

# Green cost control mechanism of enterprises under the value chain theory

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**Abstract:** *To cope with the increasingly severe problems of environmental pollution and resource scarcity, more and more enterprises have taken energy conservation and emission reduction as one of their core work, which promotes green cost control to become a key issue that needs to be considered at present. The significant similarities between the value chain theory and the green cost control content and the purpose bring new ideas to the green development of enterprises. Therefore, the implementation of green cost control under the value chain can not only promote the coordinated development of the relationship between economic interests and environmental benefits of enterprises but also lay a solid foundation for sustainable development. In this regard, starting from the consistent analysis of the development of the two entities, this work aims to carry out green cost control through product research and development, material acquisition, product production, and product marketing.*

**Keywords:** *value chain; green cost; value appreciation; product production*

## 1. Introduction

The long-term extensive economic development mode in the past has brought some damage to the ecological environment. Also, it has seriously hindered the process of modernization and the comprehensive realization of a well-off society. To shape the "Beautiful China" and promote sustainable economic development, the concept of green development has begun to be widely concerned and applied in China. To date, more and more enterprises have successively taken sustainable development as the core management idea, and regarded social benefits, economic benefits and environmental benefits as integral entities, thus resulting in "green cost". In this process, if enterprises want to achieve long-term development, it is necessary to strengthen the cognition of green cost, and reasonably control from a higher perspective, effectively deal with the balance between economic interests and environmental benefits, and determine the balance point of development. Based on this, it is valuable to focus on the construction of a green cost control mechanism from the perspective of value chain research.

## 2. The consistency of the value chain and the green cost control

### 2.1. The level of control thought

At the ideological level, both sides are based on strategic management. Green cost control is based on sustainable development, which makes itself belong to the category of enterprise strategic management. It extends the management from within the enterprise to outside the enterprise, and no longer only pays attention to the green cost already generated, but also pays more attention to the green cost that may occur. At the same time, the development of enterprises is also based on value chain implementation management with a primary focus on the effective application of external resources and the maintenance of upstream and downstream relations, which promotes the management from the inside of the enterprise to the outside of the enterprise. Therefore, the enterprise green cost management based on the value chain should take the life cycle of the product and the service as the starting point, which requires that the concept of green cost management runs through the whole process of the product life cycle of enterprises. This can be reflected in the stages of R&D, material procurement, production and marketing, and abandonment management, so as to realize the scientific analysis and control of the green cost of enterprises. Enterprises can truly guide their own operation and development with the green cost control thinking of the value chain.

## ***2.2. The level of the value-added purpose***

Since the non-value-added activities will not promote the value generation of the enterprise, the cost generated by the activity process must be supplemented by the value generated from the value-added activities. To some extent, reducing the related cost input of non-value-added activities is one of the key means of value appreciation. The essence of the value chain is to control non-value-added activities through detailed analysis and optimization of enterprise development; green cost management is also to promote the maximum enterprise value [1]. Therefore, from the perspective of the value chain, the implementation of green cost control in each link can effectively reduce the green costs in non-value-added activities, and ensure that enterprises can maximize the economic benefits and environmental benefits at the same time.

## **3. Green cost control goal based on the value chain**

Based on the value chain theory, enterprises should clarify the characteristics of each link to formulate a comprehensive green cost management system, clarify the standards and objectives of the green cost management, and regularly analyze the achievement of the green cost management objectives in each link. In operational conditions, the enterprise should establish a special green cost management department, which is responsible for planning and coordinating the green cost management related work, and timely analyze and give feedback on the achievement of the target. Specifically, there are three management objectives, namely, reducing environmental pollution, pursuing profit maximization and making rational use of resources.

### ***3.1. Reducing environmental pollution***

As the current rapid development of society, the concept of environmental protection is deeply rooted in the people. Modern enterprises should set up sustainable development goals in the operation and development, which requires enterprises to take the initiative to reduce environmental pollution, avoid the use of toxic materials, and reduce the emission of pollutants. This helps establish a good corporate image in the natural environmental protection and benign management and development of the right track.

### ***3.2. Pursuing profit maximization***

The driving force of enterprise operation and development is the acquisition of profit. Green cost management from the perspective of value chain requires enterprises to pay attention to profits and choose a reasonable realization path of profit maximization (e.g., improving production efficiency, increase the added value of products). Eventually, the enterprise should seek the maximum economic profit with very little green cost.

### ***3.3. Making rational use of resources***

It mainly requires enterprises to reduce the consumption of resources to deal with the crisis of resource shortage. Enterprises can reduce resource input through scientific and technological innovation and technological empowerment, or timely replace non-renewable resources with large energy consumption with clean renewable resources to reduce resource consumption and resource pollution, so as to achieve the purpose of green cost management.

## **4. Analysis of green cost control under the value chain**

### ***4.1. Control of product research and development***

In the process of green cost control, the product development stage will not directly generate a large number of related costs, but at the value chain level, it will affect the green cost of other links. Therefore, the actual control must start from the following aspects: 1) establishing special resource application standards to urge the subsequent procurement and production to efficiently apply limited resources, 2) optimizing the environmental protection performance in the research and development process to meet the requirements of users in production, and 3) improving product quality to reduce subsequent non-value-added activities and reducing green cost expenditure [2].

Based on the above multiple control requirements, the current product research and development stage of the most effective comprehensive control strategy is green design. It is mainly based on the product life cycle, the environmental protection, safety, health and other elements in the research and development plan, which can ensure the product environment properties at the same time, achieve green cost control, and promote the value appreciation. The specific design process includes: 1) optimizing the production process. It means focusing on the optimization of production technology and removing redundant and overlapping links, and usually, one molding material can be used for production. 2) applying high-efficiency equipment and clean energy. It means the application of harmless and low-consumption energy to fundamentally reduce pollutant emissions, and replace traditional energy with solar energy, wind energy and geothermal energy. The selection of materials should be based on environmental protection standards, preferentially recyclable materials. In addition, the production equipment should also be based on low energy consumption and high efficiency to reduce green costs as much as possible. 3) improving the production links. It needs to continue to improve the production process, reduce the generation of waste materials, and set it in a fixed link, so as to implement centralized disposal. It also needs to implement innovative reform of production management, establish a closed-loop production system, and promote the efficient application of resources. 4) controlling the pollutant output. It means starting from the source and reducing the application of highly polluting materials in the design and development. At the same time, it also requires designing the poison reduction system and advanced technology in the production link to reduce pollutant emissions and promote the application of waste recycling.

#### **4.2. Control of material acquisition**

Even if environmental factors are fully considered in the research and development process, environmental problems may arise due to the subsequent material acquisition. For example, the raw materials of chemical enterprises are basically not pollution-free, and in addition, the material acquisition process includes many links, such as supplier selection, procurement plan formulation, material storage management, material recycling and application, etc. Close contact with supply enterprises is easier to affect environmental performance. Therefore, in the procurement process, it is necessary to analyze the environmental protection of materials based on routine procurement activities and apply scientific procurement measures to implement green cost input management.

At present, one of the prevalent strategies for green cost control in the material procurement process is green procurement. Specifically, on the basis of a comprehensive weighing of materials acquisition may cause environmental problems, enterprises formulate and promote relevant procurement policies and optimize various supply relations. In general, special contents that need to be considered in material acquisition include supplier selection, supplier qualification and product understanding, enterprise logistics, material recycling application, optimized resource and allocation, and final product disposal [3]. The special contents necessitate strengthening cooperation and communication with relevant departments, and jointly selecting materials to ensure that they can meet the development requirements of the economy, society and ecology. The development focuses on resource protection and waste treatment. For the former, attention should be paid to reuse, recycling and source control. As such, the source control can be realized through low-density packaging, material replacement and purification. For the latter, non-toxic incineration, biodegradation and waste should be realized.

#### **4.3. Control of product production**

From the perspective of the value chain, product development determines the possibility of green cost generation, while product production determines the generation of green cost. This link will cause the green cost increase of the part, which is mainly reflected in the environmental protection materials use, manufacturing technology optimization, environmental protection equipment operations, production environment monitoring maintenance, environmental fines, etc. This must be precisely integrated in the common part of green cost control to reduce the governance costs and improve the resource application rate.

At present, one of the most significant strategies of green cost control in the production process is clean production. It aims to build a perfect production system for the management and control of the product production process, thus strengthening the monitoring of material input, product production, waste disposal, etc. to achieve source control and whole-process control. It is also helpful to achieve the goals of low energy consumption, low emission. and efficient utilization [4]. For example, comprehensive control can be implemented for the recycling system to reduce waste generation and

discharge and improve the material conversion rate and energy application rate. The specific methods include four aspects. Firstly, it can be done by reasonably planning the application of clean materials and energy. It means implementing systematic measurement and analysis for the input of energy and materials in production and the production of products, giving priority to the application of materials and energy harmless to the environment and human body, and treating and eliminating them at any time based on the generation of pollution, thus avoiding the expansion of pollution scale. At the same time, the production link with low application efficiency and excessive material loss is optimized. Secondly, it can be done by improving the product system. It means broadening the product series and optimizing the production system based on environmental factors, thus achieving the best use of materials to form economies of scale. Thirdly, it can be done by improving the production process and equipment. It means using the most advanced technology and process as far as possible in the production process to eliminate the old equipment in time, to realize the reasonable application of resources, and to reduce the number of pollutants. Fourthly, it can be done by optimizing production management. On the one hand, it needs to guide the leaders at all levels to fully implement green cost management and enhance the enthusiasm of personnel to participate. On the other hand, it needs to strengthen terminal management and actively recycle waste.

#### ***4.4. Control of product marketing***

In the product marketing part, the green cost control is mainly reflected in the product's outer packaging and the transportation and maintenance of the subsequent applications. Usually, companies reduce their packaging in order to reduce costs. However, there are also some for the corporate image and product grade to do excessive packaging. Under the influence of environmental protection, most enterprises will reduce the application of packaging, or through the green environmental protection, logo to win the trust of customers. By this, the overall amount of green cost is small, and the generally large amount of packaging is mainly reflected in unnecessary packaging. For follow-up transportation maintenance, green costs are mostly generated in the logistics link, such as cost control in order to reduce the waste gas of transportation vehicles.

At the present stage, one of the most effective measures to control the green cost of product marketing is green marketing. It is based on the basis of meeting consumer demand and obtaining certain profits to reduce the adverse impact on the environment as much as possible, including product pricing, development, promotion and other marketing activities. The specific methods mainly include four aspects. The first is the green product. It is to guide consumers to clarify the difference between green products and ordinary products, and promote the implementation of green consumption. The second is the Green price. It is to increase the green value above the price of ordinary products to reflect the green positioning. The third is the green channel. It is to guide dealers to establish environmental awareness, optimize the product transportation process, and reduce resource and energy consumption. The fourth is the green promotion. It means the introduction of resource-saving and green concepts in the promotion to drive customers to carry out green consumption.

#### ***4.5. Product disposal link***

The green cost management of the disposal link requires enterprises to strengthen the cost analysis and formulate the green cost management plan, which is also the focus of the green cost disposal link management of enterprises under the guidance of the value chain theory. In terms of cost analysis, it is mainly to analyze the value of waste reasonably. The production and operation links of enterprises will produce a large number of pollutants and wastes, which not only pollute the environment, but also lead to the high green cost of enterprises. Cost analysis of waste pollutants is needed, focusing on their resource consumption, treatment cost and pollution compensation to be borne. In terms of the formulation of green cost management plans, enterprises need to pay attention to the new equipment and new technologies of production, and guide the construction of a perfect production cycle system with the concept of green development, so as to achieve the efficient utilization of resources and the recycling of waste. In this way, the waste generated in the production link can be converted into useful resources through recycling and treatment. At present, the most mature application is the waste classification, treatment and reuse mode. Through recycling, waste is turned into treasure, and the resources can be used for the subsequent production and operation of enterprises. As such, a small part can be used for external sales and the rest should be properly treated according to the principle of responsibility for environmental protection for proper treatment.

## 5. Conclusion

As a systematic management and control measure, green cost control can not only promote enterprises to implement efficient environmental protection but also help enterprises to obtain certain economic benefits. Furthermore, the endeavors will ultimately promote the balanced development of the economic, environmental and social benefits. From the perspective of the value chain, the green cost control of enterprises should start from product design and development and implement the green design. Specifically, enterprises should carry out green procurement in the material purchase, promote clean production in the product production link, and implement green marketing in product marketing and other stages. These attempts can fundamentally establish a systematic control system so that the value-added activities can invest the lowest green cost while achieving the best benefits.

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