

Research on the Motivation and Performance of China Three Gorges Corporation's Issuance of Carbon-neutral Bonds under the Background of "Double Carbon"

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Abstract

Xi Jinping announced at the 75th United Nations General Assembly that China will achieve carbon peak in 2030 and achieve carbon neutrality in 2060. In February 2021, six large state-owned enterprises issued the first batch of carbon-neutral bonds in China. As one of the first domestic companies to issue carbon-neutral bonds, Yangtze Three Gorges' carbon-neutral bond issuance process is relatively typical. Based on the "dual carbon" background, this project conducts a case analysis of the carbon-neutral bonds issued by the Yangtze Three Gorges. First, the SWOT analysis method is used to analyze the motivations for the Yangtze Three Gorges Group to issue carbon-neutral bonds from the dual perspectives of external environment and internal conditions. Secondly, try to scientifically evaluate the performance of carbon neutral bonds from the aspects of economic benefits, environmental benefits, reputation effects, etc. Finally, based on the achievement of the Yangtze Three Gorges Group's goal of issuance of carbon-neutral bonds and the resulting economic consequences, policy recommendations are put forward to select appropriate opportunities to issue carbon-neutral bonds and improve corporate performance. The research of this project will help enrich the influencing factors of enterprises' issuance of carbon-neutral bonds and expand the economic consequences of enterprises' issuance of carbon-neutral bonds. It can not only provide theoretical reference for government regulators and policymakers, but also provide reference for companies to issue carbon-neutral bonds.

Keywords

Carbon Neutral Bonds; Green Financing; China Three Gorges Corporation; Motivation Research; Performance Research.

1. Introduction

1.1. Research Background

With the rapid development of the global economy and the continuous advancement of science and technology, problems such as high energy consumption and high environmental pollution have become increasingly prominent. In 1992, the United Nations Conference on Environment and Development adopted the United Nations Framework Convention on Climate Change, which led the international community to pay attention to and respond to energy and environmental issues. The concept of low-carbon economy first appeared in the British energy white paper "Our Energy Future: Creating a Low-Carbon Economy" in 2003. Since then, countries have gradually begun to pay attention to the development of low-carbon economy and formulated a series of international agreements to promote innovative financing tools for the low-carbon economy.

China also actively responds to environmental issues and continues to develop green finance. In 2007, China released the "China National Plan to Address Climate Change", officially launching the development process of China's low-carbon economy. Subsequently, the

development of a low-carbon economy was mentioned in many meetings. At the 2009 United Nations Climate Change Conference, China promised to reduce the level of greenhouse gas emissions per unit of GDP to half of 2005 by 2020, and achieved this ahead of schedule. One goal. The Chinese government attaches great importance to green finance and has clarified the importance of developing green finance through party reports and policy documents.

In order to achieve sustainable development and promote the flow of funds to environmental protection projects, green bonds came into being. Green bonds help solve the financing problems of green and low-carbon projects and are crucial to the development of China's economy in a low-carbon and green direction. However, China accounts for more than a quarter of the world's greenhouse gas emissions in 2020, so low-carbon environmental protection is urgent. In 2020, the Chinese government announced that it would achieve carbon peak before 2030 and strive to achieve carbon neutrality by 2060. To achieve these goals, China needs large amounts of green investment funds.

There are two main ways to solve the financing problem of emission reduction enterprises: government and market. The government uses various methods to attract social capital investment, but as emission reduction companies continue to expand their demand for funds, the government's support is limited. Therefore, market participation becomes crucial. China not only actively participates in international carbon emissions trading, but also launched a domestic carbon emissions trading market, prompting the rapid rise of carbon trading-related financial instruments such as carbon bonds. In the context of China's carbon peak and carbon neutrality goals, carbon neutral bonds will be officially launched in 2021 as a new green financial instrument, providing new financing channels for emission reduction companies and promoting innovation in the financial market, with the largest It embodies the function of green financing to a certain extent.

As a green financial instrument that takes into account both financing and emission reduction attributes, the introduction of carbon neutral bonds has a profound impact on the financing issues of emission reduction companies. The issuance costs and benefits of carbon-neutral bonds are also key considerations for companies to choose this financing tool, so they are worthy of in-depth study. Faced with the goal of carbon peaking and carbon neutrality, China needs huge funds to support this transformation, so how to fill this funding gap has become a top priority.

1.2. Company Profile

The headquarters of China Three Gorges Corporation was established on September 27, 1993. It is affiliated to the State-owned Assets Supervision and Administration Commission and is a state-owned enterprise in China. During the power market reform in 2002, the Three Gorges Corporation headquarters was awarded the status of a "state-authorized investment institution" and officially became a corporate legal person. Among them, its holding subsidiary Yangtze Power was listed for the first time in 2003 and became an indicator stock of the Shanghai Stock Exchange 50 Index. After nearly 20 years of development, China Three Gorges Corporation has become the largest hydropower company in China and one of the largest hydropower companies in the world. Its annual hydropower generation ranks first among domestic power companies. Up to now, the installed capacity of its units in production and under construction has reached 45 million kilowatts.

China Three Gorges Corporation's specialized industrial strategy is reflected in two aspects: Its strategic positioning is to "build a first-class clean energy group focusing on the development and operation of large-scale hydropower", and its business goal is to "take the Yangtze River Basin as the main line, water as the basic resource, electricity as the leading product, and large-scale hydropower development and operation as the main line. advocate and actively develop clean energy."

From the perspective of asset structure and profit structure, China Three Gorges Group only has one core business: "hydropower production", which is a highly specialized business model. As of the end of 2009, CTG's total assets were 280.94 billion yuan, owners' equity was 190.93 billion yuan, state-owned equity was 169.85 billion yuan, the asset-liability ratio was 32.24%, and total profits were 9.46 billion yuan. Among them, hydropower assets accounted for 79.4% of the total assets, electricity sales income accounted for 92.3% of the group's consolidated operating income, and auxiliary business income accounted for 0.5%.

CTG's development focus is on hydropower, especially in the Yangtze River Basin, to achieve the production and supply of clean energy. At the same time, the group's assets and financial structure show relatively stable characteristics, and its assets are mainly concentrated in the hydropower field, indicating the characteristics of its highly specialized business model.

Field research process:

The research team conducted a week-long on-site investigation of the Three Gorges Corporation. The main interviewees included the senior management of the Three Gorges Corporation headquarters, the asset finance department, the strategic development department, and the senior management of its subsidiaries such as Yangtze Power, as well as middle-level employees. Communicated with key employees. The purpose of this on-site survey is to gain a more comprehensive understanding of China Three Gorges Corporation's operations and strategic direction, in order to support the development of Chinese-style enterprise management scientific research projects.

Through this field survey, the research team collected a large amount of on-site information and data for subsequent analysis and research. These data and information provide important support for an in-depth understanding of the operations and management of China Three Gorges Corporation. In the research report, the data and information collected from the field interviews will be quoted in detail, and relevant themes and issues will be analyzed in depth.

2. Literature Review

2.1. Research on Carbon Neutral Bonds

Green bonds can bring environmental benefits (Brita et al. , 2018). By 2030, green finance will neutralize global carbon dioxide emissions, and its total emission reductions are approximately equal to the total carbon emissions of Germany, other EU countries, and Japan in recent years (Glomsrød et al. , 2018). At the same time, the issuance of green bonds by listed companies will generate positive cumulative excess returns, improve stock liquidity, bring stock price benefits (Tang et al. , 2020), and also optimize the company's capital structure (Basten et al. , 2018), improve the profitability of corporate investment (Allet et al. , 2015). In addition, the issuance of green bonds can also provide investors with diversified products and increase the diversity of investment returns (Nanayakkara et al. , 2019). The funds raised from green bonds will be invested in green projects, which will help achieve the " double carbon " goal and sustainable development. It will also bring good economic and social benefits and help solve problems such as environmental pollution (Li Riqiang and Wang Fengjuan , 2017). At the same time, the issuance of green bonds by a company can have a positive impact on its stock price (Chen Danning, 2018), thereby bringing good reputation and profits to the company (Chen Xiao and Zhang Ming, 2022).

Green bonds can also promote regional economic growth to a certain extent. Zeng Gang and Wu Yuxiang (2021) believe that with the strong support of the carbon neutrality goal and China's relevant policies, the carbon neutral bond market has grown rapidly. As a new type of green bond, carbon neutral bonds have broad development prospects for green bonds. plays an important role in the further development of the low-carbon transition. Xu Hanfei (2021) believes that the innovative launch of carbon-neutral bonds has injected new vitality into the

green bond market, promoted its further development, and also contributed to the realization of the "double carbon" goal.

2.2. Literature Review

After sorting out the research on carbon neutral bonds by domestic and foreign scholars, we found that although scholars have conducted some research on the motivations related to the issuance of carbon neutral bonds, which can provide some reference and guidance for the writing of this project, at present The research on carbon neutral bonds at home and abroad (especially domestic) is not enough to meet the current status of the development of carbon neutral bonds under the current hot "carbon neutrality" background, and there are few case studies on carbon neutral bonds . This project hopes to provide some reference for the practice of issuance of carbon-neutral bonds by Chinese companies by studying the motivations and performance of the Yangtze Three Gorges issuance of carbon-neutral bonds.

3. Issuance Process of China Three Gorges Corporation

In January 2018 , the board of directors of China Three Gorges Corporation approved a financing plan for the public issuance of green bonds, officially introducing green bonds as a financing method . Subsequently, the company repeatedly reviewed and refined the plan for issuing green bonds, including determining the interest rate, exchange price and initial exchange price, and integrating it into the long-term development plan. In addition, in order to take care of the interests of investors and the company itself, a downward adjustment conversion price clause was introduced to deal with abnormal stock price fluctuations in the market. The company has also set repurchase and sell-back terms to reduce possible losses caused by bond issuance and ensure the consistency and regularity of issuance.

After multiple rounds of adjustments and approvals, in June 2018 , Three Gorges Corporation finally received approval from the State-owned Assets Supervision and Administration Commission of the State Council to publicly issue green bonds . After several planning revisions, in September 2018 , the company received approval from the China Securities Regulatory Commission and was authorized to publicly issue green exchangeable bonds to investors on the Shanghai Stock Exchange . This series of approval and adjustment processes ultimately created the legal and market basis for China Three Gorges Corporation to successfully issue green bonds.

4. Carbon Neutral Bond Motivation and Performance Analysis

4.1. Analysis of the Motivations of Three Gorges Corporation

4.1.1. External Environment

The main motivation for companies to issue green bonds is the green premium, which means that compared to traditional bonds, green bonds are usually issued at lower interest rates, which helps reduce companies' financing costs. Academic research shows that the interest rate of green bonds is about 17 basis points lower than that of traditional bonds , which provides companies with a significant financing cost advantage. In addition, the study also pointed out that the interest rate of green bonds is 24.9 basis points lower than that of ordinary bonds , which can help enterprises further reduce financing costs by reducing information asymmetry, improving securities liquidity and reducing the issuer's expected risks.

In addition to green premiums, other factors also encourage companies to choose green bonds as financing tools. National policies and macroeconomic factors are considered important factors driving companies to issue green bonds. Under different policy backgrounds, factors such as bond type and financing motivations have a significant impact on the issuance of green

bonds by enterprises. At the same time, factors such as green bond issuance costs, scale, issuer profitability and liquidity status, environmental protection intensity, and macro policies have also been found to have an important impact on corporate decisions to issue green bonds. The combined effect of these factors encourages companies to choose to issue green bonds, thereby promoting sustainable development and green investment.

4.1.2. Internal Conditions

Yangtze Three Gorges Corporation is the largest shareholder of China Yangtze Power Co., Ltd., holding about 55% of its shares. The mortgage company of the green exchangeable corporate bond "G Three Gorges EB1" is Yangtze Power, accounting for nearly 8% of its shares. Figure 3-1 shows the share structure and control ratio. Even after the future stock exchange conditions are lifted, China Three Gorges Corporation will still be the largest shareholder of Yangtze Power, with actual decision-making power affecting its major affairs.

China Yangtze Power Co., Ltd.'s business covers six areas, including hydropower, new energy (hydropower, wind power and energy storage), intelligent integrated power, power distribution and sales, international trade and investment and financing business. By the end of 2021, its total installed capacity will reach 45.595 million kilowatts, and the installed hydropower capacity in mainland China is 45.495 million kilowatts, accounting for 12.32% of China's total domestic hydropower capacity.

4.2. Performance Analysis of Three Gorges Corporation

4.2.1. Economic Benefits

The green exchangeable corporate bond, code-named "G Three Gorges EB1", has an issuance period of five years and expires in 2024. The bond was issued at a price of 100 yuan each, with a total issuance of 200 million, successfully raising 20 billion yuan. The coupon rate of the bond is set at 0.5%, and simple interest is paid once a year. Both Yangtze Three Gorges Corporation and this green exchangeable corporate bond have received the highest level of AAA in the comprehensive credit rating of China Chengxin Securities Rating Co., Ltd., indicating that they have very strong solvency.

In addition to the credit rating, this bond also uses 174.2 billion shares (for Yangtze Power), which is significantly lower than the company's total shareholdings, as the underlying stock for guarantee and trust property. In the end, the G Three Gorges EB1 Green Exchangeable Bond successfully met the issuance conditions of a green bond and was issued by China Three Gorges Corporation in early 2019 and completed its listing on the Shanghai Stock Exchange.

4.2.2. Reputation Benefits

As one of the largest hydropower companies in China, China Three Gorges Corporation enjoys an excellent reputation and benefits. On the international stage, the company, as one of the world's largest hydropower enterprises, is deeply recognized and trusted by the international energy sector, which helps promote international cooperation and overseas investment. Domestically, China Three Gorges Corporation, as a state-owned enterprise, undertakes important national tasks such as hydropower development and clean energy promotion. Therefore, it enjoys a high degree of trust among the domestic government and society, which helps promote the company's development in the domestic market. In addition, China Three Gorges Corporation pays attention to social responsibility and actively participates in areas such as sustainable development, environmental protection and community development, which further enhances its social responsibility image and helps attract investors and partners who care about sustainable development and environmental protection. The company's reputational benefits are also supported by its leadership in clean energy technologies, helping to attract high-quality employees and technology partners. In short, CTG's reputational benefits are very significant both internationally and domestically, and help the company achieve

success in many fields, including sustainable development, market expansion, social responsibility, etc. This reputation helps attract investment, partners and talent, enhancing the company's market position and competitiveness.

5. Conclusion

In the context of my country's increasingly active response to climate change, carbon-neutral bonds, as a new type of debt instrument, have begun to flourish. This form of debt not only provides financing channels for enterprises, but also helps reduce financing costs, which is consistent with my country's carbon peak and carbon neutral development goals. However, we also realize that the carbon-neutral bond market faces some challenges in its development and a series of measures need to be taken to promote its sustainable development.

First, we need to unify and improve the standards for identifying carbon neutral bonds to ensure their authenticity and transparency. In addition, the regulatory system needs to be further improved to prevent abuse and circumvention of the system. The carbon-neutral bond market can also learn from international experience to further improve the uniformity and international recognition of market standards. In terms of incentive policies, we recommend taking a variety of measures to encourage companies to issue carbon-neutral bonds. This includes lowering issuance thresholds, providing tax reduction and exemption policies, and local governments introducing financial subsidy policies to directly encourage more companies to participate in the carbon-neutral bond market.

Secondly, increasing market recognition and liquidity is also key, and investor recognition of carbon-neutral bonds needs to be increased through education and publicity. At the same time, we also need to develop more secondary market tools to attract more investors to participate and increase market liquidity. Finally, assessing the certification market also requires regulation to ensure the consistency and credibility of certification standards. This will help ensure the true emission reduction benefits of carbon-neutral bonds and further increase investor trust.

In short, the carbon neutral bond market is a promising financial tool for my country's carbon neutral development, but it needs to continue to be improved and developed. By adopting appropriate policies and measures, we can promote the development of the carbon-neutral bond market and provide more support and opportunities for my country's carbon peak and carbon neutrality goals.

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References

- [1] Li Riqiang , Wang Fengjuan . Key points and development suggestions for green bond issuance [J]. Finance and Accounting , 2017(09):19-21.
- [2] Ma Jun . On building China's green financial system [J]. Financial Forum , 2015, 20(05):18-27. DOI:10.16529/j.cnki.11-4613/f.2015.05.002.
- [3] Bai Quan . The construction of ecological civilization has entered a new stage with energy conservation and carbon reduction as the strategic focus [J]. China Energy , 2021, 43(08): 6-9.
- [4] Xu Hanfei , Liu Yu . Development status and policy recommendations of local government special bonds [J]. China Money Market , 2021(10):18-23.
- [5] Zeng Gang , Wu Yuxiang . Carbon-neutral bonds: a new trend in the green bond market [J]. Contemporary Financier , 2021(08):73-75.

- [6] Shu Yinbiao , Zhao Yong , Zhao Liang , Qiu Bo , Liu Mei , Yang Yang . China's energy and electricity low-carbon transformation path under the "dual carbon" goal [J/OL]. China News : 1-9[2022-12-16] . DOI: 10.13334/j.0258-8013.pcsee. 221407.
- [7] Chen Danning . Stock price effect of green bond issuance by Chinese listed companies [J]. Journal of Shanxi University of Finance and Economics , 2018 , 40(S2):35-38.
- [8] Bai Quan . The construction of ecological civilization has entered a new stage with energy conservation and carbon reduction as the strategic focus [J]. China Energy , 2021, 43(08): 6-9.
- [9] Zhuang Guiyang . Challenges and countermeasures faced by China in achieving the "double carbon" goal [J]. People's Forum , 2021 (18): 50-53.
- [10] Le TH, Le HC, Taghizadeh-Hesary F. Does Financial Inclusion impact CO2 Emissions? Evidence from Asia[J]. Finance Research Letters, 2020:101451.
- [11] Britta, Hachenberg, Dirk, et al. Are green bonds priced differently from conventional bonds? [J]. Journal of Asset Management, 2018,19(6): 371-383.
- [12] Wulandari F, Schfer D, Stephan A, et al. The impact of liquidity risk on the yield spread of green bonds[J]. Finance Research Letters, 2018, 27.
- [13] Tthn A, Mana B, Fb A, et al. Time-frequency comovement among green bonds, stocks, commodities, clean energy, and conventional bonds[J]. Finance Research Letters, 2020.
- [14] Tu CA, Rasoulinezhad E, Sarker T. Investigating Solutions for the Development of a Green Bond Market: Evidence from Analytic Hierarchy Process[J]. Finance Research Letters, 2020:101457.
- [15] Zhang D, Zhang Z, Managi S. A bibliometric analysis on green finance: Current status, development, and future directions[J]. Finance Research Letters, 2019.
- [16] Agliardi E, Agliardi R. Financing environmentally-sustainable projects with green bonds[J]. Environment and Development Economics, 2019, 24(6):1-16.
- [17] Glomsrød S, Wei T. Business as Unusual: The Implications of Fossil Divestment and Green Bonds for Financial Flows, Economic Growth and Energy Market[J]. Energy for Sustainable Development, 2018(44): 1-10.
- [18] Basten M, Sánchez Serrano, Antonio. European banks after the global financial crisis: a new landscape[J]. Journal of Banking Regulation, 2018, 20(1): 51-73.