

Research on the Path for Financial Institutions to Realize the “Double Carbon” Goal

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Keywords: Financial institutions, "Double Carbon", carbon peak, carbon neutrality

Abstract: As the focus of attention in the modern economy, the financial sector has the responsibility to demonstrate and set an example in helping to achieve the goal of carbon peaking and carbon neutrality. By combing through domestic and international literature in recent years, this paper introduces the current situation of green and low-carbon financial institutions at home and abroad, focusing on the path to play a government-led and market-led role on the macro level and further strengthen the top-level design of financial institutions, improve the mechanism system, enhance information disclosure, and promote product innovation and tool development on the micro level to help the whole society achieve the carbon neutrality target.

1. Introduction

At the 75th General Debate of the United Nations General Assembly, Chinese President announced that China would strengthen policies and measures, increase autonomous contribution, aim to peak its carbon dioxide emissions by 2030 and achieve carbon neutrality by 2060. The 2021 government work report further emphasized the need to make solid efforts in achieving peaking carbon emissions this year and to formulate an action plan to achieve this goal by 2030. The 20th National Congress clearly proposed that China should actively and steadily promote peaking carbon emissions and carbon neutrality. Achieving peaking carbon emissions and carbon neutrality requires a broad and profound systemic economic and social change. As the core of the modern economy, what can the financial sector do or not do to contribute to achieving the 30-60 targets?

This paper filtered articles using search terms to yield 43 relevant Chinese articles. Additionally, the themes of "institution" and "carbon & finance" were used to search the Web of Science, resulting in 11 relevant English articles. All 54 articles were published after 2010. Firstly, this paper reviews the status of financial institutions in achieving carbon neutrality in China; secondly, it outlines the pathway for financial institutions to achieve the "dual carbon" goal in China, through an in-depth analysis of the 54 articles. Lastly, the paper summarizes and provides an outlook on the topic. The contribution of this paper is to clarify the current status of research on financial institutions achieving the "dual carbon" goal and to emphasize the pathways and countermeasures, with the intention of drawing the attention of researchers and practitioners to this goal.

2. The Current State of Green and Low-carbon Initiatives in Financial Institutions

The adoption of the Kyoto Protocol in December 1997 set the precedent for limiting greenhouse gas emissions, promoting low-carbon projects, greenhouse gas emission reduction, and sustainable economic development worldwide. Many European and American financial institutions like Standard Chartered Bank and Bank of America have conducted innovative demonstration experiments in carbon target trading, direct investment, and bank loans, among others [1]. However, compared to the extensive involvement of foreign banks, the financial industry and public sector in China have not given enough recognition to the significance of carbon reduction and are still lagging behind in development, despite having abundant carbon reduction resources and great potential in the carbon emission reduction market. With the national and governmental emphasis on sustainable development and the proposed “30-60” target, it is imperative for financial institutions to be involved in achieving the “double carbon” goal.

Since China committed to achieving the “30-60” double carbon target in September 2020, financial institutions are increasingly implementing carbon peak and carbon neutral targets in their policy standards, risk control, product development, and performance evaluations, accelerating the shift to low-carbon investment and financing [2]. The government’s significant progress in achieving “double carbon” is evident in the “Guidance on Promoting Investment and Financing to Address Climate Change” (Environmental Climate [2020] No. 57), released in October 2020, which encourages financial institutions to invest more in low-carbon areas, such as subsidizing interest rates for products such as green credits and green bonds. Moreover, the assessment now includes banks’ performance in carbon emission reduction [3]. Additionally, the government has introduced initiatives to encourage banks to invest in low-carbon projects and help achieve the “double carbon” goal. Multiple departments, including the People’s Bank, are making active attempts to achieve the “double carbon” goal. During the 42nd International Monetary and Financial Committee (IMFC) meeting on 15 October 2020, the Governor of the People’s Bank of China, Yi Gang, said that the PBOC is actively promoting green finance to help achieve carbon neutrality goals [4]. Other financial institutions are following suit and adopting green criteria as a primary consideration in their efforts towards carbon reduction goals. For example, a branch of the Bank of Communications has implemented a rating system that assigns credit ratings based on “three colors and seven categories”, with the color rating becoming an important basis for customer rating, market access, loan pricing, and credit management. Meanwhile, a branch of ICBC added an environmental risk assessment to its credit system, linking environmental risk identification with enterprise credit rating and credit granting [5]. On May 13, 2021, the China Banking Association, a self-regulatory organization for the banking industry, established a working group to facilitate China’s banking industry in achieving carbon peak and carbon neutral targets, and formulated a plan for the working group from 2021 to 2025. Then on July 16, 2021, China launched the world’s largest carbon emissions trading market, expanding the carbon emissions trading pilot nationwide. This market covers the world’s largest greenhouse gas emission market.

Financial institutions are responsible for implementing China’s green financial policy framework and supporting the construction of the carbon market to achieve carbon neutrality. The dual carbon objective has significant implications for the financial system [6], offering substantial investment and development opportunities while also bringing about profound changes to the business model of the financial sector. Achieving carbon neutrality has implications for the pricing, valuation, information disclosure, and risk management of financial products, making it crucial for financial institutions to contribute to this goal.

3. Investigating "Carbon Finance" and "Green Finance"

As early as 2010, when China began emphasizing the low-carbon economy, scholars started studying carbon finance from the perspective of financial institutions, paving the way for the study of how financial institutions could achieve the "double carbon" goal. Yang et al [7] focused mainly on market-driven trading of greenhouse gas emission rights, including carbon emission-related equity trading, investment and financing, and financial intermediation activities. Li [1] suggested ideas for the development of carbon finance in China, such as increased government support for fiscal, tax, environmental protection, regulatory, and credit policies, as well as low-carbon banking infrastructure. Fan et al. [8] proposed constructing a carbon finance service symbiotic network system covering commercial banks, intermediary service agencies, energy-saving and emission-reduction enterprises, and governments. They assume that various participants in carbon finance lack close connections and experience. Commercial banks should lead intermediary service agencies and provide end-to-end services, including risk management and carbon credit rating, for energy-saving and emission-reduction projects and enterprises. Zhang and An [9] suggested studying the intermediary business of commercial banks from the perspective of carbon finance, and they proposed implementing preferential tax rates, incentive mechanisms, and policies for carbon finance business. They also recommended encouraging the establishment of specialized departments to develop intermediary services, such as equipment financing and leasing and project consulting, with CDM projects as the core. Xu [10] studied the model of commercial banks supporting the development of carbon finance and pointed out that commercial banks can start with developing green operations, such as low-carbon design and decoration, and promoting voluntary emission reduction by individuals or groups. Wang [11] proposed several feasible measures for promoting the development of carbon finance in China's financial institutions, such as the effective issuance of a series of carbon-based fund products and the full utilization of government functions to support carbon finance development.

On August 31, 2016, the People's Bank of China, along with seven other ministries and commissions, released the "Guidance on Building a Green Financial System," which introduced the concept of green finance for the first time. Since then, research on green finance has been thriving. Mol [12] analyzed the relationship between finance, environmental protection, and sustainable development. The study pointed out that to successfully develop green finance, it is necessary to establish the concept of green finance, strengthen institutional design, develop innovative green financial products, enhance green credit mechanisms, and support direct financing for environmental protection enterprises for building a green financial system. Sun [13] suggested that developing green finance can be achieved by establishing green standards for business and improving the evaluation mechanism of green finance, with banks as the main practitioners. In Fei's [14] empirical study on the impact of financial development on carbon emissions and the dynamic relationships among various variables, relevant recommendations were proposed based on the empirical results. Financial regulatory authorities should actively adjust the guidance policy for green credit, and financial institutions should speed up the development and promotion of carbon finance products. Jing [15] took Gansu Province as the research object and proposed that green finance research centers can play a role as research and business promotion platforms, while implementing financial support policies to achieve green development. Zhao & Liu [16] used 17 key provinces along the "Belt and Road" as examples and suggested that on the one hand, green finance policies should be further improved, and on the other hand, with the help of green finance, international cooperation platforms can be established to promote green economic development.

4. Investigating the Pathway to Achieve the "Double Carbon" Goal

Ever since China proposed the goal of carbon peaking and carbon neutrality, discussions have been

widespread across various sectors in China, on how financial institutions can attain the "double carbon" goal. After conducting a thorough analysis, it was found that the paths to achieving this goal include both macro and micro aspects. The macro level mainly involves the government and market, while the micro level relates to the financial institutions themselves. This article will elaborate on these aspects in terms of top-level design, mechanisms, models, information disclosure, product innovation, and tool development.

At the macro level, Ning and Li [4] suggested that the government should take a leading role in promoting green financial practices and improve the top-level design of financial support for green and low-carbon transformation, after conducting an in-depth analysis of the "double carbon" target and the financial industry's requirements for it. Zhang [17] believed that the government should gradually improve the green financial policy system and give full play to the function of financial resource allocation during the process of achieving the "double carbon" target. Zhao [18] pointed out that the government should explore the establishment of a mechanism to support transition financing and assist financial institutions in launching financial instruments such as transition bonds, transition funds, and transition insurance to achieve the carbon neutrality target. To further promote the achievement of the 30-60 target, Liu [19] suggested that the government should comprehensively promote information sharing between the financial and environmental sectors and guide banking institutions to conduct mandatory carbon accounting work. Furthermore, Xiao [6] suggested that the government should explore the establishment of a carbon-neutral bond market to accelerate the development of green finance. Gu et al. [20] suggested that linking public environmental needs and government regulation is crucial for environmental development. They propose that public environmental demand and government regulatory input have significant synergistic governance advantages, and the government should increase the regulatory efforts of differentiated policies. Li and Yang [21] argued that finding the optimal dimension in the relationship between the government and the market is essential to explore the pathway to achieving carbon peaking and carbon neutrality, and to establish a reliable green financial service system while strengthening regulation of the green financial industry. Ge [22] recommended that carbon emission reduction support tools should obey market-oriented and rule-of-law principles, and financial institutions must provide financing support accordingly. Wang and Li [23] provided relevant suggestions for China's financial support for carbon neutrality based on international experience, such as improving institutional construction, enhancing the government's guiding role, attaching importance to the role of the market, and mobilizing multiple parties to participate in carbon neutrality collaboratively. An [24] argued that it is essential to promote the top-level design of the green financial policy framework, market innovation, and local practices to effectively connect them. Ning and Li [4] suggested that the government should play a leading role in green finance practices and improve financial support for the green and low-carbon transition, based on their comprehensive analysis of the "double carbon" target and the financial industry's needs to achieve it.

At the micro level, academics have provided suggestions on how financial institutions can assist society in achieving carbon neutrality and carbon peaking.

Concerning top-level design, Zhu [25] suggested that financial institutions should strengthen their top-level design to enhance macro policy matching while reducing policy and institutional risks. Ge [26] recommended that top-level design should be strengthened to make up for the lack of guidance in the specific path for China's financial institutions to participate in achieving the dual carbon goal. Liu and Li [27] asserted that, in order to further promote the achievement of the "30-60" target, it is essential to strengthen top-level design and continuously improve the green finance regulatory system. Wang [28] emphasized the importance of top-level design, establishing and improving the standard system and evaluation methods in exploring the pathway to achieve the "double carbon" target at low cost and high quality. Wang and Zhang [29] suggested that financial institutions should strengthen

the top-level design of green finance and coordinate green financial policies with the "double carbon" objective under the "double carbon" objective. Qiao et al. [30] recommended that the relevant authorities should strengthen top-down institutional design while financial institutions should improve their systems to promote low-carbon and environmentally friendly lifestyles.

Regarding the mechanism model, Sun [31] suggested that financial institutions should fully utilize the foundation of green finance and green credit while providing a clear and precise roadmap for financial institutions to help achieve the carbon peak and carbon neutrality targets through detailed decomposition of the carbon peak and carbon neutrality targets and the innovation of the institutional mechanism of climate investment and financing. Liu [32] proposed that financial institutions should support multiple types of investments such as clean and renewable energy projects, low-carbon transportation projects such as new energy vehicles, and projects that are synergistic with green development by developing projects based on green finance. Lu [33] stated that finance is the most critical tool to achieve the "double carbon" target. Financial institutions should be encouraged to invest and finance in the "double carbon" target while adjusting and optimizing the financial supervision and management system and mechanism accordingly. Wang Wen, the Executive Director of the Chongyang Institute of Finance, RenMin University of China, and Secretary General of the Green Finance Committee of the Chinese Society of Finance, suggested setting standards and norms and exploring a financing model, which combines debt financing, equity financing, government guarantees, and risk-sharing to make funds flow more precise to dual-carbon green projects [34]. Ge [22] proposed specific routes for Chinese financial institutions to participate in climate investment and financing, such as deepening the climate business model, enhancing the depth of financial institutions' participation, improving the carbon emission rights trading mechanism, and bringing into play the attributes of carbon finance. Tian [35] suggested that financial institutions should establish a robust management system and refine industry investment and financing policies. Umar et al. [36] argued that developing green financial intermediation channels is essential for achieving a zero-carbon economy, and financial institutions can benefit from lower loan loss provisions and economic capital requirements. Zhao [37] advocated for promoting the construction of a high-quality green financial standard system that is "domestically unified and internationally aligned."

Regarding information disclosure, Zhao [18] suggested studying a mandatory environmental information disclosure system for financial institutions to make the allocation of financial resources to the green and low-carbon sector more transparent, market-oriented, and expeditious. Ma [38] emphasized that financial institutions should track and disclose climate-related information and carry out environmental and climate risk analysis (ERA) in his discussion on how to improve the green financial policy system. Yin and Zhang [3] pointed out the necessity for China's financial institutions to incorporate carbon neutrality into their strategic objectives, improve their organizational structure, promote information disclosure, and strengthen market transparency and supervision to help society as a whole achieve the goal of carbon neutrality. Chen [39] emphasized that financial institutions should strengthen environmental information disclosure, green financial supervision, improve the relevant legal and regulatory systems. Furthermore, there is a need to unify regulatory rules to prevent "greenwashing" in the financial sector. Ge [22] suggested establishing an ESG information disclosure mechanism to reduce information asymmetry. Wang [23] believed information disclosure should be promoted to enhance the regulation of green financial risks. Xiao [6] suggested that financial institutions should make good plans, integrate the management of environmental and climate risks with the expansion of financial development opportunities, and strengthen environmental information disclosure work and supervision of green finance. Ning and Li [4] supported the establishment of an environmental information disclosure system that includes carbon emissions and the carbon footprint. Wang and Zhang [29] proposed the gradual establishment of a broad, mandatory ESG information disclosure system under the "double carbon" target, and improvement of the regulation of green

finance.

In terms of product innovation, Fei [14] suggested that financial institutions, including banks, securities, and insurance companies, should actively promote the business innovation of carbon financial products, accelerate the research and design of new carbon financial business products like emission right pledge loans and carbon emission money pledge loans, and explore the financial innovation of various carbon financial derivatives, like carbon swap trading, carbon securities, carbon futures, and carbon funds. Liu and Li [27] stressed that financial institutions should pay attention to the risk exposure of enterprises' high carbon assets, strengthen the innovation of green financial products, and better serve the development of a green economy. Wang [28] highlighted that financial institutions should innovate product services and promote the research and application of green and low-carbon technologies. Zhang [40] suggested that to promote the green transformation of the economy and achieve the goal of carbon peaking and carbon neutrality, it is necessary to enrich green financial products and services and build a green financial think tank platform. Yao et al. [41] pointed out that to effectively meet the requirements of the carbon-neutral target proposed by the Central Committee, central enterprises and financial institutions should promote the transformation of industries to green and low-carbon, and enrich the supply of carbon financial products and services. Zhang [34] suggested financial institutions respond to the situation and impact of carbon neutrality by further improving policy guidelines related to green finance, highlighting key areas to support green development, innovating financial products, actively participating in the carbon finance market, closely tracking policy changes, and paying attention to the risks of decarbonization transition. Bredin et al. [42] proposed products such as carbon emission rights futures and options contracts and certified emission reduction (CER) futures. Wang & Dong [43] found that financial institutions, like the Japan Bank for International Cooperation (JBIC), helped the government and enterprises undertake CER projects or purchase CER products by providing start-up capital and intermediary services while exploring the process of achieving Japan's emission reduction targets.

In terms of instrument development, Guo [44] suggested that financial institutions should actively explore the use of various green financial instruments, such as green loans, green bonds, green insurance, green funds, and green certificate trading. Zuo et al. [45] argued that building energy-efficient, green, and low-carbon data centers is an important step for the financial industry to implement the "double carbon" objective. An [24] and Zhao et al. [46] stressed that more green financial instruments must be developed, with green corporate asset-backed securities as an innovative instrument to effectively solve the problems of narrow financing channels and maturity mismatch for green projects while achieving the goals of green low-carbon development, carbon peaking, and carbon neutrality. Chandio et al. [47] contended that the development of finance is integral to sustainable agricultural production, and financial institutions can employ carbon finance as a tool to intervene in financial markets. Peng and Bai [48] suggested that direct funding, like grants and subsidies, is a viable financial tool to enable local authorities to undertake climate change mitigation projects, and financial development is crucial for sustainable agricultural production.

Many scholars have focused on banks as crucial institutes for financial support in the development of green industries. Zhou and Li [49] examined the relationship between voluntary action by banks, climate change, and exponential corporate growth in a context of regulatory uncertainty. They suggest that the banking sector should adapt to climate change principles and environmental as well as financial regulations to better support low-carbon business development. Yu [50] argued that commercial banks should strengthen top-level design, optimize resource allocation, promote product innovation, increase support for green industries, focus on core enterprises, improve industrial chain support, and pay attention to risk control for key industries in the process of green development. Lv and Nie [31] suggested that commercial banks should increase the supply of funds in key areas, continuously optimize their business structure, accelerate product innovation, improve the green

financial service system, actively connect with regulators and ecological and environmental authorities, adhere to green operations, and reduce their own carbon footprint. Liu [51] pointed out that, in exploring the development path of green finance for commercial banks under the carbon-neutral target, it is necessary to establish and improve the green financial standard system, incorporate the green development concept into the development strategy of commercial banks, innovate green financial products, enhance the risk identification and management of financial assets, and optimize the green financial support policies further. Ye [52] analyzed development opportunities for commercial banks under the carbon-neutral target of carbon peaking and suggests that banks should grasp policy opportunities of carbon-neutral development, focus on carbon reduction and sink enhancement, accelerate product and service innovation to meet carbon-neutral targets, attach great importance to, and actively respond to financial risks created by environmental and climate change.

5. Conclusions

The core idea of carbon peaking and carbon neutrality is to reduce carbon emissions, inherently interpreting China's economic shift from high growth to high-quality development. China needs to increase awareness of carbon peaking and carbon neutrality among enterprises and individuals as a whole and utilize new-generation information technology platforms such as big data and 5G to meet energy-saving and emission-reduction requirements. For financial institutions, the "30-60" target has far-reaching implications, indicating a new direction for the in-depth development of green finance. It supports green and low-carbon development and accelerates the establishment of a new development pattern, which puts forward new and higher requirements for financial work. This paper reviews the theoretical and practical countermeasures and recommendations of many scholars. It focuses on the path for financial institutions to achieve the "double carbon" goal, aiming to promote better "knowledge" and "action" of financial institutions. While there are several favorable conditions for China to achieve its carbon peak target, it faces challenges such as the urgent need to optimize its production structure, challenges in adjusting its energy structure, pressure on ecological and environmental management, and the need to improve its low-carbon development policy system. Under the strong leadership of the Central Committee, we must be confident and fully utilize the advantages of the socialist system with Chinese characteristics and the advantages of a super-sized economy to work hard and ensure the carbon peak carbon neutrality target is achieved as scheduled.

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