

# Research on the Impact of Green Finance on Industrial Structure in Shaanxi Province

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**Abstract:** With the introduction of the "dual carbon" goal, China's economic structure and the way its economy and society operate have undergone profound changes. Green finance, as a bridge connecting the financial industry with the green economy, can guide more capital to support green projects and low-carbon enterprises, driving the development of green and low-carbon industries. In recent years, China's green finance has rapidly developed, forming a multi-level green finance market system including green credit, green bonds, green funds, green insurance, green trusts, carbon finance, etc. Green finance has played an important role in promoting ecological civilization and green, low-carbon development. By directing funds to the environmental protection sector, green finance aligns with the concept of sustainable development, promotes continuous optimization and upgrading of industrial structure, and achieves green and high-quality economic development [1]. In the process of supporting the implementation of the "dual carbon" goal, green finance will further play a leading role in promoting ecological civilization construction and supporting green, low-carbon sustainable development.

**Keywords:** Green Finance, Industrial Structure, Green Economy

## 1. Introduction

Green finance refers to financial services provided to support economic activities aimed at environmental improvement, climate change mitigation, and the efficient use of resources. These services include funding, operating, and managing risks for projects in areas such as environmental protection, energy conservation, clean energy, green transportation, and green buildings. The green finance system encompasses financial tools and related policies that support the transition of the economy toward sustainability, including green credit, green bonds, green stock indices, green development funds, green insurance, and carbon finance [2-3]. Building a green financial system aims to mobilize and incentivize more social capital to invest in the green industries while more effectively curbing polluting investments. This not only accelerates the green transformation of Shaanxi Province's economy but also supports the construction of ecological civilization. Additionally, it facilitates technological advances in environmental protection, new energy, and energy conservation, thereby speeding up the development of new economic growth points and enhancing the potential for economic growth.

Under the "dual carbon" goals, Shaanxi Province is pursuing a low-carbon, high-quality economic development model. Traditional high-energy, high-emission industrial models are increasingly unsustainable, and a rational industrial structure can achieve efficient resource utilization [4]. By optimizing the industrial structure, Shaanxi can effectively reduce resource wastage and redundant construction, enhance resource efficiency, promote economic growth and innovation, foster the emergence of new industries, create more job opportunities, and drive sustainable economic growth. In response to the national calls for "carbon peak and carbon neutrality," Shaanxi Province is actively exploring breakthroughs in green industries and green finance. Compared to provinces like Zhejiang, Guangdong, Jiangxi, Guizhou, and Xinjiang, which have already established green finance reform and innovation pilot zones, Shaanxi still faces urgent developmental needs and vast potential for expansion. Therefore, Shaanxi should intensify its efforts to balance economic development with environmental protection, stimulate the development of the green finance market, establish a long-term mechanism for green finance to promote industrial upgrading, and embark on a path of sustainable development. By

implementing a comprehensive approach, Shaanxi aims to achieve a win-win scenario in both economic growth and environmental protection [5].

## 2. The Current State of Green Finance Development in Shaanxi Province

Guided by the philosophy that "lucid waters and lush mountains are invaluable assets," Shaanxi Province is steering its sustainable development into the future. In recent years, the province has actively been building its green finance system, implementing a wide range of policy measures. These measures include promoting green credit, issuing green bonds, and exploring green insurance, all of which significantly bolster the sustainable development of the green ecological economy [6].

### (1) Continuously improving the green finance policy system.

Shaanxi Province has been actively advancing a series of policies and guidelines to promote green finance, supporting its environmental goals to peak carbon emissions and achieve carbon neutrality. These initiatives include the 'Guidelines on Financial Support for Green Development in Shaanxi Province to Help Achieve Carbon Peak and Carbon Neutrality Targets' and the 'Implementation Rules for Performance Evaluation of Green Credit by Deposit-Type Financial Institutions (Corporations) in Shaanxi Province (Trial)'. Aimed at establishing and enhancing a financial support system, these policies facilitate the increase in green credit and the funding of green projects.

As shown in Figure 1, between 2020 and 2023, the balance of green loans in Shaanxi Province significantly increased. By the end of 2023, the total green loan balance reached 691.507 billion yuan, representing a year-on-year growth of 35.78%. This impressive growth indicates significant progress in Shaanxi's drive towards sustainable economic and social development.

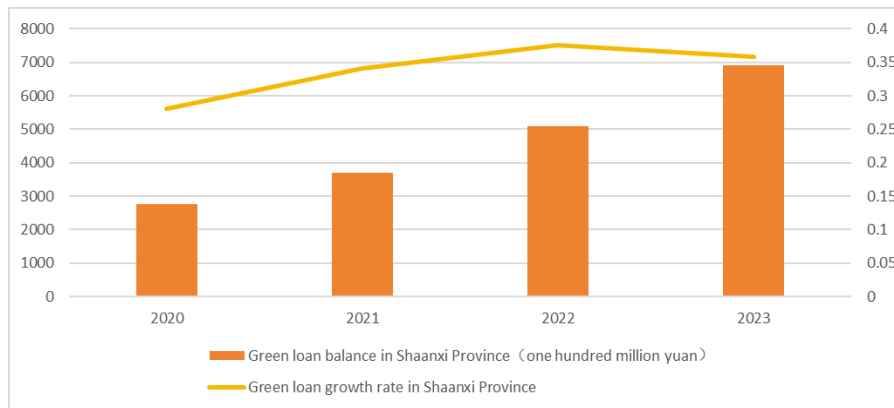


Figure 1: The scale and growth rate of green loans

As shown in Figure 2, Moreover, although the scale of green loans in relation to GDP continues to grow, it still lags behind the national level. This suggests that while initial effects of the green financial policies have been positive, further enhancements in green credit offerings and policy measures are needed to meet broader environmental and economic sustainability goals.

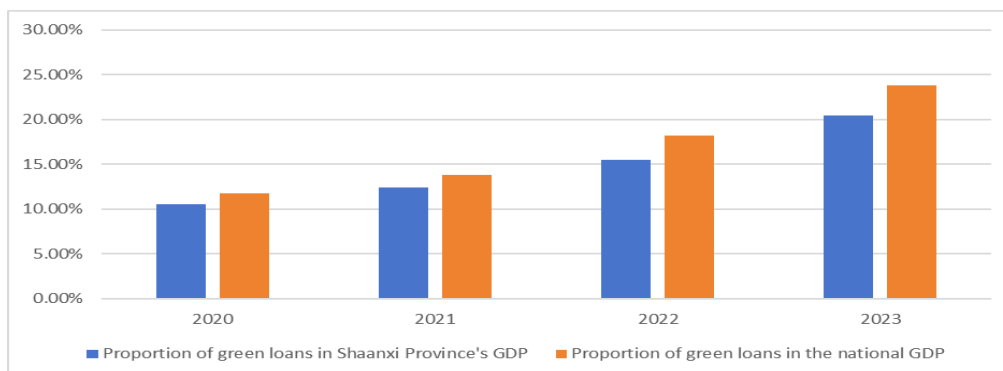


Figure 2: The Proportion of green loans in GDP

### (2)Continuously strengthening the organizational system of green finance

To continuously improve the organizational system of green finance, several strategic initiatives have been implemented: First, Establishment of New Institutions: Banks have created specialized agencies or established new technology branches dedicated to financing activities in low-carbon and clean production sectors. For example, China Merchants Bank's Xi'an branch has formed several green finance service teams to enhance its organizational systems. Second, Establishment of Risk Prevention Mechanisms: The Industrial and Commercial Bank of China's Shaanxi branch has introduced a "Green Environmental Protection Information Inquiry Form" and established a classification management mechanism for green credit customers. Xi'an Bank has adopted the "Equator Principles" to better address the identification of environmental and social risks. Bank of Communications' Shaanxi branch has implemented a series of green credit projects and established an effective set of standards for green credit issuance. These steps are part of a broader effort to strengthen the green finance framework, ensuring that financial practices support sustainable development while mitigating environmental risks.

(3)Expanding the green finance supply system

On one hand, efforts to broaden the scope of collaboration and participate in international cooperation are underway. For instance, the Xi'an branch of Industrial Bank has cooperated with the International Finance Corporation to inject 1.287 billion yuan into Jidong Heidelberg Cement Co., Ltd. Meanwhile, the Xi'an branch of Shanghai Pudong Development Bank has acted as an agent for Shaanxi Zhenping Guihua Hydropower Co., Ltd., engaging in international carbon emission reduction purchase agreements. On the other hand, there is continuous innovation in financial products. The Shaanxi Provincial Branch of the Industrial and Commercial Bank of China provided the first installment payment service of 60,000 yuan to a photovoltaic power generation enterprise. The Postal Savings Bank of Shaanxi has introduced investment opportunities in the green industry for the construction, renovation, and purchase of fixed assets. Qinnong Bank has made a significant breakthrough in green finance bonds through the inter-bank market, providing more financing opportunities to enterprises in sectors such as infrastructure green upgrades, ecological environment, and clean energy. This has substantially enhanced their financing capabilities and opened up more possibilities for innovative business activities. According to 2022 statistics, the investment usage of bonds by industry is shown in Figure 3, and As on July in 2022, the Proportions of green bond types is shown in Figure 4:

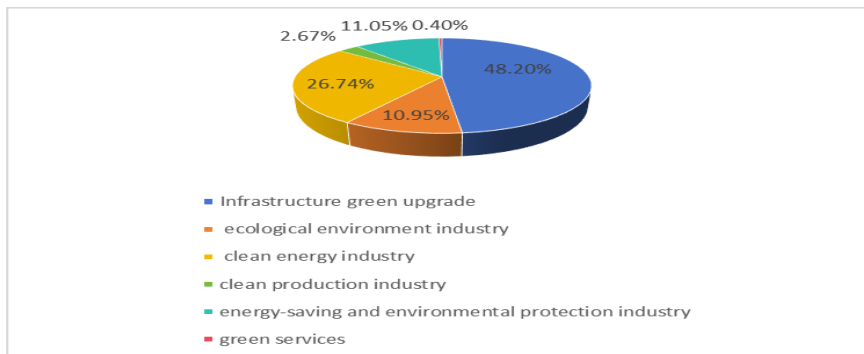


Figure 3: Industries receiving green loans

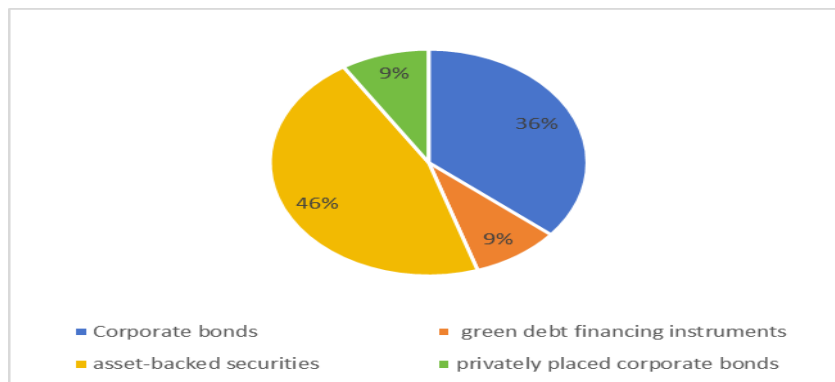


Figure 4: Proportions of green bond types

### 3. The Influencing Mechanism of Green Finance on the Industrial Structure of Shaanxi Province

#### (1)The energy industry

Green finance plays a critical role in the development of various industries in Shaanxi, offering significant support for environmentally friendly and sustainable economic activities. As one of the important energy industry bases, Shaanxi Province possesses abundant coal, oil, and natural gas resources. The advancement of energy industry structural adjustments and transformation relies heavily on green finance. Green finance, through fund guidance, supports the research, application, and promotion of clean energy technologies, not only aiding in reducing greenhouse gas emissions but also driving energy transformation and optimizing energy structures. Green finance also encourages energy enterprises to engage in environmental governance, enhancing the environmental friendliness of production processes.

#### (2)Manufacturing Industry

The manufacturing industry in Shaanxi Province has developed a relatively sophisticated industrial system, covering various fields such as machinery manufacturing, electronics and information technology, chemicals, aerospace, and new energy vehicles. While manufacturing is the cornerstone industry of the economy, it is also one of the main sources of environmental pollution. Green finance in the manufacturing sector, through providing low-interest green loans and environmental protection loans, encourages manufacturing enterprises to undergo green transformation, promoting the development of environmentally friendly manufacturing. By enhancing corporate production efficiency, improving environmental quality, it achieves a win-win situation for both the economy and the environment.

#### (3)Agriculture and Food Industry

The agricultural industry in Shaanxi Province is diversified, covering a wide range of areas including grain cultivation, fruit tree cultivation, and animal husbandry. Agriculture and food industry are crucial for food security and human health. However, traditional agriculture often involves excessive use of pesticides and fertilizers, leading to soil and water pollution. Green finance aims to encourage agricultural enterprises to transition to organic and ecological farming, reduce the use of chemical pesticides and fertilizers, and support the promotion of green and organic food in the food industry. This will improve the quality and safety of food while simultaneously reducing the negative impact of agriculture on the environment, and safeguarding ecological balance and the sustainable use of farmland.

#### (4)The service industry

The service industry in Shaanxi Province has been continuously reformed and innovated, with significant developments in sectors such as financial services, education and training, healthcare, and tourism and catering. Green finance has provided enterprises with more financing channels, driving innovation and promoting the development of the service industry in Shaanxi Province. Moreover, it facilitates the transition towards a greener, low-carbon, and sustainable direction.

### 4. The Mechanism of Green Finance's Impact on the Industrial Structure of Shaanxi Province

#### (1)Financial Guidance Role

In the traditional financial system, the environmental industry often struggles to obtain financial support due to high risks and long payback periods. Green finance provides more financing support for the environmental industry [7]. By issuing green bonds, establishing green funds, and other means, green finance offers additional financing channels for the environmental industry, reducing financing costs. Simultaneously, it attracts more capital into the green sector, enhances the competitiveness of green industries, expands the investment base in green industries, thereby promoting the upgrading and optimization of industrial structure. Investors and financial institutions pay more attention to environmental and social benefits, forming a sustainable financial ecosystem. Under the financial guidance of green finance, the development of the environmental industry not only contributes to environmental protection but also creates new economic growth points, drives the development of related industrial chains, and facilitates local economic growth [8].

#### (2)The role of price signals

Green finance provides differentiated pricing financing support to different industries and projects, reducing the financing costs of green industries and increasing the financing costs of polluting and high-energy-consuming industries, guiding enterprises towards the transformation of green industries. Carbon pricing sets a price for greenhouse gas emissions such as carbon dioxide, requiring companies to pay a certain fee to offset their environmental impact. Through carbon pricing, high-polluting industries will face higher cost pressures to offset their environmental impact, prompting them to undergo industrial structural transformation [9]. Carbon pricing creates a more competitive market environment for low-carbon industries such as clean energy.

### (3)The role of information disclosure

Under the "dual carbon" goal, green finance encourages companies to continuously disclose ESG information, publicly demonstrating their performance in environmental protection, social responsibility, and other aspects, attracting investors who prioritize sustainable development. Transparent disclosure of environmental information helps regulatory authorities understand a company's environmental performance, enabling them to better formulate environmental policies and regulatory measures. Governments are more willing to provide policy and financial support to companies that publicly disclose environmental information and actively promote sustainable development, thereby enhancing the development of the green industry.

## 5. Implications of Green Finance for Industrial Restructuring in Shaanxi Province

### (1)Promoting the development of green industries in Shaanxi to drive economic growth

Green finance is propelling the continuous development of green industries in Shaanxi, gradually becoming a new driving force for future economic growth. Under the guidance of green finance, various industries in Shaanxi are placing greater emphasis on environmental protection and the application of clean technologies, fostering continuous green innovation. The significance of green finance for the adjustment of Shaanxi's industrial structure lies in providing ample financial support and market demand for the development of green industries. The government actively supports green industries, increases investment, promotes green technological innovation and the development of emerging industries, achieving optimal industrial structure and sustainable economic growth. Green finance can support balanced development within Shaanxi province, particularly by assisting regions with weaker resource bases in developing green industries, improving the ecological environment, and promoting regional economic integration [10].

### (2)Restricting financing for high-polluting and high-energy-consuming industries

Green finance, by providing financial support to low-carbon and environmentally friendly projects, exerts financial pressure on traditional high-polluting and high-energy-consuming industries. Financial institutions are increasingly inclined to invest in projects with lower environmental risks, thereby reducing loans and investments in high-polluting industries. With the promotion and implementation of green finance policies in Shaanxi Province, high-polluting and high-energy-consuming industries are forced to enhance their environmental technologies and equipment to meet stricter environmental protection standards. The promotion of green finance provides opportunities and impetus for the transformation of high-polluting industries in Shaanxi Province, encouraging companies to engage in the research and production of clean energy and environmentally friendly materials to adapt to market and policy changes [11], gradually reducing their dependence on traditional high-polluting and high-energy-consuming businesses.

### (3)Optimize the allocation of resources in Shaanxi to enhance resource utilization efficiency

The impact of green finance has prompted companies in Shaanxi to pay more attention to the efficient allocation and utilization of resources. With the support of green finance, companies are more inclined to invest in green technologies, green products, and environmental projects to achieve efficient resource utilization. The insight for industrial restructuring is that companies should strengthen resource management and environmental protection [12]. Through the guidance of green finance, they can optimize resource allocation, reduce resource waste, improve resource utilization efficiency, and achieve sustainable industrial development.

## 6. Conclusion

Green finance empowers the development of green economy in Shaanxi Province. The financial industry in Shaanxi Province, in line with the local conditions, integrates resources and actively explores the use of financial means, strongly favoring low-carbon projects, green transformation projects, and green innovation projects. It has fully leveraged the prominent role of financial guidance in industrial restructuring and support for green development, with significant achievements in the innovative development of green finance. By promoting the innovation of various green financial instruments such as green bonds, green credit, and carbon finance, efforts are being made to construct a green financial system, providing strong financial support for the development of green industries.

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