The Principle of Green Supply Chain and Application Proposal in Construction Industry

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Abstract: According to the definition of green supply chain management, giving its connotation in detail.Analyzing the construction industry impact on the environment protection and sustainable development, reviewing the implementation of the green supply chain management in developed countries and regions construction industry, studing on how to implement green supply chain management in the construction industry.
Keywords: Green supply chain, Management, Construction Industry, Application, Proposal

1 Introduction

At present, human society has entered the era of rapid development, the construction industry has been rapid development, but led to a shortage of resources, environmental pollution. Especially in China, the economy is the development of high-speed, and large-scale construction projects are doing now, the problem of China's resources and the environment is very severe, and strive to man and nature, environmental compatibility coexistence and harmonious development is urgent. in order to achieve harmony between man and nature, green supply chain management thinking is not only necessary to the construction industry, but also is a concrete manifestation implementing the scientific concept of development.

2 Basic Principles of Green Supply Chain

2.1 The content of green supply chain management

the so-called supply chain refers to focus on core business, through the logistics, information flow and capital flow control, from procurement of raw materials, intermediate goods and even the final product, finally from the sales network to the hands of the consumer, products will be sent to suppliers, manufacturers, distributors, retailers, end-users, and will connect the functions of a whole network structure.Supply chain management is an integrated management ideas and methods, is the entire supply chain from the perspective of the traditional business enterprises within the sector between enterprises and the functions of the system, strategic coordination, to improve supply chain and every the long-term corporate performance. In recent years academics have made an in-depth study in the supply chain strategic design, planning and operation. some famous multinational corporations such as Wal-Mart, P & G, have achieved tremendous results in the practice of supply chain management. Green supply chain management is based on green manufacturing and supply chain management theory of technology, involving suppliers, manufacturers, vendors and users. Its purpose is making products from raw materials acquisition, processing, packaging, warehousing, transport, use, disposal and recycling to scrap the use of the whole process, the environmental impact is the smallest and the resources is efficient.

2.2 The features of green supply chain management

Green supply chain is the application of green manufacturing in the supply chain, but it is much more complicated than the supply chain,what in the flow of green supply chain is not just an ordinary raw materials, products, but also a“green”logistics. Large flows of green manufacturing is related to the “green” information.

2.3 The significance of green supply chain management in China's construction industry

In order to maintain the sustainable development of China's construction industry, it is imperative to implement the green supply chain management of the new strategic management. through the implementation of green supply chain management in the construction industry, not only can reduce construction activities on the consumption of natural resources, but also can effectively improve the entire construction process on the environment unfriendly act.The study shows that the implementation of green supply chain management can enhance their competitive edge, improve the enterprise's organizational performance, reduce production costs, protect the natural environment and play a very important role in the sustainable development of construction industry.

3 The Application Status of Supply Chain Management in Construction Industry

3.1 Foreign application situation

Green supply chain management originated in the United States, the U.S. National Science Foundation (NSF) funded 400,000 U.S. dollars in the Michigan State University Manufacturing Research Association (MRA) in 1996, The concept of green supply chain was an important content of the study. Construction industry supply chain management of the first foreign research began in the 1980s, Koskela in Stanford University formed a construction industry supply chain management theory,the official presentation of this study should be attributed to Bertelsen.William and Fischert, etc..the big contractors have realized that the implementation of supply chain management can improve production plans procurement, but the obstacles of the successful implementation of the supply chain management in construction industry can be found, such as the lack of trust managers.

In 1999, 0 'Brien, who pointed out that the construction supply chain management provided a new approach to reduce construction costs and increase the application on the construction of reliability and speed. Construction supply chain management is the independent production units of the production activities of large-scale systems for all these activities optimization.Manufacturing supply chain management technology applications has improved customer service, but also saved hundreds of millions of dollars of funds. Bertelsen, who in 1993, indicated that the adverse supply chain management may be on the increase-10 percent of the cost by some of the construction industry research, time limit was also affected. the Supply Chain Management Research Group of British construction industry points out: the importance of the function of the supply chain management internal organization, including: production planning, procurement, transport, storage, inventory. And providers of supply chain relationship factors, including: higher quality services, interest costs, streamlining the construction process, simplifing the procedures for orders; with the owners of the supply chain relationship factors, including: interest costs, streamlining the construction process, simplifying the bidding process; development of the construction supply chain collaboration of the main objectives, including: the interests of owners and improving customer service, reducing paper work, increasing profitability, improving the quality assurance; the key factors of construction supply chain, including: trust, the reliability of supply, top management support, mutual interests, information-smooth, joint business planning;the main obstacles of construction supply chain, including: the lack of top management commitment, bad communication, inadequate support systems, low commitment to the partnership, the lack of proper information technology support.

3.2 Domestic application situation

In China, the green supply chain management research is still in its initial stage, the focus of the study is to introduce the concept of integrated features, architecture;the main research areas, the article about the implementation of the strategy is only the strategy research, not quantitative and systematic analysis.

In short, the green supply chain management research in China's construction industry is still in the exploratory stage, we should vigorously study developed countries and regions.

4 Application Proposal of Green Supply Chain in Construction Industry Areas

4.1 The design of the green supply chain

The design of effective supply chain supply chain is a necessary prerequisite to the successful operation, It can improve customer service, achieve effective balance between cost and service, enhance corporation's competition power, increase flexibility, develop new markets and increase work efficiency. in the design of the supply chain, based on the successful supply chain in manufacturing, construction supply chain should be designed in terms of different construction corporations.

Different types of products require different supply chain design. Generally, from the broad sense, basic products can be divided into two basic types: functional products and innovative products. The so-called functional products, which refer to a lower profit margins, the demand for the products is more stable; so-called innovative products refer to higher profit margins and unstable demand products. It is easy to forecast future demand for the functional products due to their tiny changes and stable demand. In addition, these products have long life cycle and can be used to meet consumers' basic requirements. Construction products are functional products, in order to avoid less profit margins, construction corporations should improve current product and management mode to achieve higher profit margins by researching customer psychology and considering market demand, the existing production and management methods need to be improved. The processes of green products supply chain design of construction products are showed as follows: the construction market analysis, in order to understand the current market demand for construction products and the situation of construction products, features and development trends, While summing up the status of construction enterprises, researching direction of the supply chain development, analyzing the problems may affect the supply chain design, analyzing the necessity set up supply chain design goals ,and the access to lower unit costs, higher customer service levels and environmental benefits, analyzing the balance between objectives; analyzing the construction of the supply chain, and form the basic framework of the supply chain. The supply chain analysis of the composition of materials, including the main equipment suppliers, construction, engineers and contractors and the choice of location, if it is feasible, the programme can be carried out following the design, otherwise, they should re-design, the main issues to be addressed include: the composition of the supply chain members, the source of raw materials, production planning, information management system design, logistics management systems design. After green supply chain design has completed, testing through certain techniques methods is necessary.

4.2 The processes of construction green supply chain

Construction of green supply chain is the supply chain that fully integrated construction industry characteristics its operation model processes are as follows:

4.2.1 The procurement link of green supply chain

Through fountainhead control, the awareness of the environmental pollution prevention and energy conservation can be carried out in the entire supply chain. In addition, green purchasing not only can satisfy the public demand for environmental products, but also can lower the overall cost, so the green procurement policy and practice can bring economic benefits and competitive advantage for enterprises. Corporations in green supply chain should design green purchasing in following aspects: the management and choice of green supplier, at this stage we need to take into account providers whether the material is contaminated and whether the manufacturing process is clean, the process can save energy, to reduce waste and the use of materials, we can communicate with suppliers and request their productions. implementation of collaborative procurement, collaborative procurement refers to the process, in which corporations adjust their plans and delivery according to demand-supply information that are shared by both corporations and suppliers, suppliers can adjust their own plans according to corporation's inventory and plan, and decrease the inventory without reducing service level.

4.2.2 The construction link of green supply chain

Production in green supply chain includes not only construction process, but also the process happened from engineering construction design, such as material selection, logistics design and decoration design.

Green design. Green design is the entire process of life cycle, including construction concept design, construction, usage, reclaim, reuse and dispose trash. Green design examines the whole life cycle based on sustainable development, It emphasizes systematic analysis and evaluation according to life-cycle perspective in production development stage, eliminating the potential negative impact on the environment, and introducing 3 R(reduce, rescue, recycle) into production development stage directly.

Green material selection. Green material is a relative concept, which is still in the continuous development and improvement process. Green materials include advanced materials, high-quality, low energy consumption material, security during the product process, low noise, no pollution, in line with modern engineering requirements.

4.2.3 Payment in Green supply chain

Green supply chain payment is actually a delivery process from suppliers to core corporations (construction companies), including six major elements: material, the transportation of production space move, storage of time pass, circulation process, packaging, handing and information. According to the analysis of non-green factors above, here are some strategies to reduce non-green factor: transport strategy, taking use of green cars, reducing the total amount of cars by changing transport, using the green channel, reducing vehicle emissions of conducting joint distribution, reducing pollution, eliminating staggered transport; simplifyng the supply and distribution system, reducing the number of vehicles running by increasing efficiency of vehicles usage, improving distribution efficiency, building storage systems that can develop sustainably; concerning reasonable selection of logistics brokers. The brokers' green ability and reputation are important for corporations to implement green supply chain, therefore enterprises should strictly choose their own green supply chain links, and enhance their green image.

4.2.4 The recovery link of green supply chain

At present, 30 to 40 percent of municipal refuse are construction refuse in our country. Almost all construction refuse are shipped to suburbs or rural areas without any processing by construction companies, they are stacked in the open or buried, spent a lot of land acquisition costs, and other construction funds, and lost garbage, dust and sand-lime dust caused by cleaning, transporting and stacking garbage also cause serious environmental pollution. With the issue and implement of many laws and regulations that protect arable land and environment in our country, construction corporations and environmental protection department are facing an important subject: how to treat and discharge construction garbage. Recovery in green supply chain include the following major areas: recovery, with payment or free of charge, salesman reclaims waste produced by final customers or downstream corporations in the process of production and sale. These salesmen may be corporations in each supply chain nodes, for example waste from the customer may return to upstream suppliers, manufacturers, they may also be returned to downstream distributors, distribution, retailers; testing and treating decisions, in accordance with the product structure and product characteristics of the viable treatment options, the plan includes selling recovery goods directly, selling goods after processing, reusing some parts and abandoning production or parts, then confirming an optimal plan based on cost-benefit analysis; Scrap treatment: for those recovery goods or parts that have no economic value or endanger the environment seriously, it is better to select a treatment such as mechanical treatment, which has no environmental pollution or pollutes environment little.

5 Conclusion

In brief, as it is not long from the establishment of the green supply chain management theory to the development, it there may be some imperfections in the application process, particularly, to apply it in the innovative development of our country's construction industry is a completely new practice. Along with the thoroughgoing research, the green supply chain management function will be manifesting more evidently. Our country's construction industry is in the essential developing stage, they have an arduous task to reform and develop it. It will have extremely beneficial reference value if we can pay attention to the model overseas advanced management concept such as the green supply chain management. Our country's construction industry can combine it with our own situation to

enhance the benefit unceasingly and can make a greater contribution to our country economic and social development.

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