

Research on Environmental Accounting Information Disclosure of Steel Industry Based on Double Carbon Target

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Abstract: In order to actively cope with climate change and reduce the greenhouse effect, China put forward the emission reduction target of "striving to reach the peak of carbon dioxide emissions before 2030, striving to achieve carbon neutrality before 2060" (referred to as the "double carbon target") in September 2020. As a typical heavy pollution industry, iron and steel industry is one of the industries most affected by the double carbon target, and the quality of its environmental accounting information disclosure is particularly important. In this paper, 29 listed companies in the iron and steel industry were selected as research objects to explore the current situation, existing problems and causes of environmental accounting information disclosure of listed companies in the iron and steel industry, and to put forward countermeasures according to the requirements of double carbon target. The research results of this paper not only have certain inspiration for the low-carbon development of iron and steel industry, but also have certain ideas for the environmental accounting information disclosure of other heavily polluting enterprises.

1. Introduction

At the 75th Session of the United Nations in September 2020, China made a solemn commitment to the world to achieve carbon peak by 2030 and carbon neutrality by 2060. This is not only our responsibility to build a community with a shared future for mankind, but also a major strategic decision for sustainable development. The proposal of double carbon target has put forward serious challenges for our heavy pollution enterprises low carbon development, iron and steel industry is one of them. According to a report by China Central Television on June 27, 2018, among the 20 cities with the most polluted air, 17 have steel enterprises, accounting for 85 percent of the total. Among the six industries with the most serious pollution hazards, the steel industry ranks first, producing SO₂, nitrogen oxides, dust and other heavy pollution emissions accounting for 45 percent of the total emissions. At the same time, the quality of environmental information reports in the steel industry is worrying, pollution prevention and control measures have been stopped without authorization, monitoring data has been tampered with, and fraud has occurred in the steel industry. For example, in 2013, the Maanshan steel pollution incident seriously harmed the health of the villagers in Ligang Village. In 2017, the desulfurization facilities of Hebei Iron and Steel Company

were abnormal and the monitoring data were artificially altered, causing serious social harm. All of these are not compatible with the low-carbon development requirements of enterprises under the dual-carbon goal. Therefore, it is urgent to solve the negative environmental externalities brought by the steel industry by improving the quality of environmental accounting information disclosure.

About the environmental accounting information disclosure, many scholars at home and abroad have discussed and produced some influential results. Foreign research on environmental accounting began in the early 1970s. In 1971, F. A. Beamons published a paper titled "Research on the Social Cost Transformation of Pollution Control", which started the study of environmental accounting in foreign countries. Since then, many experts and scholars in western countries have conducted in-depth research on environmental accounting, and many valuable research results have emerged. Gale E. Nwell (1996) and Jerry G. Kreuze (1996) proposed that qualitative description and quantitative analysis should be combined when environmental accounting information disclosure is carried out ^[1]. Junrui zhang Hui Tingguo and Bin Li (2013) specifically pointed out that enterprises must carefully consider the consequences of the disclosure of environmental information on their assets, profits, liabilities and production and operation ^[2]. Compared with the use of annual statements to disclose environmental accounting information, Clarkson (2013) is more inclined to agree to disclose the company's environmental accounting information through the media ^[3]. Xiaobo Wei and Jue Peng (2014) believe that the intensity and implementation of environmental management by environmental regulatory authorities can promote or interfere with the disclosure of environmental accounting information ^[4]. From the domestic perspective, the research on environmental accounting information disclosure has produced a lot of valuable results in recent years.

Li Zhuping (2015) pointed out the contents of environmental accounting information disclosure after studying, sorting and summarizing the annual reports, prospectus and sustainable development reports of Chinese listed companies ^[5]. Wang Longfei (2013) believed that it was very difficult for enterprises to improve their performance by improving the environmental accounting information disclosure index ^[6]. Wang Zechun (2013) learned that more and more companies will release, transmit and provide environmental accounting information through the Internet ^[7]. Yu Qian (2016) pointed out that the main factors affecting environmental accounting information disclosure include company assets, company size, equity nature, liabilities and environmental pressure ^[8]. Among them, the level of environmental accounting information disclosure is positively correlated with the first three factors and negatively correlated with the remaining two factors.

From the above literature review at home and abroad, we can find that western countries started earlier in the field of environmental accounting research, after a large number of experts and scholars efforts, continuous research and exploration, the disclosure content and disclosure methods are relatively mature. However, the research in the field of environmental accounting needs further improvement, and the qualitative description accounts for an important proportion and quantitative information is insufficient. In this paper, with the aid of the research achievements of domestic and foreign experts and scholars in the field of environmental accounting, combined with China's 29 steel published environmental information of listed companies, analyses the factors affecting the steel industry listed company environment accounting information disclosure, dig it, and put forward optimization measures, to achieve double carbon steel industry under the low carbon development provide some useful strategies.

2. Definition of Environmental Accounting Information Disclosure

2.1. Concept of Environmental Accounting Information Disclosure

Environmental accounting information disclosure refers to the use of certain communication

tools to present the environmental income and expenditure status of enterprises in production and operation to the public, so as to let the information needs understand the sensitivity of enterprises' environmental activities to the financial status of enterprises.

Environmental accounting information disclosure is the final result of environmental accounting work, but also the most important part of environmental accounting system. The disclosure of environmental accounting information to reveal the utilization of environmental resources and the treatment of environmental pollution is an inevitable requirement for the treatment of severe environmental problems.

2.2. Basic Contents of Environmental Accounting Information Disclosure

At present, there is no common professional standard for Chinese establishment and disclosure of environmental information, and there is no unified standard for the content of environmental accounting information disclosure. However, in general, the disclosure of environmental accounting information should include the following contents: The company's environmental policy and environmental management system, leads to significant environmental impact of all of the major direct and indirect factors and its explanation, environmental objectives and its relationship with the company's major environmental problems, the activity of enterprise environment, the influence of enterprise financial statements, about the environmental performance of your company for many years the main data and compliance in significant environmental impacts.

2.3. Basic Methods of Environmental Accounting Information Disclosure

Generally, independent environmental report and supplementary information disclosure are the two main forms of environmental accounting information disclosure. Independent environmental accounting reporting means that enterprises use specific methods and forms to provide environmental information in order to prepare independent environmental reports. Independent environmental reports can be divided into two types, namely comprehensive environmental reports and specific environmental reports. Common corporate data, such as social responsibility report, annual report, prospectus, business report of chairman and general manager, board of directors report, financial report and so on, are supplementary information disclosure methods.

3. Current Status of Environmental Accounting Information Disclosure in the Steel Industry

3.1. Production Characteristics of the Steel Industry and Its Impact on the Environment

The iron and steel industry is an indispensable basic industry for the development of national economy. The main target of its processing is black minerals and some non-metallic minerals which can produce a lot of pollution gases. At the same time, the iron and steel industry has many necessary production processes and long and complex technological processes, involving many specialized technologies, such as sintering, coking and chemical product processing, iron making, steel making, steel rolling, forging and pressing as well as power, transportation, machining, etc. To match, it has a variety of furnace, sintering machine, rolling mill, oxygen machine, large electromechanical and other high temperature and high pressure equipment. Thus, the steel industry is a technology and labor intensive industry, equipment concentration, large scale, high energy consumption, large material flow, the negative effect on the environment is great, for example, in the process of steel production, accompanied by the output of products, will produce a large number of raw materials, auxiliary materials, semi-finished products and industrial waste. And after experiencing such processes as coking, iron making, steel making, sintering, steel rolling and so on,

a large number of waste gas, waste water, dust, coal dust, coke dust, soot, acid fog, noise pollution, solid waste and so on. All these pollutants must be purified to meet the national emission standards before they can be discharged. Because of the negative effect of the steel industry on the environment, its pollution is concerned by the society. The quality of environmental accounting information disclosure of the steel industry is particularly important.

3.2. Analysis of the Status Quo of Environmental Accounting Information Disclosure of Listed Companies in the Steel Industry

3.2.1. Statistical Analysis of Environmental Accounting Information Disclosure of Listed Companies in the Steel Industry

In this paper, China Steel listed companies (including: Handan Iron and Steel, WisCO, Baosteel, Baogang, Jinan Iron and Steel, Laisteel, Xining Special Steel, Hangzhou Steel, Ningxia Hengli, Ling Steel, Nangang, JISCO Hongxing, Fushun Special Steel, Anyang Iron and Steel, Bayi Iron and Steel, Xingang, Luyin Investment, Ma Steel, Liuzhou iron & steel group co. are presented. the, chongqinsteel, tangsteel, panzhihua steel vanadium, daye special steel, steel songshan, benxi steel plates, pipes, taigang stainless emerging, anshan iron and steel, valin iron and steel, shougang, total 31 listed companies), as the research sample, this paper and two * ST shares (* ST shares refers to the domestic listed company listed and is not included in the abroad, And meet the characteristics of three consecutive years of losses.) -- Fushun Special Steel and Panzhihua Steel Vanadium, finally conducted research and analysis of 29 listed steel companies.

3.2.2. Proportion of Environmental Accounting Information Disclosure in the Prospectus

On consulting relevant documents on the listed companies on the basis of public website and stock exchange data through integration, at the same time to study more than 29 steel's prospectus of listed companies, realize total 25 companies disclose the environment accounting information, there are four steel in the prospectus of listed companies is not involved in the environmental accounting information content, therefore, Disclosure accounts for 86.2% of the total, the degree of disclosure is not high. See Table 1 for details:

Table 1: Proportion of environmental accounting information disclosure in prospectus

Year of Listing (year)	Number of companies issuing prospectuses (number of companies)	Number of Companies Disclosing environmental Accounting Information (companies)	Disclosure ratio (%)
1994	1	1	100
1996	3	2	66.7
1997	7	4	57.1
1998	5	5	100
1999	3	3	100
2000	5	5	100
2001	2	2	100
2002	2	2	100
2004	1	1	100

3.2.3. Contents of Environmental Accounting Information Disclosed in the Prospectus

In 2001, China Securities Regulatory Commission explicitly pointed out in relevant guidelines

documents that when listed companies publicly present their prospectuses to the public, they should clearly explain in the prospectus the risks that may be brought to investors or creditors due to the needs of environmental protection during the investment of the raised funds. In the same year, in the No. 9 and No. 12 application documents, legal opinions and legal work reports, the stock issuers are required to provide evidence to prove whether the business they are carrying out and will carry out and the investment projects proposed by the IPO price meet the requirements of environmental protection. When analyzing the prospectuses of the above 29 sample companies, it is found that the prospectus has a fixed length used to disclose the risk factors of the company, especially the risk of environmental protection and the corresponding countermeasures. In addition, it also clearly indicates the use and investment of the raised funds. Regarding the disclosure of environmental risks, there are a total of 5 enterprises with detailed data on environmental protection input, which are: WisCO, Hangang, Shaosteel Songshan, TISCO Stainless, Shougang, and 4 enterprises did not disclose the risks of environmental protection at all. In addition, the remaining 20 companies only made generalities about the environmental risks brought by the steel industry, lacking valuable data.

In terms of numbers, 23 of the 29 listed steel companies mentioned environmental issues at some point in their prospectuses, albeit to varying degrees, but still six didn't mention environmental issues at all. Early form according to the analysis of the steel in the prospectus about environmental information of listed companies, the qualitative description of the large space, and the lack of a clear monetary measurement way, but is to late, especially since 2000, in addition to the basic qualitative description, systematic and quantitative information, such as a specific environmental protection investment, There are even detailed lists in the form of tables and schedules. As shown in Table 2:

Table 2: Qualitative and quantitative information

number	Qualitative narrative information	Quantitative monetary information
1	Emissions indicator	Discharge of pollutants
2	Environmental protection concept	Environmental benefits
3	Environmental accident	Investment in environmental protection
4	Environmental protection measures	Green fees and green area
5	Environmental certification	Total resource consumption
6	Environmental risk	Number of environmental science and technology R&D
7	Environmental publicity	"Three wastes" recycling rate
8	Environment for verification	-

Looked from the content of the disclosure, the initial prospectus simply mention environmental protection and responsibility, with the passage of time, also in 2000, after the prospectus is more specific and standard, according to the environment accounting information increase, such as increasing the disclosure of the environmental protection investment and environmental protection check and number of environmental technology research and development, etc. When we explore the initiative of disclosure, we can still find that the early environmental information was in an extremely passive state. The reason why enterprises disclosed environmental information at that time was because they were forced by laws and regulations. Gradually, enterprises gradually woke up their environmental awareness, changed from passive to active, and began to take the initiative to assume social responsibilities. A focus on cleaner production and sustainable projects and projects has been put on the agenda.

3.2.4. Environmental Information Content Disclosed in the Annual Reports of Listed Companies in the Steel Industry

Our securities Regulatory Commission and other agencies to the listed company annual report environmental information disclosure give the full autonomy, under the relaxed regulations, listed companies in our country mostly tend to give consideration to the characteristics of environmental information on the premise of the synchronization to consider the company's own situation. The environmental accounting information disclosed by the sample companies in the annual report is presented by qualitative and quantitative information^[9]. Qualitative information mainly includes: Environmental policy laws and regulations, personnel, propaganda and education and training, energy conservation and emissions reduction targets, ISO and other environmental certification, the safe production responsibility system, green industrial chain steel, clean production, saving energy consumption, environmental protection concept's achievements in energy conservation and emissions reduction and environmental protection, technology upgrading, zero emission, insurance risk ring, adjust the industrial structure, energy and environment index, the enterprise can be Sustainable development strategy, etc. Quantitative information mainly includes the following indicators: Green coverage, environmental protection projects in the forehead, environmental monitoring, discharge, afforestation fees, government subsidies amount, pollutant discharge success rate, investment funds for energy conservation and emissions reduction, environmental protection investment amount of operating income ratio, resource utilization, solid waste comprehensive utilization and "three wastes" emissions, environmental pollution accidents, environmental cost, return discharge, environmental protection, fine, fine for delaying payment, etc .

The comparison between the prospectus and the 2016-2020 annual report shows that: first of all, from the perspective of quantity, the number of listed steel companies disclosing environmental information in the annual report accounts for 90%, and the total amount of information disclosed is far ahead of the prospectus. Secondly, by comparing the forms of the two, it can be understood that simple qualitative description is the norm of the prospectus, while the qualitative and quantitative information disclosed in the annual statement is richer and more accurate. Thirdly, when evaluating the content of both, the prospectus is mainly reflected in the environmental protection risks and measures to match them. In addition, the annual report also includes the environment-related business plan for the next year.

4. Problems and Causes of Environmental Information Disclosure in the Steel Industry

4.1. Problems in Environmental Information Disclosure

4.1.1. The Disclosure of Environmental Accounting Information by Enterprises Is Characterized by the Phenomenon of "Emphasis on Achievements and Light on Problems"

Steel listed companies announced the conclusion of the prospectus, and nearly five years of annual tabulated, found always disclosure of positive information on the company, such as the environment of honour, adopt some measures to keep the environment is improved, and keen to list the research and development of environmental science and technology, etc., and for bad negative news, for example, environmental pollution incidents are hidden and avoided.

4.1.2. The Environmental Information Disclosed Is of Little Value

Although the company has completed the mandatory requirements of environmental accounting information disclosure, the environmental information disclosed is of little value. Such as "the company will focus on improve the pollution control system, improve the environmental protection

personnel quality", "the future of the company would improve existing facilities, recycling and comprehensive utilization of" three wastes ", further improve the economic and social benefits ", "the company will firmly implement the security environmental protection, energy conservation and emissions reduction measures" such as standardized is broadly similar, there is no material description. It is worth noting that the above descriptive information has little use value and cannot provide an effective basis for external information demanders to make decisions.

4.1.3. Poor Independence of Environmental Accounting Information Disclosure

From the environmental information report, it can be found that only a small number of enterprises mention the subject of responsibility for the disclosure of environmental accounting information. It can be inferred that most enterprises do not have special environmental accounting information responsibility subject, or intentionally do not disclose the subject of responsibility, reflecting the lack of confidence in the quality of the disclosed environmental accounting information of enterprises ^[10]. In addition, the creation of independent environmental groups is far less often done by traditional accounting departments. Thus, the quality of environmental accounting information disclosure is not high, one of the performance is poor disclosure independence.

4.2. Cause Analysis of the Problem

4.2.1. Inevitable Choice Based on Apparent Rationality

The goal of an enterprise is profit maximization, and the pursuit of profit is the internal driving force of various activities of an enterprise. It is also a rational measure for an enterprise to weigh the advantages and disadvantages before taking any action. From the point of view of enterprises, for the appearance of rationality, selective disclosure of environmental accounting information favorable to enterprises is generally adopted by enterprises. It can enhance the external image of the enterprise and bring inestimable positive value to the enterprise, which has a far-reaching impact on the subsequent development of the enterprise. On the contrary, the negative information will cause the image to be greatly reduced or even receive negative score evaluation. In the sharp contrast between good and bad, enterprises will choose to conceal negative environmental information and disclose positive information with great probability.

4.2.2. Enterprises Are in a Passive State when Disclosing Environmental Accounting Information

China Securities Regulatory Commission forces listed companies to disclose environmental accounting information. At this time, enterprises are generally in a passive situation to disclose environmental accounting information. Generally speaking, in order to show good profit quality and development level, so as to attract more potential investors, enterprises passively disclose environmental accounting information that lacks practical value in order to meet the requirements of laws and regulations.

4.2.3. Lack of Qualified Professionals for Environmental Accounting Positions

In the late start of the study of environmental accounting, most of the universities in our country have only offered the traditional major course of accounting, and have not included the environmental accounting course in the scope of professors. In addition, there is a considerable shortage of lecturers and professors in the field of environmental accounting research. Therefore, it

is difficult to export outstanding environmental accounting professionals, which leads to the lack of qualified environmental accounting professionals in most enterprises.

5. Improvement Measures of Environmental Accounting Information Disclosure under the Double Carbon Target

Low-carbon development of iron and steel industry is an important task to realize double carbon goal in our country. Based on the problems faced by Chinese iron and steel industry environmental information disclosure, it is urgent to seek effective countermeasures to improve the quality of environmental information disclosure. The author believes that in view of the important position of the iron and steel industry in the development of national economy and its impact on the society, the solution of its environmental information disclosure problem needs to be jointly reached by the government, enterprises and society.

5.1. Perspective of Government Agencies

5.1.1. Strengthen Guidance, Management, Supervision and the Use of Laws and Regulations

The current environmental accounting research and application in our country is still in the green stage, lack of practical experience to ensure the quality to environmental accounting information disclosure of enterprise is difficult to to this, the government should take the initiative to guide, active management, and strengthen supervision, on a regular basis, do not regularly check and spot check the implementation of enterprise environment, at the same time and improve the relevant policies and regulations, Use laws and regulations to stop bad behavior of enterprises ^[11]. On the one hand, relevant government agencies should strengthen the monitoring and management of pollutants. For example, if an enterprise's environmental protection is found to be below normal standards, the government can give it a profound lesson according to the pain points of the enterprise, such as severe punishment, public notice, and strict ban on those who break the bottom line of environmental tolerance. On the other hand, governments need to encourage and support enterprises that focus on environmental protection, such as giving tax incentives or various environmental subsidies, or rating them as pacesetters. A two-pronged approach is adopted to help enterprises wake up to environmental awareness, realize social responsibility, and gradually disclose practical environmental information.

5.1.2. Draw on Advanced Environmental Governance Experience of Developed Countries to Strengthen Government Management

Although the research of environmental accounting of our country started late, the research achievements are slightly lower than those of Western countries, our country can make use of the "free rider effect", and make use of the ready experience and lessons from Western countries to deal with and solve the problems of our country in the field of environmental accounting disclosure. Among them, we can appropriately learn from the European and American countries to establish a reward and punishment mechanism for environmental protection projects ^[12]. For enterprises that actively respond to and cooperate with environmental protection policies, the government may give awards or a certain percentage of compensation to affirm and praise the efforts made by the enterprises to meet the environmental protection requirements of various production indicators. Through positive or negative incentives, it is beneficial to improve the enthusiasm of enterprises to disclose environmental accounting information or restrain the unqualified behavior of enterprises.

5.2. Enterprise Perspective

5.2.1. Take Enterprise Environmental Accounting As the Entry Point

The quality of environmental accounting information disclosure is affected by environmental information accounting. Therefore, enterprises can take environmental accounting as the entry point. Enterprises timely accounting environmental income and expenditure, based on which to explore countermeasures to cope with internal environmental costs, master the method of identifying and quantifying external environmental accounting costs. At the same time, environmental accounting and pollution prevention methods are linked together to provide a strong basis for pollution management decisions. Finally, it is necessary to establish targeted environmental database and data model of iron and steel enterprises.

5.2.2. Strengthen the Environmental Awareness of All Staff and Improve the Quality of Accounting Personnel

It should be noted that at present, most iron and steel enterprises environmental awareness is still sleeping, ignoring environmental benefits is a normal state. In view of this situation, enterprises urgently need to update their ideas, wake up environmental awareness, and actively disclose environmental accounting information. In addition, in order to cope with the problem that the personnel quality of environmental accounting positions in our country needs to be improved, universities should teach students, especially accounting students, the professional knowledge of environmental accounting, and create conditions and environment, so that students can combine practical knowledge. For the enterprise accounting personnel on the job, should update the knowledge structure in time, such as through on-the-job training, keep up with the pace of development of The Times, when necessary, but also understand the relationship between the production and operation of iron and steel enterprises and the environment. At the same time, qualified enterprises can directly introduce outstanding talents in the field of environmental accounting to accelerate the application process of their own enterprises in environmental accounting.

5.3. Social Perspective

5.3.1. Accelerate the Study of Environmental Accounting Practice

At present our country there are many problems in the field of environmental accounting information disclosure, a large part of the reason is behind the process of our environmental accounting practice research, to this, our country can reasonably draw lessons from foreign advanced system and the management pattern, at the same time learn they committed in the research process, accelerate the research on environmental accounting practice, and constantly improve the environmental accounting application in our country.

5.3.2. Properly Guide Public Forces and Social Supervision

With the continuous awakening of the public's awareness of environmental protection, this can form a powerful push, and relevant departments can guide the public power and public supervision, and promote enterprises to disclose environmental accounting information. At the same time, make good use of media to create public opinion effect and expose the list of illegal enterprises. In order to avoid public pressure brought by environmental protection issues, enterprises will pay more attention to environmental investment and finally achieve the purpose of environmental protection

out of rational consideration.

6. Conclusion

Taking 29 listed companies in China's steel industry as research samples, this paper summarizes the research results of environmental accounting information disclosure at home and abroad. Through the analysis of the data of five annual statements and prospectuses from 2016 to 2020, it finds that there are common problems in the disclosure of environmental accounting information of listed companies in steel industry, such as, Steel companies are willing to disclose good environmental accounting information while hiding bad ones; The disclosed environmental accounting information is of little value; The independence of environmental accounting information disclosure is poor, and the subsequent analysis of its reasons, the main reasons are: the inevitable choice of enterprises based on the surface of rationality; Enterprises are in a passive state when they disclose environmental accounting information; Lack of qualified professionals for environmental accounting positions, finally combined with the current double carbon target requirements, respectively from the three perspectives of the government, enterprises and society to put forward the corresponding improvement suggestions.

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