

Studies on How to Innovate the Green Finance System to Support the China (Shaanxi) Pilot Free Trade Zone's High-Quality Development

Peng Zhang*, Zhongli Li

School of Economics, Northwest University of Politics and Law, Xi'an, Shaanxi, China

**Corresponding Author.*

Abstract: According to the "14th Five-Year Plan," green finance has shown great potential to facilitate the overall transition toward a green and low-carbon economy during the period of the "dual carbon" goals. In addition to playing a critical role in driving economic development of the five provinces in the northwest of China, Shaanxi Province also falls within the core region of the "Belt and Road Initiative". Green finance development in Shaanxi plays an important role in transforming the economy of the western part of the nation. By analyzing literature and conducting on-site interviews, this paper examines what green finance development looks like in Shaanxi Pilot Free Trade Zone (PFTZ) and the challenges that communities face. A theoretical analysis explains the role of the PFTZ in promoting green finance development by coupling green finance development with the construction of the PFTZ. Further, specific strategies for further optimizing green finance development within the PFTZ are highlighted, accompanied by policy recommendations that are practical and feasible.

Keywords: Green Finance, Economic Transformation, Realization Path, PFTZ, High-Quality Development

1. Introduction

With the increasing severity of global environmental concerns and the growing desire for sustainable development, green finance has become an area of high international and governmental attention, including China. Through supporting China's economic transformation, upgrading, and sustainable development, green finance may help create a

win-win scenario for both environmental protection and economic progress. The Shaanxi Pilot Free Trade Zone (PFTZ), which is located in central and western China and is at the heart of the Belt and Road Initiative, enjoys favorable geographical location and transportation advantages, presenting significant potential. Exploring how the PFTZ can generate green finance is critical to drive the economic transformation, improving, and high-quality growth of Shaanxi.

2. Current Status of Green Finance Development

2.1 Development Process and Present Situation for Green Finance of China

The United Nations Environment Program initially established the notion of "green finance" in 2007, followed by various countries exploring its development [1]. China launched its green finance initiative with the Guiding Opinions on Promoting Green Credit Business in 2010 [2]. A new phase in the growth of green finance in China was marked in 2011 with the joint issuance of the Notice on Strengthening the Support of Green Credit for Environmental Protection Industries and Energy Conservation and Environmental Protection Projects by the People's Bank of China and six other ministries. The growth path of green financial bonds was specified in the Guidelines on Issuing Green Financial Bonds in the Inter-bank Bond Market, published in 2015 by the competent authorities in China [3]. The establishment of green finance was sparked by the Chinese government in 2016, which saw it as a crucial pillar that would promote both the development of an ecological civilization and financial supply-side structural change.

In turn, this gave China's green finance system

a strong policy base upon which to grow. Since then, China's green finance system has entered a phase of tremendous expansion [4]. Currently, the green finance sector in China has developed progressively into a comprehensive system of markets and products, encompassing green bond, green credit, green securities, green insurance, and more. In addition, the idea of green finance has been widely acknowledged and accepted.

2.2 A Summary of Shaanxi's Progress in Green Finance

Shaanxi Province has had a rapid rise in the green credit market. According to statistics, Shaanxi's overall green credit amount reached 48.2 billion yuan in 2019, a YoY increase of 40.1%. Shaanxi's green securities market has grown more slowly than other areas, but in recent years it has begun to take shape. As of 2021, several companies in Shaanxi Province have issued green bonds, with a total scale exceeding 10 billion yuan, showing a YoY growth of over 30%. Nowadays, green stocks and bonds make up the majority of Shaanxi's green securities offerings. While Shaanxi's green insurance market has grown more slowly than other regions, there is evidence of a recent uptrend in its speed. According to statistics, in 2019, the green insurance premium income in Shaanxi Province reached 290 million yuan, with a growth of 28.9%. The products mainly target agriculture, environmental pollution, natural disasters, and other areas. Shaanxi's carbon trading market is still in its infancy and operates on a relatively limited scale. The carbon trading market in Shaanxi mainly involves two types of products: carbon emission rights and carbon reduction projects, with carbon emission rights trading being the primary focus.

To encourage long-term, sustainable economic growth, Shaanxi Province has actively developed green finance and implemented a number of guidelines and actions to support and facilitate the growth of the market for green credit [5]. These policies include implementing preferential tax policies for green credit, motivating banks to increase their green credit allocation. Additionally, the establishment of a dedicated fund of 1 billion yuan, named the "Green Finance Special Fund", has been clarified. The goal of this fund is to encourage the creation of environmentally

friendly financial tools including green bonds and green loans [6]. Furthermore, encouraging financial institutions to expand the scope of green credit available through guarantees, insurance, and other means to support the financing of environmental protection projects has been clearly stated.

3. A Theoretical Examination of Shaanxi PFTZ's Green Finance Development

3.1 An Examination of the Benefits and Drawbacks of Advancing Green Financing in Shaanxi PFTZ

The Shaanxi PFTZ is China's only PFTZ in the north-west region, and it is vital to the Western Development Strategy and the Belt and Road Initiative. The development of green finance is a crucial strategy for the zone, which presents distinct advantages and disadvantages.

3.1.1 The benefits of advancing green finance in the Shaanxi PFTZ

Firstly, it enjoys a favorable policy environment. The PFTZ has greater policy autonomy, allowing for targeted policies suited to local conditions, offering outstanding policy support for the growth of green finance.

Secondly, it possesses abundant resource advantages. Shaanxi Province has rich energy resources such as coal, oil, and natural gas, and it is also a major agricultural province in China [7]. With vast needs for ecological protection and restoration, Shaanxi Province provides a solid resource foundation in order to advance green finance.

Thirdly, there is a great deal of potential in the green finance market. Shaanxi Province has a large base of enterprises and population, with a significant economic volume ranking among the very best in the nation. As green finance develops, the market demand will continue to expand, providing ample room for the green finance market growth [8].

Lastly, there is a diversified financial system. Shaanxi Province has a relatively mature financial industry, with established systems in banks, insurance, securities, and other financial institutions. This provides ample support for the innovation and issuance of green finance products.

3.1.2 The drawbacks of advancing green finance in the Shaanxi PFTZ

Firstly, the green finance market falls behind. Compared to some developed regions, the

market of green finance in Shaanxi Province is still youth, with a limited variety of green finance products and relatively slow market development.

Secondly, there is a need to enhance environmental awareness. The environmental consciousness of the people in Shaanxi Province still needs improvement, and there isn't enough knowledge and societal backing for the growth of green financing.

Thirdly, there is a shortage of technology and talent among institutions of finance. The overall level of institutions of finance in Shaanxi Province falls behind, with a shortage of technology and talent. As a result, the growth of the green financing market faces substantial obstacles.

Fourthly, market supervision must be reinforced much further. The market for green finance is an emerging market, and the regulatory system is relatively immature. Therefore, there is a need for further enhancement of market supervision.

3.2 The Strategic Needs for Shaanxi to Integrate into the National High-level PFTZ

The establishment of the PFTZ in Shaanxi Province is an important measure in the continuous deepening of reform and opening-up [9]. Through measures such as easing market access and optimizing the business environment, the PFTZ encourages more foreign investment and innovation-driven entrepreneurship. It promotes international exchanges and cooperation, enhances international competitiveness, and continuously improves the region's degree of openness and economic development. At the same time, the PFTZ in Shaanxi Province requires pilot exploration of new technologies, new industries, and new business models to enhance technological innovation capabilities and industrial transformation and upgrading.

Furthermore, the growth of green financing in Shaanxi Province's PFTZ not only improves the internationalization of the zone but also attracts more international financial institutions and investors, thereby promoting the construction of an internationalized business environment in the PFTZ. Furthermore, it enables better integration into the international green finance system, strengthening the zone's capacity to align with international standards. Simultaneously, it optimizes the regional

spatial layout within Shaanxi Province, guiding economic development towards a more efficient, intensive, and eco-friendly direction. This transformation improves resource utilization efficiency and environmental protection levels.

3.3 The Inherent Requirements for Shaanxi Province to Meet the "Dual Carbon" Target

The "dual carbon" goal can be achieved in two ways, firstly, by controlling carbon emissions to reduce carbon footprint, and secondly, by increasing carbon sinks to enhance carbon absorption [10]. Among them, developing green industries and green finance is crucial for accomplishing the "dual carbon" goal. As a national strategic initiative, the PFTZ serves as an important platform for realizing this goal. The PFTZ can support Shaanxi Province's pursuit of the "dual carbon" goal financially and encourage financial innovation by advancing green finance, thus accelerating the province's economic transformation and upgrading. The Shaanxi PFTZ may attract green financing investments to propel the growth of green industries, provide increased financial support through green finance innovation, and lead the worldwide trend, boosting green finance growth in Shaanxi Province [11].

3.4 Effective Pathways to Achieve High-quality Development in Shaanxi

Green finance development and the creation of a high-quality cluster of green industries within the Shaanxi PFTZ can bring multiple benefits to Shaanxi Province's high-quality development [12]. By attracting more green financial institutions, the PFTZ can provide convenient and flexible financing channels for businesses, thereby promoting industrial innovation and technological advancement. Moreover, through the use of financial instruments, the PFTZ can encourage businesses to increase their investments in green technologies, thereby fostering the development of Shaanxi's green economy. This strategic approach will contribute to the overall goal of attaining high-quality development in Shaanxi province.

The Shaanxi PFTZ's green finance development can further optimize the investment environment and create a high-quality business environment, thereby

enhancing the competitiveness and attractiveness of enterprises. Green finance is quickly emerging as a new investment and financing trend in global scale. By developing green finance within the PFTZ, more environmentally conscious and responsible companies can be attracted to invest in Shaanxi Province, providing greater support and momentum for its high-quality development.

3.5 An Inevitable Choice to Enhance the Level of the Shaanxi PFTZ

The growth of green financing may hasten the speed of building while also facilitating the zone's economic transformation, upgrading, and long-term development. Green finance not only provides diversified financing channels for emerging industries within the region, but also offers preferential interest rates and financing conditions to businesses that meet green standards. This effectively reduces the financing costs for emerging industries, thereby promoting their development within the PFTZ. In addition, with the help of green finance, businesses could fulfill their social responsibilities more effectively, encourage sustainable growth and environmental preservation while boosting the region's rising industries' social standing and brand value [13]. In addition to providing financing support to various enterprises within the region, green finance can also offer risk management services and high-quality financial solutions. Through services such as green insurance and green credit rating, green finance helps businesses mitigate risks, improve their credit ratings, and enhance their financing capabilities. Furthermore, green finance institutions can assess and monitor the environmental and social performance of businesses, helping them identify potential environmental and social responsibility risks. Based on these assessments, appropriate preventive and governance measures can be proposed, ultimately increasing the sustainability and competitiveness of the enterprises [14].

4. Recommendations for Green Finance Development in Shanxi PFTZ

4.1 Establishing a Green Financial System in the Shanxi PFTZ

4.1.1 Vigorously developing green credit

Encouragement should be given to state-owned and joint-stock commercial banks to establish specialized green institutions and pilot green finance branches within the PFTZ, thus creating dedicated departments and teams for green finance. To guide and encourage regional financial institutions to become green banks and hasten the growth of green banking, the organisational structure of specialised green finance institutions should be strengthened. Financial institutions should be encouraged to provide long-term and stable financing support for green development, supporting banks and other financial institutions to develop personalized, differentiated, and customized green financial products, and innovate green credit varieties.

4.1.2 Innovating and developing green insurance

It is recommended that insurance institutions get assistance in leveraging modern technology, such big data and the internet, to engage in the development of environmental risk monitoring and early warning systems for firms insured against environmental pollution liability. A "green claims" channel should be established to improve the pre-paid claims system, strengthening the management of claims work. The risk protection and transfer functions of green insurance should be fully leveraged, guiding the green utilization of insurance funds. Insurance products and services that meet market demand and effectively safeguard environmental risks should be actively developed to promote the participation of insurance institutions in environmental pollution risk management.

4.1.3 Actively guiding and encouraging green securities business

Efforts should be made to guide and encourage eligible green enterprises to pursue listings and financing in domestic and international capital markets. The utilization of asset securitization to unlock existing assets should be supported. The guiding role of fiscal funds should be fully leveraged through the establishment of collaborative green development guidance funds with private capital. Capable institutional investors and social capital should be attracted to establish carbon neutrality funds, green industry investment funds, and professional investment management firms should be introduced to oversee investment activities.

4.1.4 Development of new financial formats

Emphasis should be placed on the development of emerging financial formats such as supply chain finance, trusts, financial leasing, asset-based lending, consumer finance, automotive finance, wealth management, asset management, carbon finance, third-party payment and clearing, and internet finance, with a particular focus on green finance. The exploration of “investment-lending integration” models should support the growth of green industries.

4.1.5 Green finance market innovation

Apart from the several financial institutions that have been established in the Shanxi PFTZ, providing an extensive array of environmentally friendly financial offers, significant attention should be given to the development of financial markets dedicated to green finance. This would enable the creation of a more powerful and influential green finance center, with clearer and stronger radiation and aggregation effects. Examples of such markets include carbon emissions trading markets, stock exchanges specializing in green finance, and bond markets.

4.2 Creation of a Framework for Green Financial Openness in Shanxi PFTZ

4.2.1 Strengthening international exchange and cooperation

Efforts should be made to deeply integrate into the international development framework of the Belt and Road Initiative, actively learn from and draw upon advanced concepts, innovative experiences, and regulatory models in international green finance development. Leveraging the humanistic exchange advantages of the Shanxi PFTZ, active promotion of exchanges and cooperation with international financial organizations should be pursued. Support and green financial services from various international financial institutions for green projects should be sought, while strengthening cooperation with foreign rating agencies and index companies.

4.2.2 Deepening regional collaborative cooperation

Enhanced interaction and exchange with the southeast coastal regions should be established, along with the establishment of robust mechanisms for policy coordination and information sharing among the provinces, cities, and districts along the Yellow River

Economic Belt in the green finance area. Active cultivation of efficient and convenient regional trading markets should be undertaken, and pilot projects for cross-regional environmental rights trading should be launched. Active efforts should be made to obtain approval for national carbon trading pilot projects, focusing on trading “carbon rights”, and orderly development and opening up of financial products such as carbon leasing, carbon funds, and carbon bonds. This will establish a comprehensive and multi-level carbon emission rights trading market system.

4.3 Development of Green Financial Infrastructure in the Shanxi PFTZ

4.3.1 Establishment of a green financial aggregation zone

Leveraging the advantages of the PFTZ, including the concentration of high-end industries and well-established supporting facilities, the encouragement of a diverse range of financial institutions gathering, the concentration of domestic and international financial professionals, the vibrant presence of financial market participants and products, the richness of financial formats, and the cultivation of a sound financial ecosystem should be fostered in regions where conditions allow for the development of a green financial aggregation zone.

4.3.2 Promotion of financial technology advancements

Collaborative innovation between various financial institutions and technology enterprises should be encouraged. Using sophisticated technologies like big data, artificial intelligence, blockchain, and the Internet of Things to empower the financial sector. Emphasis should be placed on the supportive role of financial technology in green finance, including green identification, risk management, assessment of environmental and climate impact, credit evaluation, and the realization of ecological product value.

4.3.3 Enhancement of information management systems

The establishment and improvement of specialized shared platforms for green financial credit information services should be pursued, achieving inter-connectedness among regional platforms and breaking down data barriers between platforms and regions. Active efforts should be made to develop a

comprehensive information management system for green finance in the Shanxi PFTZ, enabling unified monitoring and disclosure of enterprise information within the region and gradually achieving comprehensive information sharing and efficient collaboration with national and provincial-level information platforms.

Additionally, the establishment of a green project resource database should be prioritized. Strict adherence to national green industry guidelines, focusing on six major categories of green industries, in alignment with the green statistical criteria of regulatory agencies, will guide the formulation of the Methods for Identification and Evaluation of Green Projects in the PFTZ. This will ensure a progressive alignment with higher international standards, leading to the creation of a green project repository that demands more rigorous criteria.

4.4 Optimization of the Green Financial Service System in the Shanxi PFTZ

4.4.1 Establishment of sound standards

Utilizing the institutional advantages of being a pioneering and experimental zone, appropriate criteria and standards should be developed for the recognition and evaluation of green finance entities and financial institutions, taking into account the local development characteristics. These standards should include certification and licensing criteria as well as statistical standards. In alignment with the nationally unified green financial standards, complementary systems should be formulated according to the practical needs of business development, providing normative guidance for the concrete implementation of green finance [15]. The existing third-party institutional rating system should incorporate and enhance the weightage of green evaluation, with a specific focus on conducting specialized green ratings for green projects.

4.4.2 Enhancing the disclosure of environmental information

We should gradually establish a standard for disclosure of environmental information within the PFTZ, exploring ways to disclose environmental information across the entire value chain. This will enhance transparency and standards for local enterprises and legal entities in terms of environmental information disclosure [16], continuously improving

transparency in the green financial market. Efforts should be made to encourage rating agencies to enhance the quality of green bond ratings, guiding the inclusion of risk assessment indicators related to the issuer's green credit history in the rating process, and providing specific disclosures in credit rating reports.

4.4.3 Strengthening service system development

A concerted effort should be made to promote green service businesses and actively introduce various green service institutions. This includes nurturing and attracting green certification and assessment organizations, as well as training institutions [17]. The establishment of a comprehensive green financial service center, encompassing functions such as assessment, consultancy, legal services, finance, financing, data value-added services, project management, and talent recruitment, should be explored. This will form a green financial intermediary service institution supported by big data, creating an integrated platform for comprehensive intermediary services in green finance.

4.4.4 Effectively preventing financial risks

Enhancing the capacity to identify risks in green finance and strengthening financial risk management are crucial. Strict supervision should be exercised over the promotion and marketing of green financial products by financial institutions, financing projects by relevant organizations, and the green certification reports or green rating reports. This will effectively prevent and mitigate risks associated with green finance.

5. Conclusions

The western region, being a concentrated area of abundant resources and energy advantages on a national scale, has failed to leverage these advantages to establish economic superiority and sustain long-term growth. Instead, resource exploitation has led to severe ecological degradation. Despite the implementation of numerous stringent measures and comprehensive compensation plans by the national government, efforts to reverse the vicious cycle of excessive resource exploitation, environmental damage, and economic backwardness in the western region have remained futile. The unsustainable economic growth pattern persists.

Drawing from international development experience, it becomes evident that the underlying cause of the western area's predicament lies in the inadequate development of the financial sector, which significantly constrains both economic progress and ecological preservation. To position the Shaanxi PFTZ as a trailblazer in driving reform and opening-up efforts across the western area, It is crucial to grasp the emerging idea of "green finance" and leverage the prevailing landscape of energy and resource transactions in the region. This approach will serve as a pivotal breakthrough, enabling the Zone to garner extensive domestic and international support, attract prominent national and international financial enterprises with advanced development experience and models, and cultivate a strategic comprehension of the evolution of green finance. Capitalizing on the prospects presented by the "14th Five-Year Plan", it will provide a continuous impetus for facilitating high-quality economic advancement within the confines of Shaanxi Province.

Acknowledgments

This paper is supported by Innovation Capacity Support Plan of Shaanxi (2020KRM 144)

References

- [1] Sun Y, Liu Y. Research on the Path of Promoting the Development of Green finance in China Based on Internet Finance. *E3S Web of Conferences. EDP Sciences*, 2021, 275.
- [2] Kong F. A better understanding of the role of new energy and green finance to help achieve carbon neutrality goals, with special reference to China. *Science Progress*, 2022, 105(1).
- [3] Xie H, Ouyang Z, Choi Y. Characteristics and influencing factors of green finance development in the Yangtze river delta of China: Analysis based on the spatial durbin model. *Sustainability*, 2020, 12(22): 9753.
- [4] Gu B, Chen F, Zhang K. The policy effect of green finance in promoting industrial transformation and upgrading efficiency in China: analysis from the perspective of government regulation and public environmental demands. *Environmental Science and Pollution Research*, 2021, 28(34): 47474-47491.
- [5] Liu Z. *Digital Finance: How Innovation Reshapes the Capital Markets*. Springer Nature, 2023.
- [6] Wang W, Tian Z, Xi W, et al. The influencing factors of China's green building development: An analysis using RBF-WINGS method. *Building and Environment*, 2021, 188: 107425.
- [7] Zhang P. Data Analysis and Measurement of Shaanxi Province Green Total Factor Productivity under SBM-DEA Model. *2021 3rd International Conference on Artificial Intelligence and Advanced Manufacture*. 2021: 2799-2804.
- [8] Zhang K. Research on the Development of Green Real Estate Finance in Guizhou Province. *Proceedings of the 23rd International Symposium on Advancement of Construction Management and Real Estate*. Springer Singapore, 2021: 629-640.
- [9] Zhou C, Su Y. Trade Effect of the Free Trade Zone. *International Business Research*, 2021, 14(1): 1-34.
- [10] Meng J, Lu F, Cheng B. China ' s Climate Change Policy Attention and Forestry Carbon Sequestration Growth. *Forests*, 2023, 14(11): 2273.
- [11] Chi F. *Winning at the Turning Point*. Springer Singapore, 2019.
- [12] Yang S, Wang D. The Evolution of the Macro Context of Urban Migration in Shanghai. *Urban Migration and Public Governance in China: A Case Study of Shanghai*. Singapore: Springer Nature Singapore, 2023: 73-113.
- [13] Zhang G. The heterogeneous role of green finance on industrial structure upgrading-Based on spatial spillover perspective. *Finance Research Letters*, 2023, 58: 104596.
- [14] Li Z, Zhang T, Gao J, et al. Preliminary prediction of the control reproduction number of COVID-19 in Shaanxi Province, China. *Applied Mathematics-A Journal of Chinese Universities*, 2021, 36(2): 287-303.
- [15] Fang Y, Meng H, Xue C, et al. Real-Time Monitoring and Early Warning Algorithm of Ozone+ Nitrogen Oxides in High-Density Residential Space Based on Big Data. *Mobile Information Systems*, 2022.
- [16] Hu H, Chang C P, Dong M, et al. Does

environmental information disclosure affect the performance of energy-intensive firms' borrowing ability? Evidence from China. *Energy & Environment*, 2018, 29(5): 685-705.

[17] Kong F. A better understanding of the role of new energy and green finance to help achieve carbon neutrality goals, with special reference to China. *Science Progress*, 2022, 105(1).