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Research on the operation mechanism of green bank based on international experience

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Abstract: *From the G20 Hangzhou Summit in 2016 to the second "One Belt And One Road" International Cooperation Forum in 2019, China has continuously promoted the international practice of green finance. This paper fully studies the eu and its main members green financial development experience, summarizes the theoretical connotation and function of the green bank definition, starting from the demand of present developing green bank industry to build a simple analysis framework, based on setting goals, capital sources, operation management, industry requirements and solution design such as content to build green bank operation mechanism, promote China's economic concrete path to the transformation of the "green" as soon as possible.*

Keywords: *green bank, green credit, equatorial principle*

1. Introduction

In recent years, vigorously developing green economy has become a global consensus, but the lack of green investment is also a common problem facing all countries in the world. According to estimates by the United Nations Conference on Trade and Development (UNCTAD), global investment in the green economy should be between $5tn and $7tn a year between 2016 and 2030 to achieve the global Sustainable Development Goals. According to estimates from the International Energy Agency (IEA) and the World Bank, to meet the climate targets set in the Paris Agreement adopted at the 21st UN Climate Change Conference, new global investment in sustainable infrastructure should be no less than $90tn between 2016 and 2030, more than double the current investment stock. In order to fill this huge funding gap, relying on public finance alone is far from enough. We must respond to various practical challenges and fully mobilize the investment enthusiasm of the private sector. In this context, how to reasonable participation by the public sector, including play a policy-oriented financial institution (the national development bank, the green investment bank and green development fund, etc.), try to leverage and guide private investment into the green economy, build green financial system step by step, to become the world's major economies of the important task facing the government.

In recent years, China has significantly accelerated the pace of building a green financial system. The scale of products such as green credit and green bonds has grown rapidly, and market participants have become increasingly diversified. However, compared with the European Union and its major member states, which started the practice of green finance in the 1970s and made remarkable achievements, the different stages of development determine that China has a heavier and more difficult task to develop green finance. Therefore, it is necessary to fully study the practical experience of the EU and its major member states in developing green finance and draw valuable enlightenment from it.

This article will focus on the green Banks operating mechanism, from the green bank industry demand, in the face of the current development of the financial market failure phenomenon and green barriers to investment and financing to build a simple analysis framework, based on setting goals, capital source, operations management, industrial requirements and solution design such as content to build green bank operation mechanism, to promote their green financial system play a role to build and promote the development of green economy, in order to design is beneficial to promote China's economic concrete path to the transformation of the "green" as soon as possible.

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2. Theoretical Connotation and Functional Definition of Green Bank

2.1. Theoretical connotation

At present, there is no unified definition and interpretation of the concept of green bank at home and abroad, but some basic consensus has been formed in practice. Green banks refer to specialized banks that invest in green industries such as new and renewable energy, energy conservation and energy efficiency, low-carbon infrastructure, and environmental protection. Huang Jinsheng (2015) believes that green bank attaches great importance to environmental issues in the process of business development, and takes concrete actions to promote or promote real changes in this aspect of the entire banking industry. In essence, green bank is a value system that supports various activities of a bank. This value system believes that all business activities of a bank should not only benefit its employees and shareholders, but also benefit its customers and economic development. Zhu Shouqing et al. (2015) believe that green banks refer to professional banks that invest in green industries such as new and renewable energy, energy conservation and energy efficiency, low-carbon infrastructure, and environmental protection. Asia-Pacific Economic Cooperation (OECD) has read the concept of the Green Bank from the perspective of its goals. It is believed that the Green Bank aims to promote more social capital to invest in low-carbon development and infrastructure projects to deal with climate change, especially to support the development of clean electricity projects. Finally, the cost of clean energy for residents will be reduced, the market demand of low-carbon projects will be expanded, and the low-carbon transformation of social economy will be realized.

2.2. Function definition

According to the 2019 China Green Finance Development Research Report, in 2018, China's total demand for green finance funds was 2.1 trillion yuan, while the total supply was 1.3 trillion yuan, with a gap of 0.8 trillion yuan. Relying on social capital investment is the way out for the development of green industry. However, ordinary investors and commercial banks lack the ability to assess the risk of green projects, and at the same time, lack of understanding of green projects leads to insufficient investment in green industry, which forms a huge funding gap. Green bank is a powerful tool to solve the capital gap of green industry and leverage social capital to invest in green industry.

3. Field and scope of green industry

In 2015, the China Green Finance Committee released the Catalogue of Green Bond-supported Projects, which divided green projects into six categories: energy conservation, pollution prevention and control, resource conservation and recycling, clean transportation, clean energy, ecological protection and adaptation to climate change. In March 2019, the National Development and Reform Commission and other seven ministries and commissions released the Green Industry Guidance Catalogue (2019 Edition), which divides the green industry into six categories: energy conservation and environmental protection industry, clean production industry, clean energy industry, ecological environment industry, green upgrading of infrastructure, and green service industry.

4. Goals of the Green Bank

4.1. An independent public investment institution operating under government supervision

Combined with China's current situation, the Green Bank can be established as a state-owned policy bank with government capital injection. However, as a public investment institution, the Green Bank should operate independently without government intervention and in accordance with commercial standards. Green financial products should ensure that there is no government intervention from the initial financing to the sales of financial products in the later stage, and the credit authorization of the project is controlled and decided by the board of directors. All activities are carried out through open and transparent bidding to ensure fairness and transparency in the process. The Board of Supervisors, composed of government departments, only supervises the green bank business. This ensures efficient and fair use of funds.

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4.2. Cooperate with commercial banks to expand business areas

4.2.1. Credit channels

In order to solve the problem of not competing with commercial banks, the credit funds can be lent to borrowers through re-lending or lending instead of directly to lenders. In this way, the relationship between green banks and commercial banks is not a relationship of competition but a relationship of cooperation.

After receiving loan applications from enterprises, commercial banks will input relevant information of the applicant enterprises into the Green Credit Rating System of Green Bank through the information sharing platform, which will rate the loan applicant enterprises and feedback the rating results to the commercial banks. Then, the commercial bank will negotiate with the Green Bank according to its feedback, and finally decide whether to grant loans to the enterprises applying for loans or the amount of loans. With the continuous promotion of this cooperation model, more and more commercial banks join in, promote the continuous expansion of project financing scale, improve the efficiency of financial support, and promote the development of the national economy.

4.2.2. Private investment

The Green Bank could issue green bonds with a smaller face value (e.g., 1,000 yuan) through commercial banks, allowing private investors to invest in smaller amounts. Private investors will be able to buy Green Bank bonds only through regular commercial banks. And commercial banks can provide the best advice to private investors on the choice of bonds.

4.3. Focus on green technologies and explore integrated services

Combined with the National Development and Reform Commission's Industry Guidance Catalogue, the scope of green technology industry can be defined, and the green technology field can be divided into environmental quality, resource utilization, energy utilization, life and health, ecological safety and other categories. Want to strengthen the operability, at the same time in the field of industry elaboration related to the scope of instruction, puts forward a clear technical category and case, set up a specific reference index for all kinds of technology, and establish the confusing but not included in the scope of "negative list" green technology, practical for the green results of bank collection and storage project, promoting the transformation of achievements transfer and financial support to provide relatively clear reference standard.

4.4. Pay attention to the construction of institutional team, highlighting the investment ability

As the first green investment bank in the world, the Green Investment Bank of the UK has established a set of green technology project evaluation index method. Many invested projects have achieved good results, and its development model is worth learning and reference. According to GIG's experience, Green Bank employees are composed of investment experts, asset managers and support controllers. Asset managers mainly include industry investment experts and financial product experts. Financial product experts have professional backgrounds such as structural finance, financial modeling and pricing, engineering and construction. Investment experts and technical experts account for more than 60% of the total number of employees

4.5. Establish an effective information communication and disclosure mechanism with environmental protection authorities

Approval from the environmental sector is key to the success of green finance. In the implementation process of green finance policy, the environmental protection department plays an important role in auditing to ensure that the discount interest policy can accurately support energy conservation and environmental protection projects. To obtain a discount interest loan for each environmental protection project, it must be approved by the local or higher-level environmental protection department.

5. Source of capital

5.1. The main sources of funds are diversified

As public financial institutions, green banks usually receive initial capital from government finance or other government projects. This will ensure that the government has absolute control over the green bank, ensuring that both are aligned in their goals and that they do not compete with private capital. At the same time, the government, as the initiator of the project, provides implicit guarantee to private capital to some extent, which improves the expected return of private investors or reduces the expected risk. At the same time, because the government provides the preliminary evaluation and preparation of the project, the investment cost of private investors is reduced.

5.2. Diversified nature of funds

The diversification of the nature and structure of funds mainly includes the direct investment sources of governments, enterprises, individuals and investment institutions, as well as the direct or indirect sources of funds of various financial institutions.

5.3. The capital structure is multi-layered

Credit and bonds mainly provide debt financing, but many green financings also require capital financing, mezzanine financing, etc., as well as long-term capital in the society, such as social security fund, pension fund, long-term insurance fund, etc. These different sources of capital need to invest in green projects with different capital hierarchies, so multi-level capital structure design is needed to achieve multi-level capital structure financing.

6. Operations management

6.1. Target industries of Green Bank

6.1.1. Selection criteria for priority intervention areas

Green bank in China can consider to draw lessons from the green investment bank GIG, at least to meet 1 in the 5 green index indicators, be included in the scope of project evaluation of green technology in China, namely, to reduce greenhouse gas emissions, increasing the service efficiency of natural resources, protect or improve the natural environment, to protect or improve biodiversity and promote environmental sustainability.

6.1.2. Target domain

The Green Bank should focus on traditional energy efficiency, renewable energy (solar, offshore and onshore wind, hydro, waste and biomass), as well as innovative technology areas such as smart grids, biofuels, low-carbon transport, energy savings and tidal technologies. Based on the concept of inclusive finance, the Green Bank should also attach importance to supporting small and medium-sized green projects. For example, a special "Energy Efficiency Loan Project" could be set up for small and medium-sized projects, mainly providing low-interest loans to small and medium-sized enterprises in the fields of heating, energy efficiency buildings and renewable energy.

6.2. Business model

Green bank can be based on the experience of the GIG privatization model for the development of market-oriented operation, to establish "government guide, market profit and green" organic combination of "value driven" development pattern, promoting green technology bank operating subject and green technology venture investment fund management main body effectively, promote the discovery of green technology collection and storage, screening assessment, pilot maturation and smooth the financial support of unity. A "value-driven" development model that combines government guidance, market profit and green public welfare.

6.3. Follow the principle of

The practice comparison of green finance between German and British policy banks and its

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enlightenment

6.3.1. Equator Principles

Under the Equator Principles, banks will refuse to provide financing if the lending enterprise does not meet the social and environmental standards of the Equator Principles. The significance of the Equator Principles lies in the quantification, clarity and concretization of vague environmental and social criteria in project financing for the first time. The Equator Principles can reduce project risks and enterprise costs, improve management capacity, avoid policy risks and facilitate international cooperation.

Banks that commit to the Equator Principles are called "Equator Banks".Equatoria Bank employs qualified and experienced environmental and social experts or institutions to scan, identify and assess the possible environmental and social risks in the project, and help customers to put forward technical methods and management suggestions to reduce or eliminate these potential risks, and prevent the economic risks caused by these risks. At the same time, it requires the customers applying for project financing to establish and improve the project cycle, and the environmental and social management system corresponding to the nature and scale of the project, so as to help the enterprise improve the processing process, reduce the energy consumption of processing, improve the comprehensive utilization of resources, so as to reduce the management cost of the enterprise. Require project parties to comply with local environmental regulations and standards, as well as the requirements of environmental, health and safety guidelines.

6.3.2. The "double bottom line" in investing

1) Effect of green

The "green effect" principle requires that the project meet one or more of the following five objectives: (1) reducing greenhouse gas emissions; (2) improve the efficiency of the use of natural resources; (3) to protect and improve the natural environment; (4) conservation and improvement of biodiversity; (5) Improving environmental sustainability.

2) ***Sustainability***

China's green bank should pay full attention to the green effect of green technology transfer and transformation, but also consider the sustainability. The selection of target industries and projects is subject to policy orientation and shows a certain degree of flexibility. Green Bank's target industries and projects are screened in response to market and policy changes to timely change the direction of investment, to ensure the sustainability of operations. On the basis of obeying the policy orientation, it shows a certain degree of flexibility.

3) Leverage

The principle of "leverage effect" clarifies the positioning of Green Bank as a for-profit organization. It is far from enough to rely on the initial capital injected by the government into the Green Bank to realize the green transformation. Only by demonstrating good profitability and leveraging social capital into the field of green investment can the Green Bank attract more private sector investment in the green economy and expand the financing channels and scale. Its business model therefore aims to show the private sector the investment attractiveness of green projects. The business model starts with the financing of green projects by green investment banks. Through the promotion of demonstration effect and replicable experience, the innovation of technology and financing means, etc., the profit rate of green projects can be improved, and the recycling of capital and the attraction of social capital can be realized. For China to build a green financial system, it is necessary to further strengthen the selection of projects. From the perspective of the government, it is necessary to meet the government's demand for low carbon and green, and for social capital, it is necessary to meet the profit-making demand of capital.

7. Green Financial Services

7.1. Green credit

Green credit usually means that banks use favorable interest rates and other conditions to support projects with environmental benefits, or to limit projects with negative environmental effects. Green loans include housing loans, auto loans and green credit card business for individuals, as well as project

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finance, construction loans and equipment leasing for enterprises. When it comes to corporate lending, the Equator Principles is the voluntary green credit principle currently in vogue around the world. Under the Equator Principles, banks will refuse to provide financing if the lending enterprise does not meet the social and environmental standards of the Equator Principles. The significance of the Equator Principles lies in the quantification, clarity and concretization of vague environmental and social criteria in project financing for the first time.

7.2. Green bonds

The reasons why green bonds can attract investors are as follows: first, green theme and social value; Second, shorter maturity and higher liquidity. The maturity of green bonds is generally 3 to 7 years and has good liquidity in the secondary market. Third, some green bonds are exempt from tax and have a good return on investment. Fourth, lower risk. By investing in green bonds, investors avoid the risk of investing in individual environmentally friendly projects, and the issuers themselves will be able to carefully select the projects they invest in.

7.3. Green fund

7.3.1. Green private equity financing and venture capital funds

At present, the leading parties of large-scale green direct investment in the world are internationally renowned financial groups, while some professional investors also participate in it. According to the study data calculation, from 2007 to 2018 in the first half of the Chinese VC/PE for a total of 1448clean energy investment, a total of $20.7 billion, and there are many listed company success at home and abroad. It is worth noting that the number of projects invested in clean energy has decreased in the past two years, reflecting several problems in the development of China's clean technology industry. First, there is insufficient policy support, low return rate of green industry projects and long cycle of capital recovery. Second, the domestic marketization is still not sufficient, the basic supporting facilities are not complete (such as wind power, solar power, etc.), some products are more dependent on export, the demand volatility is large; Third, investors and consumers have not yet formed a good understanding of clean technology and products and social responsibility.

7.3.2. Green ETFs and mutual funds

There are already a considerable number of green financial products with good liquidity in foreign financial markets, mainly ETF index and fund products, including derivatives of carbon emission rights, etc. These products attract a wide range of investors, including individuals. At present, the international green index mainly includes: Standard & Poor's Global Clean Energy Index (including 30 major clean energy company stocks worldwide), Nasdaq American Clean Energy Index (tracking more than 50 listed clean energy companies in the United States), and FTSE Japan Green 35 Index (Japanese companies with environment-related businesses).Each of these indices has spawned corresponding investment funds that track the index. Other featured indexes and funds include Deutsche Bank X-Trackers for the S&P U.S. Carbon Emissions Fund and Barclays' Global Carbon Index Fund. China started late in this regard. At present, there are some fund products in the A-share market (such as A-share Richina Low Carbon Environmental Protection Fund, China Shipping Environmental Protection New Energy Fund, etc.), but the scale is relatively small and the investment targets are not strictly limited to the environmental protection industry.

7.4. Green insurance

Green insurance, also known as ecological insurance, is a means of environmental risk management under the conditions of market economy. Generally speaking, environmental liability insurance with the insured because of pollution of water, land or air, the liability of compensation that should be undertaken according to law as the object of insurance. The significance of ecological insurance lies in that without insurance, many enterprises will be unable to provide compensation and repair the environment after accidental pollution events. Moreover, compulsory insurance for some industries can internalize the environmental costs and reduce the investment behaviors that are too risky for the environment.

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7.5. Green consumption

The green finance business of most commercial banks is aimed at corporate customers, while the green finance business of individuals is rarely involved. Green banks can cooperate with commercial banks to expand green financial services from corporate customers to individual customers. For example, they can issue low-carbon themed credit cards to encourage cardholders to actively participate in carbon emission reduction and advocate low-carbon life. Launch the retail green credit product "Green Mortgage Loan", which is mainly aimed at the customers who trade houses that meet the green building standards and meet the qualifications of personal housing mortgage loans; Green financial management and other green investment products for individual customers. On the one hand, it alleviates the term mismatch problem of related green projects, broadens the financing channels and reduces the financing cost. On the other hand, it can also meet the investment needs of individual customers and expand the share of financing. Such innovative financial products targeted at individuals are conducive to the expansion of green finance business of Green Bank and play a positive role in promoting it.

7.6. Emissions

In the field of emission rights financial services, Green Bank can provide comprehensive and comprehensive services for customers to participate in all aspects of emissions trading, including carbon trading, carbon finance, carbon fund, securitization based on carbon emission rights receivable and emission rights financial service products. Among them, carbon financial service products include CDM financial consultant, carbon asset pledge credit and carbon asset delivery performance guarantee, etc. Emission rights financial service products mainly refer to a series of financial services provided by Green Bank for the national or regional environmental capacity right trading markets, including the management and financial management of the paid use of emission rights.

8. Policy Suggestions

8.1. Integrate international resources

In the construction of green financial system, China is a late start, we should strengthen the energy conservation and environmental protection financial services with international financial organizations and foreign banks experienced exchanges and cooperation, learn from experience, introduce advanced practices, better promote the domestic green financial services with international standards, rapid and healthy development.

8.2. Legislation shall be adopted to clarify the legal responsibility of financial institutions for the pollution projects they invest in

China started late in clarifying the environmental responsibility of financial institutions, and the current regulations are still at the level of principle, not strong in operation, and no bank has faced litigation for environmental problems. To this end, we need to strengthen the legal system to ensure the smooth operation of the green economy.

8.2.1. Improve the legal liability system for the environment of lenders

China's financial market control shows a trend of strengthening, but in the green finance, especially the green credit provisions are vague, laws and regulations are also less ink. It is suggested that the environmental liability of the lender should be defined as the civil tort liability. If a financial institution or legal person having a direct economic relationship with the polluter without any direct pollution acts fails to fulfill its duty of prudence, it shall bear the joint and several liability of the person liable for tort.

From the source of environmental pollution funds, improve the administrative responsibility related systems. It is suggested that the administrative counterpart and the administrative related persons should be included into the enforcement scope of the "environmental protection prohibition order", and the "administrative organs with environmental protection obligations" should be added as the administrative organs that can apply for compulsory enforcement without limitation of time limit.

8.2.2. Establish the legal obligation of enterprise environmental information disclosure

With the establishment of ESG information disclosure framework by CSRC, the environmental information disclosure system is advancing towards the ultimate goal of mandatory disclosure of all enterprises. But efforts at the policy level cannot replace the construction of a legal system. It is suggested to stipulate mandatory information disclosure obligations from the legislative perspective of the Environmental Protection Law. The first step is to clarify the company's responsibility for information disclosure, and specify the disclosure principles, disclosure matters and format specifications according to the ESG system. The second step is to stipulate the responsibilities of enterprises with non-mandatory disclosure, establish an environmental information disclosure system in line with the national conditions, and reduce the transaction costs and risks caused by information asymmetry. Standardize the business process of the third-party certification body, establish its evaluation index system, and ensure the reference and rigor of the certification opinions.

8.3. Avoiding "Government Failure" and "Regulatory Capture"

To solve the problem of market failure through government intervention, efforts should be made to avoid the problem of "government failure" (Stiglitz and Wu Xianming, 1998).When the government intervenes in the market, it is likely to be accompanied by rent-seeking behavior and other political and economic problems, which makes the government incur huge costs when exercising the function of improving social welfare, and even exceeds the benefits brought by overcoming the market failure, thus forming the problem of government failure. At the same time, when the government takes intervention measures, it should also strictly prevent the problem of "regulatory capture", that is, the intervention policies issued by the interest groups are interfered with, and the interests of the interest groups and the public are harmed. This is particularly noticeable in the field of resources and the environment, because monopolies represented by large resource companies and radical political forces with "environmental protection" and "justice" as their armor are often able to interfere with the government.

8.4. Strengthen the supervision and risk prevention and control of green technology loans in the later stage

We will create fair opportunities and platforms, set unified standards, and urge market entities to make quality decisions spontaneously. At the same time, the concept of functional supervision is introduced to further improve the supervision system. To construct evaluation and monitoring system and further optimize risk early warning. Cooperate with "One Line, Two Sessions" to develop measures and emergency plans for financial risks in the cross-capital business of green technology bank from the aspects of constructing risk statistical monitoring index system, assessment method and alarm issuing mechanism.

9. Conclusion

By referring to the practical experience of KfW Bank, Green Investment Bank of the United Kingdom, Japan Policy Investment Bank, Industrial Bank and other major green banks, this paper concludes a "value-driven" business model of green bank with the organic combination of "government guidance, market profit and green public welfare". As an independent public investment institution under the supervision of the government, it cooperates with commercial banks to focus on green technology and expand comprehensive business areas. Establish an effective information communication and disclosure mechanism with environmental protection authorities; We will build up our workforce and improve our capacity for green investment.

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References

[1] Yang Wang, Li Yiming, Xu Huilin (2020). Connotations and Experience of Green Bank [J].International Finance,vol.466,no.4,pp.75-80.
[2] Zhang Chunpeng, Cui Yuhan, Zhang Jingyuan, et al (2020). Screening and Evaluation Methods

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and Practice of Green Technology Projects in the UK [J].Science and Technology Management Research, vol. 40,no.16,pp.25-30.

[3] Qu Jie, Yang Ning, Wang Jia(2019). Experience and Enlightenment of the Development of Green Finance by KfW Bank [J].China Economic and Trade Review (China), vol. 951,no.11,pp.105-106.

[4] Sun Yanhong(2018). Comparison and Enlightenment of Green Finance Practice between German and British Policy Banks [J].European Studies, vol.36,no.1pp.5-6, 26-48.

[5] Yu Tianye, Yang Hongbiao(2016). International experience of green finance [J]. Party and Government Vision,no.02,p.35.

[6] ZHU S Q, ZHOU L H, SUN Y N(2015). International reference of green bank [J]. China Finance, vol.818,no.20,pp.41-42. (in Chinese)

[7] Huang Jinsheng(2015). International experience of green bank development and its enlightenment to China [J].Zhejiang Finance, vol. 439,no.10,pp. 55-60.