



Environmental Accounting Information Disclosure of the Automobile Manufacturing Industry in China under the Background of “Dual Carbon”

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Abstract. The environmental problems caused by global climate change are becoming increasingly severe and have attracted worldwide attention. With the strengthening of environmental awareness in China, China has put forward the concept of "dual carbon (peaking carbon emissions and carbon neutrality)" and proposed requirements for energy conservation, emission reduction, and green development in the Chinese government's "14th Five-Year Plan" (a policy outline containing information on environmental protection). According to the author's research, greenhouse gas emissions are primarily caused by industrial manufacturing and motor vehicle emissions, with automobile emissions accounting for roughly 70% of total emissions. China has a large automobile production capacity, and the automobile manufacturing industry emits a lot of pollution, putting a lot of strain on the environment. As a result, the industry responsible for making cars is essential for advancing long-term environmental growth. In order to identify qualitative and quantitative data, this review study first collects and organises environmental accounting disclosure information from annual reports of publicly traded automobile manufacturers. The remainder of the study explores the state of and problems with environmental accounting information disclosure in the Chinese auto sector. The study also provides a summary of the state of environmental accounting information disclosure in the Chinese auto industry. Finally, this paper proposes solutions to the discovered problems to improve environmental accounting information disclosure. In general, this paper provides a reference for the sustainable and healthy development of China's automobile manufacturing industry and the realization of the "dual carbon" target.

Keywords: Environmental Accounting, Information Disclosure, Automobile Manufacturing Industry, Dual Carbon.

1 Introduction

With the increasingly severe global climate issue, China has proposed the concept of a "dual carbon(peaking carbon emissions and carbon neutrality)". Some automobile

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manufacturers have realized the necessity and importance of environmental accounting information disclosure, and their willingness and quantity of disclosure have increased. However, the overall quality of environmental accounting information disclosure could be higher. According to Mu, specific indicators related to national environmental policy requirements should be disclosed, and the use of environmental accounting information disclosure under the guidance of government guidelines can improve enterprise development [1]. Specific information, such as contingent environmental liabilities and the impact of environmental protection measures on current and future enterprise expenditures, should be disclosed as well. After analyzing the environmental accounting information disclosure report, Shen points out that most of the indicators disclosed in the environmental report of enterprises need to be more consistent[2]. To prevent the spread of unfavourable information about the company, only share positive and rather obscure facts. The needs of regulators, as well as those of social and environmental protection, can be met by this occurrence. The majority of the environmental accounting data presented in the annual report, according to Yue, is qualitative, and greater financial measurement disclosure is needed[3]. Therefore, it is suggested that extensive study be done on environmental accounting theory and practise, that representative case enterprises be chosen for introduction and summary, that stricter normative standards be proposed for the creation of laws, and that more precise disclosure of the content's scope be required. These regulations are designed to improve comparability by standardising information amongst businesses.

This article consists of three parts: first, the qualitative and quantitative classification of environmental accounting disclosure information of the researched enterprises; second, the analysis and summary of the reasons for the classified information; and third, feasible suggestions for the abovementioned problems. These three parts will appear in the article's main body and trigger people's thinking on environmental accounting information disclosure in the automobile industry.

2 The Current Situation of Environmental Accounting Information Disclosure in China's Automobile Industry

2.1 Disclosure Channels in China's Automobile Industry

This article refers to the industry classification of the China Securities Regulatory Commission in 2012. According to the "Industry Classification Results of Listed Companies" released by the China Securities Regulatory Commission in 2021, 150 listed automobile manufacturing companies are on the Shanghai and Shenzhen stock exchanges[4]. The author selects these 30 automobile manufacturing enterprises as samples through data screening and sorting and analyzes the current status of environmental accounting information disclosure in the automobile manufacturing industry through corporate annual reports, social responsibility reports, and environmental reports.

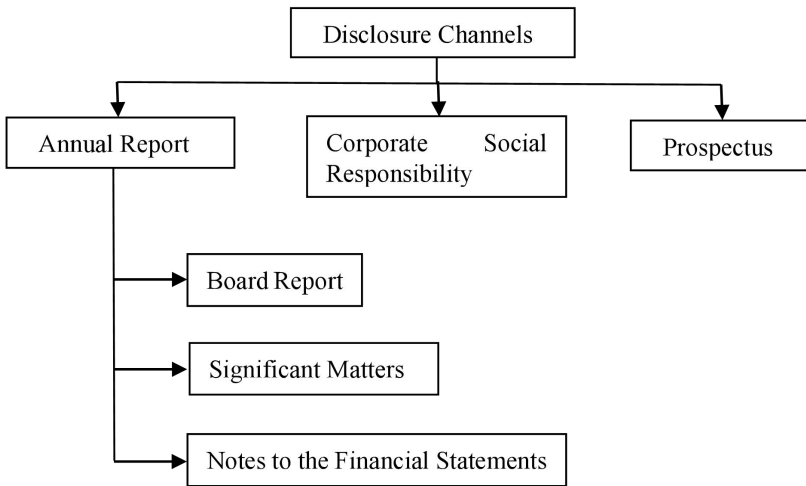


Fig. 1. Channels for environmental accounting information disclosure in China’s automobile industry.

As shown in Figure 1, the Chinese automobile manufacturing industry primarily discloses information through annual reports, social responsibility reports, and prospectuses. Among them, social responsibility reports that independently disclose environmental information has formed an independent disclosure system, including various elements such as text and charts. The information disclosed is relatively comprehensive and centrally located, allowing stakeholders to gain a more comprehensive understanding of the financial impact of the company's environmental activities.

Table 1. Statistics of environmental accounting information disclosure channels in China's automobile industry

Year	Annual Report		Corporate Social Responsibility Report		Prospectus	
	Disclosure Quantity	Proportion	Disclosure Quantity	Proportion	Disclosure Quantity	Proportion
2019	28	93.3%	16	53.3%	18	60.0%
2020	28	93.3%	18	60.0%	19	63.3%
2021	30	100%	19	63.3%	19	63.3%
2022	30	100%	20	66.7%	19	63.3%

Data source: sample company's annual report

From Table 1, the author can see that the disclosure ratio in annual reports has increased from 93.3% in 2019 to 100% in 2022, showing an upward trend year by year. The disclosure of environmental accounting information in annual reports is mainly reflected in the board of directors' report on the company's development strategy, potential risks, and other modules[5]. Second, in the sample, the proportion of environmental accounting information disclosed in corporate social responsibility reports has also increased yearly. The disclosure ratio reached the highest point of 66.7% in 2022. Compared with the information in annual reports, the disclosure of information in corporate social responsibility reports is more comprehensive, covering environmental policies, environmental honors, environmental behaviors, pollutant emissions, and environmental investments, which are not included in annual reports. Finally, the prospectus is also a meaningful way to disclose environmental information, and the main text of the prospectus lists information related to natural resources, environmental risks, and other environmental issues that the company depends on[6].

Environmental accounting information disclosure regulations and norms are generally more stringent for automakers. They typically reveal such information in annual reports as opposed to independent environmental reports. Despite the fact that all 30 automakers have revealed their environmental accounting data, the disclosure documents' formats and contents vary, making it challenging for interested parties to grasp the firms' environmental performance in a timely and correct manner. On the other hand, Japanese businesses publish environmental data through independent environmental reports, and all environmental data is made public in such reports[7]. In addition, the format of Japanese environmental reports is uniform, which not only improves the disclosure of environmental information but also makes it easier for stakeholders to obtain it[8]. In general, Chinese companies can learn from this experience and improve the disclosure of environmental accounting information.

2.2 Disclosure Contents in China's Automobile Industry

The author categorizes the environmental accounting information disclosed by 30 companies into two main types: qualitative information and quantitative information. Qualitative information includes environmental protection concepts, goals, risks, policies, emission statements, and environmental measures. In contrast, quantitative information includes environmental investment amount, pollutant emissions, resource consumption, technology research and development expenses, and government subsidies. Overall, the quantity of environmental accounting information disclosure in China's automobile manufacturing industry has increased. Environmental awareness among automobile manufacturing companies is constantly improving, with over half of the companies disclosing their environmental protection concepts and environmental management organizational structures[7,8]. Environmental management system construction is on the rise, and by 2022, more than 70% of companies will have disclosed the status of their environmental management system construction. More companies are implementing targeted environmental protection measures, such as enhancing environmental education and employee training,

Waste Utilization and Disposal	5	16.7%	6	20.0%	7	23.3%	7	23.3%
Wastewater and Waste Treatment	3	10.0%	3	10.0%	4	13.3%	5	16.7%
Major Emergency Response Plans	12	40.0%	15	50.0%	18	60.0%	19	63.3%
Environmental Awards	3	10.0%	8	26.7%	9	30.0%	9	30.0%
Environmental Education and Training	2	6.7%	4	13.3%	6	20.0%	6	20.0%

Data source: sample company's annual report

Table 3. Quantitative information on environmental accounting information disclosure in China's automobile manufacturing industry from 2019 to 2022.

Year	2019		2020		2021		2022	
Disclosure Content	Quantity	Proportion	Quantity	Proportion	Quantity	Proportion	Quantity	Proportion
Environmental Investment Amount	30	100%	30	100%	30	100%	30	100%
Pollutant Emissions	27	90.0%	27	90.0%	28	93.3%	28	93.3%
Resource Consumption	12	40.0%	12	40.0%	15	50.0%	17	56.7%
Technology Research and Development	22	73.3%	24	80.0%	25	83.3%	28	93.3%

Quantitative Information

Expenses								
Government Subsidies	27	90.0%	27	90.0%	29	96.7%	29	96.7%
Safety Production Costs	23	76.7%	24	80.0%	24	80.0%	25	83.3%
Environmental Tax	28	93.3%	29	96.7%	29	96.7%	29	96.7%

Data source: sample company's annual report

Qualitative Information Analysis.

First, the author deduces from Table 2 that "environmental policies," which all sample companies reveal, are the item that is most frequently disclosed, demonstrating that the corporations adhere to national policy directives. Only a few corporations did not provide "environmental measures" in their social responsibility reports, showing a growing interest in environmental accounting information disclosure. It is important to note that, in contrast to Western corporations, Chinese automakers only give qualitative information regarding their "environmental measures" and do not provide quantitative data. For instance, whereas the United States has developed construction timetables for environmental measures[10], some Japanese corporations have reported environmental measure reserves in their reports. Therefore, environmental accounting information disclosure in China should include more quantitative information.

Second, more than 60% of environmental protection concepts, emission statements, and emission management systems were disclosed. Pollutant emissions were disclosed in the annual report's essential matters section, and most companies demonstrated a high level of willingness to disclose. Starting in 2020, more and more companies have provided detailed information on emission standards, significant pollutants, total emissions, and the construction and operation of pollution control facilities[11]. "Environmental risks" and "environmental policies" were both disclosed in the board report (business discussion and analysis) of the annual report. The disclosure rate of environmental target information has been increasing year by year, which may be due to the companies' implementation of China's New Development Philosophy[12]. Additionally, it illustrates the pattern of adapting to the growth of a low-carbon economy. The disclosure rate for "environmental risks" has likewise gone up every year, from 16.7% in 2019 to 23.3% in 2022. The quality of the disclosure content varies, despite the fact that the overall number of disclosures on "environmental risks" has continually increased. In this regard, certain businesses have performed admirably, such as Changan Automobile, which has revealed comprehensive environmental risk data from 2019 to 2022, including emission limits and the application of numerous safety regulations[13]. The disclosed information[13] shows that Changan Automobile's safety, energy-saving, and environmental protection rules have been consistently enhanced and strengthened.

Third, aside from accidents and violations, the disclosure rate for environmental education and training is the lowest. In 2022, only six companies disclosed information on environmental education and training, indicating that Chinese automakers place less emphasis on environmental education and training. In comparison, European, American, and Japanese governments highly value disclosing this information. They value employee and corporate management education and training, hoping to express their company's commitment to environmental sustainability in their corporate culture.

Quantitative Information Analysis.

Firstly, from Table 3, it can be seen that all 30 sampled listed companies disclosed data on environmental investment amounts. This may be because "green manufacturing" has been identified as one of the five key projects to be implemented in China's Made in China 2025 initiative to build an efficient, clean, low-carbon, circular green manufacturing system[11]. As environmental problems become increasingly severe, the automobile industry must follow this direction as a part of the manufacturing sector to achieve sustainable development. However, only some companies disclose specific information about resource consumption and other related aspects.

Secondly, the proportion of disclosure of safety production costs by sample companies is constantly increasing, but they only list the amounts with little explanation. The proportion of technology research and development expenses disclosure is over 70%. As companies such as FAW, SAIC, GAC Group, and Qoros Automobile have successively obtained eco-car certifications for their models, the industry has become more attentive to this indicator[14]. Only a few businesses, nevertheless, make their R&D (research and development) expenditures for environmental protection solutions public. Comparatively speaking, the disclosure in the United States is more thorough and includes environmental liabilities, that is, costs or obligations associated with the environment. In contrast, costs in Japan are split into upstream and downstream costs, management activity expenses, R&D costs, social activity costs, and environmental damage costs, with thorough disclosure of the core business contents and amounts of various cost accounting shown in tables.

Thirdly, in the social responsibility report, nearly half of the companies continuously disclosed environmental information for four consecutive years. Specifically, GAC Group stands out by clearly and carefully presenting national environmental policies, environmental innovation technologies, and environmental performance indicators in a graphic manner, which is worthy of emulation by other automobile companies[14].

3 Environmental Accounting Information Disclosure Issues

3.1 Lack of Uniform Reporting Standards in Disclosure Formats

As shown in Table 1, some companies disclose their environmental accounting information in their annual reports, while others disclose it in their social responsibility reports. Companies with different disclosure methods for the same content lack a standardized reporting format. This situation makes it difficult for users of environmental accounting information to find the information they need quickly. They must determine if the information is complete, even if they find it. Automobile manufacturing companies tend to increase the disclosure of environmental accounting information in traditional financial statements but lack independent environmental accounting reports. In addition, in the existing disclosure methods, the disclosure content of environmental accounting information in traditional financial statements and social responsibility reports is relatively small, and the proportion is also tiny. It is necessary to sift through a large amount of information to find environmental accounting information, making it difficult for stakeholders to quickly and accurately grasp corporate environmental information. Companies have the option to disclose environmental information because there are no formal regulatory requirements or accounting standards for doing so. The majority of businesses present environmental accounting data in their annual and social responsibility reports comments using descriptive wording, necessitating more precise quantitative accounting data[12]. As a result, there are big variations in the environmental accounting data that businesses disclose.

3.2 Incomplete Disclosure of Information

There are two problems with environmental accounting information disclosure in the automobile manufacturing industry. On the one hand, there needs to be more awareness. Environmental accounting information disclosure is still in the exploratory stage in China, and many enterprises would instead invest more human and financial resources. They mainly rely on annual and social responsibility reports to disclose information and tend to disclose information beneficial to the enterprise while disclosing less about environmental accidents and violations, resulting in incomplete disclosure of information[11]. On the other hand, the practicality of disclosed environmental accounting information could be more robust. Most of the environmental accounting information disclosed by enterprises is about transactions or events that have already occurred in the past, such as pollution fees, greening fees, and tax reductions, which have little impact on the operation of the enterprise. Less typically provided, however, is information that could have a big impact on how the business develops in the future, like information about environmental lawsuits and environmental rewards and penalties. In addition, more encouraging than unfavourable signs have emerged. China's economy is growing quickly, and the nation supports the creation of an ecological civilisation. People and publicly traded

firms are starting to pay attention to what businesses are doing for society's environment[12]. It has caused some businesses to only choose to reveal positive environmental indicators, highlighting the efficacy of their environmental protection, while ignoring or withholding bad environmental information about the business.

3.3 Lack of Third-Party Verification in Disclosed Information

The advancement of the "dual carbon" goal has further accelerated the pace of China's ecological civilization construction. Surrounding residents, investors, financial institutions, and governments have a higher demand for corporate environmental information. Environmental accounting information should be guaranteed for its authenticity and accuracy by internal managers, external investors, and regulatory agencies [11]. Currently, only financial statements are audited in China, and independent third-party audits are required for the environmental accounting information disclosed in social responsibility reports, raising concerns about the information's reliability [10]. Because China requires environmental accounting standards and auditors require a foundation for conducting audits, auditing environmental accounting information is difficult [11].

4 Suggestions for Environmental Accounting Information Disclosure in China's Automobile Industry

4.1 Standardizing the Content of Environmental Accounting Information Disclosure in Enterprises

Under national guidelines, the automotive industry should create a consistent disclosure policy for environmental accounting information and firmly enforce it. To enable prompt access to pertinent information for report readers, companies should publish major environmental accounting information in interim reports and separately in annual environmental reports. The data in the "Measures for Environmental Information Disclosure" should be utilised to systematically classify the released information in terms of disclosure content [15]. The disclosure should also include, both directly and indirectly, the impact of environmental issues on the company's financial condition and operating performance in the short and long term, so that report users can make financial decisions based on environmental accounting information.

4.2 Standardizing the Form of Environmental Accounting Information Disclosure

China's automobile manufacturers mainly disclose their environmental accounting information through annual and social responsibility reports. However, scattered disclosures in annual reports increase the time cost for stakeholders and result in information duplication. Therefore, China can learn from foreign environmental

accounting disclosure channels, such as Japan's independent environmental report, to better meet the needs of stakeholders[13]. This approach can concentrate information, provide rich content, and satisfy stakeholders' needs while adapting to the relatively simple nature of Chinese enterprises' environmental production and operation activities.

4.3 Strengthening Third-party Supervision of Environmental Accounting Information Disclosure of Companies

Companies tend to disclose favorable environmental information to maintain an excellent corporate social image, which may result in low credibility. As a result, an independent regulatory body must be established. The government and social intermediaries have primarily overseen China's environmental accounting information disclosure[14]. The supervision of government departments and social intermediaries, including government supervision and special environmental audits, must be strengthened. A unique environmental audit of significant projects, for example, conducted by a national audit agency or accounting firm, can fully contribute to strengthening supervision and promoting continuous improvement of the environmental accounting information disclosure system[15]. The government can also form a regulatory working group to put targeted disclosure supervision measures in place, compile a list of essential regulated businesses, and enhance oversight of listed businesses, such as automakers with a history of significant environmental litigation.

5 Conclusions

This article mainly reviews the current status of environmental accounting information disclosure in the Chinese automobile industry, summarizes qualitative and quantitative information from different disclosure channels, and provides specific analysis and appropriate recommendations in the context of the "dual-carbon" policy. In general, first, China still needs to improve its environmental accounting information disclosure system. China's accounting regulations appear to be rather lax in comparison to those in place in Japan and Western nations, lacking accurate disclosure procedures, essential disclosure criteria, and stringent regulatory frameworks. China is, in fact, making progress in this direction through theoretical study and the collection of real-world experience. Second, it is noteworthy that more Chinese businesses are beginning to understand the significance of releasing environmental accounting information as a result of the "14th Five-Year Plan" concept of green and sustainable growth. However, due to a lack of education and training, relevant personnel are unable to effectively propose solutions, resulting in only a superficial disclosure of environmental information in annual reports. Furthermore, a lack of demand for or understanding of related stakeholders' corresponding basic policies of environmental accounting information necessitates increased awareness of the importance of disclosing environmental accounting

information. Finally, looking ahead to the future, Chinese automobile companies need to have a high sense of responsibility, and accounting information disclosure should be balanced but implemented in practice. Companies must fulfill their social responsibilities and contribute to global green and sustainable development.

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