
CHARTING THE PATH TO SUSTAINABILITY: AN EXAMINATION OF GREEN FINANCE IN SHANGHAI

¹Ming Wei Zhang and ²Hong Qian Chen

¹Faculty of Professional Finance and Accountancy, Shanghai Business School, Shanghai, China

²School of Marxism, Shanghai University of Finance & Economics, Shanghai, China

Abstract: *The release of the "Implementation Opinions on Accelerating Shanghai to Build an International Green Finance Hub to Serve the Goal of Carbon Peak and Carbon Neutrality" in October 2021 marked a pivotal moment in Shanghai's green finance trajectory. With ambitious targets set for 2025, Shanghai aims to become a global leader in green financial development by fostering an environment that supports green financing exceeding 1.5 trillion CNY and green insurance guarantees exceeding 1.5 trillion CNY. This will position Shanghai to play a prominent role in both national and global green financial cooperation, establishing itself as a hub for carbon trading, pricing, and innovation.*

While Shanghai has made significant strides in green finance, this paper identifies lingering challenges and offers strategic recommendations based on the current state of green finance development in the city. By addressing these issues, Shanghai can solidify its status as an international green finance hub and contribute substantially to nationwide green and low-carbon initiatives. This paper offers critical insights to guide Shanghai's journey towards a sustainable financial future.

Keywords: *Green finance, Carbon neutrality, Sustainable development, Financial innovation, Shanghai finance hub*

1. Introduction

In October 2021, the Implementation Opinions on Accelerating Shanghai to Build an International Green Finance Hub to Serve the Goal of Carbon Peak and Carbon Neutrality was officially released, ushering in a top-level design for Shanghai's green finance development. By 2025, Shanghai will form a world-class environment for green financial Development, achieve a balance of green financing exceeding 1.5 trillion CNY, and the amount guaranteed by green insurance exceeding 1.5 trillion CNY. Shanghai will provide stronger support for green and low-carbon development nationwide, play a more important role in global green financial cooperation, basically build a carbon trading, pricing and innovation center with international influence, and basically establish its status as an international green finance hub. Although Shanghai's green finance development is in the first echelon in China, there are still some problems. Therefore, according to the current situation of green finance development in Shanghai, this paper finds out the problems existing in the process, and finally gives corresponding suggestions.

2. The Development Status of Green Finance in Shanghai

Although Shanghai is not the pilot zone of green finance reform and innovation in China, as China's economic center and international financial center, Shanghai has a solid financial foundation. The

speed of green finance development is still leading among provinces and cities in China, and Shanghai belongs to the first echelon in the evaluation of green finance development index in China's Local Green Finance Development Report (2022). Green finance has been developing fast and stably in Shanghai. Under the favorable policy environment, the innovation ability of green finance products in Shanghai continues to be enhanced, the types of green finance products continue to increase, the issuance scale of green finance products expands, and the market scale of green finance in Shanghai expands. The speed of green finance development is closely related to the policy environment of green finance, the speed of green finance product innovation and the Development of market scale. Therefore, this paper analyzes the development status of green finance in Shanghai from three aspects: the policy environment of green finance development in Shanghai, green finance products in Shanghai and the market scale of green finance in Shanghai [1].

2.1. Policy Environment for the Development of Green Finance in Shanghai

The Development of green finance in Shanghai and other cities in China is mainly managed by the following government agencies and the implementation of corresponding policies.

2.1.1. Ministry of Environmental Protection

The Ministry of Environmental Protection is responsible for formulating and implementing national environmental protection policies, regulations and standards, and reviewing and approving environmentally friendly projects, such as green buildings and energy-saving and environmental protection technologies. Environmental damage is often easier than environmental protection, and easily causes greater impact. For the Development of green finance and the implementation of sustainable Development, it is necessary to stop the damage to the environment while carrying out green projects to restore the environment and make it better. While developing environment-friendly projects, it is necessary to crack down on high-pollution projects to prevent the continued damage to the environment, so as to achieve the purpose of improving the environment, realizing the rational use of resources, and restoring the ecological environment. The emergence of national environmental protection policies and regulations can greatly constrain companies, avoid the destruction of the environment for the sake of Development, and also give the plan to punish companies that destroy the environment.

2.1.2. National Development and Reform Commission

The National Development and Reform Commission (NDRC) is responsible for the formulation and implementation of green finance policies, as well as the identification and management of various green finance products such as green bonds, green loans and green funds. Green finance policies can accelerate the Development of green finance at a proper development direction . For example, on October 8, 2021, Shanghai issued *the Implementation Opinions on Accelerating Shanghai to Build an International Green Finance Hub to Serve the Goal of Carbon Peak and Carbon Neutrality*. This document specifies the basic principles of green finance development as well as the specific direction of green finance development, and makes efforts to improve the market environment of green finance. Due to the formulation and implementation of green finance policies, the guidance on the development direction of green finance, and the support for green companies and green financial institutions, green finance can develop steadily and rapidly[2].

2.1.3. People's Bank of China

The central bank is responsible for policy formulation and management in the field of green finance, including green credit, green insurance and carbon finance. The People's Bank of China is also responsible for the supervision and management of green financial institutions, formulating relevant regulations and measures on the supervision and management of banking financial institutions, organizing and reviewing the establishment, renaming, termination and business scope of banking financial institutions and their branches, and supervising and managing green financial service activities implemented by banking institutions [3].

With the support of large national institutions through green finance policies, in order to better develop green finance, Shanghai also has local government agencies responsible for supporting and supervising the Development of green finance in Shanghai. For example, Shanghai Financial Work Bureau has set up an agency specialized in green supervision -- Shanghai Green Finance Regulatory Agency, which is mainly responsible for green finance policy research, standard formulation, regulatory implementation, information release, publicity and promotion. The establishment of the Agency aims to promote the Development of green finance in Shanghai, advance enterprises and financial institutions to better understand and respond to environmental and social risks, improve the marketization and social influence of green finance, and help to promote the realization of sustainable Development. In addition, other government agencies in Shanghai also support the Development of green finance in Shanghai in various aspects. The emergence of these local government agencies helps to, with Shanghai as a model point for green finance development in China, implement Shanghai's local green finance policies and products, and provide replicable and promotable Shanghai solutions, which could be deployed nationwide to promote the Development of green finance in China.

2.2. Shanghai's Green Financial Products

Common green financial products include green credit and green bonds. Shanghai's current green financial products are mainly issued by commercial banks. Green financial products such as green loans, green bonds and green insurance are launched to support projects and enterprises in the field of environmental protection and sustainable Development. In addition, there are some professional green financial institutions in Shanghai, such as the Shanghai Green Finance Center and the Shanghai Environmental Protection Industry Investment Fund, which also provide financial support and services to enterprises in the field of environmental protection and sustainable Development.

Besides, these green financial institutions that issue green financial products usually assess the environmental, social and governance risks of potential borrowers to ensure that they meet green financial standards and policy requirements. For green companies, they usually need to provide detailed environmental and social responsibility information to prove their qualifications. These standards usually include environmental and social impact assessment of a project, energy and resource efficiency, carbon emission, environmental and social governance, social responsibility, *etc.*

In addition, green finance institutions usually evaluate the companies' financial position and business plan to ensure their abilities of on-time repayment. If a company meets these criteria, a green financial institution will usually issue loans to support green projects or sustainability initiatives. In the process of granting loans, green financial institutions usually work with borrowers and provide technical and resource support to ensure that the smooth implement and operation the projects.

Green financial institutions provide green financial products and funds to green companies, and cooperate with them to achieve win-win results. At the same time, they help green companies as much

as possible to recover their costs while ensuring the latter's profitability. Green financial institutions can provide green companies with green financial products, which boost the Development of the latter, earn profits, develop themselves, and lead to the launch of better green financial products. Green companies and green financial institutions will pay taxes to the government. With sufficient funds, government institutions can bring more favorable green financial policies and better support green financial institutions and green companies. In such a virtuous cycle, green finance will usher in rapid Development. **2.3. Market Size of Green Finance in Shanghai**

Shanghai's green finance is developing fast and steadily. The market scale of green finance in Shanghai is constantly expanding with constantly innovated green financial products. There are more and more types of green financial products, and the issuance scale of green financial products is also increasing. The amount of capital and trading volume in Shanghai green financial market are increasing. Shanghai Pudong Development Bank Co., Ltd. issued the largest green finance bond since 2023, with an size of 30 billion CNY, which was twice oversubscribed and the subscription fund exceeded 60 billion CNY. All the funds raised this time will be used for green projects in the fields related to reducing carbon emissions and mitigating climate change. Other banks and financial institutions in Shanghai are also expanding the scale of green finance business and increasing the number of green finance development business in Shanghai. Bank of Shanghai launched the "Green Tree City Bank" financial service platform, which has continuously improved the scale of green finance business and the number of customers it serves, and increased the proportion of green finance business. By the end of 2022, the bank's green loan balance increased by 119.07% compared with the beginning of the year, and the number of green credit customers increased by 147.95%. The growth rate of green credit was among the best of the banking financial institutions in Shanghai.

According to *the Shanghai Green Finance Index* launched at the 2022 Shanghai International Center Development Forum, the overall score of Shanghai Green Finance Index in 2021 is 11.67%, which is a significant increase compared with 3.92% in 2018, 5.61% in 2019 and 6.67% in 2020. Shanghai's green finance is developing rapidly. With the good development prospects, it also benefits from the continuous expansion of the market size.

Shanghai's green finance market is given a clear plan and outlook on its development scale. Shanghai Banking and Insurance Regulatory Bureau, together with Shanghai Development and Reform Commission, Shanghai Economic and Information Technology Commission, Shanghai Science and Technology Commission, Shanghai Health and Environmental Protection Bureau, Shanghai Housing and Urban-Rural Development Commission, Shanghai Transportation Commission and Shanghai Local Financial Regulatory Bureau, issued *the Action Plan for Promoting the Carbon Peak and Carbon Neutrality Strategy of Shanghai Banking and Insurance Industry during the 14th Five-Year Plan Period*.

According to the Plan, by 2025, Shanghai's banking and insurance industry will be basically built into a green financial ecological service system fitting with the current carbon neutrality and carbon peak, control carbon emissions within a controllable range, form a benchmark in the green financial industry, provide new ideas for other cities, steadily develop green credit, green bonds and other green financial services, and make breakthroughs to continuously improve the innovation capacity of green finance and achieve a balance of green financing exceeding 1.5 trillion CNY and the amount guaranteed by green insurance exceeding 1.5 trillion CNY[4].

3. Problems in the Development of Green Finance in Shanghai

Green finance should guide resources to green projects, speed up the development process of green projects, meet the financing needs of green companies, provide policy support and financing assistance, promote the cooperation between green companies and other companies, and help green companies to develop from all aspects, so as to develop more green projects. In the process of guiding resources to green projects, the market should also be supervised through green finance laws and regulations, so as to ensure that the funds are really used in the Development of green projects, and at the same time, the Development of high-pollution projects should be restrained, so as to provide a good market environment for the Development of green companies. Therefore, combining the problems of Yanhua Intelligent and its development prospects with the development status of green finance in Shanghai, we can see that there are some problems in the Development of green finance in Shanghai, specifically including noconsistency in the identification standards of green projects, imperfect information disclosure system, unsound laws and regulations of green finance and the to-be-deepened incentive mechanism.

3.1. The Green Project Identification Standards are Not Unified

Yanhua Intelligent improves its competitiveness by reducing production costs, so it needs more funds for research and Development. As a green financial product that helps green companies obtain funds, green credit is undoubtedly a good way for Yanhua Intelligent to obtain funds[5].

The launch of green credit is essentially to use part of the funds for the Development and construction of green projects through green project identification. It raises the threshold of loans, and takes the Development of green environmental protection projects as the premise for green loan application. It is the higher loan threshold that restricts those disqualified, and forces them to change their past production that is not environmentally friendly. The loan threshold of green project identification ensures that the green credit loans will not flow to those companies with high pollution, benefit companies like Yanhua Intelligent with lower loan interest to help their Development, relieve their financial pressure, and allow them to have more funds to invest in and try more environmentally friendly production methods and reduce the pollution to the environment. However, this loan threshold prevents some companies from developing green environmental protection projects, which is caused by the uneven identification standards of green projects. Without unified standards, some green projects will not be properly recognized, and some companies developing environmental protection projects will be rejected by the threshold of green credit. The inconsistency of green project identification standards is an important problem for the Development of green finance in Shanghai. The *Catalogue of Projects Supported by Green Bonds* jointly issued by the People's Bank of China, the National Development and Reform Commission and the China Securities Regulatory Commission in 2021 made three key breakthroughs. First, the definition standard of green projects is more scientific and accurate; second, the management mode of bond issuance is more optimized, and the definition standard of green projects by relevant management departments of green bonds is unified for the first time; and third, it provides a stable framework and flexible space for the Development of green bonds in China. However, this document only identifies the green projects supported by green bonds. The types of green financial products in China are increasing. The different thresholds for the application of these green financial products in green projects would increase the workload and difficulty of green

project identification. Besides, it will also lead to the lack of policy support and green financial resources for green projects because of the vague identification standards.

3.2. Imperfect Disclosure System of Green Finance Information

In order to speed up the Development of green projects, green finance will guide resources to green projects through policies and incentive systems. In the field of financial laws, listed financial institutions do not have compulsory disclosure obligations if they are not subject to administrative penalties for environmental problems. The current green finance information disclosure system is not applicable to most enterprises and financial institutions within the concept of green finance, and has not been widely popularized.

In terms of restricting the orientation of green finance funds, green credit with relatively more audiences must be constrained by green finance laws and regulations on its capital flow. Green credit can promote the Development of green industry by supporting green enterprises[6]. Therefore, attention should be paid to prevent unqualified enterprise projects from obtaining green credit or green credit from not being used in developing green projects, which requires government departments or financial institutions to supervise the use of their funds. The process of supervision requires the restrictions provisioned by green finance laws and regulations, the supervision executed by regulatory authorities, the authenticity of enterprises' green finance information (such as funds), and the review on the disclosure of green finance information.

3.3. The Laws and Regulations on Green Finance Are Not Perfect

In the process of green finance development, the laws and regulations of green finance have been constantly improved, but there are still defects, which lead to the lack of binding force and make it difficult to implement and achieve the expected results.

First, the current legislation level of green finance laws and regulations is low, and there is no special green finance law formulated by the highest state authority. The field is mainly guided by policies without effective binding force. The low level of legislation also leads to the insufficient understanding, the deviations in reading policy documents and obstacles to the implementation of the policies.

Second, the current green finance laws lack systematicity and integrity. The current green finance policies in Shanghai cover all aspects of guidance, but there are different implementation rules for different green finance products and different implementation departments. The green finance laws and policies exist in the policy system of various functional departments and have not yet formed an organic whole. This will lead to gaps in the implementation of green finance laws and overlaps in the implementation of work content, resulting in waste of work resources and failure to achieve the expected work objectives.

Finally, green finance laws and regulations lack operability, accountability and punishment mechanism. In view of the current Development, most of the policy documents are mainly guidance, and only make preliminary provisions such as clear concept, scope and organizational process planning. The sweeping content leads to poor practicability and lack of clear definition. Without defining specific indicators of violations and specific plans for punishment, it is difficult to achieve the expected results.

3.4. The Incentive Mechanism for Green Finance Needs to Be Deepened

For enterprises that comply with and actively respond to national policies, the government often gives preferential treatment and rewards to them. In the green financial system, incentive system is a very important link. For example, green credit supports more companies in line with the idea of green

Development, and rewards enterprises that make contributions in the Development by means such as reducing tax rates and plant rent, to encourage them to actively develop green projects. However, at present, China's green financial incentive system is still insufficient. There is no certain incentive standard, and it's impossible to fairly stimulate the Development of green projects. As a result, green companies do not get enough green financial assistance in Development and insufficient resources from policy incentives.

Due to the insufficient incentive of green finance, green financial institutions are not motivated to carry out green financial business, reduce the funds for green financial Development, and cannot support and guide green industries in terms of funds and other aspects. At present, China does not adopt compulsory supervision and evaluation, but only guides institutions to carry out green finance business. The lack of incentive system brings about low enthusiasm of financial institutions, their low participation in the development strategy of green finance, and the insufficient willingness to invest in the Development of green companies. The incentive system of green finance also affects investors' confidence in the investment of green companies, makes them doubt the determination of government institutions as well as the return and Development prospect of green finance investment. The lower investment willingness of financial institutions and investors reduces the financing of green companies, and affects the capital investment of green projects and the Development of green finance.

4. Policy Suggestions for Green Finance Development in Shanghai

In view of the problems existing in green finance development in Shanghai, this paper puts forward the policy suggestions of unifying the green project identification standards, improving the information disclosure system, perfecting the laws and regulations of green finance, and deepening the incentive mechanism of green finance.

4.1. Unify Green Project Identification Standards

Unifying green project identification standard can enable qualified green projects to enjoy the support of green financial policies, and green enterprises to get due preferential treatment. At the same time, it can also avoid the repeated identification of green projects when applying for green financial products, and reduce the waste of work resources in green finance.

To determine a unified green project identification standard is not only to unify that for a single green financial product. The supporting projects for green financial products should be unified among various financial products, so as to avoid the repeated identification of green projects for different green financial products and avoid increasing the workload of green project identification.

In addition, according to the current development status of green finance, appropriate green project identification standards should be formulated to guide green resources to favor the types of green projects that are in urgent need of Development. According to the goals of green finance development in different stages, we should focus on developing different types of green projects. In the process of green finance development, we should gradually raise the identification threshold of green projects, have higher standards for the evaluation, and pursue a higher level of environmental protection[8].

4.2. Improve the Information Disclosure System

The regional authorities should improve the information disclosure system, avoid preferential treatment to disqualified high-polluting enterprises, involve the public in the supervision, and avoid favored enterprises from violating the development concept of green finance by disclosing enterprise

information. Improving the information disclosure system can undoubtedly reduce the difficulty of supervising companies and financial institutions.

Improving the information disclosure system is beneficial to the implementation of green finance laws and regulations, and can make the latter better supervise enterprises [9]. The disclosure should not only be limited to the supervision of the government or financial institutions, but also include social supervision on the trend of investment, and guide social investment to green low-carbon and other environment-friendly enterprises. After the information disclosure system is improved, enterprises that pay attention to environmental protection, such as Yanhua Intelligent, can get more support, while the Development of high-polluting enterprises will be restricted, contributing to higher competitiveness of environmentally friendly enterprises in the industry.

At the same time, it is also conducive to guiding enterprises to pursue a higher level of green environmental protection. The improvement of green information disclosure system helps enterprises in the industry to better understand the level of green environmental protection in the industry. In order to compete for more green financial policy support, they can improve the level of green environmental protection in their own Development, thus upgrading the green environmental protection level of the industry.

4.3. Improve Green Finance Laws and Regulations

To improve green finance laws and regulations, we should first improve the legislative level of green finance laws, formulate special laws on green finance, clarify the basic concepts of green finance laws, guide enterprises to change their development concepts into sustainable Development, implement protection for the Development of green projects, and guide enterprises to develop green projects[10]. The authorities need to clarify the definition standards and punishment measures for violations, restrict the Development of high-pollution projects and enterprises, transform the guidance of vague policy documents into mandatory requirements, prohibit enterprises from developing high-pollution projects, guide enterprises to develop green projects and promote the Development of green finance.

Besides, the division of labor in various departments should be clarified to improve the efficiency of green finance work. Meanwhile, inter-departmental connections should be strengthened for cooperation, and the departments of formulating, implementing and supervising green finance laws should be clarified. The identification and supervision of green projects and products, and the formulation and management of green finance policies should be assigned to certain departments in accordance with green finance laws and regulations. Through inter-departmental coordination and cooperation, while ensuring comprehensive coverage of work content, it is also necessary to avoid the increase of workload caused by overlap. Meanwhile, the coordination work should be refined. Information should be shared among departments to achieve timely information transmission and processing, and improve work efficiency.

4.4. Deepen the Incentive Mechanism for Green Finance

To deepen the incentive system for green finance, we should focus on financial institutions and design diversified and differentiated incentive mechanisms. We should fully consider local characteristics and needs and formulate incentive mechanisms with local characteristics.

To formulate a diversified and differentiated incentive mechanism is to distribute resources according to different financial institutions and green financial products, such as adjusting the intensity of

financial discount and tax reduction according to different levels of Development, and allocating limited financial resources according to different development conditions [11].

The Development of incentive mechanism with local characteristics is to set the different goals according to the different development conditions of green finance in different regions of Shanghai, the expected development process, and the focus of green finance development in different regions, and to formulate regional and local incentive systems favoring the development focus.

At the same time, the incentive system is essentially to reward enterprises and financial institutions that actively develop green projects. Various incentive methods encourage more enterprises to develop green projects, reward those that dare to take risks, encourage innovation, provide new ideas for the Development of green projects, and promote the Development of green finance. Besides, it attracts more financial institutions to develop green finance, and provide funds to and cooperate with green companies. Therefore, to deepen the green finance mechanism, we should plan appropriate incentive system for green companies, green financial institutions and investors, so as to attract green companies to continuously develop green projects, green financial institutions to continuously innovate green financial products and expand green financial business, and investors to invest in green finance, so as to continuously provide power for the Development of green finance.

5. Conclusions

In recent years, under the favorable policy environment, the innovation ability of green finance products in Shanghai continues to be enhanced, the types of green finance products continue to increase, the issuance scale of green finance products expands, and the market scale of green finance in Shanghai expands. Although Shanghai's green finance development is in the first echelon in China, there are still some problems such as no-consistency in the identification standards of green projects, imperfect information disclosure system, unsound laws and regulations of green finance and the to-be-deepened incentive mechanism. Therefore, the authorities need to unify the green project identification standards, improve the information disclosure system, perfect the laws and regulations of green finance, and deepen the incentive mechanism of green finance.

Acknowledgements

This work was supported by the Ideological and Political Project of the school-level Curriculum of Shanghai Business School (SBS-2023-XJKCSZ-10).

References

Cai Y. P. and Zhang Y. P., *Construction of green financial system: Problems and solutions [J]. Journal of Financial Theory and Practice, 2014, No.422 (09):66-70.*

Yi L., *The exploration of accelerating the construction of China's carbon financial system [J]. Dongyue Essays, 2012, 33(08):175-178.*

Yu Z. S. and Song D., *Current Situation Analysis and Development Suggestions of Carbon emission trading in Shanghai Carbon Finance[J]. Shanghai Energy Conservation, 2022, (04) : 358-362.*

Shu L. M. and Yang L., *Research on the Implementation Status of Green Credit in Commercial Banks [J]. Friends of Accounting, 2015,(23): 44-50*

Li H. T., Zhou F. Q., and Shang Y. M., Problems and countermeasures of green finance development in Shanghai from the perspective of carbon peak and carbon neutrality [J]. Shanghai Economy, 2021, (06):61-75.

Chen L. M., Guo L. H., and Zhang W. W., Operational mechanism and implementation path of green credit policy in China [J]. Contemporary Economic Research, 2016,(1) : 91-96.

Li K. and Liu X., Research on the Impact of green Credit on the development of tertiary industry in Jiangsu Province [D]. Proceedings of the 2016 Annual Meeting and Academic Seminar of the Chinese Society of Development Economics, 2016.79-85.

Hu X., Research on the impact of carbon trading pilot policy on the Development of green finance [J]. Quality and Market, 2022, (03):143-145.

Hu Y., Diao Z. K., and Hou, Y. T., Current situation, deficiency and improvement of China's green financial system [J]. Journal of Shihezi University (Philosophy and Social Sciences), 2020, 36(01):3442.

Li, J. T and Huang H. Y., Ecological and environmental effects of green finance: a practical test of Guangdong-Hong Kong-Macao Greater Bay Area under dual carbon targets [J]. Journal of Guangdong University of Finance and Economics,2022,(01):87-95.

Jiang T. T. and Xu H. Y., The nature, impact and countermeasures of carbon border adjustment mechanism in the European Union [J]. International Trade, 2021, (09):38-44.