

# Research on environmental cost control of ANGANG STEEL COMPANY LIMITED under the background of low-carbon economy

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**Abstract:** In recent years, with the rapid development of our country's economy, our country's natural environment resources are also being consumed at an accelerated rate. In 2021, our country's economic work requires promoting the effective combination of consumption and investment on the basis of insisting on expanding domestic demand, and accelerating the development of the green and low-carbon economy. Iron and steel enterprises as an important body responsible for our country's implementation of carbon emission reduction targets, they should take the initiative to act and make preparations to accelerate the development of the low-carbon economy. The promulgation of the "14th Five-Year Plan for Industrial Green Development" and the "Guiding Opinions on Promoting the High-quality Development of the Iron and Steel Industry" has accelerated the adjustment of the iron and steel industry's industrial structure. Green and low carbon will be the future direction of China's iron and steel industry. The development of low-carbon economy is inseparable from the environmental cost control, so it is very necessary to research the problems and countermeasures in the environmental cost control of iron and steel enterprises. ANGANG STEEL COMPANY LIMITED is one of the largest domestic steel production enterprises and one of the successful models of iron and steel enterprises. This paper takes ANGANG STEEL COMPANY LIMITED as the research object, and uses the low-carbon economy theory as the theoretical tone of the full text. Combined with the literature analysis method and case analysis method, it collects and organizes the environmental data of ANGANG STEEL COMPANY LIMITED, and analyzes the problems existing in the environmental cost control of it. Finally, according to the existing problems, this paper will put forward corresponding suggestions to solve the problems, provide reference and help for other iron and steel enterprises, so as to help our country gradually improve the market to promote energy conservation, emission reduction and the development of a green and low-carbon economy.

**Keywords:** Low-carbon economy, environmental cost, Environmental cost control

## 1. Related Concepts and Theoretical Basis

### 1.1. Environmental cost

The concept of environmental cost was first mentioned in 1993. For the specific connotation of environmental cost, scholars at home and abroad have different opinions, but there is no unified concept or definition. However, many scholars have further refined and enriched the environmental cost based on the 1998 United Nations Intergovernmental Working Group of Experts on International Accounting and Reporting Standards in the document "Position Statement on Environmental Accounting and Reporting". Therefore, the definition of environmental cost in this paper also adopts the concept defined by the United Nations. Environmental costs are defined in the document in accordance with the principle of being responsible for the environment, the costs of measures taken or required to manage the impact of corporate activities on the environment, and other costs incurred by companies in implementing environmental goals and requirements.

### 1.2. Environmental cost control

The environmental cost control of an enterprise means that the enterprise analyzes the relevant information of environmental cost based on the attitude of being responsible for the environment, makes methods and measures that are beneficial to the development and environmental protection of

the enterprise according to the enterprise's actual situation, and reasonably controls the factors that form the environmental cost in its production activities to achieve the sustainable development of enterprises.

### ***1.3. Low carbon economy theory***

The term "low-carbon economy" first appeared in the energy white paper *Our Energy Future: Creating a Low-Carbon Economy* issued by the British government. The concept of "low-carbon economy" has been widely disseminated because of it. Countries around the world also put forward the concept of low-carbon economy as the future development direction.

The low-carbon economy is an economic model based on low energy consumption, low pollution and low emissions. The background of the "low carbon economy" is a severe challenge to human survival and development due to global warming. With the continuous growth of global population and economic scale, the environmental problems and incentives caused by energy use are constantly recognized, and global climate change has also been recognized as an indisputable fact.

### ***1.4. The impact of low carbon economy on enterprise environmental cost control***

During the "14th Five-Year Plan" period, our country's ecological civilization construction has entered a critical period in which carbon reduction is the key strategic direction, the synergy of pollution reduction and carbon reduction is promoted, the comprehensive green transformation of economic and social development is promoted, and the improvement of ecological environment quality has changed from quantitative to qualitative. Undoubtedly, the low-carbon economy is of great significance to maintaining the security of the ecological environment and accelerating the improvement of the ecological environment. In addition, the low-carbon economy also has a significant impact on corporate environmental cost control: First, the implementation of low-carbon economy's concept is conducive to expanding the cost management scope of Chinese enterprises, and the cost information will be more complete; Secondly, under the background of the implementation of low-carbon economy, enterprises' environmental cost information disclosure methods will be more complete, and the disclosure content will be more comprehensive; Finally, if an enterprise attaches importance to environmental cost control, it will help the enterprise establish a "green" image and achieve the two goals of economic benefit and public recognition.

## **2. Analysis of the current situation and existing problems of environmental cost control in ANGANG STEEL COMPANY LIMITED**

### ***2.1. The current situation of ANGANG STEEL COMPANY LIMITED***

#### ***2.1.1 Brief Introduction of ANGANG STEEL COMPANY LIMITED***

ANGANG STEEL COMPANY LIMITED is a large-scale steel production and sales enterprise in China. It was listed on the Hong Kong Stock Exchange and the Shenzhen Stock Exchange in 1997. ANGANG STEEL COMPANY LIMITED is China's modern super-large iron and steel conglomerate, which enjoys the reputation of "the cradle of the new China's iron and steel industry". ANGANG STEEL COMPANY LIMITED has a diversified product structure, with a relatively complete product series such as hot-rolled coil, medium and heavy plate, cold-rolled sheet, galvanized sheet, color-coated sheet, cold-rolled silicon steel, heavy rail, profile, seamless steel pipe, wire rod, etc. Products are widely used in machinery, metallurgy, petroleum, chemical, coal, electric power, railway, ship, automobile, construction, home appliances, aviation and other industries.

As the Central Committee of the China's Communist Party proposed the major strategic goal of "achieving carbon peak by 2030 and carbon neutrality by 2060", ANGANG STEEL COMPANY LIMITED actively responded to climate change, On the basis of improving energy efficiency, it vigorously implements renewable energy replacement, eliminates outdated production capacity, taps the potential of energy conservation and carbon reduction, adheres to the green and low-carbon development model, vigorously promotes clean production, energy conservation and emission reduction, and realizes resource reduction, harmless emissions, clean energy, ecological environment, and strive for the development of a low-carbon economy. ANGANG STEEL COMPANY LIMITED has won the title of "Environment-friendly Enterprise of Cleaner Production in China's Iron and Steel Industry" in 2020. It can be proved that ANGANG STEEL COMPANY LIMITED continues to

promote clean production, implement equipment upgrades and energy-saving and environmental protection transformation, and the continuously improved levels of energy saving, consumption reduction and pollution reduction have been recognized by the industry. In 2021, the company will have zero major environmental pollution accidents, and the implementation rate of environmental protection "three simultaneous" construction projects, the compliance rate of hazardous waste disposal, and the compliance rate of radioactive sources are all 100%.

### ***2.1.2 The composition of environmental cost of ANGANG STEEL COMPANY LIMITED***

Combined with the characteristics of iron and steel enterprises themselves, the author analyzes the driving factors of environmental costs generated in their production and operation activities. The environmental cost of ANGANG STEEL COMPANY LIMITED can be divided into environmental prevention cost, environmental loss cost and environmental governance cost.

The environmental prevention cost refers to the cost incurred to prevent ANGANG STEEL COMPANY LIMITED from damaging or polluting the natural environment during production and operation activities. In order to minimize the cost caused by damage to the environment, ANGANG STEEL COMPANY LIMITED should make capital investment in advance based on the concept of environmental protection before production and operation activities cause damage to natural resources. Setting pollution prevention costs is conducive to improving ANGANG STEEL COMPANY LIMITED's purification capacity and efficient utilization of resource recovery, and can also effectively tap existing development potential, upgrade ANGANG STEEL COMPANY LIMITED's production equipment, and avoid other costs arising from environmental issues.

The cost of environmental loss is different from the cost of pollution prevention. The cost of environmental loss is based on the irreversible environmental damage that ANGANG STEEL COMPANY LIMITED has caused to the natural environment. Due to the environmental pollution caused by ANGANG STEEL COMPANY LIMITED's own production and operation, it was punished by the government department accordingly and compensated the main body of environmental pollution damage. It is usually a passive expenditure that is accompanied by administrative penalties or civil litigation.

The environmental governance cost is also incurred when ANGANG STEEL COMPANY LIMITED has caused irreversible environmental damage to the natural environment. However, unlike the cost of environmental loss, the cost of pollution control is the cost of preventing pollution from being directly discharged into the natural environment and causing pollution. It occurs after the cost of pollution prevention is invested, and in special cases, there is also the cost of pollution control because ANGANG STEEL COMPANY LIMITED did not invest in the cost of prevention. At this time, ANGANG STEEL COMPANY LIMITED has already caused certain damage to natural environment resources. ANGANG STEEL COMPANY LIMITED needs to invest funds to restore the natural environment to a balanced level, which is the cost of pollution control.

Since ANGANG STEEL COMPANY LIMITED did not summarize and classify the environmental cost-related information, it only listed some of the environmental cost expenditures involved in the business activities of the enterprise. Therefore, based on the environmental cost-related information disclosed in the relevant reports released by enterprises in 2021, the author has sorted out the following environmental costs:

#### **Environmental investment**

ANGANG STEEL COMPANY LIMITED has released and implemented 82 environmental protection renovation projects with an investment of RMB 2.22 billion. The existing environmental protection facilities of ANGANG STEEL COMPANY LIMITED are operating stably, the waste gas discharge meets the standard, and the waste water discharge of Chaoyang Iron and Steel and Bayuquan Iron and Steel Branch meets the standard.

#### **Product development fee**

ANGANG STEEL COMPANY LIMITED focuses on independent innovation of R&D platform, strengthens key core technology research, continuously enhances scientific and technological innovation capabilities, and has obtained more intellectual property achievements in the field of environmental resources. In 2020, ANGANG STEEL COMPANY LIMITED carried out 83 scientific research projects in the field of energy conservation and emission reduction, among which the "Integrated Technology and Application of Metallurgical Dust Recycling, Clean Recycling and Application" project obtained 8 national invention patent authorizations, and the project of "Online Oil

Removal Technology Research of Advective Tank Sludge on Line 1780 " has won 7 invention patents. In 2021, in order to promote the reduction of water consumption, ANGANG STEEL COMPANY LIMITED implement the optimization and reduction of water supply pipeline network and a number of water-saving transformation projects, carry out technological research and development with universities to reduce leakage of the pipeline network. In 2021, ANGANG STEEL COMPANY LIMITED invest 5,831.6 million yuan in research and development. Table 1 shows the specific R&D projects of ANGANG STEEL COMPANY LIMITED and its environmental protection and economic benefits.

Table 1: Key R&D projects in 2021

Main R&D project name	R&D purpose/economic and environmental benefits		
	Improve energy and resource utilization efficiency, reduce smelting costs and environmental costs	Improve product production skills and develop brand competitiveness	Technological breakthroughs fill the domestic technological gap
Blast furnace twin data cockpit and production operation evaluation platform	√		
Development and Application of Ansteel Bayuquan Coal Blending Model Based on Data Mining	√	√	
Research on the key production technology of polar low temperature and extreme environment steel for polar marine shipbuilding and marine engineering			√
National demonstration platform for production and application of new materials (advanced marine engineering and high-tech ship materials)		√	
Research and development of high-performance bridge steel---420MPa grade weathering bridge steel and high-strength bolts		√	
Development of the third generation pipeline steel for super large capacity		√	
Development of high-purity and homogenized continuous casting billets for nuclear power large forgings and development of extra-thick plates for containment			√
Product development of high-aluminum zinc-aluminum-magnesium steel sheet		√	

#### Employee environmental training fee

In 2021, in order to promote environmental protection awareness, ANGANG STEEL COMPANY LIMITED incurs 135,000 yuan in employee training expenses, and environmental protection training cover 3,500 person-times. The training includes online video training such as "Cloud Lectures" on energy conservation and carbon reduction, and offline environmental protection training such as energy-saving knowledge Q&A. It also organizes energy-saving publicity weeks and low-carbon day activities, and carries out environmental protection public welfare activities to promote the community to practice green together.

#### Environmental costs in the governance phase

In 2021, ANGANG STEEL COMPANY LIMITED incurs a total of 9 million yuan in greening fees and 16 million yuan in residual soil discharge fees during the treatment stage.

#### Sintering machine renovation project

In 2021, ANGANG STEEL COMPANY LIMITED carries out an environmental protection upgrade and transformation project of the sintering machine in the iron-making plant, it worths 292 million yuan.

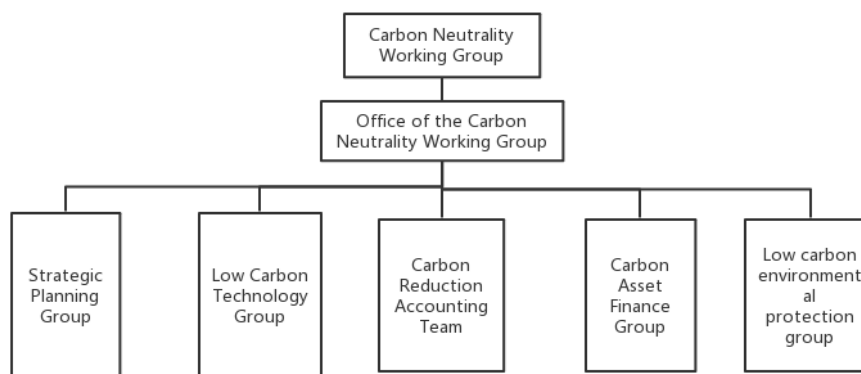
#### Packaging costs at the recycling stage

In order to vigorously promote the reduction and resource utilization of solid waste sources, ANGANG STEEL COMPANY LIMITED constructs and implements the steel slag treatment project at the Anshan headquarters and the rotary hearth furnace project at the Bayuquan base. In terms of packaging materials, ANGANG STEEL COMPANY LIMITED gives priority to adopting green and environment-friendly types, promoting the recycling of packaging materials and reducing the use of packaging materials. In 2021, The total amount of packaging materials is 73,000 tons, and the density is 4,100 tons/ton of steel.

### **2.1.3 Status Quo of Environmental Cost Control of ANGANG STEEL COMPANY LIMITED**

In the current environmental cost control process, ANGANG STEEL COMPANY LIMITED focuses on the in-process and post-event stages, and rarely pays attention to the pre-event stage.

In terms of personnel organization for environmental cost control, with the country's call for the development of a low-carbon economy, ANGANG STEEL COMPANY LIMITED establishes a leading group for carbon neutrality. Under the leading group, there are five functional working groups, namely the leading group office and the strategic planning group, the low-carbon technology group, the carbon reduction accounting group, the carbon asset finance group, and the low-carbon environmental protection group. The leading group is responsible for formulating special work plans, organizing internal and external experts to promote specific carbon reduction work such as low-carbon construction in the business field, and providing organizational guarantee for the company's low-carbon development. Figure 1 shows the organizational structure of the Carbon Neutrality Working Group.



*Figure 1: Organizational Structure of the Carbon Neutrality Leading Group*

In terms of environmental information disclosure, as a listed company in a highly polluting industry, ANGANG STEEL COMPANY LIMITED 's environmental cost information should disclose its environmental costs in detail to help target users of financial reports make corresponding decisions. However, ANGANG STEEL COMPANY LIMITED 's self-disclosure is not very strong. It only discloses some positive environmental performance information, and the disclosure of relevant financial information is not comprehensive.

## **2.2. Problems existing in the current environmental cost control system of ANGANG STEEL COMPANY LIMITED**

Under the background of low-carbon economy, there are obviously many problems in the current environmental cost control system of ANGANG STEEL COMPANY LIMITED. The author analyzes the problems in the three stages before, during and after the event:

### **2.2.1 Ecodesign that does not pay attention to environmental costs**

According to the environmental protection achievements and measures disclosed in the report of ANGANG STEEL COMPANY LIMITED, the author believes that ANGANG STEEL COMPANY LIMITED 's environmental governance mainly focuses on the in-process and post-event stages, but ignores the equally important pre-planning stage. As a leading large-scale steel production enterprise in the iron and steel industry, ANGANG STEEL COMPANY LIMITED 's in-process management and post-processing are more standardized and mature than other steel companies. The current handling method adopted by ANGANG STEEL COMPANY LIMITED is clean production, and the post-event measures adopted are circular production. ANGANG STEEL COMPANY LIMITED promotes cleaner production through the self-established independent innovation system, strengthens the management of

water resources by continuously improving the treatment effect of sewage treatment systems such as Xidagou and optimizing the process, and also optimizes the management requirements for waste, and has a good impact on iron and steel production. ANGANG STEEL COMPANY LIMITED identifies and classifies the main parts of waste generated in the process, implements waste classification management and directional disposal, and improves the level of harmless and resource utilization of waste. ANGANG STEEL COMPANY LIMITED 's effective in-process and ex-post management and control have reduced many environmental governance costs and environmental loss costs for the company. However, even if the management and post-event management are actively taking measures, without prior planning, it will never be able to maximize the benefits. The pre-planning of the environment is mainly about eco-design, which is a method of designing a product with special consideration to the impact of the product on the environment throughout its life cycle. The cycle cost of products is the core concern of eco-design, which is characterized by initiative and a special environmental response. An article in the academic journal called *Window of Reform* also mentioned that the eco-design control method in the design and development stage is one of the effective methods for controlling the environmental cost of enterprises. The use of ecological design is very beneficial to the development of enterprises' control of environmental costs, and it can better help enterprises to prevent the occurrence of environmental costs. But the existing design links of ANGANG STEEL COMPANY LIMITED are not perfect, and there are almost no ecological design links. In addition, each department of the enterprise controls the environmental cost very independently, there is no mutual connection between the departments, and there is no overall control of the environmental cost.

### **2.2.2 Lack of dedicated environmental cost accounts**

According to the environmental-related costs disclosed by ANGANG STEEL COMPANY LIMITED in recent years, the author found that ANGANG STEEL COMPANY LIMITED still uses traditional accounting methods for the accounting of environmental costs. ANGANG STEEL COMPANY LIMITED has always classified the costs related to the environment into the items reflected in "construction in progress" and "research and development expenditures", and has not conducted separate accounting for environmental costs. For example: in the process of iron and steel production, the environmental protection upgrading and transformation project of the sintering machine in the iron-making plant is included in the construction in progress, and the completed environmental protection equipment is included in the fixed assets and depreciation is provided. Fines charged by the government for water pollution and air pollution caused by enterprises are included in non-operating expenses. Iron and steel enterprises have always been the main pollutant emission enterprises concerned by the society. The simplified treatment of environmental costs by iron and steel enterprises has resulted in chaotic and scattered records of environmental costs, and the total amount of environmental costs in each accounting period is not intuitive and clear. This easily leads to distortion of accounting information, and it is impossible to reflect the real environmental cost and the company's environmental pollution and resource consumption in each accounting period, which greatly affects the accuracy of the company's total cost accounting. It is time-consuming and laborious to set up a special environmental cost accounting account. Many companies give up the establishment of environmental cost accounts for to pursuit immediate benefits, ignoring its future convenience. Nowadays, the country pays more and more attention to environmental protection issues. Under the background of the country's promotion of a low-carbon economy, the environmental protection pressure of ANGANG STEEL COMPANY LIMITED continues to increase, and may even develop into operational risks.

### **2.2.3 Enterprises have weak awareness of environmental cost control**

Insufficient disclosure of environmental cost accounting information is a common problem shared by many companies. Since our country has not yet formulated a guiding document related to environmental accounting information disclosure, and enterprises in various industries lack autonomy, the amount of information disclosed by enterprises is often quite insufficient, incomplete, and non-standard. In addition, due to the pressure of industry competition, companies only selectively disclose, only disclose some information that has achieved good environmental performance, and hide information that is unfavorable to themselves, which makes companies lack comparability with each other, and the information is far away from each other. It does not meet the needs of information users and it is difficult to conduct a comprehensive environmental information analysis of enterprises. At present, ANGANG STEEL COMPANY LIMITED 's disclosure of environmental accounting information mainly focuses on environmental early warning indicators, completion of environmental goals, consumption, environmental protection investment training costs, and environmental protection-related certification fees. In the first half of 2020, ANGANG STEEL COMPANY LIMITED was issued three "Decisions on Environmental Protection Administrative Penalties" by the Anshan

Municipal Bureau of Ecology and Environment because its flood control drainage water pollutants exceeded the comprehensive discharge standard limit, with a total penalty of 400,000 yuan. For negative environmental incidents, ANGANG STEEL COMPANY LIMITED consciously disclosed the content of punishment and rectification measures in its social responsibility report. However, ANGANG STEEL COMPANY LIMITED is vague and general about the disclosed environmental accounting information data. ANGANG STEEL COMPANY LIMITED mentioned in the report that it invested 2.22 billion yuan in environmental protection, but the details were not listed. According to the disclosed information, the author can only know that ANGANG STEEL COMPANY LIMITED invested 135,000 yuan in environmental protection training, 9 million yuan in greening fees, 16 million yuan in residual soil discharge fees, and 292 million yuan in the environmental protection upgrading and renovation project of ANGANG STEEL COMPANY LIMITED Iron and Steel General Plant sintering machine and so on, other data is not known. Much of the information disclosed is usually mainly descriptive information, there is basically no data information that can be used for accounting, and there is very little data related to the production and operation of enterprises, and there is no detailed statement on environmental protection measures. It can be seen that the disclosure of ANGANG STEEL COMPANY LIMITED is still insufficient and incomplete.

### 3. Measures to optimize the environmental cost control of ANGANG STEEL COMPANY LIMITED

In the context of the prevalence of low-carbon economic development, countless pairs of eyes are staring at iron and steel enterprises that consume a lot of pollution. As a large iron and steel enterprise, ANGANG STEEL COMPANY LIMITED is likely to face a heavy price with the latent environmental problems if it does not improve its environmental cost control. In order to implement effective environmental cost control for ANGANG STEEL COMPANY LIMITED, the author in this chapter combines the problems existing in ANGANG STEEL COMPANY LIMITED under the low-carbon economy, and makes targeted improvements to ANGANG STEEL COMPANY LIMITED in three stages: pre-planning stage, in-process processing stage, and post-event feedback stage, optimize the environmental cost control system of ANGANG STEEL COMPANY LIMITED, in order to help ANGANG STEEL COMPANY LIMITED to control the environmental cost quickly and effectively.

#### 3.1. Strengthening linkages across departments and optimizing eco-design

##### 3.3.1. Strengthen the control of various departments on environmental cost control

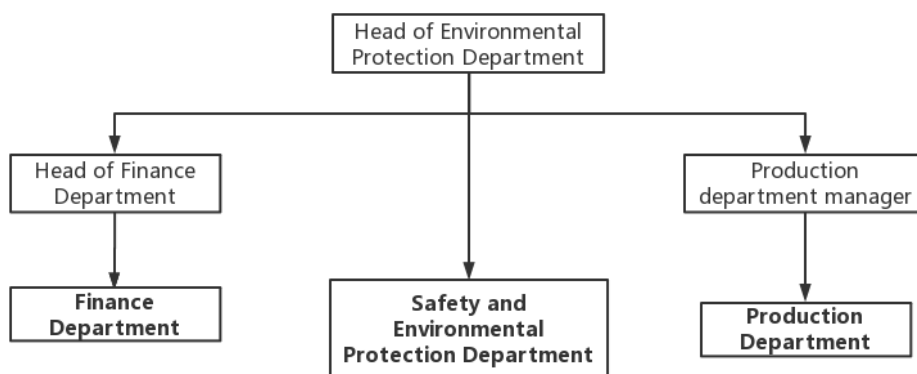


Figure 2: Department Responsibility Diagram

On the basis of the existing organizational structure, ANGANG STEEL COMPANY LIMITED should contact the environmental work of various departments to implement overall control of environmental costs. Communicate and contact the existing safety and environmental protection department with the financial department and production department, and communicate with each other in terms of environmental protection. The person in charge of the safety and environmental protection department should be in charge of the environmental protection work of each department, be familiar with each work process of the enterprise, cultivate the overall concept of environmental cost in each department, scientifically allocate environmental cost to the department where the cost occurs, and put the responsibility cost in place. Finally, according to the actual situation and the whole process of

production and operation, the overall control of the environmental cost is carried out to minimize the environmental cost. In addition, enterprises should incorporate the implementation of environmental costs by employees in various departments into the year-end performance evaluation and assessment system to stimulate and mobilize the initiative of employees to control environmental costs. The responsibilities of each department are shown in the figure 2.

### 3.3.2. Optimize enterprise ecological design

Eco-design is an important measure to achieve pollution prevention. Eco-design is an activity to achieve environmental protection in accordance with the concept of the whole life cycle, in the stage of product design and development, the system strives to reduce the impact of raw material selection, production, sales, use, recycling, processing and other links on resources and the environment. The use of eco-design can minimize resource consumption and reduce pollutant generation and emissions in the entire life cycle of products. However, there is almost no ecological design in ANGANG STEEL COMPANY LIMITED at present.

In the design stage, if the enterprise fully considers the existing technical conditions, raw material guarantee and other factors, and optimizes and solves the resource and environmental problems in each link, it can maximize resource conservation and reduce pollution. Producing ecological design not only considers product use functions but also environmental protection functions. Although it will lead to increased costs and cause conflicts between environmental protection and profits to a certain extent, ecological design is a pre-planning of the environmental cost of enterprises, which will bring certain benefits to enterprises. ANGANG STEEL COMPANY LIMITED should comprehensively consider pollution prevention measures at the product design stage, adopt reasonable structure and function design, and carry out product ecological design through product demand analysis. The dismantled and used parts can better fulfill the responsibilities of product recycling, utilization and final disposal, maximize economic, environmental and social benefits, and implement the extended producer responsibility system. Figure 3 shows the design process of eco-design:

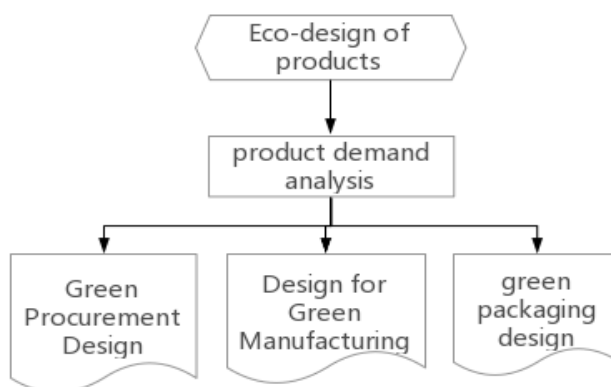


Figure 3: Eco-design diagram

### 3.2. Setting up a dedicated environmental cost account

At present, there are two ways to set environmental cost subjects: one is to set up secondary subjects based on the original accounting subjects, such as "manufacturing expenses - environmental pollution costs"; the other is to set up special environmental cost accounts, which are based on accrual. In principle, cost and expense accounts shall be set up to account for various environmental expenditures incurred in the production and operation of enterprises. The advantage of method one is that it is relatively time-saving and labor-saving, while the advantage of method two is that it can make the environmental cost information clearer and more intuitive. For ANGANG STEEL COMPANY LIMITED, which is in a high-polluting industry, intuitive environmental cost information is more conducive to ANGANG STEEL COMPANY LIMITED to find links with environmental pollution more quickly and stop losses in time. Therefore, it is recommended that ANGANG STEEL COMPANY LIMITED adopts the second method. This article will set up a special cost account "environmental cost" for ANGANG STEEL COMPANY LIMITED, and set up three detailed accounts according to the different purposes and uses of ANGANG STEEL COMPANY LIMITED's environmental costs: "environmental prevention cost", "environmental loss cost", "environmental governance cost". The "environmental cost" is used to collect all the accounts related to the environmental cost incurred by the



enterprise, and is mainly used to collect various indirect costs related to the environment and allocate it to the product cost.

Some of the R&D expenses invested by ANGANG STEEL COMPANY LIMITED can achieve certain results and can be converted into intangible assets, but at the same time, some of them will be recorded in the income statement due to unsuccessful R&D. ANGANG STEEL COMPANY LIMITED can set up "environmental R&D expenditures" under the "environmental prevention cost" account to account for the company's R&D investment for environmental protection. At the end of the period, the R&D expenses will be transferred to "intangible assets" or "fixed assets" if the capitalization conditions are met. Included in the current profit and loss treatment.

The production process is the most common part of ANGANG STEEL COMPANY LIMITED where environmental costs occur. In order to reduce environmental costs, the company will purchase some environmental protection equipment to improve the utilization rate of energy resources and reduce environmental pollution. It also conducts environmental protection training for employees to improve employees' environmental protection awareness. ANGANG STEEL COMPANY LIMITED can set the item "Environmental Protection Equipment Transformation Fee" under "Environmental Treatment Cost" to reflect the operating cost of the purchased environmental protection equipment. For depreciation expenses, the accounting treatment is to debit "environmental governance cost - depreciation expense" and credit "accumulated depreciation". For employee environmental protection training fees, the company can set up the subject of "employee environmental protection training fees" under "environmental prevention costs" to calculate separately.

Secondly, ANGANG STEEL COMPANY LIMITED will generate a large amount of waste water, waste gas and solid waste during production. In order to control these wastes, the company will incur costs for greening and residual soil discharge. Therefore, ANGANG STEEL COMPANY LIMITED Corporation needs to set "residual soil discharge fee" and "greening fee" under "environmental treatment cost" to account for the cost of the company's waste discharge and greening treatment. Figure 4 shows the specific content of setting up environmental cost accounts:

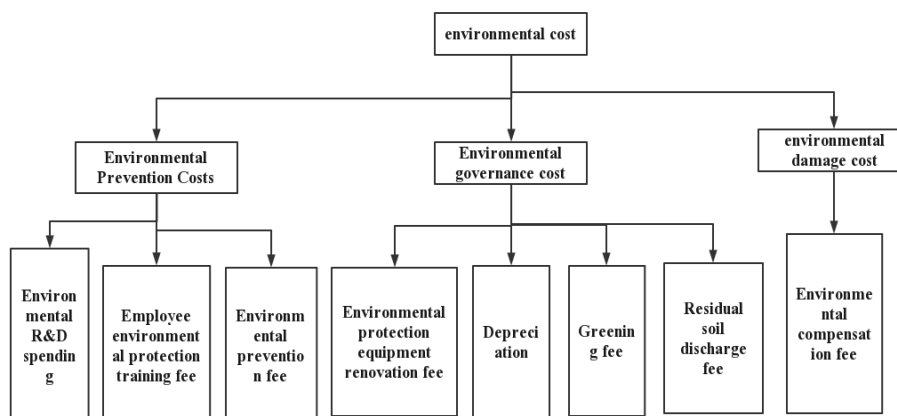


Figure 4: Environmental cost accounting account and subject list

In the process of operation and sales, ANGANG STEEL COMPANY LIMITED adopts green and environment-friendly packaging materials to improve the recycling rate of packaging materials. Recycling environmental protection materials has prevented possible pollution in advance, and ANGANG STEEL COMPANY LIMITED can set this expenditure in the "prevention fee" set under "environmental prevention cost".

When environmental pollution occurs, the government department will impose fines and compensation costs, ANGANG STEEL COMPANY LIMITED can set up "environmental compensation fees" under "environmental loss costs" for separate accounting.

### 3.3. Enterprise's Environmental Cost Control Consciousness

The steel industry is a resource- and energy-intensive industry. In order to respond to the country's call for a low-carbon economy and promote the development of the enterprise, ANGANG STEEL COMPANY LIMITED should disclose its environmental cost accounting information in a timely and complete manner, including but not limited to all financial information related to environmental costs,

non-positive environment information related to the enterprise, the specific achievements of the environmental protection department, the completed or planned environmental protection measures and so on to help the senior leaders to carry out further improvement measures for the enterprise environmental cost control. In addition, ANGANG STEEL COMPANY LIMITED should vigorously publicize the importance of environmental protection and improve the environmental protection awareness of all employees. The safety and environmental protection department set up separately by ANGANG STEEL COMPANY LIMITED should strive to promote low-carbon awareness to employees and play its role. The members of the board of directors who are also the leaders of various departments should be aware of the importance of environmental protection in a timely manner, and always implement the green environmental protection ecological concept from research and development, production, transportation, sales to pollution treatment, and lead the employees of various departments to improve the environmental protection awareness of the production and operation of the enterprise, Start from oneself, strengthen the construction of enterprise green culture. The production department responsible for the production of the enterprise's products should pay attention to the steps of possible environmental pollution in all aspects of production, conduct avoidance control in a timely manner, reduce pollution to a minimum, and timely and truthfully provide feedback on pollution and treatment costs and other information in a timely manner. The financial department should set up environmental cost-related accounts in a timely manner, collect and classify financial information related to environmental costs, provide intuitive and effective data for enterprise users, help enterprises find out the problems of environmental costs, and take timely measures. Every employee of an enterprise should realize that corporate environmental protection is related to the entire enterprise's interests. The interests of employees are in direct proportion to the interests of the enterprise. Therefore, they should implement the spirit of environmental protection with practical actions and lay a good foundation for the development of environmental cost control of the enterprise.

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