is expected to experience significant growth between 2015 and 2020. This growth was initiated with the establishment of China's Green Finance Committee in April 2015. The integration of China's "green finance" system into the 13th Five-Year Plan Outline at the conclusion of 2015 marked the formal elevation of China's green finance construction to the national strategic level. The year 2016. The issuance of the "Guiding Opinions on Building a Green Financial

DOI: 10.54254/2754-1169/92/20231070

System" in August 2016 marked a significant milestone in the development of China's green financial system. This key document was jointly issued by the People's Bank of China, the Ministry of Finance, the National Development and Reform Commission, and seven other relevant agencies. The adoption of green finance has undergone a significant transformation, evolving into a comprehensive national plan. China has implemented various measures to facilitate the growth of green credits, encourage green investment in the securities market, leverage social capital through the government-social capital partnership (PPP) model, and enhance the transaction of environmental rights and interests. China has implemented various measures to advance the growth of green credit, foster green investment in the securities market, mobilize social capital through the government-social capital cooperation (PPP) model, enhance the environmental rights and interests trading market, support the local-level development of green finance, and facilitate international cooperation in the field of green finance [4]. China made a noteworthy addition to the G20 agenda in the same year by establishing the notion of green financing. The implementation of this endeavor was accompanied by the establishment of the G20 Green Finance Research Group and the dissemination of the G20 Green Finance Comprehensive Report. The State Council launched the development of pilot zones in June 2017, with the objective of implementing reform and fostering innovation in the field of green finance. The pilot zones were selected in five provinces, specifically Zhejiang, Guangdong, Guizhou, Jiangxi, and Xinjiang.

The expansion of green finance in China has been substantial from the year 2020. The Chinese government has been continuously making efforts to strengthen relevant policies in accordance with China's "dual-carbon" goal. The G20 Hangzhou Summit in 2021 witnessed a collective endeavor by China and multiple nations to build an all-encompassing framework of global standards concerning green finance. The internationalization of green finance has been advanced by the Belt and Road Initiative, which functions as a guiding framework for nations worldwide to participate in global environmental governance and achieve sustainable development goals. The notion of sustainable development.

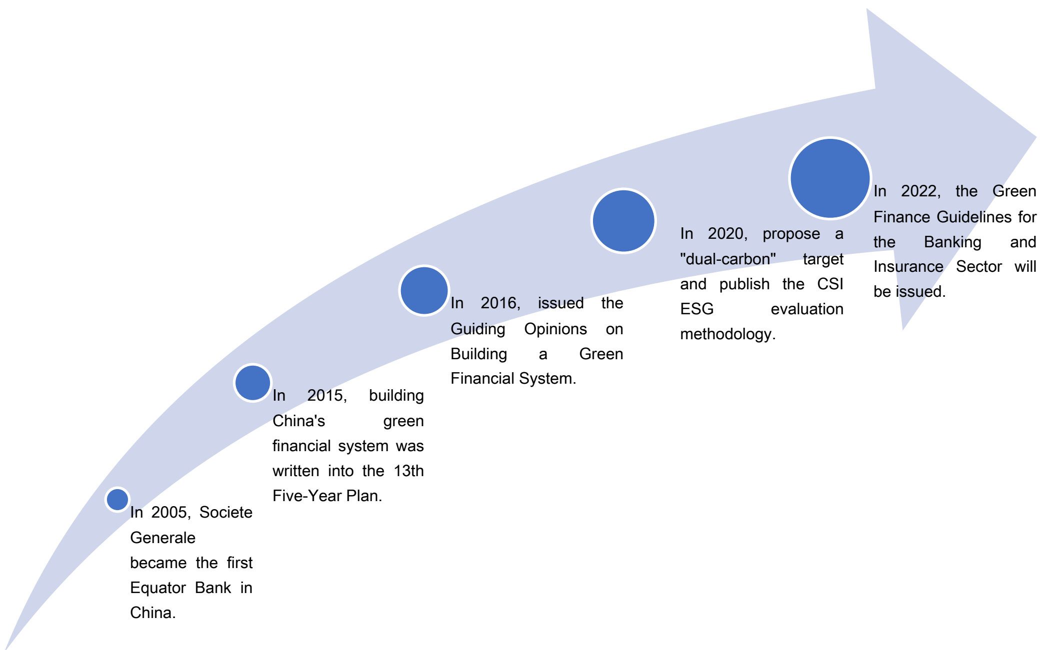

Figure 1: China's Green Finance Development History

3. Development Status and Trends of Green Finance in China

3.1. Current Development of Green Finance in China

The pace of green finance advancement in China has regained momentum subsequent to the stabilization of the COVID-19 outbreak. Following China's establishment of its "dual-carbon" objective in 2020, significant endeavors have been undertaken to foster the advancement of green finance. Based on data provided by the official website of the Central People's Government of China, the total amount of local and foreign currency green loans in China reached RMB 22.03 trillion by the conclusion of 2022. This figure reflects a year-on-year increase of 38.5%, surpassing the growth rate of all loans by 28.1 percentage points. Notably, these green loans experienced an annual increment of RMB 6.01 trillion. Green credit is a financial mechanism that considers environmental governance and ecological protection as fundamental requirements for credit allocation. It use economic tools to incorporate the costs associated with environmental impacts. Simultaneously, commercial banks employ differential pricing strategies to direct capital towards environmentally conscious firms, so facilitating the mitigation of credit risk in alignment with the sustainable development objective of the Chinese government. However, the expeditious advancement of green finance has the potential to mitigate the unchecked growth of firms that consume huge amounts of energy and contribute to environmental pollution [5].

Green bonds play a pivotal role in propelling the advancement of green finance within the Chinese context [6]. Green bonds are a type of financial instrument that are specifically issued to raise funds for the purpose of supporting environmentally sustainable economic operations that adhere to predetermined criteria. Based on the statistical data presented in the China 2022 Green Bond Annual Report, it is revealed that China has successfully issued a total of 983.899-billion-yuan worth of fresh domestic and foreign green bonds. Furthermore, the report indicates that the number of bond issuances amounted to 568. Within this group, the magnitude of domestic green bonds amounted to 874.658 billion yuan, with a total of 521 issuances. China's green bond stock reached over 3 trillion yuan, positioning it as a global leader by the conclusion of 2022.The year 2022. The China Green Bond Principles were established by the Green Bond Standards Board in July. The principles categorize green bonds into four distinct classifications: regular green bonds, carbon revenue green bonds, green project revenue bonds, and green asset-backed bonds. The introduction of the China Green Bond Principles has the potential to enhance the oversight of green bonds within China and enhance the existing framework for green bond standards. The year 2022. In November, the Central Clearing and Settlement Corporation (CCASS) issued the "Indicator System for Disclosure of Environmental Benefits of Chinese Green Bonds." The indicator system primarily consists of two components, namely project elements and environmental benefit indicator elements. The introduction of this indicator system facilitates the quantifiable and verifiable environmental advantages associated with green bonds.

3.2. Trends in the Development of Green Finance in China

China has made significant strides in developing its green financial system, establishing itself as a leader in worldwide breakthroughs pertaining to green loans and green bonds. The implementation of green financing has gradually extended from its initial experimental regions to embrace the entirety of the country. Over the course of time, commercial banks have taken on the predominant role within China's green financial system. For example, the percentage of green credit offered by banking institutions in China accounts for about 90% of the whole quantity of green financial products, exceeding the proportion of RMB loan stock in the total quantity of social finance, which is recorded at 60.25%. In the year 2022, The CSI ESG Evaluation Methodology was officially released by CSI

DOI: 10.54254/2754-1169/92/20231070

Indexes Ltd. in December 2012. The CSI ESG evaluation approach has three key components, specifically the examination of industry characteristics and the assessment of information quality pertaining to listed companies. The comprehensive framework additionally includes a total of 14 subjects, 22 components, and more than 100 underlying indicators that are relevant to the domains of environment (E), society (S), and corporate governance (G). The aforementioned improvement adds to the enhancement of the risk assessment framework within the field of green finance [7].

China's green finance encompasses a wider array of businesses and exhibits a greater degree of diversification in its green financial product offerings [8]. As of the conclusion of the third quarter of 2020, the transport, storage, and postal sectors, along with the electricity, heat, gas, and water production and supply sector, exhibited proportions of green credit amounting to 30% and 29% respectively. In contrast, the remaining industries experienced a rise in their green credit proportion from 24% at the conclusion of 2018 to 41% at the end of the third quarter of 2020. This observation suggests a gradual diversification in the allocation of green credit within the industry. The gradual diversification of green sector investment is evident via the implementation of the green stimulus strategy and the emphasis placed on it in the "14th Five-Year Plan". Investment opportunities encompass several sectors such as infrastructure, energy, digitalization, and consumer.

Table 1: Green stimulus and 14th Five-Year Plan priorities (cumulative investment of $44.6 trillion) (2021-2025)

Categories	Priority Industries	Size of Investment (RMB)	Sources of Funding, methods
Information infrastructure	5G base station	2.5 trillion	Based on public + market debt and loans
	artificial intelligence (AI) and massive data centers.	2 trillion	Market-based debt, loans and equities
	industrial internet	800 billion	
Renewable and friendly energy/power systems	The topics of interest include centralised and distributed renewable energy systems, power system flexibility, and smart grids, among others.	4.7 trillion	Based on public + market debt and loans
Green low-carbon urbanisation and modern cities	The implementation of high-speed railway and intercity travel inside urban clusters, the installation of electric vehicle charging infrastructure, the adoption of clean heating and cooling systems, the construction of low-carbon buildings, and the development of public service facilities, among other measures.	7.8 trillion	Market-based debt, loans and equities
Digital upgrading and green transformation of traditional industries	● Scenario-specific digital applications ● Electrification of specific sectors and processes ● Integrated supply chain reorganisation for small and medium-sized enterprises in specific regions and urban agglomerations. ● Environmental quality improvement and ecological restoration (taking carbon emissions into account)	16.5 trillion	Based on public + market debt and loans
Expanding and reshaping green consumption	● Green and low-carbon product consumption: energy-intensive electrical appliances and electric vehicles ● Low-carbon lifestyle in smart cities: healthcare, elderly care, sports, education/training, entertainment	5.5 trillion	Based on public + market debt, subsidies and loans
Innovative infrastructure	Major Science and Technology Infrastructure, Science and Education Infrastructure Construction, Industrial Technology Innovation Infrastructure Construction	300 billion	Based on public + market debt and loans

DOI: 10.54254/2754-1169/92/20231070

3.3. Issues Facing the Development of Green Finance

Nevertheless, the advancement of green finance in China continues to encounter numerous challenges. China's green finance initiative was implemented rather late, and its central system structure exhibits certain shortcomings. The absence of a standardized framework for evaluating the quality of financial products within the financial market poses challenges for banks in assessing the viability and risk associated with green projects. Simultaneously, the inherent flaws within the system contribute to the lack of transparency and unequal distribution of financial information. Obtaining precise and reliable information regarding green projects is a challenge for investors. As a consequence, investors experience a diminished inclination to allocate funds towards environmentally sustainable initiatives. Furthermore, it might be argued that the laws and regulations pertaining to green finance in China exhibit certain imperfections. At present, the financial market in China continues to face challenges pertaining to inadequate disclosure of business information and dissemination of incorrect information. China lacks sufficient laws and regulations to effectively govern the disclosure of company information. Simultaneously, the carbon market transactions are currently in the experimental phase, without well-defined laws and regulations to govern the green financial market. Moreover, it might be argued that China's green finance lacks sufficient innovation. The major body of green credit issuance in China continues to be dominated by banks. China's green financial products predominantly consist of green credit and bonds, with green insurance and green funds still in their nascent stages of development and constituting a very little share.

4. Proposals for the Development of Green Finance in China

China should prioritize and provide substantial backing for investments in carbon-neutral science and technology. Enhanced allocation of resources towards carbon-neutral scientific research and innovation has the potential to facilitate the development of environmentally sustainable financial products in China, thereby aiding the nation's pursuit of carbon neutrality. As an illustration, the augmented allocation of funds could be directed towards investments in zero-carbon electrification. This would entail an increase in investment in the installation of wind and solar power systems, the development of extra-high voltage transmission lines, the enhancement of energy storage and distribution grids, and the expedited construction of electric vehicle charging infrastructure. Enhanced investment has the potential to bolster the allocation of resources towards the development of 'new infrastructure' propelled by technology advancements, including but not limited to 5G, artificial intelligence, the Internet of Things, data centers, fiber optics, and several other important future technologies. In order to achieve carbon neutrality in research and innovation investments, it is imperative to ensure that investments in conventional infrastructure efficiently facilitate the development of environmentally friendly and energy-efficient metropolitan areas. Advocate for sustainable consumption practices, encompassing the endorsement of electric automobiles [9].

Furthermore, it is imperative for China to establish a comprehensive monetary policy framework that aligns with the objective of achieving carbon neutrality inside the country. The implementation of robust monetary policies is crucial in facilitating the safe development of green finance in China and establishing a green financial system that aligns with the unique characteristics of the country. One potential recommendation is for the People's Bank of China (PBOC) to consider implementing an active structural monetary policy alongside a macroprudential framework that prioritizes zero-carbon initiatives. The implementation of a zero-carbon macroprudential framework would contribute to the ongoing improvement of financial regulation by promoting a proactive, harmonized, and flexible approach. This will enable a more efficient identification, prevention, and mitigation of systemic financial hazards. The People's Bank of China (PBOC) has the ability to address discrepancies in the relative prices within the financial system by implementing non-neutral monetary policies based on prices and quantities. These policies aim to facilitate a transition towards carbon neutrality and optimize social welfare. Simultaneously, the People's Bank of China (PBOC) possesses a considerable reservoir of expertise in employing "window guidance" strategies, exemplified by the successful implementation of the financial refinancing mechanism to foster economic growth and provide employment stability amidst the crisis caused by the epidemic.

In addition, it is imperative for China to enhance the restructuring of its risk management system in accordance with its "dual carbon" goals. The prevailing approach to financial risk management is founded upon the principles outlined in the Basel Capital Management Framework. The potential consequences of climate change and the transition to carbon neutrality will manifest in distinct manners across the three pillars of Basel:

i. The minimum capital requirements in Pillar 1 take into account the adjustment of risk weights for high carbon and green assets.

ii. Under the framework of Pillar 2 external regulation, there will be a promotion of stress tests that focus on climate change and the achievement of carbon neutrality.

iii. The enhancement of climate-related information disclosure is necessary within the framework of the third pillar of market discipline.

It is recommended that the Chinese government undertake efforts to facilitate the adoption and implementation of Environmental Risk Analysis (ERA) methodology [10]. This should encompass many stages, such as the identification of risks, estimation of exposures, assessment of losses, and reflection on past risk episodes. By doing so, regulators and financial institutions can enhance their comprehension of climate change concerns. One effective approach to mitigate losses is to implement various tactics, among which the third strategy involves the utilization of modeling techniques inside corporate governance systems to closely monitor the fluctuations in environmental risks associated with current investments.

In December 2015, the Financial Stability Board, operating under the auspices of the G20, established the Working Group on Climate-Related Financial Disclosure (WGCRFD). The primary objective of this working group is to formulate uniform and voluntary guidelines for the disclosure of financial information pertaining to climate-related matters. The WGCRFD Recommendations Report was published by the WGCRFD in June 2017. This report introduces a reporting framework that focuses on four fundamental aspects of organizational functioning: Governance, Strategy, Risk Management, and Metrics and Objectives. Additionally, the report provides a set of recommended disclosures that are applicable across various industries.

Table 2: Four-element reporting structure

Governance	Strategy	Risk Management	Metrics & Targets
Please include information regarding the organization's governance pertaining to risks and opportunities associated with climate change.	The organization is required to provide comprehensive information regarding the current and potential effects of climate-related risks and opportunities on its companies, strategy, and financial planning, particularly when such information is deemed significant.	This inquiry pertains to the process through which the organization discloses its methods of identifying, evaluating, and mitigating risks associated with climate change.	Provide the measurements and targets utilized for evaluating and overseeing significant climate-related risks and opportunities, specifically in cases where this information holds considerable significance.
Recommended disclosures			

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Table 2: (continued).

a. Elucidate the board's supervision of climate-related risks and possibilities.	a. This inquiry pertains to the identification of climate-related risks and opportunities that the company has recognized across the short, medium, and long-term time horizons.	a. Outline the procedures employed by the organization to identify and evaluate hazards associated with climate change.	a. Please provide details regarding the measures employed by the firm to evaluate climate-related risks and opportunities in accordance with its strategy and risk management procedures.
b. This paper aims to elucidate the pivotal role of management in the evaluation and administration of climate-related risks and opportunities.	b. This paper aims to analyze the influence of climate-related risks and opportunities on the organization's enterprises, strategy, and financial planning.	b. Outline the procedures implemented by the organization to effectively handle and mitigate hazards associated with climate change.	b. Provide a comprehensive account of the greenhouse gas (GHG) emissions pertaining to Scope 1, Scope 2, and, if applicable, Scope 3, together with an analysis of the associated hazards.
	c. The resilience of the organization's strategy is assessed by considering several climate-related scenarios, including a scenario where global warming is limited to 2°C or below.	c. This paper aims to elucidate the integration of processes for recognizing, assessing, and managing climate-related risks within the organization's overarching risk management framework.	c. This inquiry pertains to the organization's utilization of targets for the purpose of effectively managing risks and opportunities associated with climate change, as well as the evaluation of performance in relation to these targets.

5. Conclusion

China's green finance has developed rapidly from 2005 to 2022. Especially after China proposed the "double carbon" goal in 2020. China's green financial system has become more complete. China's green bond scale ranks among the top in the world. At the same time, China's green finance has been promoted from pilot projects to nationwide promotion. Green finance products and industries are also increasingly diversified. However, the development of green finance in China also faces many problems. First, China's green financial system is imperfect, and the evaluation of green projects is uncertain. Second, China's laws and regulations on green finance are not perfect enough, and there are problems with companies' omissions, incomplete information and false information. Third, China's green finance is not innovative enough. I have put forward four suggestions for the above issues. First, China should vigorously support carbon-neutral science and technology investment. Second, China should build a Chinese-style structural monetary policy consistent with carbon neutrality. Third, China should strengthen the reshaping of its risk management system consistent with its "dual carbon" goals. Fourth, based on the "Recommendations Report of the Climate-related

Financial Information Disclosure Working Group", accelerate the implementation and improvement of corporate information disclosure management measures. Developing China's green finance also requires further strengthening of international cooperation. Work with countries worldwide to use economic and financial power to protect the environment.

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