

Research on Green Supply Chain Management Strategy Based on Circular Economy Value Theory

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Abstract: With the rapid development of supply chain economy, the shortage of resources becomes more and more obvious, so circular economy has become the focus of current research. This paper expounds the related concepts of circular economy and green supply chain, taking green transportation, green packaging and waste recycling as examples, analyzes the value expression of developing "circular economy" and "green supply chain", and the problems existing in the implementation process of "green supply chain", and puts forward some green supply chain management strategies and suggestions based on the value theory of circular economy. Specifically, it includes: perfecting the policy system of "green supply chain", perfecting the operation strategy of "green supply chain", and improving the management ability and informatization level of "green supply chain", so as to realize the long-term steady development of enterprises.

Keywords: Supply chain economy, Circular economy, Green supply chain, Management strategy

1. Introduction

Under the background of socialized mass production, the development of supply chain is faced with the problems of high quality, high efficiency, energy conservation and environmental protection, so the concept of "green supply chain" comes into being. Since China's accession to the WTO, the traditional color of trade barriers has gradually faded, while the requirements of green environmental protection are increasing, which has brought some opportunities and challenges to most supply chain enterprises. Focusing on improving resource utilization efficiency and strengthening the research and development of key technologies of circular economy, we can build a long-term mechanism for the development of circular economy[1]. The construction of "green supply chain" mode needs the support of "circular economy" value theory. To improve the enthusiasm of the implementation of "green supply chain", it is a key link to promote the combination of its interest system and the value of "circular economy". This paper expounds the related concepts of "circular economy" and "green supply chain". Taking green transportation, green packaging and waste recycling as examples, it analyzes the ways to develop "green supply chain", and puts forward some management strategies and suggestions of "green supply chain" based on the value theory of "circular economy".

2. Overview of "circular economy" and "green supply chain"

2.1 Connotation and principle of "circular economy"

2.1.1 The connotation of "circular economy"

First, from the micro level, compared with the extensive linear economic model, the "circular economy" model is a sustainable green economic development form. Its economic activities show a

closed-loop process of "natural resources-products-renewable resources", and all resources are used reasonably in circular economy, thus minimizing the harm of economic activities to the natural environment.

Secondly, from the macro level, "circular economy" includes the following three aspects: building a circular mechanism for the sustainable operation of natural resources; A well-designed waste recycling process; Integrate social production activities into natural circulation and maintain ecological balance.

The mode of "circular economy" is shown in Figure 1.

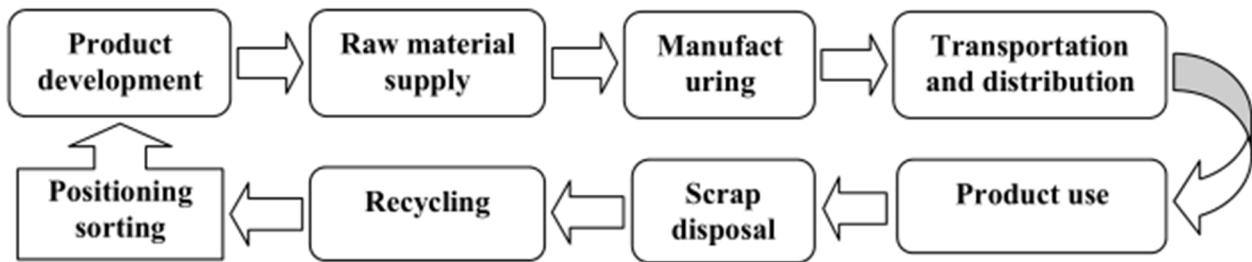


Figure 1. "Circular Economy" Mode

2.1.2 The principle of "circular economy"

The code of conduct of "circular economy" activities is the "3R principle", which has the following three aspects:

First, Reduce: belongs to the input control link, which requires using the least resources to achieve the established production goals, reducing the loss of resources at the source and greatly improving the environmental conditions.

Second, Reuse: It belongs to the process control link, which requires producers to exclude the idea of "one-time use" and gain profits in commodity design and R&D, so that the products and packages produced can be reused.

Third, Recycle: belongs to the output control link, which requires that the produced goods can be re-transformed into available resources after realizing their use functions. According to the thinking of circular economy, recycling has two manifestations, including "primary recycling" (that is, waste products are recycled to produce new commodities of the same type) and "secondary recycling" (that is, waste resources are converted into raw materials of other commodities).

2.2 The concept and characteristics of "green supply chain"

2.2.1 The concept of "green supply chain"

First, "green supply chain" is to curb the possibility of harm to the environment in the related activities of the supply chain, and make rational use of supply chain resources to achieve the demand of purifying the supply chain environment. Green supply chain is an innovation oriented by sustainable development and seeking value creation and factor acquisition. It includes the comprehensive value and shared value of economy, society and environment[2]. Specifically, its connotation mainly aims at reducing resource loss and protecting environment, and uses advanced supply chain technology to plan and implement the whole process of supply chain activities.

Second, "green supply chain" is a development pattern of resource conservation and environmental protection with economic and social attributes, and the goals of resource conservation, environmental protection and economic profit are consistent in terms of long-term interests.

The mode of "Green Supply Chain" is shown in Figure 2.

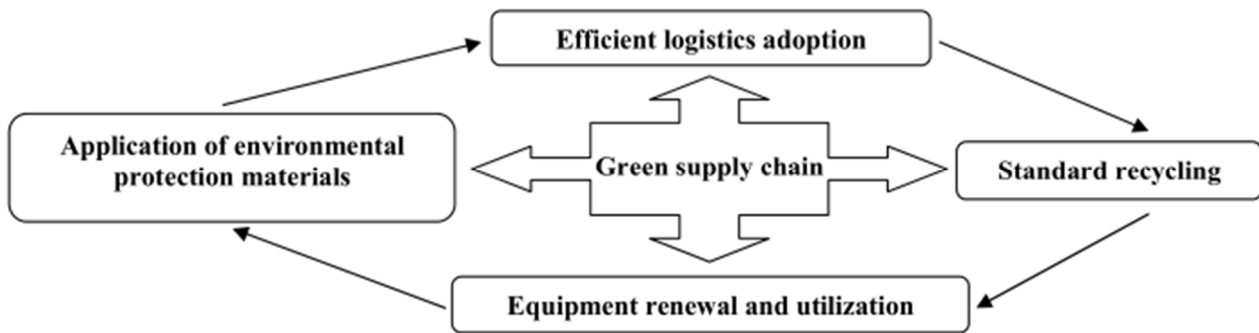


Figure 2. "Green Supply Chain" Model

2.2.2 Characteristics of "green supply chain"

First, hierarchy. From the perspective of the management and control subject of green supply chain, it can be divided into three levels: social decision-making level, enterprise management level and operation management level. From the system point of view, the green supply chain system is composed of multiple unit modules;

Second, the goal. The activities of the supply chain should follow the requirements of the strategic objectives of sustainable development, attach importance to resource conservation, ecological environment protection, coordinated development of economy and ecology, etc., and achieve the unity of the four objectives of economic benefits, consumer rights, social benefits and ecological environment benefits.

Third, time and space. It consists of two parts: timeliness and spatiality. Timeliness means that green supply chain management activities run through the whole process of commodity life cycle (from raw material supply, commodity production, sale, use and recycling). Spatiality means that under the background of economic globalization, the implementation of green supply chain management strategy must be actively participated and responded by all members of the supply chain.

Fourth, the interdisciplinary nature. "Green supply chain" belongs to the interdisciplinary field of environmental science, supply chain management and ecological economics. Because of the close relationship between supply chain and natural environment, environmental protection and resource utilization should be considered when studying "green supply chain", and because of the interaction and influence between ecosystem and economic system, ecosystem will certainly have a certain impact on the subsystem of economic system (supply chain system). Circular economy is a new research trend in the field of green supply chain management in recent five years[3].

3. Value expression of developing "circular economy" and "green supply chain"

3.1 The relationship between "circular economy" and "green supply chain"

3.1.1 "Green supply chain" is the basis and requirement of "circular economy"

The reduction principle of "circular economy" requires the realization of a virtuous cycle of resources, the improvement of resource utilization and the reduction of supply chain costs on the premise of effective control of environmental pollution. At the same time, we should reduce the waste ratio and improve the waste recycling process system. "Supply chain" is closely related to the development of "circular economy", and all social activities basically depend on "supply chain". The "green supply chain" is the improvement and promotion of the traditional supply chain. To improve the level of "circular economy", we must seriously explore the development model of "green supply chain".

3.1.2 "Green supply chain" and "circular economy" promote each other

"Circular economy" promotes the formation and development of "green supply chain" and promotes the transformation and upgrading of supply chain enterprises. On the basis of "circular

economy", horizontal coupling and vertical coupling of supply chain enterprises can be realized through "green supply chain". And "green supply chain" is an important way to promote the development of "circular economy". "Supply chain" is just like the main artery of national economy, the whole social and economic activities are inseparable from "supply chain". "Green supply chain" is the upgrading mode of traditional supply chain and an important way to realize the sustainable development of social economy. There is a significant positive correlation between green supply chain management and sustainable competitive advantage[4]. Therefore, it is the general trend to change the operation mode of traditional supply chain and promote the development of "circular economy" by realizing "green supply chain".

3.1.3 "Green supply chain" promotes "circular economy"

"Green supply chain" is the inherent requirement of promoting the development of "circular economy". Based on the value of circular economy, the utility present value of green supply chain can be effectively improved, so as to realize supply chain coordination[5]. "Circular economy" focuses on commodity circulation and sustainable utilization of resources, while "green supply chain" can bear this responsibility and runs through the whole process of "circular economy". The effective operation of "circular economy" is influenced by the process of "green supply chain". Implementing "green supply chain" is an important means to develop "circular economy". To upgrade the "circular economy", we should pay attention to the research of "supply chain efficiency" and "waste recycling process" to ensure the steady development of the "circular economy". From the perspective of the relationship between "circular economy" and "green supply chain", "green supply chain" and "circular economy" have the same essence. Therefore, "green supply chain" is regarded as the concrete manifestation of "circular economy" in the field of supply chain, which has the following four aspects: First, the development of "green supply chain" needs to be based on "circular economy value theory". Second, the development of "green supply chain" needs "circular economy" to provide a reliable living environment. Third, if we want to accelerate the development of "circular economy", we must pay attention to the efficient promotion of "green supply chain". Fourth, the formation and development of "circular economy" needs the support of "green supply chain". Green supply chain can maximize profits with the help of circular economy value[6].

3.2 The necessity of developing "green supply chain" under the value theory of "circular economy"

3.2.1 Enhance the comprehensive competitiveness of enterprises

Circular economy is a study on the integration law and operation mechanism of "economy society nature" composite ecosystem[7]. The development of "green supply chain" based on "circular economy" pays attention to the whole benefit of society. Therefore, the development of "green supply chain" can enhance the sense of social responsibility of enterprises, and help improve the trust of consumers, the popularity of enterprises and their comprehensive competitiveness.

3.2.2 Guarantee the implementation of circular economy

Because supply chain plays an important role in social economy and affects the development of national economy, it is necessary to give priority to the development of "green supply chain" in order to develop "circular economy". To ensure the effective operation of the "circular economy" system, it is necessary to intensify the research on supply chain efficiency and waste recovery.

3.2.3 Promote the sustainable development of social economy

With the rapid growth of social economy, it also brings the problem of environmental pollution. If we want to change the traditional model of "pollution first and treatment later", we must rely on the development of "green supply chain" to achieve this goal. Constructing a perfect "green supply chain

system" and promoting the harmonious development of ecological environment can promote the sustainable development of social economy.

3.2.4 Promote the healthy and rapid development of modern supply chain

The development of "green supply chain" can effectively prevent the waste of supply chain resources and environmental pollution caused by waste, and guarantee the operation ability and management level of supply chain enterprises and the overall optimization of supply chain system, thus promoting the healthy and rapid development of modern supply chain.

4. Problems in the implementation of "green supply chain"

4.1 The policy system of "green supply chain" is not perfect

Because of the late start of supply chain research in China, its development level is directly affected. Although there are a large number of supply chain enterprises in China, their business scale is generally small, the degree of modernization is low, and they lack the concept of "green supply chain". The policy system of "green supply chain" is not perfect, which is mainly reflected in: the policies and regulations for the development of "green supply chain" have not been clearly defined; Lack of unified "green supply chain" evaluation indicators, methods and standards; There are some problems such as imperfect supervision system and inadequate incentive policies. National policies play an important role in guiding the layout of "green supply chain", which can prevent waste of resources and avoid the pressure of environmental pollution caused by extensive development.

4.2 The operation strategy of "green supply chain" is missing

"Green supply chain" is a new concept, and it is difficult for enterprises to understand the importance of its implementation because of its insufficient cognition. In addition, driven by economic interests, enterprises only pursue high profits one sidedly and lose the consciousness and sense of responsibility of implementing "green supply chain", which leads to the lack of corresponding operation strategies[8].

4.3 The management ability and informatization level of "green supply chain" are low

As China has just entered the period of developing modern supply chain industry, the related infrastructure, technical equipment, standardization system, automation performance and other aspects need to be improved, which affects its management ability. In addition, the informatization level of supply chain enterprises is generally low, and there is a lack of an open supply chain information exchange platform. Therefore, only when we attach importance to the development of supply chain technology and improve its information level, can we truly realize the development of "green supply chain".

5. Suggestions on the management strategy of "green supply chain" based on the value theory of "circular economy"

Green supply chain is a systematic process. Under the value theory framework of "circular economy", the system of "green supply chain" is shown in Figure 3.

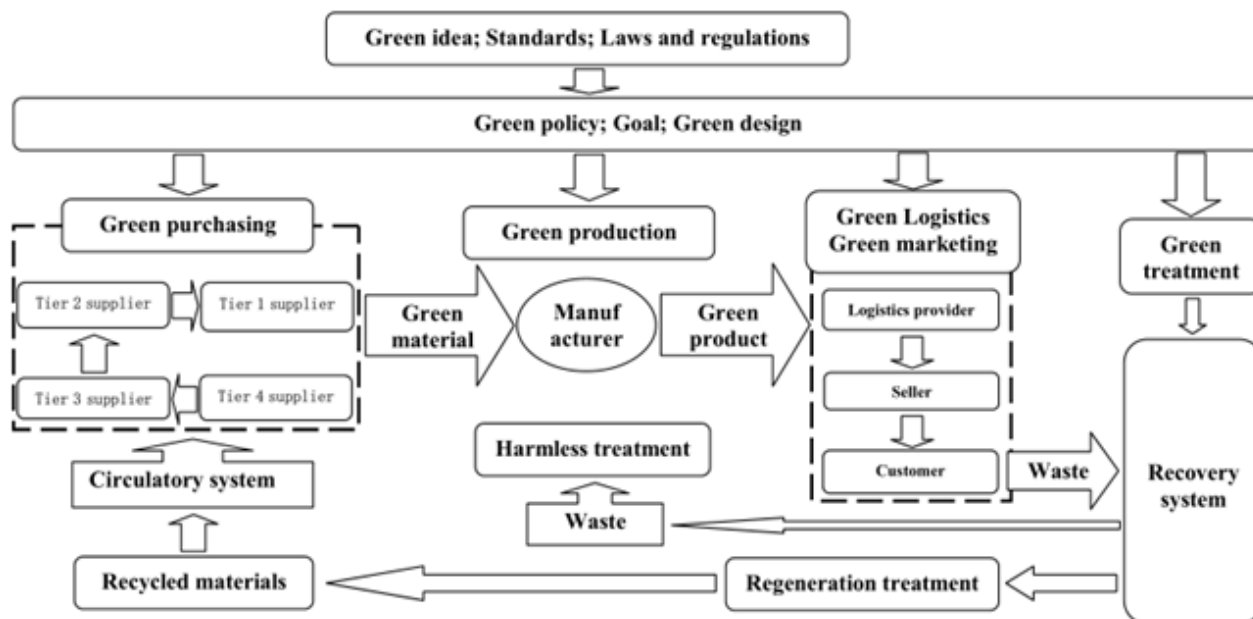


Figure 3. "Green Supply Chain" System

Green supply chain is of great significance to the development of social economy[9]. Based on the value theory of "circular economy", the author has the following three strategic suggestions for the development of "green supply chain".

5.1 Improve the policy system of "green supply chain"

First, strengthen the concept of "green supply chain". The government should strengthen the speech guidance of "green supply chain", publicize the concept of "green supply chain" to the society, implement environmental protection strategy, highlight its importance and urgency, improve the public's awareness of environmental protection, build a socialist harmonious social environment, and promote the steady development of "green supply chain".

Second, build a "green supply chain" policy and legal environment. The rapid development of "green supply chain" needs the support and guidance of the government. In order to ensure the steady development of "green supply chain", the government should formulate corresponding policies to encourage the development of "green supply chain" in combination with market development demand and supply chain industry characteristics. In addition, the government should build a good legal environment, strengthen law enforcement, and truly achieve "laws to follow, strict law enforcement, and violators must be prosecuted", and strictly supervise the operation activities of supply chain enterprises to realize the steady and efficient development of "green supply chain".

Third, establish the standard of "green supply chain". To develop "green supply chain", it is necessary to formulate unified standards and specifications to judge whether the supply chain activities of enterprises meet the corresponding requirements. The government should make full use of the functions of macro-control to guide the supply chain industry to formulate the "green supply chain" standard.

5.2 Improve the operation strategy of "green supply chain"

First, implement the "green packaging" strategy. Taking the express delivery enterprises in the supply chain industry as an example, due to the rapid growth of their business volume, a large number of packaging materials are lost. According to the report of the postal administration, China's express delivery business in 2021 will be about 80 billion pieces, and express delivery enterprises will probably lose about 40 billion packing boxes, 12 billion woven tapes, 33 billion plastic bags and 68 billion meters of tape. Excessive use of packaging is accompanied by high pollution and high energy consumption, so it is the general trend to implement the "green packaging" strategy and expand its application fields. Specifically, the following five aspects should be achieved: First, enhance the

awareness of enterprises and consumers on "green packaging". Second, improve the relevant legal system to ensure the normal operation of the "green packaging" system. Third, formulate policies to support the development of "green packaging" enterprises and their products. Fourth, make full use of recyclable containers to realize "circular economy". Fifth, do a good job in the standardized operation of "green packaging" to prevent waste of resources.

Second, the development of "green transportation" strategy. Transportation vehicles may pollute the environment and destroy the ecological balance due to the use of traditional fuels, which is not conducive to the sustainable development of economy. Therefore, developing "green transportation" is the key factor to improve the natural environment and human environment, which is beneficial for supply chain enterprises to gain market competitive advantage. "Green transportation" reflects the new development trend of the supply chain industry, which can effectively reduce the operation cost of the supply chain and improve the utilization efficiency of resources. Green transportation plays an extremely important role in the steady and efficient development of green supply chain.

Third, pay attention to the strategy of "waste recycling". According to the statistics of the postal administration, during the "Double Eleven" event in 2021, the volume of mail and parcels handled by Chinese express delivery enterprises exceeded 1.5 billion pieces, an increase of 35% year-on-year. Among them, the vast majority of express packaging materials can not be effectively recycled, resulting in varying degrees of environmental pollution. Supply chain enterprises should enhance the awareness of environmental protection, attach importance to the strategy of "waste recycling", and vigorously develop "green supply chain", so as to integrate environmental protection effect with economic benefit[10]. In addition, through the "waste recycling" strategy, we can create social resources, reduce environmental pollution caused by waste, and improve social comprehensive economic benefits.

5.3 Enhance the management ability and informatization level of "green supply chain"

5.3.1 Enhance the management ability of "green supply chain"

First, choose and optimize the "green transportation" strategy. First, shorten the line, improve the actual load rate, and achieve the purpose of energy saving and emission reduction. Secondly, choose the appropriate means of transport to reduce transportation costs. ; Finally, organize multimodal transport and joint distribution to improve the utilization efficiency of supply chain resources.

Second, strengthen the management of "green warehousing". First of all, through optimizing storage conditions, scientific storage planning and storage procedures are drawn up to achieve the purpose of reducing consumption and restraining pollutant emissions. Secondly, do a good job in safety management measures to prevent harmful substances from leaking and causing irreversible threats to the environment. Finally, the warehouse resources are reasonably regulated and controlled to reduce the transportation cost.

Third, build a "waste recycling supply chain". First of all, do a good job in the rational allocation of resources and reduce the generation of waste. Secondly, through the recycling of resources, supply chain activities are organized reasonably and effectively, and waste management is strengthened. Finally, build a perfect supply chain circulation system.

5.3.2 Upgrade "green supply chain" technology and equipment

First, upgrade the "green packaging". First of all, develop new recyclable packaging materials to reduce cargo damage and improve operational efficiency. Secondly, use degradable packaging materials to reduce environmental pollution. Finally, strengthen the awareness of recycling and build the system of packaging recycling.

Second, upgrade the equipment of Green distribution processing. First, eliminate redundant processes and optimize environmental protection measures in the process. Secondly, every link in the supply chain process is measured by the standards that are beneficial to environmental protection and resource conservation. Finally, broaden the channels to recycle and reuse the waste.

5.3.3 Improve the informationization level of "green supply chain"

Build a perfect supply chain system, fully realize information sharing and improve resource utilization efficiency. Supply chain enterprises should strengthen the connection with related enterprises, build a perfect information network sharing platform, realize the sharing of resources and information, and improve the comprehensive competitiveness of enterprises.

6. Conclusions

In a word, the value theory of "circular economy" is of great practical significance to the development of "green supply chain". The advantages of "green supply chain" can be fully revealed if advanced technology, equipment and information platform can be obtained as support. Under the value theory of "circular economy", developing "green supply chain" can enhance the comprehensive competitiveness of enterprises, guarantee the implementation of circular economy, promote the sustainable development of social economy and promote the healthy and rapid development of modern supply chain. From the strategic height of sustainable development, the basis for enterprises to achieve long-term steady development lies in integrating into "green supply chain", starting from "circular economy", perfecting the policy system and operation strategy of "green supply chain", and improving the management ability and informatization level of "green supply chain". So as to further expand the living space and remain invincible in the market competition.

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