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Research Progress on the Construction and Effectiveness of the Green Financial System under the "Dual Carbon" Goal

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Abstract

The proposal of the goal of "carbon peaking and carbon neutrality" marks that the economy and society have entered a critical stage of systematic green transformation, and puts forward all-round reform requirements for industrial restructuring, energy consumption upgrading and other fields. As the core link connecting financial capital and green projects, green finance is not only a key financing channel to achieve the "dual carbon" goal, but also an important incentive mechanism to guide market players to fulfill their environmental protection responsibilities. This article systematically sorts out domestic and foreign research literature on the construction of green financial systems (policies, markets, products) and their effectiveness in supporting green and low-carbon development, summarizes the main consensus, key controversies and deficiencies of existing research, and proposes possible future research The direction provides reference for enriching the theoretical system of environmental economics and finance, guiding policy formulation and market practice.

Keywords

green finance, dual carbon targets, system construction, effectiveness, literature review

1. Introduction

On September 22, 2020, the General Secretary put forward the strategic goal of "dual carbon" for the first time at the general debate of the 75th session of the United Nations General Assembly, and clearly made a solemn commitment to "achieve carbon peaking by 2030 and carbon neutrality by 2060". This is not only an important action for my country to deal with global climate change and demonstrate the responsibility of a major country, but also a major strategic deployment focusing on long-term development, which has far-reaching significance for promoting global sustainable development. Achieving the "dual carbon" goal requires systematic and deep-seated changes in various economic and social fields, covering multiple tasks such as energy structure transformation, industrial low-carbon upgrading, and technological innovation breakthroughs. A series of challenges such as unbalanced regional development urgently require strong financial support and an effective incentive mechanism.

Green finance refers to a series of financial activities carried out to support environmental improvement and respond to climate change risks [1]. Through the resource allocation function of financial media, it guides funds to flow to green fields such as low-carbon innovative projects and ecological environment protection.

As a key link to achieve the "dual carbon" goal, the core role of green finance is reflected in providing financial guarantee and providing long-term and stable financing support for green projects such as carbon emission reduction technology research and development, renewable energy project construction, and ecological restoration; Give full play to the role of incentives and constraints, guide enterprises to fulfill their environmental protection responsibilities through differentiated financial policies, and promote the transformation of high-carbon enterprises [2]; Optimize the allocation of resources, promote the tilt of financial resources from high energy consumption and high pollution fields to green and low-carbon fields, and improve the efficiency of capital utilization. This paper summarizes from the theoretical and practical levels. The research on green finance integrates multi-disciplinary knowledge such as environmental economics, finance, and sustainable development theory, which helps to deeply analyze the internal relationship between financial activities, environmental governance, and climate change., enrich the relevant theoretical system, and provide a new analytical perspective for solving the negative externalities of environmental pollution. Systematically sort out the research results on the construction and effectiveness of the green financial system, provide scientific basis for policy makers to improve the green financial policy framework, financial institutions to innovate green financial products, and enterprises to formulate sustainable green development strategies , and help the "dual carbon" strategy The smooth realization of the goal.

2. Theoretical Basis and Development of Green Finance

2.1 Concept Definition and Evolution of Green Finance

The concept of green finance is not static, but gradually evolves with the increasingly severe global environmental problems and the popularization of the concept of sustainable development. The early "environmental protection finance" mainly focused on financial support related to environmental pollution control, and the scope was relatively limited; The subsequent rise of "sustainable finance" expanded its perspective to the coordinated and symbiotic development of economy, society and environment, emphasizing the long-term sustainability of financial activities; The current "green finance" focuses more clearly on addressing climate change and supporting green and low-carbon transformation, and strives to guide funds to invest in projects and activities with significant environmental benefits. Green finance is closely related to concepts such as ESG investment and climate finance, and each has its own emphasis. ESG investment [3] focuses on comprehensively evaluating the sustainability of investment projects from the three dimensions of environment, society, and governance. Green finance is the core component of ESG investment; Climate finance addresses financial activities related to climate change, including climate change mitigation and adaptation, and is an important subdivision of green finance.

2.2 Theoretical Support for Green Finance

2.2.1 Theory of Externalities and Internalization of Environmental Costs

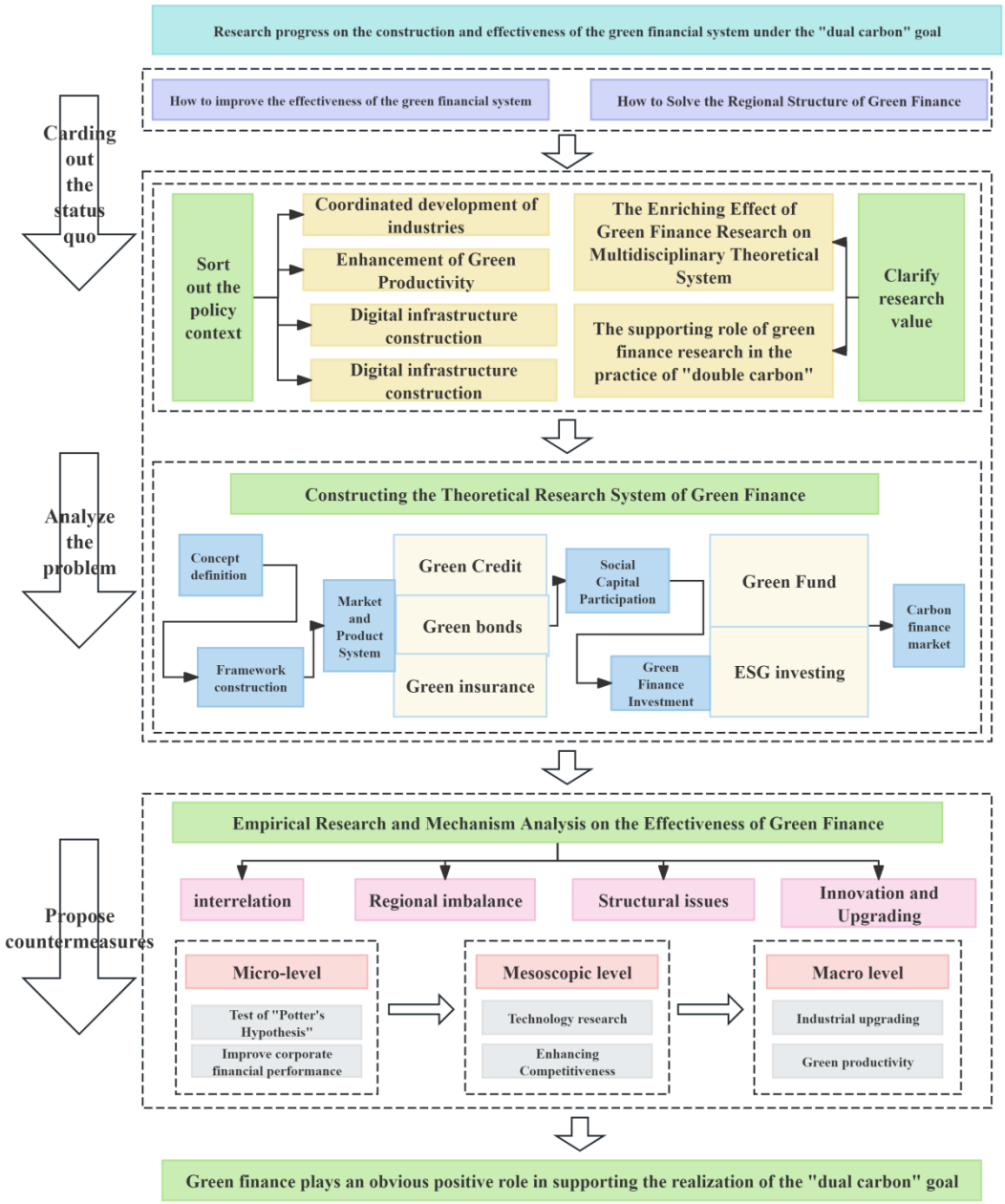
Externality theory constitutes one of the core theoretical foundations of green finance. In traditional economic activities, the negative externalities caused by corporate environmental pollution are often not included in their production costs, resulting in excessive consumption of environmental resources, which in turn leads to the phenomenon of "tragedy of the commons". Green finance corrects this negative externality through market-oriented means, and internalizes environmental costs into the production and operation decisions of enterprises. Financial institutions can increase the economic cost of their negative environmental externalities by raising the credit threshold and financing interest rate for high-polluting enterprises. The cost provides preferential financing support for green and environmentally friendly enterprises and reduces the financial burden of their low-carbon transformation. This differentiated financial arrangement can encourage enterprises to actively control pollution and turn to green production models, thereby realizing the synergy of environmental benefits and economic benefits.

2.2.2 Theory of Sustainable Development

The theory of sustainable development emphasizes the coordination and unity of economy, society and environment, and advocates that while meeting the needs of contemporary development, it does not damage the ability of future generations to meet their needs. As a sustainable development theory, green finance practices in the financial field, integrates sustainable development goals into the entire process of financial

activities, and guides the economic and social transformation to green and low-carbon through resource allocation. Green finance supports the development of green industries such as renewable energy, energy conservation and environmental protection, and promotes the transformation of economic growth mode from extensive to intensive; By restricting the supply of funds to high-energy-consuming and high-pollution industries, it will help prevent the transmission of environmental risks to the financial system, maintain the long-term stability of the financial system, and then achieve the organic unity of sustained economic growth, social fairness and justice, and ecological environment improvement.

Figure 1: Full Process Flowchart



2.3 Overview of Global Green Finance Development

International green finance originated at the beginning of the 21st century. The proposal of the “Equator Principles” in 2003 marked the beginning of standardization and standardization of green finance, and provided an international framework for financial institutions to assess and manage project environmental and social risks. At present, developed economies such as the European Union and the United States are the main

promoters of global green finance. Among them, the European Union is in a leading position in system construction. Taxonomy) and other policies have established a relatively complete green financial standard and disclosure system, and its carbon trading market is also becoming more and more mature; The United States focuses on guiding the development of green finance through market mechanisms. The green bond market and ESG investment market are large in scale and rich in innovative products, forming a market-led development model.

The development of China's green finance began with the promulgation of the "Guiding Opinions on Building a Green Financial System" in 2016, and then experienced a rapid development process from "top-level design" to "market practice". Driven by the policy, China has initially formed a "1 N" policy system centered on the "dual carbon" goal, and the scale of green credit [4], green bonds and other products has grown rapidly. China's green finance presents the characteristics of significant policy-driven role, leading market scale, and active product innovation. However, compared with developed markets such as the European Union and the United States, the development of China's green finance is still in the deepening stage, and there is still room for further improvement in terms of the improvement of the standard system, the maturity of the market mechanism, and the depth of participation in international rules.

3. Framework for Building a Green Financial System under the "Dual Carbon" Goal

3.1 Top-level System and Policy System

3.1.1 Green Finance Standard System

Green financial standards are the basis for regulating green financial activities and ensuring the "green attributes" of funds. Dong [5] established a semi-parametric variable coefficient panel model through the semi-parametric estimation method. Under the conditions of panel data in 273 cities, they found that the impact of green finance on carbon emissions through industrial structure upgrading decreases with the increase of its development index. A number of mainstream green financial standard systems have been formed at home and abroad. Internationally, it is mainly represented by the EU's "Green Classification Scheme" (Taxonomy) and the "Green Bond Principles" (GBP) issued by the International Capital Markets Association (ICMA); Domestically, the "Green Loan Support Project Catalog" and "Green Bond Support Project Catalog" are the core frameworks.

Domestic and foreign green financial standards are consistent in terms of core objectives. They are all committed to clarifying the definition scope of green projects and guiding the flow of funds to environment-friendly projects. However, there are certain differences in specific classification and identification standards. For example, the EU's "Green Classification Scheme" regards "substantial contribution" and "no significant damage" as the core principles of project identification, and the classification system is more detailed; China's green financial standards are more in line with the actual development of domestic industries, and cover key areas such as new energy, energy conservation and environmental protection more comprehensively. With the improvement of the interconnection of the global green financial market, the trend of integration of domestic and foreign standards has become increasingly apparent, and promoting the internationalization of green financial standards has become an important development direction.

3.1.2 Information Disclosure and Regulatory Requirements

Environmental information disclosure is the key guarantee for the effective operation of green finance, which can reduce information asymmetry [6], help financial institutions assess project environmental risks, and guide investors to make rational decisions. Liu, Yang and Guo [7] used panel data model and multiple regression analysis to study heavily polluting listed companies, and found that the quality of environmental accounting information disclosure is positively correlated with equity concentration, and negatively correlated with the degree of integration of the two positions. At present, the global environmental information disclosure policy is mainly divided into two modes: mandatory disclosure and voluntary disclosure. Countries and regions such as the European Union and Japan have established mandatory environmental information disclosure systems, requiring companies to regularly disclose environmental-related information; At present, voluntary disclosure is still the main method in China, but the mandatory disclosure system is gradually improving. The "Administrative Measures for the Legal Disclosure of Enterprise Environmental Information", which will be

implemented from 2023, marks that my country's environmental information disclosure has entered a new stage of standardization and rule of law.

Mandatory environmental information disclosure can more effectively restrain corporate environmental behavior and improve the efficiency of green financial resource allocation, but it may also increase corporate compliance costs; Voluntary disclosure puts more emphasis on corporate autonomy and is applicable to the initial stage of green financial development. In the future, building an information disclosure system with "mandatory disclosure as the mainstay and voluntary disclosure as the supplement" and improving disclosure content [8], standards and verification mechanisms will become an important development direction of green financial supervision.

3.1.3 Incentive and Restraint Mechanism

The incentive and restraint mechanism is the core driving force to promote the development of green finance, mainly including the central bank's structural monetary policy tools, fiscal discounts, regulatory assessments, etc. In terms of the central bank's structural monetary policy tools, China's carbon emission reduction support tools provide financial institutions with low-cost funds to guide them to increase credit for carbon emission reduction projects; The fiscal discount policy uses subsidies to reduce the financing cost of green projects, thereby improving the project income level and market attractiveness; In terms of regulatory assessment, effective positive incentives are formed by incorporating indicators such as the proportion of green credit and the issuance of green bonds into the regulatory evaluation system of financial institutions.

At present, there is still some controversy about the policy effect of the incentive and restraint mechanism in the academic circles. Policies such as the central bank's structural monetary policy tools and fiscal discounts can effectively reduce the financing costs of green projects and promote the expansion of green finance; However, some studies have pointed out that due to insufficient incentives and inadequate policy implementation, some policies have not fully achieved the expected results in actual implementation [9]. In addition, the restraint mechanism for high-polluting enterprises is not yet perfect, and the risk pricing mechanism for "brown" assets has not yet been fully established, making it difficult to form an effective force for the transformation of high-carbon enterprises.

3.2 Market and Product System

3.2.1 Green Credit

Green credit is the core product of China's green financial system and the largest green financial product at present. Zhang and Luo [10] led people to build a difference-in-differences model based on the "Green Credit Guidelines" as a quasi-natural experiment. Under the conditions of A-share panel data from 2007 to 2022, they found that the green credit policy significantly promoted the green and low-carbon transformation of "two high" enterprises. Major commercial banks are the main suppliers of green credit. Large state-owned commercial banks occupy a dominant position in the green credit market by virtue of their advantages in financial strength and policy execution, and their green credit balance accounts for more than 60%.

Green credit can effectively reduce the financing costs of green enterprises and support the development of industries such as renewable energy, energy conservation and environmental protection, but there are still some problems. For example, financial institutions have a low risk appetite for green projects, and some green projects are difficult to obtain sufficient credit support due to the characteristics of long cycles, low returns, and uncertain risks; The structure of green credit is unbalanced, with strong support for large enterprises and insufficient coverage for small and medium-sized enterprises. In addition, the "greenwashing" risk of green credit has also attracted attention, and some companies may obtain preferential credit by falsely declaring green projects.

3.2.2 Green Bonds

Green bonds are an important financing tool in the green financial market, and the issuance scale has continued to expand in recent years. Guo [11] used the multi-period DID model to take A-share non-financial listed companies from 2013 to 2023 as samples, and found that the issuance of green bonds by enterprises can significantly improve innovation efficiency and play an intermediary role in reducing the risk of debt default. At present, relevant research mostly focuses on the issuance pricing, certification mechanism and "green

premium" of green bonds. Green bonds attract ESG investors because of their environmentally friendly attributes, thus having a "green premium", that is, the issuance rate is lower than that of ordinary bonds; my country's green bond market is still in the early stages of development. Affected by factors such as imperfect certification mechanisms and insufficient market liquidity, the "green premium" is not obvious, and even the issuance rate of some green bonds is higher than that of ordinary bonds.

Certification mechanism is the key to ensure the "green attribute" of green bonds. At present, my country's green bond certification is mainly undertaken by third-party organizations, but there are problems such as inconsistent certification standards and irregular processes, which affect market credibility to a certain extent. In the future, further improving the green bond certification mechanism, improving market liquidity, and promoting the normalization of "green premiums" will be important directions for the healthy development of the green bond market.

3.2.3 Green Insurance, Green Fund and ESG Investment

Green insurance supports green development through a risk protection mechanism, mainly covering environmental pollution liability insurance, green project engineering insurance and other categories. Studies have shown that green insurance can effectively disperse the environmental and engineering risks of green projects, reduce the credit risks of financial institutions, and promote the implementation of green projects. However, at present, the overall scale of my country's green insurance market is small, the product categories are relatively single, and the coverage is limited.

Green funds are an important carrier to guide social capital to participate in green investment, including guidance funds, private equity funds, public funds, etc. Qi [12] used the parametric quadratic programming method and pairwise t-test to construct a green investment index and portfolio model. After analyzing the data of four green theme funds, they found that their investment strategies were basically implemented and performed well, but there was still room for improvement. Among them, the guidance fund leverages social capital through financial funds, focusing on supporting early green technology research and development and green industry cultivation; Private equity funds and public funds focus more on market-oriented operations, mainly investing in mature green companies and projects. Green funds can effectively make up for the funding gap of green projects, but they also face challenges such as difficulty in raising funds and a long return on investment cycle.

ESG investment is a green financial investment model that has emerged rapidly in recent years. By evaluating the performance of companies in the three dimensions of environment, society and governance, companies with sustainable operating capabilities are selected for investment. Existing studies believe that ESG investment can help guide capital flow to green companies and promote companies to improve their environmental performance. However, my country's ESG investment market is still in the development stage, facing problems such as imperfect ESG information disclosure and inconsistent evaluation standards, which restrict the further promotion of this model.

3.2.4 Carbon Finance Markets

The national carbon emissions trading market is the core of China's carbon financial system and has a close linkage with the green financial system. The carbon financial market forms a carbon price signal and guides enterprises to reduce carbon emissions by pricing and trading carbon emission rights [13]; Green finance provides financial support for carbon emission reduction projects and promotes the research and development and promotion of carbon emission reduction technologies.

Studies have shown that the linkage between the carbon financial market and the green financial system will help improve the efficiency of carbon emission reduction and reduce the total cost of social emission reduction. Enterprises support carbon emission reduction projects through green credit, and the resulting carbon emission allowances can be traded in the carbon market, forming a virtuous circle of "financing support-emission reduction implementation-quota trading-income increase". However, my country's carbon financial market is still in the early stages of development, and there are problems such as low market activity, low carbon prices, and limited financialization. The linkage mechanism with the green financial system has not yet been fully established.

4. Empirical Research and Mechanism Analysis of Green Finance Effectiveness

4.1 Macro Level: Support Effect for Economic Green Transformation

Empirical research at the macro level mainly focuses on the relationship between the scale of green finance and key indicators such as carbon emission intensity [14], industrial structure optimization, and green total factor productivity. A large number of studies have shown that green finance has a positive supporting role in the green transformation of the economy. First, by supporting carbon emission reduction projects and green technology research and development, green finance can help reduce carbon dioxide emissions per unit of GDP, that is, weaken carbon emission intensity; Second, green finance can guide funds from high energy consumption and high pollution industries to green industries such as energy conservation, environmental protection, and renewable energy, promote the optimization of industrial structure, and increase the proportion of tertiary industries and green industries in the national economy; Third, green finance can improve the quality and efficiency of economic growth by promoting technological innovation and optimizing resource allocation to improve green total factor productivity. Ye and Cai [15] used combing analysis and dimensional analysis to build a research framework. Under the conditions of combing the "dual carbon" five-year policy and financial path, they found that green finance has a supporting role but still has challenges and put forward optimization suggestions. The support effect of green finance on economic green transformation is not significant, and may even have a negative impact. The main reason for this difference is that there is a significant regional imbalance in the development of green finance, the development level of the eastern region is relatively high, and the support effect is more obvious; The development of the central and western regions is relatively lagging behind, and it is difficult to effectively support the green transformation of the local economy. Factors such as the imperfect green financial system itself and inadequate policy implementation will also restrict its macro effects.

4.2 Mesoscopic Level: Impact on Industries and Enterprises

4.2.1 Support for Green Industries

Green finance can effectively support the development of green industries. From the perspective of financing costs, green finance reduces the financing costs of green industries such as renewable energy [16], energy conservation and environmental protection, and improves the profitability and market competitiveness [17] of the industry by providing financing tools such as preferential credit and green bonds; From the perspective of industrial scale, the financial support of green finance has promoted the technology research and development and capacity expansion of green industries, promoted the development of industrial clusters, and formed a scale effect; From the perspective of technological innovation, green finance provides stable financial support for the technology research and development of green industries, promotes breakthroughs in key technologies such as carbon capture and new energy storage [17], and enhances the core competitiveness of green industries.

However, there are also structural problems in the current support. The support for relatively mature industries such as new energy, energy conservation and environmental protection is relatively strong, while the coverage of emerging industries such as green agriculture and green service industry is insufficient. Financing support for large enterprises is relatively sufficient, but financing obstacles for small and medium-sized green enterprises still exist.

4.2.2 Restrictions on Polluting Enterprises

The restraint effect of green finance on polluting enterprises is mainly realized through mechanisms such as "brown" asset risk pricing and environmental stress testing. Yin and Ou [18] used empirical analysis methods to build relevant models, taking Shanghai and Shenzhen A-share heavily polluting enterprises from 2012 to 2022 as samples, and found that improving ESG performance can alleviate their financing constraints, and there are multiple influencing factors. The "brown" asset risk pricing mechanism incorporates environmental risks into financing costs, making polluting enterprises face higher loan interest rates and stricter financing conditions; Environmental stress testing forces enterprises to transform and upgrade by simulating the impact of extreme environmental events. Green finance can restrain the pollutant discharge behavior of polluting enterprises to a certain extent, and promote their transformation to green and low-carbon. Under pressure, some high energy-consuming enterprises have increased investment in environmental protection and

improved processes. However, some enterprises evade constraints by transferring production capacity or making false rectifications, reflecting that the implementation effectiveness of the constraint mechanism still needs to be strengthened.

4.3 Micro-level: Corporate Financial Performance and Behavioral Response

4.3.1 Test of the "Potter Hypothesis"

"Porter Hypothesis" believes that appropriate environmental regulation can stimulate enterprise innovation, thereby improving the financial performance and market value of enterprises. As a market-oriented means of environmental regulation, whether green finance can verify the "Porter hypothesis" has become the focus of academic attention.

There are differences in the test results of the "Porter hypothesis" in existing studies. Some studies support the "Porter Hypothesis", which believes that green finance can encourage enterprises to increase investment in green technology research and development, improve the environmental competitiveness of products, and then improve corporate financial performance and market value [19]; However, there are also studies that do not support the "Porter Hypothesis", believing that green finance increases the financing costs and environmental protection investment of enterprises, and will reduce the financial performance of enterprises in the short term, while the long-term effect is not yet clear. The main reason for the difference lies in the influence of factors such as enterprise type, industry characteristics, and policy environment. For example, green industry enterprises are more likely to achieve innovation-driven performance improvement with the support of green finance, while high-polluting enterprises may lead to high transformation costs. Decline in financial performance.

4.3.2 Impact of Green Behavior of Enterprises

After enterprises obtain green financing, changes in actual investment in pollution reduction, green technology research and development, etc. are key indicators to measure the micro-effectiveness of green finance. Based on the data of A-share new energy listed companies from 2011 to 2022, Fan [20] used the entropy method and fixed effect model to find that companies that obtain green credit or green bonds will significantly increase investment in environmental protection, reduce emission intensity, and increase green research and development efforts. For example, renewable energy companies will expand production capacity and improve energy efficiency after obtaining financing, while manufacturing companies will invest in research and development of cleaner production technologies. At present, there is a phenomenon of "emphasizing financing and ignoring investment". Some enterprises have not fully used green funds for established projects, which has weakened the policy effect. The sustainability of corporate green behavior has also attracted much attention: Although short-term financing may promote transformation, due to factors such as market competition and cost pressures, long-term maintenance of green investment still faces challenges.

5. Conclusion and Outlook

This article systematically sorts out the relevant research on the construction and effectiveness of the green financial system under the "dual carbon" goal. The main conclusions show that the green financial system is composed of top-level institutional policies and market product systems. The former is based on standards, information disclosure, and incentive and restraint mechanisms, while the latter is centered on green credit and bonds, supplemented by other products, and plays a role together; Its implementation has shown a positive impact on low-carbon transformation at the macro, meso and micro levels, but there are also problems such as uneven regional development, insufficient structural support, and some enterprises "emphasizing financing and ignoring investment"; The current development still faces challenges such as inconsistent standards, low market activity, and a shortage of interdisciplinary talents. Based on this, policy suggestions are put forward: improve the top-level design, promote the internationalization of standards, establish an information disclosure system based on mandatory disclosure, and improve the incentive and restraint mechanism; Optimize the market and product system, expand the market scale, improve the financialization level of the carbon market, and promote product diversification; Strengthen talent training and international cooperation, build a professional talent system and deepen international coordination. In terms of research deficiencies and future prospects, this paper mainly combs the literature, lacks empirical testing and in-depth analysis of the interaction

mechanism of elements in the system. Future research can be devoted to building a scientific effectiveness evaluation system, discussing the synergistic effect of policy-market-product, focusing on the integration of digital finance and green finance, and deeply analyzing regional imbalances, in order to provide high-quality development of the green financial system. More accurate theoretical support and policy reference.

References

[1] Sun, S., Guo, Y., Tian, C., Xu, X., Ghaffar, A. Green Finance and Economic Growth: Evidence from China's Natural Resource Markets. Economic Analysis and Policy. 2025, 87, pp. 2202–2222. https://doi.org/10.1016/J.EAP.2025.07.043

[2] Tang, L., Cao, S., Li, K. Does Digital Transformation Enhance Carbon Reduction? New Evidence from Micro-Enterprises and Listed Enterprises in China. Environmental Impact Assessment Review. 2026, 118, p. 108255. https://doi.org/10.1016/J.EIAR.2025.108255

[3] Chen, Y., Qu, Y., Zhu, Q. Digital Transformation for Corporate ESG Performance: Configurations of Applied Digital Technologies and Digital Technology Application Scenarios. Industrial Management and Data Systems. 2025, 125(9), pp. 2665–2692. https://doi.org/10.1108/IMDS-10-2024-1014

[4] Yu, Z., Shi, E. Green Finance and Corporate Credit Ratings - Exploring the Potential of the Sharing Economy. Finance Research Letters. 2025, 86, p. 108914. https://doi.org/10.1016/J.FRL.2025.108914

[5] Dong, P. Analysis of the Dynamic Relationship between Green Finance, Industrial Structure and Carbon Emissions. Cooperative Economy and Technology. 2025(23), pp. 39–41. https://doi.org/10.3969/j.issn.1672-190X.2025.23.013

[6] Tsatsaronis, M., Stergiouli, A., Vaggelas, G. ESG Disclosure as a Proxy of Port Corporate Communication and Sustainable Management Strategy: An LDA Approach. Research in Transportation Economics. 2025, 114, p. 101680. https://doi.org/10.1016/J.RETREC.2025.101680

[7] Liu, K., Yang, J., Guo, Z. Analysis of the Impact of Corporate Governance Structure on the Quality of Corporate Environmental Accounting Disclosure. Times Economics and Trade. 2025, 22(11), pp. 34–38.

[8] Wang, X., Zhang, Y., Luan, X., Ma, Z. Can Environmental Information Openness Inhibit the Strategic Behavior of ESG Information Disclosure? Evidence from the "Ambient Air Quality Standards" in China. Environment, Development and Sustainability. 2025, 27, pp. 1–41. https://doi.org/10.1007/S10668-025-07070-X

[9] Kou, M., Yang, Y., Feng, Z., Chen, K., Wei, J. Are Incentives Excessive or Insufficient? The Impact of R&D Fiscal Policies on R&D Inefficiency in China. Technological Forecasting and Social Change. 2023, 194, p. 122707. https://doi.org/10.1016/J.TECHFORE.2023.122707

[10] Zhang, Y., Luo, M. The Impact of Green Credit on the Green and Low-Carbon Transformation of “Two High” Enterprises: Evidence from Quasi-Natural Experiments. Credit Investigation. 2025(11), pp. 72–84.

[11] Guo, J. The Impact of Green Bond Issuance on Enterprise Innovation Efficiency. Business Observation. 2025, 11(33), pp. 81–85. https://doi.org/10.3969/j.issn.2096-0808.2025.33.016

[12] Qi, Y. Investment Strategy Analysis and Performance Evaluation Research of Green Theme Funds under the Background of Green Development: Based on Parametric Quadratic Programming. Future and Development. 2025, 49(10), pp. 107–116. https://doi.org/10.3969/j.issn.1003-0166.2025.10.018

[13] Wang, K., Xu, Y. Development of the Green Finance Market, Carbon Emission Trading, and Corporate Environmental Responsibility. Finance Research Letters. 2025, 79, p. 107277. https://doi.org/10.1016/J.FRL.2025.107277

[14] Tao, C., Cheng, B., Liao, Z., Wei, Z., Chen, F., Yu, C. The Impact of Carbon Emissions Trading Policy on Green Innovation of Export Enterprises: Evidence from China. Economic Analysis and Policy. 2025, 88, pp. 1922–1938. https://doi.org/10.1016/J.EAP.2025.10.028

[15] Ye, Y., Cai, D. Guided by the "Double Carbon" Goal, Promote Green Finance to Serve the Green and Low-Carbon Transformation of the Economy and Society to a New Level. Bonds. 2025(10), pp. 6–12. https://doi.org/10.3969/j.issn.2095-3585.2025.10.003

[16] Østergaard, P. A., Cabrera, P., Johannsen, R. M., Duic, N., Kalogirou, S. Advancing Sustainability through Renewable Energy Technologies: Trends and Innovations. Renewable Energy. 2025, 255, p. 124595. https://doi.org/10.1016/J.RENENE.2025.124595

[17] Huang, X., Sun, Y. Digital Transformation, Management Characteristics and Market Competitiveness. Finance Research Letters. 2025, 85, p. 108110. https://doi.org/10.1016/J.FRL.2025.108110

[18] Yin, J., Ou, X. Balancing ESG Construction and Production and Operation: Alleviating Financing Constraints of Heavy Polluting Enterprises. Gongxin Finance and Technology. 2025(5), pp. 66–87. https://doi.org/10.3969/j.issn.2096-9724.2025.05.006

[19] Lee, S. P., Isa, M. M. ESG and Financial Performance: Moderating Role of Industry Sensitivity and Shariah Compliance. Review of Managerial Science. 2025, 19, pp. 1–30. https://doi.org/10.1007/S11846-025-00954-2

[20] Fan, Z. Research on the Impact of Green Finance on Green Innovation of New Energy Enterprises. Cooperative Economics and Technology. 2025(23), pp. 36–38.

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