

Review of Green Building Supply Chain Research at Home and Abroad

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Abstract: In 2020, China proposed the goal of "striving to reach the peak of carbon dioxide emissions by 2030 and making efforts to achieve carbon neutrality by 2060." In the future, the construction industry in China will inevitably develop towards the direction of building more resource-saving, environmentally friendly, and pollution-reducing high-quality buildings. This paper starts from the concept of green building supply chain, the significance of its development, and its practical applications, and reviews the relevant literature on green building supply chain at home and abroad in recent years. By analyzing the shortcomings of existing studies, it puts forward the future prospects of green building supply chain research.

Keywords: Green Supply Chain; Architecture; Literature Review.

1. Introduction

The theory of green supply chain originated in foreign countries, whose main core idea is to incorporate environmental protection into traditional supply chain links. Many foreign scholars conducted research on green supply chain as early as the 1990s. Green building supply chain is based on the traditional building supply chain, and adds green elements, combining various advanced green technologies, paying attention to the impact of the supply chain's operation on the environment and resources, and applying the concept of green supply chain management to the production and operation of buildings. It is of great importance for the current development of China's construction industry. This paper analyzes the research on green building supply chain at home and abroad, summarizes the existing research experience, points out the relevant problems and research deficiencies, thus promoting the in-depth research of green building supply chain.

2. Research Status of Green Building Supply Chain at Home and Abroad

2.1. Concept of Green Supply Chain

In the 1990s, Michigan State University first put forward the concept of green supply chain. Foreign scholars, based on supply chain management technology and green manufacturing theory, believe that a green supply chain is a supply chain model that reduces the impact on the environment and improves resource utilization in the production, transportation and sales of products[1]. Although the green supply chain has not been introduced into China for a long time, domestic scholars have also carried out in-depth research on it. But Bin and Liu Fei discussed the concept and connotation of green supply chain, analyzed the relationship between green supply chain and supply chain, and the relationship between green supply chain and green manufacturing. It is believed that green supply chain is "a modern management model that integrates environmental impact and source efficiency throughout the entire supply chain, which is based on green manufacturing theory and supply chain management technology and involves suppliers,

manufacturers, distributors, and users. Its goal is to minimize the negative impact on the environment (environmental impact) and maximize resource efficiency throughout the entire process of product acquisition, processing, packaging, storage, transportation, use, and disposal." [2]. Wu Chunyou et al. proposed that enterprises should conduct green supply chain management by carrying out environmentally friendly practices at different stages of the supply chain to enhance their economic and environmental benefits based on foreign experience and China's actual situation [3]. Wang Nengmin et al. argued that green manufacturing has put forward new requirements for supply chain management and proposed the basic principles of green supply chain design, as well as the green supply chain model [4]. Since the concept of green supply chain was put forward, domestic and foreign scholars have conducted in-depth research on it, and the basic concept of green supply chain has been clarified, and various evaluation indicators have been established.

2.2. The Concept of Green Building Supply Chain

The green building supply chain is based on the traditional construction supply chain and incorporates green elements, combining various advanced green technologies, paying attention to the environmental and resource impacts of the supply chain's operation, and applying the green supply chain management concept to the production and operation of buildings. Wang Qiuliang et al. analyzed the characteristics and structure of green supply chain management in the construction industry and constructed a green building supply chain management model, verifying its advantages [5]. Guo HanDing believes that sustainable development of the construction industry involves multiple stakeholders throughout the process, and the effective approach to implementation is to construct a green building supply chain [6]. Ren WenXin constructed a hierarchical structure model of the green supply chain for construction enterprises, and in detail discussed the green marketing, green supplier management, green procurement, and green construction strategies based on supply chain management, designed a three-level recycling model and a full-channel model that include the construction industry's reverse logistics, and

constructed a green supply chain management information and organizational structure[7]. In summary, the concept of green building supply chain can be summarized as combining traditional construction industry with modern technology, adding green elements to important design, procurement, construction, and recycling links, and applying supply chain theory to scientifically manage the production and operation of green buildings.

2.3. Development and Application of Green Building Supply Chain

Wang Jianting further enriched the supplier selection theory in the green building supply chain, providing new ideas and reference methods for studying the selection of suppliers in multiple green building supply chains[8]. Wang Yixin proposed that improving the resilience of the green building supply chain, as one of the key construction objects of the green and low-carbon circular economic system, is very important for promoting the green transformation and sustainable development of the construction industry[9]. In the context of the transformation and upgrading of the manufacturing industry, Chen Jie proposed introducing green supply chain management into the prefabricated building field to enhance the competitiveness of the prefabricated building supply chain[10]. Feng Ya Hong and Wang She-liang used game theory to argue that in order to build a green supply chain throughout the construction industry, the first step is to give full play to the macro-regulatory role of the government in the economy. Secondly, fully give play to the role of the market in resource allocation, and achieve sustainable development of the construction industry[11]. Shurrab Jaber et al. believe that construction companies adopting green building factors can improve sustainability performance and enhance the degree of compliance with customer expectations in the construction industry[12]. Taghavi Erfan et al. developed a comprehensive method by combining fuzzy decision trial and evaluation laboratory and fuzzy analytical network process to determine the main factors and prioritize them for implementing green supply chain management in the construction industry[13]. Sofia Kesidou et al. integrated low-carbon building supply chains and argued that legislation and the development of industry standards are needed to drive demand for low-carbon buildings[14]. In summary, research on green building supply chains is relatively less at present, but because the construction industry consumes large amounts of energy and resources and causes serious environmental pollution, the development of green building supply chains is urgent to further promote sustainable development in the construction industry.

2.4. The Significance of Green Building Supply Chain

Implementing the green revolution is an inevitable requirement for sustainable human society development, which is an extremely complex process. The green building supply chain is an important manifestation of sustainable development in the construction industry, with significant economic and social significance. From a social perspective, the construction industry is a pillar industry of China's economic development, and the green supply chain of the construction industry is an inevitable trend of the development of the construction industry, which helps solve the pressure of high pollution, high energy consumption, and rudimentary management in the construction industry

brought about by resources and the environment, and achieves green development, thus pushing China to achieve the goal of carbon peak and carbon neutrality. From an economic perspective, at present, the competition among enterprises is more inclined towards the competition among the supply chains they are in, and the green supply chain of the construction industry is a modern supply chain model that takes into account environmental and resource efficiency more than traditional construction supply chains, making the various links in the entire supply chain have less impact on the environment and improve resource efficiency, thereby enhancing the competitiveness of each enterprise in the supply chain and enhancing the economic interests of the enterprises themselves. Therefore, the implementation of the green supply chain model for the construction industry is imperative.

3. Analysis of the Current Research Status of Green Building Supply Chain at Home and Abroad

Through the sorting and analysis of the above literature, it can be seen that green building supply chain is a new research field, and the main research directions of domestic and foreign researchers are basically the same, but there are also differences. First of all, domestic scholars mostly analyze the concept of green building supply chain, and there are more theoretical studies conducted, while the actual development and application are less. Meanwhile, foreign scholars have mostly moved from theoretical research to practical research, combining green building supply chains with the actual development of the construction industry and offering relevant suggestions. Secondly, from the research method, domestic scholars use fewer research methods and angles, while foreign scholars are good at combining various research methods to analyze and argue, providing strong support for the research conclusions. We need to learn more from foreign scholars' comprehensive research methods and open up new paths for innovation. Finally, domestic research on green building supply chains often starts with a macro-level analysis, proposing general directions and ideas, while foreign research often starts from a micro-level perspective, analyzing more detailed content. This can be learned from each other to promote the development and improvement of green building supply chains.

In summary, for traditional building supply chains, there are still many shortcomings in the research of green building supply chains. With the continuous development of China's construction industry and the goal of achieving carbon peak and carbon neutrality, the construction industry in China will inevitably develop towards building higher-quality buildings that are more resource-saving, environmentally friendly, and pollution-reducing in the future. Research on green building supply chains must undoubtedly set stricter requirements. First of all, a unified concept of green building supply chains is needed, which is the basis for further research. Secondly, macro and micro research should be combined, as we need to consider the overall direction from a big framework, and also analyze each field in detail to promote the continuous improvement and development of the green building supply chain. Finally, theoretical research should be combined with actual situations, as pure theoretical research cannot effectively apply to actual development. We need to combine China's actual situation in the construction industry to provide

reasonable suggestions for the green and healthy development of China's construction industry.

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