

## *Original Paper*

# Study of Carbon Information Disclosure Issues in X Company

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### **Abstract**

*China's carbon trading pilot work is advancing, and the power industry, as one of the largest carbon-emitting industries, has become a key pilot subject in the carbon trading market. Therefore, the low-carbon development of the power industry has an important impact on China's carbon peak target. This paper takes X Company, a leading enterprise in the power industry, as an example to study its position, method, content, and disclosure quality in carbon information disclosure. The problems with X Company's carbon information disclosure are summarized, and targeted optimization recommendations are proposed.*

### **Keywords**

*carbon information, information disclosure, power industry*

## **1. Introduction**

In December 2017, the National Development and Reform Commission issued a notice on the “Construction Plan for National Carbon Emission Trading Market (Power Generation Industry)”, marking the beginning of the national carbon market construction. The power industry is one of the earliest industries to join the carbon trading pilot market and plays a crucial role in the development of the national carbon market. To promote the establishment of the carbon market and improve the system of carbon information disclosure, it is particularly necessary to study the issue of carbon information disclosure in the power industry. At the end of December 2021, the China Electricity Council issued a “Pathway Study on Carbon Peaking and Carbon Neutrality Development in the Power Industry”, which focuses on the issues of carbon peaking time, power sources and grid structure, and power supply cost in the power industry. Based on ensuring power supply security, the study takes low-carbon, electrification, and digitization as the main directions. The study proposes that achieving carbon peak in the power industry is a mandatory task and must be completed to ensure that the sector reaches carbon peak before 2030, strives to achieve carbon peak by 2028, and gradually transitions to the stage of reducing carbon emissions, thereby providing support for sustainable development and energy

conservation and emission reduction goals while also providing important assistance to the construction of the national carbon market.

The carbon information disclosure system is a very important system arrangement, which not only helps companies optimize their information disclosure structure but also helps improve the carbon accounting system. Currently, although environmental protection departments and industry associations have issued documents supporting the implementation of carbon information disclosure work, the specific content of carbon information disclosure has not yet been clearly defined, and there are various ways to disclose it, which exacerbates the urgency and necessity of establishing a carbon information disclosure system. Especially against the background of building China's carbon market, how to regulate the behavior of listed companies in the power industry in the carbon trading market and ensure the effective operation of the national carbon trading market has become an important issue facing us. As a representative of the national carbon market, the carbon trading pilot reflects the urgency of establishing a carbon information disclosure system. The power industry is the main driving force behind the carbon trading pilot. Due to the large amount of carbon emissions in this industry, relatively complete data foundation and relatively standardized industry management, the regulatory authorities can easily verify it. Therefore, we need to examine the current status of carbon information disclosure of relevant companies and the problems therein in-depth to promote the establishment and improvement of China's future carbon information disclosure system, accelerate the pilot of carbon emission rights trading in China, and define and standardize accounting standards for enterprises. These measures have important theoretical and practical guiding significance for promoting the stable development of the carbon market, achieving energy conservation and emission reduction goals, and achieving sustainable development goals.

## **2. Analysis of Carbon Information Disclosure Characteristics of Company X**

X company is an A+H share listed corporation controlled by a national energy conglomerate, committed to providing high-quality, reliable and innovative integrated energy products. The company mainly operates in six business segments, including coal, railway, power, port, shipping and coal chemical, with more than 77,872 employees. With the growth of renewable and clean energy markets, X Company actively explores sustainable development businesses and invests in new energy industries. The company will continue to adhere to the concept of "safety, efficiency, and sustainable development," dedicated to providing more diverse and high-quality energy services, and contributing to promoting China's energy transformation and clean development.

### *2.1 Disclosure Location and Disclosure Method Analysis*

This article analyzes X Company's carbon information disclosure from 2018 to 2022. All data is sourced from X Company's official website and the author's compilation of its social responsibility reports. According to the research results, although X Company has conducted carbon information disclosure, it has not provided an independent carbon information disclosure report as shown in Table 1.

It should be noted that since carbon information disclosure is a relatively new concept and the field is still in its early stages of development, there is still a lot of room for improvement in targeted disclosure of carbon information.

**Table 1. Location and Method of Carbon Information Disclosure by Company X**

Disclosure location	2018	2019	2020	2021	2022
annual report	√	√	√	√	√
ESG report		√			
Environmental, Social Responsibility, Corporate Governance Reports	√		√	√	√

*Note.* Compiled based on X Company's annual financial reports and sustainable development reports, etc.

In the ESG report, as well as environmental, social responsibility, and corporate governance reports, the disclosure of carbon information is relatively concentrated, mainly in the sections related to the environment and sustainable development. This layout is relatively more convenient for readers to search, and also enables readers to obtain information on a company's carbon emissions and carbon reduction measures from the report. It should be noted that X Company still needs to further strengthen its attention to carbon information disclosure in the report preparation process, and further improve its disclosure methods and content, to provide more comprehensive, transparent, and standardized carbon information disclosure to the public. In the annual financial report, X Company's carbon information disclosure has only qualitative descriptions, and the content is too brief; while in the ESG report and environmental, social responsibility, and corporate governance reports, the carbon information is disclosed more detailed and relatively concentrated. These reports use a combination of qualitative and quantitative disclosure, with quantitative disclosure mainly focused on CO<sub>2</sub> emissions reduction.

## 2.2 Analysis of Carbon Information Disclosure Content

Based on China's current national conditions and international organization standards, this article summarizes the main contents that Chinese companies should cover in carbon information disclosure, and analyzes in detail the carbon information disclosure situation of X Company. The study found that X Company did not publicly disclose the content of its carbon information audit and certification in the past five years. In addition, although X Company's disclosure of carbon information in environmental, social responsibility, and corporate governance reports is relatively comprehensive, there is still room for improvement. Table 2 shows the relevant situation of X Company in carbon information disclosure, which indicates that there is still room for improvement in some areas of X Company.

**Table 2. Carbon Information Disclosure Content of Company X**

Disclosure content	annual report	Environmental, Responsibility, Governance Reports	Social Corporate
Risks, opportunities, and policies related to carbon emissions	√	√	
Enterprise carbon emissions		√	
Corporate carbon reduction measures and performance	√	√	
Corporate carbon trading		√	
Carbon information audit and verification			

*Note.* Based on the annual financial report, environmental, social responsibility, and corporate governance reports of Company X.

### 2.3 Analysis of Carbon Information Disclosure Level

Taking into account the research results of Chinese scholars on carbon information disclosure and relevant policies, this article formulated a carbon information disclosure level scoring method (as shown in Table 3) based on four requirements (significance, timeliness, reliability, quantifiability), and analyzed X Company's carbon information disclosure content during the period of 2018-2022 using this method. As data reliability verification is currently difficult, this article focuses on analyzing the significance, timeliness, and quantifiability of the disclosure.

**Table 3. Scoring Table for Carbon Information Disclosure Level**

		Scoring requirements		
Scoring situation	significance	Timeliness	Quantification	
0 points	undisclosed	undisclosed	undisclosed	
1 points	General statements in the text	Disclosure of information unrelated to events during the reporting period	Lack of quantitative information	
2 points	Subtitle, prominent font	Disclosure of information related to events during the reporting period	Quantitative non monetary information	
3 points	Add text in the picture to express	Disclosure of information is closely related to events during the reporting period	Quantitative monetary information	

This article mainly takes the requirements of the international Carbon Disclosure Project (CDP) as the basis, and divides carbon information disclosure content into four aspects: low-carbon strategy, greenhouse gas emissions accounting, corporate governance of carbon emission reduction, and global climate governance. Combining these four aspects, this article provides a detailed interpretation of X Company's carbon information disclosure.

**Table 4. Carbon Information Disclosure Level of X Company from 2018 to 2022**

Disclosure content	2018			2019			2020			2021			2022		
	Significance	Timeliness	Quantification	Significance	Timeliness	Quantification	Significance	Timeliness	Quantification	Significance	Timeliness	Quantification	Significance	Timeliness	Quantification
Low Carbon Strategy	2	1	1	2	1	1	2	1	2	2	1	1	2	1	1
Accounting for Greenhouse Gas Emissions	3	1	2	3	1	2	3	3	2	2	3	2	3	3	2
Corporate Governance for Carbon Reduction	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2
Global Climate Governance	2	1	2	3	1	2	2	1	1	2	1	1	2	1	1

From the Table, it can be seen that X Company has maintained a certain level of significance in carbon information disclosure in recent years, and the overall situation is good. This reflects the company's active response to the national low-carbon emission reduction policies and its commitment to promoting the achievement of China's "dual carbon" goals.

Compared with the significant score, X Company's performance in terms of timeliness of carbon information disclosure is poor. Although there has been a slight improvement in recent years, the growth rate is slow. The company failed to disclose events that occurred during the year in a timely

manner, which may prevent business operators and other stakeholders from making effective decisions. Therefore, it is recommended that X Company follow the “Enterprise Environmental Information Disclosure Management Measures” released in 2021 and disclose environmental information for the previous year (from January 1st to December 31st) before March 15th each year.

The company’s information disclosure lacks quantifiable data, mainly non-monetary information, and there is little disclosure of monetary information. Specifically, in terms of low-carbon strategies, carbon emissions reduction in corporate governance, and global climate governance, the company has hardly disclosed any monetary information proactively. The only place where monetary information is involved is in greenhouse gas emission accounting.

### **3. Problems in Carbon Information Disclosure of Company X**

#### *3.1 Lack of Legal and Regulatory Constraints and Relevant Theoretical Basis*

China is still in the exploratory stage in terms of carbon information theory. Although relevant laws and regulations have been formulated, there are still no clear provisions for carbon information disclosure, and no corresponding carbon accounting standards have been developed. Because there are multiple carbon emission information standards and calculation methods, there are still some challenges in carbon emission trading. Due to the incompleteness of laws and regulations and the lack of guiding theories, the data obtained from the greenhouse gas statistics and reporting system established by listed companies lacks sufficient reliability and accuracy. Without the step of organizing, collecting, and accounting for the data, it is impossible to accurately identify and measure carbon information. Due to the lack of norms and related theoretical guidance, X Company’s carbon information disclosure lacks scientific support, leading to arbitrary disclosure content and strong manipulability.

#### *3.2 Unclear Disclosure Form*

X Company did not disclose carbon information separately and did not include any carbon accounting items in its financial statements. It also does not prepare financial statements related to carbon emission rights accounting, such as financial position, operating results, and cash flows. The company only discloses emissions reduction through text descriptions and simple data, and lacks unified quantitative standards to calculate carbon emissions.

#### *3.3 Carbon Information Is not Audited and Lacks Reliability*

By integrating economic, social, and environmental benefits together and applying them to carbon information auditing, listed companies can improve the efficiency of carbon auditing. On the contrary, if a company discloses carbon information through qualitative descriptions, it will increase the difficulty of auditing, lead to lack of objectivity and generate audit risks. Due to X Company’s mainly descriptive carbon information disclosure, lack of monetary measurement and independent carbon accounting system, it is difficult for registered accountants to verify the company’s disclosed carbon information, making it more difficult to conduct carbon audit evidence and establish a company’s carbon audit system. Although the company commissions third-party auditors to audit its annual reports

annually, these issues still exist according to data from the past five years.

#### **4. Countermeasures and Suggestions**

##### *4.1 Improve Relevant Laws and Regulations, Strengthen Theoretical Research*

Currently, listed companies are not required to disclose their carbon emissions. In order to better understand the actual situation of enterprises, it is recommended that the government formulate laws and regulations that are tailored to China's characteristics to regulate carbon information disclosure based on national conditions. Enterprises should establish a sound system for disclosing carbon information and publicly disclose their carbon emissions, energy-saving and emission-reduction achievements, and other related information. Relevant regulatory authorities should develop more detailed carbon information disclosure standards to ensure that the information disclosed by enterprises is true, accurate, complete, and comparable. In addition, China's carbon information as an emerging discipline is still in its early stages of development, and there is a shortage of professional talents. To make up for this shortfall, we can learn from the carbon information research results of Western countries, introduce relevant professionals, and increase investment in carbon information theoretical research and practical applications.

##### *4.2 Improve the Content of Carbon Information Disclosure*

To improve the content of carbon information disclosure, the following suggestions are proposed: 1. Enterprises should disclose specific data on their carbon emissions, including the emissions of greenhouse gases such as carbon dioxide, methane, nitrous oxide, and their impact on global climate change. Additionally, detailed information on the structure and sources of a company's carbon emissions should also be disclosed 2. In addition to disclosing carbon information, companies should also indicate their energy-saving and emission-reduction measures, clean energy utilization, and other environmental protection efforts to demonstrate their sense of environmental responsibility and actions taken 3. Apart from voluntary disclosure by companies themselves, relevant regulatory authorities should supervise and promptly disclose carbon information disclosures by companies to ensure that the disclosed information is truthful, accurate, complete, and comparable 4. Finally, to facilitate public understanding of a company's carbon information, it is recommended that companies use intuitive and easy-to-understand formats and methods when disclosing information.

##### *4.3 Increase Carbon Information Disclosure Verification*

Whether in social responsibility reports, sustainable development reports, or separate carbon footprint reports, companies should ensure the integrity and authenticity of the information disclosed. Based on X company's carbon information disclosure, due to a lack of independent third-party auditing, the reliability of its information may be affected. Regarding a company's carbon information disclosure, an effective verification mechanism can increase public trust in the authenticity and credibility of corporate data. Therefore, the following suggestions are proposed: 1. Develop carbon information disclosure standards. The government can collaborate with professional organizations to establish

industry-recognized carbon information disclosure standards 2. Strengthen corporate supervision. Strengthen the review and oversight of companies' carbon information disclosure to ensure that the disclosed information is true and credible.3. Encourage third-party institutions to provide carbon information verification services. The government can support and regulate third-party institutions to provide carbon information verification services and encourage companies to submit their carbon information to these institutions for verification. This will help improve the credibility and public trustworthiness of carbon information.

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