

Research on Carbon Accounting Information Disclosure of Hunan Valin Steel under the "Double Carbon" Policy

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Abstract: In recent years, with the continuous development of social economy, the global temperature problem has become more serious, and carbon emissions have become a hot topic that all countries pay close attention to. In March 2021, General Secretary Xi Jinping proposed that China should achieve the goal of carbon peak in 2030 and carbon neutrality in 2060, which is the "double carbon" policy. As a highly polluting steel industry, it should take the initiative to assume the corresponding social responsibility and respond to national policies. Among them, carbon accounting information disclosure is very important. On the one hand, carbon accounting information disclosure can make enterprises and information users better understand the green development and energy conservation and emission reduction of enterprises. On the other hand, carbon accounting information can help government departments have a deeper understanding of the current carbon emissions, and at the same time have a reliable forecast of the future development trend. The important data collected in this paper are sorted out and summarized on the basis of relevant data. This paper analyzes the situation, problems and solutions of carbon accounting information disclosure in Hunan Valin Steel, and points out that there are some problems in carbon accounting information disclosure of Hunan Valin Steel, such as nonstandard contents, limited ways of disclosure and lack of supervision. It also analyzes the causes of these problems from both internal and external aspects of enterprises and puts forward corresponding countermeasures, so as to promote the development of carbon accounting information disclosure of iron and steel enterprises and the smooth implementation of China's "double carbon" policy.

1. Introduction

"double carbon" policy means reaching peak carbon emissions by 2030 and achieving carbon neutrality by 2060. Businesses are driving economic development and bringing pollution with them. In recent years, increasing attention has been paid to environmental management. The iron and steel industry, as one of the 16 heavily polluting industries and one of the pillar industries in China, should pay more attention to its pollution problems, especially carbon emissions. The article combines the "double carbon" policy with Hunan Iron and Steel as an example to analyse the current situation of carbon accounting information disclosure in the iron and steel industry. In this way, it identifies the imperfections and proposes optimisation measures. China's low-carbon economy started late, and the development of carbon accounting is still not perfect, and there is much room for improvement. At present, most scholars gather their eyes on theoretical research, and few apply it to specific practical enterprises in China. In this paper, we take specific enterprises in key industries as cases to provide ideas for optimising carbon accounting information disclosure in actual iron and steel enterprises, and build a carbon accounting

information disclosure system for them to make their contents more enriched and scientific. It makes the disclosure of carbon accounting information of listed companies in the iron and steel industry more systematic and standardised, and provides a theoretical basis for subsequent research on related issues. At the same time, this paper makes suggestions from various levels in relation to the current situation of carbon accounting information disclosure in iron and steel enterprises, which can also better help the implementation of the .

2. Related concepts

2.1. "Double carbon" policy

"Double carbon" means carbon peaking and carbon neutralization. The "double carbon" policy means that China strives to achieve the goal of carbon peaking by 2030 and carbon neutrality by 2060.

Carbon peaking means that at a certain point of which the emission of carbon dioxide reaches its peak, and then stops increasing and gradually decreases. That is to say, the peak of carbon is the inflection point of the trend of carbon dioxide emissions, which means that the

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economic development is not at the expense of carbon emissions, and the economic model has also changed to some extent. The target of carbon peaking includes not only the time, that is, 2030, but also the peak of carbon emissions.

Carbon neutrality refers to the total emission of carbon dioxide or greenhouse gases emitted by individuals, enterprises, countries, activities or products in a certain period of time, which includes indirect emissions and direct emissions. During this period, each subject will offset the total emission of carbon dioxide or greenhouse gases by means of energy conservation and emission reduction, afforestation, etc., thus achieving "zero emission".

2.2. Disclosure of carbon accounting information

Carbon accounting information disclosure is the manifestation of carbon accounting. Carbon accounting information disclosure refers to the disclosure of relevant carbon accounting information and related use of carbon resources in the course of business for stakeholders, government and other information users to use under the premise of following relevant laws and regulations. There are three ways to disclose carbon accounting information: corporate statements, environmental protection reports and corporate social responsibility reports.

At present, the Carbon Disclosure Project (CDP) questionnaire is a relatively more authoritative framework for carbon information disclosure in the world. This questionnaire is to investigate the carbon-related contents in the development of enterprises. As shown in Table 2-1, CDP mainly involves low-carbon strategies of enterprises and accounting of carbon emissions.

Table 2-1 Main Contents of Carbon Disclosure Project (CDP)

Classification	Content
Low carbon strategy	Carbon risk management, low-carbon development opportunities, carbon management strategies, carbon emission reduction targets
Corporate Governance of Carbon Emission Reduction	Responsibility, personal performance, communication
Greenhouse gas emission accounting	Carbon accounting methods, direct accounting of carbon emissions, indirect accounting of carbon emissions
Global climate governance	Responsibility sharing of climate change, overall and individual emission reduction effectiveness, and international climate governance mechanism

Data source: Literature collation

3. General Situation of Carbon Accounting Information Disclosure of Hunan Valin Steel

3.1. Brief introduction of Hunan Valin Steel

Hunan Valin Steel Group Co., Ltd. (referred to as Hunan Valin Steel) was formerly Hunan Valin Iron and Steel Group Co., Ltd. (referred to as Valin Group), which was established in Hunan in 1997 by three Hunan iron and steel enterprises, namely Xianggang, Henggang and Liangang. Hunan Valin Steel has a crude steel production capacity of over 20 million tons, and its main production technologies, equipment and processes are at the domestic and even international advanced level. Hunan Valin Steel products involve more than 7,000 kinds of products in ten categories, such as cold and hot rolled thin plates, wide and thick plates and seamless steel pipes.

Hunan Valin Steel actively implements the "double carbon" policy. At present, the energy consumption level of Hunan Valin Steel is at the advanced level in the industry. In the future development, Hunan Valin Steel has always insisted on implementing innovation and transformation, industrial chain and supply chain manufacturing, and empowering steel manufacturing with "double circulation", and advancing towards the goal of carbon peaking and carbon neutrality.

3.2. Hunan Valin Steel Carbon Accounting Information Disclosure Change

Hunan Valin Steel began to disclose carbon accounting information in 2011, and then it has been constantly changing and gradually improving. According to the timeline, this paper sorts out the disclosure changes and contents of Hunan Valin Steel from the beginning of carbon accounting information disclosure to the present.

Table 3-1 Changes of carbon accounting information disclosure in Hunan Valin Steel

Time	Disclosure mode	Disclosure content	
		Qualitative	Quantitative
2011	Social responsibility report	Low carbon achievement	Carbon use, energy use
2012	Social responsibility report	Gas utilization and low-carbon achievements	
2013	Green Development, Social Responsibility Report	Low-carbon development goals, low-carbon governance systems and low-carbon measures	Carbon dioxide emissions
2014-2015	Green Development, Social Responsibility Report	Low-carbon technology, low-carbon achievements	Low carbon input

2016	Green Development, Social Responsibility Report	Low-carbon achievements, low-carbon measures and low-carbon governance system	Carbon usage
2017-2018	Social responsibility report	Low carbon measures	
2019	Social responsibility report	Low carbon input and low carbon achievement	Low carbon input and total carbon emissions
2020	Green development, social responsibility report, chairman's speech, environment and corporate governance report	Low-carbon results, low-carbon goals and low-carbon measures	Total carbon emissions and carbon consumption
2021	Green development	Low-carbon achievements, low-carbon measures	Carbon dioxide emission reduction

It can be seen from the table that the release time of Hunan Valin Steel's Green Development Report is not fixed, and it is not based on years, but mostly based on major events. The content of the report is mainly based on a certain theme, and there is no specific division of the content. The social responsibility report is an annual report, but the release time is delayed. By combing the timeline, we can see that the way of carbon accounting information disclosure in Hunan Valin Steel is gradually increasing, and the disclosure content is becoming more and more perfect. However, the way of disclosure is unstable, and the content has not yet formed a fixed pattern.

4. Analysis on the Problems and Causes of Carbon Accounting Information Disclosure of Hunan Valin Steel under the "Double Carbon" Policy

4.1. Problems of Hunan Valin Steel Carbon Accounting Information Disclosure under the "Double Carbon" Policy

4.1.1 Limitation of disclosure channels

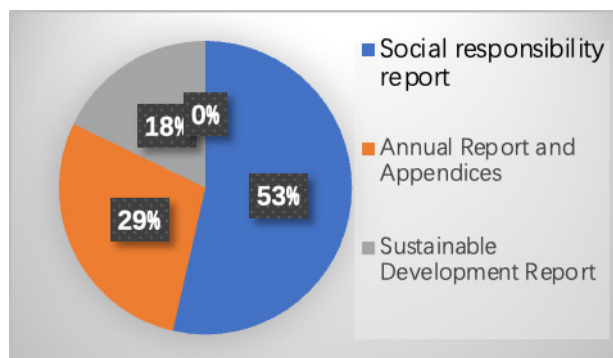


Figure 4-1 Ways of carbon accounting information disclosure in iron and steel industry

Hunan Valin Steel carbon accounting information disclosure channels are limited, the content is scattered, and there is a lack of special independent reports. According to the collected reports and collated data, the main ways to disclose carbon accounting information of Hunan Valin Steel are green development and social responsibility report. As can be seen from Figure 4-1, the disclosure methods of carbon accounting information in the whole steel industry are mainly concentrated in the annual report and appendix, sustainable development report and social responsibility report. Annual report and appendix are the first choice for information users to know about enterprises, and Hunan Valin Steel has not disclosed carbon accounting information in them. Hunan Valin Steel's carbon accounting information disclosure methods are all off-balance sheet supplementary report disclosure, lacking on-balance sheet disclosure and independent report disclosure. The disclosure of carbon accounting information by enterprises is scattered in different parts of different regions, which increases the difficulty for internal and external information users to collect information and reduces the efficiency of information use.

Table 4-2 Disclosure Time of Hunan Valin Steel Carbon Accounting Information

Year	Report type	Time of disclosure
2017	Corporate Social Responsibility Report	2021.4
	Green development	None
2018	Corporate Social Responsibility Report	2019.3
	Green development	2018.3
2019	Corporate Social Responsibility Report	2020.4
	Green development	2018.3, 2019.1
2020	Environmental, Social Responsibility and Corporate Governance Report	2021.3
	Green development	2018.3
2021	Environmental, Social Responsibility and Corporate Governance Report	2022.4
	Green development	None

According to Table 4-2, although the disclosure method of Hunan Valin Steel Carbon Accounting Information is relatively stable, the disclosure time is uncertain. Social responsibility reports often take the year as the reporting unit, but the actual disclosure time lags behind. However, carbon accounting information is often effective, and lagging carbon accounting information is often not of use value.

4.1.2 Inadequate disclosure

Table 4-3 Summary of Accidents of Hunan Valin Steel in Recent Years

Events	Whether to disclose
Collapse accident on March 4, 2015	Undisclosed
High-pressure blasting accident of high-pressure cabinet in 2018	Undisclosed
Gas poisoning accident of 6# boiler in 2018	Undisclosed

Hunan Valin Steel Carbon Accounting Information Disclosure is incomplete and the content is repeated. It is clearly mentioned in the Format Guidelines for Legal Disclosure of Environmental Information of Enterprises that the carbon emissions of the current and previous years should be clearly stated in the disclosure of environmental information of enterprises. However, in some reports, Hunan Valin Steel chose to increase or decrease the percentage of carbon emissions, which lacked intuitive data. Hunan Valin Steel also selectively ignores some negative or possible negative carbon accounting information. For example, the past accidents affecting carbon emissions of Hunan Valin Steel collected in Table 4-3 have not been disclosed in the relevant reports on carbon accounting information disclosure. Generally speaking, the disclosure of carbon accounting information of Hunan Valin Steel is highly repetitive and has the phenomenon of selective disclosure.

4.1.3 Lack of effective supervision

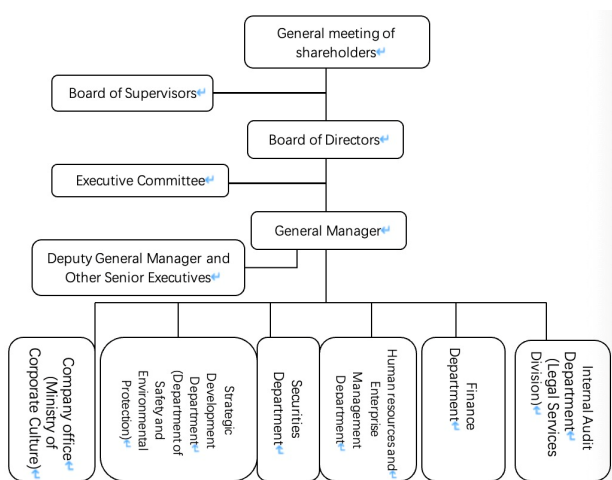


Fig. 4-4 Organization Structure Chart of Hunan Valin Steel

4.2. Analysis on the Causes of Carbon Accounting Information Disclosure in Hunan Valin Steel under the "Double Carbon" Policy

4.2.1 Lack of professional talents and independent departments

Carbon accounting information disclosure professionals and independent departments are closely related. Adequate and high-quality professionals can form a professional department. And an independent department can make the disclosure of the report unaffected by other factors

On the one hand, at present, the research on carbon accounting information disclosure in China is still in the stage of theoretical perfection and exploration and practice, and there are not many professionals and related learning resources. Financial accountants in enterprises lack the complex knowledge and skills needed for carbon accounting information disclosure, and the learning cost is high and the cycle is long. Enterprise management may not organize the study of carbon accounting information disclosure professional knowledge and personnel training because of the cost. The lack of professional talents makes the current carbon accounting information disclosure of enterprises may lack professional ability, and can not be perfect in carbon accounting information disclosure.

On the other hand, from the organizational structure of enterprises, we can see that Hunan Valin Steel has no special environmental protection department, which means that Hunan Valin Steel's carbon accounting information disclosure may lack independence. There may be selective disclosure or subjective disclosure of carbon accounting information for the overall strategy of enterprises, thus affecting the information quality.

4.2.2 Lack of unity standard

Hunan Valin Steel Company for carbon accounting information disclosure is often lack of special system norms, therefore, its Accounting Information Disclosure Confusion is chaotic and repetitive, and the disclosure content is not comprehensive. China's carbon accounting information disclosure has not yet formed a unified standard, and Hunan Valin Steel lacks reference or guidance.

First of all, there is still no clear standard of carbon accounting information at present, which makes the disclosure of carbon accounting information of enterprises chaotic and lacks measurable indicators. Secondly, the content of carbon accounting information disclosure of Hunan Valin Steel is mostly descriptive qualitative information, while the quantitative information is often only three parts: carbon emissions, carbon consumption and resource consumption. For quantitative information, there is also a lack of clear statistical calculation methods and disclosure caliber, and the data sources are not clear. Finally, there are many ways to disclose carbon accounting information,

and enterprises often choose the ways to disclose carbon accounting information according to their own situation.

The imperfection of carbon accounting information system makes enterprises lack of unified carbon accounting information disclosure requirements, which is also one of the reasons for the problems in carbon accounting information disclosure of Hunan Valin Steel.

4.2.3 Lack of effective supervision

Internally, there is no special supervision organization in Hunan Valin Steel, which does not play a supervisory role in the disclosure of carbon accounting information. At the same time, enterprises have not evaluated carbon accounting information through third-party institutions. Carbon accounting information lacks corresponding audit system and procedures, and it is difficult to implement the audit of carbon accounting information. Hunan Valin Steel has no independent department responsible for carbon accounting and information disclosure, and it lacks data source basis for auditing in third-party institutions, which can not complete the review of each data, and also affects the authenticity and reliability of enterprise carbon accounting information.

Externally, at present, the departments that supervise the environmental protection and related information measurement disclosure of enterprises are mainly stock exchanges, the Ministry of Finance, the National Development and Reform Commission and the Ministry of Environmental Protection Planning. Hunan Valin Steel Carbon Accounting Information Disclosure is relatively chaotic, but it has not been pointed out by relevant departments, which can reflect that the division of responsibilities among various departments may be unclear or ineffective supervision. In addition, the content involved in carbon accounting information disclosure is difficult to measure and calculate, which increases the difficulty of supervision. At the same time, China has no clear punishment measures for carbon accounting information disclosure, and most of them are just interviews and warnings. Low-cost violations can not attract the attention of enterprises, enterprises may be more casual non-standard carbon accounting information disclosure.

5. Countermeasure for Carbon Accounting Information Disclosure Problem of Hunan Valin Steel under the perspective of "Double Carbon" Policy

5.1. Enterprise internal perspective

5.1.1 Strengthen the training of professional talents and the construction of departments

Carbon accounting information disclosure has higher requirements for professional quality and business ability of enterprise accountants, which is one of the reasons for the problems in enterprise carbon accounting

information disclosure. On the one hand, enterprises should recruit excellent professionals; on the other hand, enterprises can also select excellent talents internally. For carbon accounting talents in enterprises, enterprises should provide employees with learning opportunities to improve their business capabilities. In the process of work, we should also assess it and formulate a reasonable reward and punishment system. In addition, enterprises should learn from other enterprises in carbon accounting information disclosure, and exchange progress together. For activities such as study lectures organized by the government or associations, enterprises should also actively participate, keep up with policies and market trends, and adjust their carbon accounting information disclosure system in time. Professionals can form an independent carbon accounting department, which is composed of professionals. The department is not affected by other departments and can independently sort out and disclose carbon accounting information.

5.1.2 Establish an internal supervision and evaluation system of enterprises

Perfect carbon accounting information supervision and evaluation system is the guarantee of enterprise carbon accounting information disclosure quality. Employees in the carbon accounting information disclosure will pay attention to the quality of carbon accounting information disclosure, in order to avoid carbon accounting information disclosure contrary to its evaluation standards which would be lower than the requirements. Therefore, enterprises should establish a complete set of carbon accounting information evaluation system from carbon accounting daily accounting, carbon accounting information disclosure, carbon accounting information disclosure evaluation, carbon accounting information disclosure supervision.

The supervision of carbon accounting information disclosure of Hunan Valin Steel can start from two aspects: perfecting internal audit system and conducting internal carbon accounting information audit. On the one hand, although Hunan Valin Steel has an internal audit department, the current internal audit focuses on finance and internal management, and does not involve the audit of carbon accounting information disclosure. Auditing carbon accounting information disclosure of Hunan Valin Steel is a necessary step to optimize its carbon accounting information disclosure. By incorporating carbon accounting information audit into the internal audit process, enterprises can audit their carbon accounting information regularly, and can also realize my supervision in daily activities, thus avoiding the emergence of pollution problems and imperfect information disclosure. On the other hand, Hunan Valin Steel also needs to include carbon accounting information audit when hiring a third-party audit institution to audit it. Hunan Valin Steel can select professionals, and the management of the enterprise is responsible for them. Carry out regular audit of carbon accounting information of enterprises, report problems in time, and put forward opinions, and sort out and

summarize the audit report of carbon accounting information disclosure and other statements at the end of the year.

5.2. Enterprise external perspective

5.2.1 Improve relevant laws and regulations

China is still in the primary stage of carbon accounting information disclosure, and the disclosure policies and regulations of various standards are imperfect. It is mentioned in the opinions issued by the State Council on doing a good job of carbon peaking and carbon neutralization. The establishment, perfection and standardization of the measurement and accounting system can refer to the experience and lessons of foreign developed countries in this respect. According to China's basic national conditions, the Ministry of Finance, the National Development and Reform Commission, the Securities Regulatory Bureau and other departments jointly formulate and issue a comprehensive and operable accounting standard for carbon accounting information disclosure in line with China's national conditions. At the same time, in terms of active disclosure, the government and relevant departments should also be a rigid requirement for enterprises to disclose carbon accounting information.

For heavy polluting enterprises such as steel industry, it is necessary to require them to disclose carbon accounting related information. Iron and steel industry will produce a large number of sulphur, carbon dioxide and other pollution gases in the process of steel exercise, and these pollution emissions are often inversely proportional to the quality of products. Some of the polluted gases produced in the production process of iron and steel enterprises are discharged into the air, and some remain in products, which often affects the quality standards such as plasticity and hardness of steel, and even makes steel produce hot brittleness. Therefore, no matter from the perspective of environment or interests, the effect of carbon accounting information disclosure in iron and steel enterprises is positive. In terms of specific content, first of all, it is necessary to make a unified standard for the measurement and accounting of enterprise carbon accounting. Each enterprise calculates carbon accounting information according to its own accounting method, which makes the carbon accounting disclosure information between enterprises unable to be compared horizontally, and reduces the practical value and reference significance. Secondly, to disclose good carbon accounting information, we should also disclose negative carbon accounting information. We should not deliberately ignore negative carbon accounting information for our own benefit, so as to ensure the comprehensiveness of carbon accounting information. And we should also make specific provisions on the ways of carbon accounting information disclosure to avoid repeated disclosure and information confusion.

Standardized carbon accounting information disclosure policies and related laws and regulations can make enterprises have to standardize the disclosure of

carbon accounting information, which is the guarantee for enterprises to optimize carbon accounting information.

5.2.2 Strengthen supervision and broaden supervision channels

In order to effectively supervise the disclosure of carbon accounting information of enterprises, the relevant departments of our government can issue corresponding policies to regulate enterprises. As an important regulator of the economic market, the government needs to strengthen the supervision and punishment of corporate carbon accounting information. First of all, we should ensure the authenticity of carbon accounting information disclosure data. Enterprises may selectively disclose carbon accounting information that is beneficial to themselves. In the case of asymmetric information, stakeholders may harm their own interests because of the lack of authentic information, and the government cannot judge the progress of the "double carbon" policy. Therefore, the government should vigorously supervise the authenticity of enterprise carbon accounting information disclosure. Secondly, it is necessary to ensure the comprehensiveness and integrity of enterprise carbon accounting information disclosure. The disclosure of carbon accounting information by enterprises has two forms: on-balance sheet and off-balance sheet, with various ways and different contents. When enterprises selectively disclose carbon accounting information or lack quantitative information, information users may be misled. Therefore, the government needs to ensure the integrity of enterprise carbon accounting information disclosure. Thirdly, it is necessary to supervise the cycle and time of enterprise carbon accounting information disclosure to ensure the long-term and stable disclosure of enterprise carbon accounting information. Timely and stable disclosure of carbon accounting information in enterprises is beneficial for information users to understand and compare the low-carbon environmental protection work of enterprises. Finally, the government should formulate corresponding reward and punishment measures. Enterprises with good disclosure of carbon accounting information can be rewarded by means of honorary achievements and preferential policies. However, enterprises with problems in carbon accounting information disclosure can be punished by means of fines, downgrade of ratings, informed criticism, etc., and ordered to rectify as required within the prescribed time limit.

In addition to government supervision, external supervision can also develop third-party supervision channels. The authenticity and comprehensiveness of enterprise carbon accounting information disclosure needs third-party audit, and China needs to establish a third-party audit system of carbon accounting information at present. First of all, the government needs to explicitly require the carbon accounting information of iron and steel enterprises to be audited before it can be disclosed. Secondly, it is necessary to stipulate the

responsibilities of third-party audit institutions. Finally, the third-party audit institutions need to establish a perfect audit report system. These include whether the audited enterprises implement low-carbon policies and obtain government subsidies in compliance, and whether the audit objectives are in line with the carbon accounting objectives and development strategies of enterprises. On this basis, the third-party audit institutions verify and examine the disclosure of carbon accounting information of enterprises, so as to ensure the authenticity of enterprise information and help the government realize the "double carbon" policy

6. Conclusions

Carbon accounting information disclosure is very important for the sustainable development of enterprises and the realization of "double carbon" policy. As a whole industry of iron and steel industry, Hunan Valin Steel should develop and improve its carbon accounting information disclosure, combine the policy direction, actively use the policy advantages to transform, achieve sustainable development, and avoid carbon accounting information disclosure becoming its development shortcoming. Through analysis, this paper finds out the problems of carbon accounting information disclosure in Hunan Valin Steel and puts forward corresponding optimization measures.

From the internal perspective of enterprises, we should absorb and train professionals and strengthen the construction of departments. The disclosure of carbon accounting information of our company should meet the requirements of unified ways and standardized contents. Strengthen the awareness of carbon accounting information disclosure of enterprises in order to improve the initiative of this kind of disclosure. At the same time, the enterprise evaluates and audits its own carbon accounting information disclosure, and provides timely feedback and improvement. From the external perspective, it is necessary to introduce relevant laws and regulations to make clear provisions and requirements for enterprise carbon accounting information disclosure. Meanwhile, it is imperative to strengthen government supervision and make a better guarantee for the quality of carbon accounting information disclosure of enterprises with the help of third-party audit. Various measures ensure the smooth realization of the "double carbon" policy.

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