Advance in Sustainability, 2023, 3(1), 1-6
https://www.hillpublisher.com/journals/as/
ISSN Online: 2769-3074

Application of Green Finance in Promoting Low-carbon Transformation of Enterprises

Lanting Liu[1,2,*], **Grace R. Tobias**[1]

[1]College of Business Administration, University of the Cordilleras, Baguio, Philippines.
[2]School of Economics and Management, Shandong Youth University of Political Science, Jinan, Shandong, China.

How to cite this paper: Lanting Liu, Grace R. Tobias. (2023) Application of Green Finance in Promoting Low-carbon Transformation of Enterprises. *Advance in Sustainability*, 3(1), 1-6.
DOI: 10.26855/as.2023.06.001

Received: March 28, 2023
Accepted: April 26, 2023
Published: May 24, 2023

[*]**Corresponding author:** Lanting Liu, College of Business Administration, University of the Cordilleras, Baguio, Philippines; School of Economics and Management, Shandong Youth University of Political Science, Jinan, Shandong, China.

Abstract

In response to the increasingly severe climate issues, governments around the world have set emission reduction targets, and the low-carbon transformation of enterprises has become a hot topic of global concern. As an emerging financial model, green finance plays a very important role and significance. This paper discusses the application of green finance in promoting the low-carbon transformation of enterprises from three aspects: green credit, green bonds, and green investment funds. The paper presents cases of state-owned banks promoting green credit for enterprises, enterprises using green bonds to support low-carbon transformation, and financial institutions issuing green investment funds. It analyzes their practical processes and effects and summarizes the practical experiences in order to provide guidance and reference for other enterprises and financial institutions. The conclusion is that green finance can effectively promote the low-carbon transformation of enterprises, but it needs to strengthen supervision and standardization, improve transparency and sustainability, and requires joint efforts from enterprises and financial institutions to form a positive interaction in order to achieve sustainable development goals.

Keywords

Green finance, low-carbon transformation, sustainable development

1. Introduction

With the growing attention to global climate change, the low-carbon economy has emerged as a global development trend. Low-carbon transformation of enterprises is a crucial component in achieving a low-carbon economy and is an urgent need to address the challenges posed by climate change [1]. In December 2015, the United Nations held the 21st United Nations Climate Change Conference in Paris, where the Paris Agreement was adopted. The agreement aims to achieve a net zero growth in global greenhouse gas emissions and to limit the increase in global average temperature to within 1.5 degrees Celsius. Among them, the commitment of corporations to achieve a low-carbon economy and reduce carbon emissions is an important part of the agreement [2]. In this context, green finance, as a new type of financial model, has become an important means to promote corporate low-carbon transformation [3]. Green finance emphasizes the concept of sustainable development and encourages financial institutions and investors to invest in low-carbon, environmental protection, and renewable fields to contribute to achieving a low-carbon economy [4, 5].

People's concern for environmental protection and climate change has shifted the attention of academic researchers and policy makers to green finance. Many countries have actively explored and practiced in the field of green finance, promoting the development of corporate low-carbon transformation through policies and measures [6, 7, 8]. In 2016, the People's Bank of China issued the "Guiding Opinions on Financial Support for Green Development", proposing green finance tools such as green credit and green bonds, as well as offering preferential loans to enterprises that meet green standards. The US Environmental Protection Agency launched the "Climate Leaders Program", aimed at encouraging companies to reduce greenhouse gas emissions, and has also introduced a series of related policies such as production tax credits for supporting renewable energy development and tax incentives for green building. In addition to supporting the promotion of low-carbon technologies and issuing green bonds, the UK government has also established the Low Carbon Innovation Center to promote the development and commercialization of low-carbon technologies.

Based on the above analysis, this paper further explores the application mode of green finance in corporate low-carbon transformation. Multiple successful cases are selected for analysis, and the experiences are summarized to identify the shortcomings and provide suggestions for using green finance to promote corporate low-carbon transformation. Through this study, the aim is to provide theoretical support and practical reference for promoting corporate low-carbon transformation and promoting sustainable development.

2. Theory of green finance and low-carbon economy

2.1 Green finance

Green finance is a financial business and investment with environmental and social values that aims to promote sustainable development and reduce environmental and social impact. Specifically, green finance refers to a series of financial activities that provide financing and investment support for environmentally friendly and low-carbon economic development through financial markets and financial products. It has characteristics such as environmental orientation, sustainability, innovation, and risk. Green finance can be realized through various financial products and tools, such as green bonds, green loans, green investment funds, etc.

2.2 Low-carbon economy

Low-carbon economy refers to an economic development model that ensures economic growth while minimizing carbon emissions and energy consumption through promoting green and sustainable development. Its core is to achieve economic growth by reducing greenhouse gas emissions and carbon footprint.

The transition to a low-carbon economy requires action on three fronts: energy transformation, technological innovation, and policy support. Energy transformation provides the foundation for achieving a low-carbon economy, while technological innovation serves as the means to achieve it, and policy support provides the necessary guarantee. In practice, implementing a low-carbon economy requires coordination across different departments and cooperation across different sectors. Governments must work with enterprises, academia, social organizations, and other stakeholders to promote the development of a low-carbon economy.

2.3 Theoretical framework

Sustainable development philosophy. Sustainable development requires the protection of the environment and the promotion of social justice while promoting economic development. Green finance applies this philosophy to financial activities, supporting enterprises to transform towards low-carbon development. In this process, green finance not only focuses on the economic benefits of enterprises, but also pays attention to their environmental and social benefits. This green finance based on sustainable development philosophy provides enterprises with a way to balance economic, environmental, and social benefits, instead of solely pursuing economic benefits.

Investment and financing theory. Green finance is an investment and financing approach that integrates environmental risks with economic benefits in order to achieve sustainable development goals. The primary objective of green finance is to support environmentally responsible enterprises and projects that meet specified environmental, social, and governance (ESG) standards, thereby ensuring the sustainability and viability of investments. By taking into account ESG factors, green finance provides a more comprehensive evaluation of enterprise risks, thereby promoting sustainable development of both the financial sector and the real economy. The application of green finance in supporting the low-carbon transformation of enterprises is based on investment and financing theory, which further emphasizes the importance of ESG factors in guiding investment decisions and ensuring the long-term success of enterprises.

3. Analysis of current status and limitations

3.1 Current status of green finance in low-carbon transformation

3.1.1 Green credit

Green credit refers to a financial service provided by financial institutions through credit to support projects related to environmental protection, energy conservation and emissions reduction, and the recycling of resources. In the low-carbon transformation of enterprises, green credit can provide low-cost and long-term financial support for enterprises, promoting innovation and practice in energy conservation, emissions reduction, green production, and clean production.

In recent years, an increasing number of countries and regions have implemented a range of green finance policies and measures to encourage financial institutions to increase their investment and support for green credit services. With growing awareness of the importance of environmental protection and sustainable development, more and more companies are taking the initiative to participate in green credit services, seeking financial support to facilitate their low-carbon transformation. In response to this trend, major financial institutions have been ramping up their investment and innovation in green credit services, actively promoting and expanding their business scope and scale. Through these efforts, green finance has gradually become a critical driving force in the transition to a low-carbon economy, enabling financial institutions to effectively integrate environmental, social, and governance factors into their investment decisions and support the sustainable development of the real economy. According to data released by the People's Bank of China, the balance of green loans in China reached 15.9 trillion yuan in 2021, a year-on-year increase of 33%, and the stock scale was the world's largest.

3.1.2 Green bond

Green bonds are a specific type of bond instrument that is utilized to fund environmentally-friendly projects, such as renewable energy, emission reduction, energy efficiency, and other sustainable initiatives. In the context of corporate low-carbon transformation, green bonds offer long-term and cost-effective financial support for companies, facilitating the transition to sustainable practices and accelerating the development of a low-carbon economy.

As the green bond market continues to expand, more and more companies are participating. According to the International Finance Corporation, the global green bond market reached $167 billion in 2018, with issuers from various industries and sectors including renewable energy, transportation, construction, and industry. Many countries and regions have introduced policies and measures to support the development and regulation of the green bond market, including the establishment of green bond standards, the creation of green bond certification agencies, and the provision of tax and fiscal subsidies. At the same time, more and more financial institutions such as banks, insurance companies, and asset management companies are participating in the green bond market, actively issuing, selling, and investing in green bonds, and promoting the healthy development of the green bond market.

3.1.3 Green investment funds

Green investment funds are investment tools that focus on investing in environmentally friendly, sustainable, low-carbon or other green areas. In the context of corporate low-carbon transformation, green investment funds can provide funds and value-added services to companies, promoting their focus on environmental protection and resource conservation in production and operation.

In developed countries, green investment funds have become an important means of promoting the development of low-carbon economy. For example, the European Union's investment plan, the "European Green Deal", focuses on investing in green energy and clean technology to promote Europe's low-carbon transformation. As China strives to become a more environmentally sustainable nation, the popularity of green investment funds is on the rise. One of the key drivers of this trend was the release of the China Green Finance Development Guidelines in 2016, which called for the creation of more green funds and provided policy support measures to incentivize their development. In addition, more and more financial institutions and investors are joining the ranks of green investment funds, actively promoting the low-carbon transformation of enterprises.

3.2 Limitations of green finance in low-carbon transformation

Insufficient scope definition: Different institutions have different definitions of green finance, making it difficult to implement in practice. Some institutions classify investments related to the environment and society as green finance, which may result in some "green" projects not achieving the goals of environmental and social sustainability, thus affecting the effectiveness of corporate low-carbon transformation.

Incomplete evaluation and regulatory standards: The evaluation and regulatory standards for green finance products are not yet complete, lacking unified definitions and certification mechanisms, making it difficult for investors to determine the quality and authenticity of products, thereby affecting the market circulation of green finance products.

High technological barriers: Enterprises need to have the corresponding technology and management capabilities when undergoing low-carbon transformation. However, some enterprises still lack these capabilities, which may result in poor implementation of low-carbon transformation projects, thereby affecting the effectiveness of green finance.

4. Analysis of practical cases

4.1 Green credit: A case study of state-owned bank A's practical experience

4.1.1 Background

As global climate change continues to intensify, low-carbon and environmental protection have become a common concern for global businesses and governments. In response to this trend, State-owned Bank A has started actively promoting its green credit business to help enterprises achieve low-carbon transformation. The bank has developed green credit products that aim to support low-carbon, environmental protection, and sustainable development. These products mainly target qualified small and medium-sized enterprises and large enterprises.

4.1.2 Practice process and effects

Bank A has taken a series of measures to promote its green credit business. Firstly, it defined the scope and standards of green credit by developing green credit product and certification standards and funding projects in the fields of environmental protection and energy conservation, such as clean energy, environmental technology, and low-carbon transportation. Secondly, the bank has increased publicity and promotion efforts for green credit, actively expanded its customer base for green credit, and carried out a series of training and guidance activities to enhance corporate awareness and understanding of green credit. Finally, the bank has implemented strict management and supervision of green credit business, strengthened post-loan monitoring and evaluation, assessed the performance of low-carbon transformation, and provided relevant consulting services to ensure the effectiveness of green credit funds.

By promoting the green credit business for enterprises, Bank A has achieved significant results. On the one hand, the bank has significantly expanded the scale of its green credit operations, with the balance of green loans increasing steadily year after year. On the other hand, the bank has also been successful in supporting a large number of enterprises in their low-carbon transformation and environmental protection efforts, thereby promoting sustainable development across related industries. Thanks to these efforts, the bank has gained a strong reputation for its expertise in green finance, earning both social recognition and significant economic benefits from its green loan activities. These achievements have laid a solid foundation for the continued growth of the bank's green finance business.

4.1.3 Experience summary

To promote green credit business for enterprises, the following aspects need to be considered:

Banks must establish a comprehensive green credit product system that channels funding towards projects focused on environmental protection and energy conservation. Additionally, banks should establish a green evaluation mechanism to assess the environmental impact of their clients' operations and guide them towards more sustainable practices.

Banks need to enhance the cultivation and promotion of green awareness within their organization. One key strategy is to increase awareness and acceptance of green finance among employees and customers. By doing so, banks can help promote the popularization and development of green finance, and encourage greater investment in sustainable projects.

4.2 Green bond: A case study of enterprise B's practical experience

4.2.1 Background

Enterprise B is a large energy company with businesses covering multiple sectors including petroleum, natural gas, chemical, and new energy. Due to the increasingly severe problem of high carbon emissions and environmental pollution in the energy industry, the company actively explores the path of low-carbon transformation to promote green development. In order to finance its low-carbon transformation efforts, the company chooses to issue green bonds.

4.2.2 Practice process and effects

In 2019, Enterprise B successfully issued a green bond with a total size of $200 million, a 10-year maturity, and a coupon rate of 3.75%. The proceeds from the bond issuance will be entirely used for investment in green projects such as clean energy, energy conservation, and emission reduction.

After the bond issuance, Enterprise B attracted a lot of attention and recognition from environmental investors through market promotion and professional rating agencies, enhancing its reputation and influence in the green field. The funds raised through the issuance provided strong financial support for the company's low-carbon transformation, enabling it to accelerate its progress towards green development. In addition to these benefits, the issuance of green bonds also had a positive impact on the company's financial position and credit rating. By demonstrating its commitment to sustainability, Enterprise B was able to enhance its reputation as a responsible and forward-thinking company, which in turn helped to attract new investors and partners.

4.2.3 Experience summary

The company needs a clear and specific low-carbon transformation plan and goals, while developing a scientifically reasonable green bond project and funding use plan that fully reflects the investment value and social benefits of green bonds.

The company needs to fully consider market demand and investor preferences, optimize the issuance structure and information disclosure of green bonds, and improve the market liquidity and investment attractiveness of the bonds.

The company needs to pay attention to the subsequent management and evaluation of the green bonds, track and publicize the progress and environmental benefits of the bond projects in a timely manner, establish a long-term supervision mechanism for green bond projects, and ensure the safety and investment benefits of the funds.

4.3 Green investment: A case study of financial institution C's practical experience

4.3.1 Background

Financial institution C is an international bank dedicated to promoting sustainable finance and green investment. In the financial industry, green finance is becoming an increasingly important area of focus. To meet market demands, the financial institution actively explores innovative models for green investment and collaboration with businesses to support their low-carbon transformation.

4.3.2 Practice process and effects

Financial institution C has launched a project called the "Green Finance Partnership Program", which aims to support the low-carbon transformation and environmental investments of enterprises through financial innovation. Specifically:

Firstly, the financial institution will provide a range of green finance services to enterprises, including green credit, green bonds, carbon trading, etc., to help enterprises obtain low-cost and long-term green financing support. Secondly, the financial institution will actively explore green investment opportunities, set up a professional green investment team, and provide high-quality green investment projects for enterprises to help them achieve low-carbon transformation. Finally, the financial institution will collaborate with enterprises to jointly promote the development and implementation of environmental projects, and improve the efficiency of environmental investment and environmental management of enterprises.

After a period of practice, the "Green Finance Partnership Program" of the financial institution has achieved certain results. The program not only enhances the understanding and awareness of enterprises regarding green finance but also promotes their low-carbon transformation and sustainable development.

4.3.3 Experience summary

Financial institutions need to fully consider the actual situation and needs of enterprises, and provide tailor-made green financial products and services to help enterprises achieve low-carbon transformation and environmental protection investment.

Financial institutions need to establish a sound green finance risk management mechanism, strengthen the risk assessment and monitoring of green investment projects, ensure the safety and liquidity of funds, and improve the social and economic benefits of green finance.

5. Discussion

The cases presented above illustrate the practical application and effectiveness of green finance in facilitating the low-carbon transformation of enterprises through background descriptions and situational analyses. They emphasize not only the significant role of green finance-related policies and institutional environment in enhancing the environmental and economic benefits of companies but also the major challenges that green finance encounters in promoting corporate low-carbon transformation and the necessity to proactively explore solutions to address these challenges.

5.1 Government policy support and guidance

Improve relevant laws and policies to encourage financial institutions to engage in green finance business. For example, green bond issuance guidelines can be established to clarify the scope and certification standards of green bonds, thereby increasing the confidence of market participants. Use fiscal taxation to guide financial institutions to prioritize support for green enterprises and green projects, and encourage companies to engage in low-carbon transformation. For example, tax incentives can be given to green bonds to encourage more companies to issue green bonds. By increasing taxes on pollutant emissions and environmental protection taxes, companies are encouraged to adopt low-carbon technologies and achieve environmentally friendly production.

5.2 Innovate financial products and optimized service

Financial institutions can innovate green finance products based on the low-carbon transformation needs of enterprises to meet their financing needs. For example, they can issue green bonds specifically designed to support the development of renewable energy, encouraging companies to adopt renewable energy. Financial institutions can provide more comprehensive green finance services based on the low-carbon transformation needs of enterprises. For example, they can provide energy management consulting, environmental risk assessment, and other services to help companies optimize their operations, improve resource utilization efficiency, and reduce carbon emissions.

5.3 Mindset shift and technological innovation for enterprises

Enterprises should clearly define their low-carbon development goals and pathways at a strategic level, and adopt environmentally friendly and low-carbon solutions in every aspect of their product design, production processes, and energy use. For instance, they can introduce clean energy, improve energy utilization efficiency, and increase the recycling rate of materials to reduce energy consumption and waste generation. Moreover, enterprises should actively conduct research and development, and innovation to promote the application and promotion of new technologies, products, and services. By developing new energy, materials, and processes, they can reduce carbon emissions and resource consumption while enhancing their economic and social benefits. Additionally, enterprises can strengthen cooperation with universities and research institutions to jointly advance the research and application of green technologies.

6. Conclusion

Green finance has played a positive role in promoting the low-carbon transformation of enterprises. Through the analysis of the effects of three practical cases of green credit, green bonds, and green investment, green finance has provided sustainable financial support for the low-carbon transformation of enterprises, guided capital flow to low-carbon and environmental protection areas, and helped to stimulate the environmental awareness of enterprises. However, there are still shortcomings in green finance in promoting the low-carbon transformation of enterprises, and it is necessary to further improve green finance policies and evaluation mechanisms, strengthen product services and innovation, in order to achieve more sustainable economic growth and social development.

There are still some areas that require further research. For instance, how can we effectively evaluate the impact of green finance on promoting low-carbon transformation in enterprises? How can we improve the standardization of green finance to enhance its competitiveness in the market? Addressing these questions will be critical to promoting the active role of green finance in the low-carbon transformation of enterprises.

Acknowledgements

The author expresses gratitude to her fellow PhD colleagues for their assistance and support during the writing of this paper.

References

[1] Ki-Hoon Lee, Byung Min. (2015). Green R&D for eco-innovation and its impact on carbon emissions and firm performance. *Journal of Cleaner Production*, 108, 534-542.

[2] J Hou, Teo, Thompson S. H, F Zhou, Lim, Ming K, H Chen. (2018). Does industrial green transformation successfully facilitate a decrease in carbon intensity in China? An environmental regulation perspective. *Journal of Cleaner Production*, 184, 1060-1071.

[3] Eftichios S. Sartzatakis. (2021). Green bonds as an instrument to finance low carbon transition. *Economic Change and Restructuring*, 54, 755-779.

[4] Wenqi Li, Jingjing Fan, Jiawei Zhao. (2022). Has green finance facilitated China's low-carbon economic transition? *Environmental Science and Pollution Research*, 29(38), 57502-57515.

[5] Bhatnagar S, Sharma D. (2022). Evolution of green finance and its enablers: A bibliometric analysis. *Renewable and Sustainable Energy Reviews*, 162, 112405.

[6] Carlo Carraro, Alice Favero, Emanuele Massetti. (2012). Investments and public finance in a green, low carbon, economy. *Energy Economics*, 34, 15-28.

[7] Robyn Owen, Geraldine Brennan, Fergus Lyon. (2018). Enabling investment for the transition to a low carbon economy: government policy to finance early stage green innovation. *Current Opinion in Environmental Sustainability*, 31, 137-145.

[8] Ren Yayun, Yu Jian, Xu Shuhua, Tang Jiaomei, Zhang Chang. (2023). Green Finance and Industrial Low-Carbon Transition: Evidence from a Quasi-Natural Experiment in China. *Sustainability*, 15(6), 4827.