

# Research on the Mechanisms by Which Green Finance Policies Promote Low-Carbon Economic Development

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**Abstract:** This paper explores the mechanisms by which green finance policies promote low-carbon economic development, analyzing their implementation effects and challenges in China, and proposing corresponding policy recommendations. Green finance, defined as financial activities supporting environmental protection and sustainable development, aims to direct funds towards environmentally friendly and low-carbon projects. It includes green credit, green bonds, green investment funds, and green insurance, and involves providing preferential loans, issuing green bonds, establishing investment funds, and developing insurance products to support green projects and reduce environmental risks. Additional policies such as green incentives, environmental information disclosure, green ratings, and international cooperation further enhance the effectiveness of green finance. The mechanisms by which green finance policies promote low-carbon development include guiding funds to low-carbon industries, optimizing resource allocation, promoting technological innovation, supporting industrial structure transformation, enhancing market competitiveness, and promoting socially responsible investment. Despite significant progress, challenges such as insufficient supply of green finance resources, regional disparities in policy implementation, limited innovation in green finance products, and imperfect information disclosure and regulatory systems remain. The paper concludes with policy recommendations to increase policy support, improve information disclosure and regulatory systems, promote product innovation, strengthen regional coordinated development, and enhance international cooperation.

**Keywords:** Green finance, Low-carbon economy, Green credit, Green bonds, Green investment funds, Green insurance.

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## 1. Introduction

The issue of global climate change is becoming increasingly severe. Reducing greenhouse gas emissions and achieving low-carbon economic development have become a consensus among countries [1]. As an emerging financial model, green finance policy supports low-carbon economic projects through financial tools and measures, optimizes resource allocation, reduces environmental pollution, and promotes the coordinated development of the economy and the environment. This paper aims to explore the mechanisms by which green finance policies promote low-carbon economic development, analyze their implementation effects and challenges in China, and propose corresponding policy recommendations.

## 2. Definition and Connotation of Green Finance

### 2.1. Definition and Connotation of Green Finance

Green finance refers to financial activities that support environmental protection and sustainable development through financial means. It aims to direct funds towards environmentally friendly and low-carbon projects, supporting the development of clean energy, energy conservation, emission reduction, and resource recycling [2].

Its main components include green credit, green bonds, green investment funds, and green insurance. Green credit involves financial institutions providing preferential loans to support environmental projects and green enterprises, reducing financial support for high-pollution, high-energy-consumption industries. Green bonds are bonds specifically issued for environmental and green projects, attracting social capital into green industries and supporting renewable energy

and energy conservation projects. Green investment funds are established to facilitate the flow of capital into the environmental and low-carbon economic sectors, supporting technological innovation and the development of green industries. Green insurance develops products that provide risk protection for environmental projects and green enterprises, reducing environmental risks.

In addition, green finance policies include green incentives that encourage enterprises and individuals to participate in green financial activities through tax incentives and financial subsidies, supporting the implementation of environmental projects. Environmental information disclosure requires enterprises and financial institutions to disclose their environmental risks and performance, enhancing transparency and promoting market attention to environmental factors. Green ratings establish standards for evaluating the environmental performance of financial products and enterprises, guiding investors to focus on green projects. Lastly, international cooperation strengthens global collaboration in green finance, promoting the development of global green financial markets and collectively addressing climate change challenges.

### 2.2. Definition and Connotation of Low-Carbon Economy

A low-carbon economy refers to an economic model that achieves sustainable development by reducing greenhouse gas emissions. It emphasizes minimizing the emission of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases in economic activities to address climate change, reduce environmental pollution, and promote sustainable development. The core objective of a low-carbon economy is to decouple economic growth from carbon emissions, fostering an economic development model that is green, energy-efficient, and environmentally friendly [3].

The connotation of a low-carbon economy mainly includes the following aspects: Firstly, by optimizing the energy structure, a low-carbon economy emphasizes increasing the proportion of renewable energy use and reducing reliance on fossil fuels such as coal, oil, and natural gas, while promoting clean energy sources such as solar, wind, hydro, and biomass. Secondly, through technological innovation and management optimization, a low-carbon economy aims to improve energy efficiency and reduce energy waste by promoting energy-efficient buildings, equipment, and technologies. Additionally, it involves transforming and upgrading traditional high-energy-consumption and high-emission industries and supporting the development of low-carbon and green industries such as clean energy, circular economy, and environmental protection industries. In the transportation sector, it promotes public transportation, electric vehicles, and low-carbon transportation tools to reduce carbon emissions and optimizes transportation management to improve efficiency. By establishing and improving carbon emission trading markets, it uses market mechanisms to control and reduce carbon emissions, encouraging enterprises to reduce emissions through technological innovation and management optimization. In terms of green building, it promotes green building design and construction standards, using environmentally friendly materials and energy-saving technologies to reduce energy consumption and carbon emissions in buildings. For ecological protection and restoration, it strengthens efforts to increase carbon sinks (such as forests and wetlands) and enhance the carbon absorption capacity of ecosystems. Regarding policy support and incentives, governments support the development of a low-carbon economy by formulating and implementing relevant policies and regulations, providing tax incentives and financial subsidies, and encouraging enterprises and individuals to participate in low-carbon actions. Meanwhile, it enhances public awareness and education about low-carbon practices, promoting low-carbon lifestyles and encouraging the entire society to participate in building a low-carbon economy. Through these measures, a low-carbon economy aims to reduce greenhouse gas emissions, mitigate the impacts of climate change, and achieve sustainable economic growth and environmental protection. This not only helps address global climate change challenges but also promotes economic structure optimization and technological innovation.

### **3. Mechanisms by Which Green Finance Policies Promote Low-Carbon Economic Development**

Green finance policies promote the development of a low-carbon economy through various mechanisms, primarily reflected in the following aspects:

#### **3.1. Guiding Funds to Low-Carbon Industries**

One of the core aspects of green finance policies is guiding funds to low-carbon and environmentally friendly industries through financial tools. Specific measures include green credit and green bonds [4]. These tools achieve funding for low-carbon industries in several ways. Firstly, green credit involves financial institutions offering preferential loans to support environmental projects and green enterprises. Banks and other financial institutions provide projects that meet green standards with preferential interest rates and flexible

loan terms, reducing financing costs for these projects. For example, banks can offer low-interest loans for solar and wind energy projects, easing their financial burden and promoting their development. Governments and companies issue green bonds to raise funds for environmental and low-carbon projects. The funds from green bonds are strictly limited to projects that meet environmental standards, such as clean energy and energy-saving projects. Issuing green bonds not only provides long-term stable funding for low-carbon projects but also uses market mechanisms to direct social capital to green industries, increasing capital market attention and investment willingness towards green projects.

Through these financial tools, green finance policies effectively lower the financing costs of low-carbon projects, attract more capital into clean energy, energy conservation, and emission reduction fields, thereby promoting the development of low-carbon industries.

#### **3.2. Optimizing Resource Allocation**

Green finance policies optimize resource allocation by directing resources towards low-carbon economic fields, mainly in the following ways. Governments and relevant agencies establish green rating standards to evaluate the environmental performance of financial products and enterprises [5]. The establishment of green rating standards increases the transparency and sustainability of green projects, enabling investors to better understand the environmental performance and social benefits of projects. This transparency helps attract more social capital to green projects, optimizing resource allocation. Requiring enterprises and financial institutions to disclose their environmental risks and performance information enhances information transparency. Environmental information disclosure can increase investor trust in green projects, making them more willing to invest in these projects. At the same time, information disclosure encourages enterprises to focus more on environmental management and improve their sustainable development capabilities.

Through green ratings and environmental information disclosure, green finance policies enhance the market recognition and attractiveness of green projects, optimize resource allocation, and improve resource utilization efficiency [6].

#### **3.3. Promoting Technological Innovation**

Green finance policies promote technological innovation by supporting the research and application of green technologies, specifically in the following aspects:

Establishing dedicated green investment funds to support the research and application of green technologies [7]. Green investment funds provide venture capital and funding support, reducing the risks and costs for enterprises in green technology research and application, encouraging them to innovate. For example, some green investment funds focus on investing in cutting-edge fields such as new energy technologies and environmental protection technologies, driving rapid development and application of these technologies through capital injection. Developing green insurance products to provide risk protection for environmental projects and green enterprises. Green insurance can mitigate various risks that green projects may face during implementation, such as technological and market risks, thereby encouraging enterprises and investors to participate in green technology research and application. By

spreading and mitigating risks, green insurance increases the market competitiveness of green projects and promotes technological innovation.

Through funding support and risk protection, green finance policies effectively reduce the risks and costs for enterprises in green technology research and application, enhancing the market competitiveness of low-carbon technologies.

### **3.4. Promoting Industrial Structure Transformation**

Green finance policies support the development of green industries, promoting the transformation and upgrading of traditional high-energy-consuming and high-emission industries through financial support and industrial upgrading [8]. By providing preferential loans and green bonds, green finance policies support traditional industries in introducing low-carbon technologies and energy-saving equipment, driving changes in production methods. For example, some high-energy-consuming enterprises can apply for green credit to obtain funding support when introducing advanced energy-saving equipment, thus reducing the cost of purchasing and installing equipment. Financial institutions restrict financing for traditional high-pollution enterprises, encouraging them to accelerate transformation and upgrading, introduce low-carbon technologies, and reduce resource consumption and pollutant emissions. For example, traditional high-energy-consuming industries such as steel and cement have accelerated the application of low-carbon technologies under the guidance of green finance policies, promoting industrial structure transformation towards green and low-carbon directions.

Through these measures, green finance policies promote the optimization and upgrading of industrial structures, driving the transformation of traditional high-energy-consuming and high-emission industries towards green and low-carbon directions [9].

### **3.5. Enhancing Market Competitiveness**

Green finance policies enhance the market competitiveness of green industries by providing more competitive financing conditions [9], mainly in the following two aspects. Firstly, offering preferential interest rates and flexible repayment methods. Financial institutions provide green projects with preferential interest rates and flexible repayment terms, reducing the funding costs for green industries. For example, banks can offer lower loan interest rates and extended repayment periods for projects that meet green standards, alleviating financial pressure on enterprises and enhancing their market competitiveness. Secondly, green ratings and environmental information disclosure. By improving green ratings and environmental information disclosure, the market recognition and attractiveness of green projects are enhanced. Green ratings and environmental information disclosure enable investors to better understand the environmental performance and social benefits of projects, increasing their confidence and willingness to invest in green projects [10].

Through these measures, green finance policies reduce the funding costs for green industries, enhance their market competitiveness, and give them a greater advantage in the market.

### **3.6. Promoting Socially Responsible Investment**

Green finance policies promote socially responsible

investment by advocating Environmental, Social, and Governance (ESG) investment principles, guiding investors to focus on environmental performance and social responsibility, mainly through green bonds and green credit [11-13]. By issuing green bonds and providing green credit, financial institutions support enterprises' investments in environmental protection and social responsibility projects. For example, financial institutions can raise funds through issuing green bonds to support enterprises' environmental protection and social responsibility projects, promoting the development of socially responsible investment [14, 15]. ESG investment principles advocate that investors consider environmental, social, and governance factors in their investment decisions, guiding more funds towards enterprises with good environmental performance and social responsibility. For example, some financial institutions prioritize investments in enterprises that excel in environmental protection and social responsibility during investment evaluations. Yao, Y. (2024) also mentioned that financial institutions can raise funds by issuing green bonds to support enterprises' ecological environmental protection and social responsibility projects and promote the development of socially responsible investment [14-16]. Xu, T. (2024) and Liu, M., & Li, Y. (2023, October). In his paper, he emphasized that green credit refers to preferential loans provided by financial institutions to support environmental protection projects and green enterprises. Financial institutions such as banks provide preferential interest rates and flexible loan conditions for projects that meet environmental standards, reducing the financing costs of these projects [17, 18]. Through these measures, green finance policies promote the development of socially responsible investment, enhance corporate sustainability, and improve corporate social responsibility and environmental performance.

## **4. Implementation Effects and Challenges of China's Green Finance Policies**

In recent years, China has made significant progress in promoting green finance policies, but it also faces some challenges.

### **4.1. Implementation Effects**

China's green credit balance has been steadily increasing, and the issuance of green bonds ranks among the top in the world [18]. Through the implementation of green finance policies, more funds have been directed towards clean energy, energy conservation, and emission reduction projects, effectively promoting the development of the low-carbon economy. Additionally, China has established multiple green investment funds, attracting social capital into the environmental and low-carbon sectors, supporting the research and application of green technologies, and promoting the development of green industries. The variety of green insurance products has gradually expanded, providing risk protection for environmental projects and green enterprises, reducing the risks of green projects, and enhancing the market competitiveness of green industries. At the same time, China has gradually established environmental information disclosure and green rating systems, increased the transparency and sustainability of green projects, and attracted more investors to focus on and choose green projects.

## 4.2. Challenges

Despite the achievements of China's green finance policies, the supply of green finance resources is still insufficient and cannot fully meet the growing demand for green finance, especially in some regions where the policy implementation effects are not significant. The implementation effects of green finance policies vary significantly across different provinces. Some regions, due to strong policy support and abundant green finance resources, have shown significant effects in low-carbon economic transition; while other regions, due to insufficient policy support and scarce green finance resources, have made slow progress in low-carbon economic transition. Furthermore, Lin, Y. (2024) mentioned that although the variety of green finance products in China is gradually increasing, there is still a gap compared to international advanced levels [19]. The innovation of green finance products is insufficient, failing to fully meet the diverse needs of the market, thus limiting the development of green finance. Despite some progress in environmental information disclosure and green ratings, Yang, J. (2024) stresses that the information disclosure and regulatory systems are still imperfect, with transparency and credibility needing improvement. Insufficient information availability for investors regarding green projects limits the development of the green finance market [20, 21].

## 5. Policy Recommendations

To further promote the implementation of China's green finance policies and advance the development of the low-carbon economy, the following policy recommendations are proposed:

### 5.1. Increase Policy Support

The government should further increase policy support for green finance and increase the supply of green finance resources. Through financial subsidies and tax incentives, financial institutions and enterprises should be encouraged to actively participate in green finance activities, supporting more funds to flow into low-carbon and environmental protection projects.

### 5.2. Improve Information Disclosure and Regulatory Systems

The government should establish and improve environmental information disclosure and green rating systems to enhance the transparency and credibility of green projects. Yang, J. (2024) said that strengthening the regulation of the green finance market would ensure the legality and compliance of green finance products, protect the legitimate rights and interests of investors, and promote the healthy development of the green finance market [21, 22].

### 5.3. Promote Innovation in Green Finance Products

The government should encourage financial institutions and enterprises to innovate green finance products, develop a variety of green finance products, and meet the diverse needs of the market. Through policy guidance and support, the development and application of green finance products should be promoted, enhancing the competitiveness of the green finance market.

## 5.4. Strengthen Regional Coordinated Development

The government should formulate differentiated green finance policies based on the actual conditions of different regions to promote regional coordinated development. By strengthening cooperation and exchanges between regions and sharing successful experiences of green finance policies, the low-carbon economic transition of all regions can be promoted, achieving coordinated development across regions.

## 5.5. Strengthen International Cooperation

The government should enhance international cooperation in green finance, learn from and adopt international advanced experiences, and promote the international development of green finance policies. By participating in the formulation and promotion of international green finance standards, China's green finance policies' international influence should be increased, promoting the development of the global green finance market.

## 6. Conclusion

Green finance policies have significantly contributed to the promotion of low-carbon economic development in China. Through various mechanisms such as guiding funds to low-carbon industries, optimizing resource allocation, promoting technological innovation, supporting industrial structure transformation, enhancing market competitiveness, and promoting socially responsible investment, green finance has effectively supported the transition towards a sustainable economy. However, challenges such as insufficient supply of green finance resources, regional disparities in policy implementation, limited innovation in green finance products, and imperfect information disclosure and regulatory systems need to be addressed. To further advance the implementation of green finance policies and support low-carbon economic development, it is essential to increase policy support, improve information disclosure and regulatory systems, encourage innovation in green finance products, strengthen regional coordinated development, and enhance international cooperation. By addressing these challenges and implementing these recommendations, China can continue to lead in the development of green finance and contribute to global efforts in combating climate change and promoting sustainable development.

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