

Green Supply Chain

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Abstract: *There is a growing alarming concern that global warming may lead to a great disaster. Green supply chain is an emerging concept motivated by the need for environmental consciousness. It aims at integrating environmental thinking into supply chain. Its principles can be applied throughout the entire supply chain. Companies must now include “green” or “environmental strategies” in order to retain competitive advantage. This paper provides a brief introduction to green supply chain.*

Key Words: *green supply chain, green supply chain management*

I. INTRODUCTION

Countries all over the world are facing severe problems such as high resource consumption, low efficiencies, and high pollution emissions. Concern for the environment is forcing many manufacturing companies to address the size of their carbon footprint, which is an important indicator of environmental impact. People worldwide are expressing concerns over the increase of energy consumption [1]. Developing this profitable business without sacrificing the environment is gaining increasing attention.

The supply chain is an important branch of operations management. Implementing a green supply chain is truly a win-win scenario for your company, your shareholders, your consumers, and your planet. This eliminates waste in every stage of supply chain. The more green a company’s supply chain becomes, the more it can become a marketing boon. For green and sustainable product development, it is becoming important to consider social and environment criteria along with economic factors.

II. SUPPLY CHAIN

A supply chain is a system that is concerned with transforming raw materials, natural resources, and other key components into a finished product or service. It may also be regarded as a network consisting of all parties involved in producing and delivery products or services to ultimate customer. It consists of all parties involved in fulfilling a customer request, including the suppliers, transporters, warehouses, retailers, distributors, manufacturers, and customers. It is hard to evaluate green supply chain with single index due to the complexity of it. Standard measurements of the performance of the supply chain include customer satisfaction, service, time, responsiveness, cost, and quality. Flexibility is an important requirement for supply chain, because it facilitates the response to challenges like globalization and technological changes.

Supply chain practices are used in manufacturing, automotive industry, and healthcare.

Geographic information systems (GIS), building information modeling (BIM), and radio-frequency identification (RFID) are currently finding their way into practice in all types of supply chains.

III. GREEN SUPPLY CHAIN KEY CONCEPTS

Green supply chain (GSC) is a modern concept which originated in the 1970s. GSC is now accepted in many corporate organizations worldwide. It is essentially the extension of supply chain. The green supply chain includes all components of the conventional supply chain. Adding the “green” component to supply-chain involves addressing the relationships between supply-chain and the natural environment. Green supply chain integrates environmental parameters (or requirements) into supply chain management, such as the design of green product, lower costs and better served customers. The green nature of products is based on the green materials and green technology. Due to the higher cost of making green products, the price of the green products is higher [2].

Green supply chain issues are of prime concern for manufacturing, automotive, electronics, and food industries. Cooperation among the companies on the supply chain is crucial in improving the environmental compatibility of their businesses. Suppliers, manufacturers, customers, and disposal companies must be integrated in implementing green

supply chain. Sustainable supply chains can only be developed if companies make environmental sustainability a core value not only for their own operations but also for their broader supply chain. If company senior leaders (or top management) fully support sustainability efforts, the rest of the company is more likely to be on the same page. When employees are given freedom to decision making, they work towards enhancing GSC practices.

IV. DEVELOPING GREEN SUPPLY CHAIN

Companies that intend to design and implement a green supply chain can follow the following basic steps [3].

- *Product Selection:* At the product design stage, the product should be designed in such a way that it should be safe for use, creating least pollution and consumes less energy. We always consider development cycle, cost, quality, and other factors and ignore the negative effects like environmental pollution.
- *Process and production:* Process has to be designed so that it conforms to the green supply chain management initiatives to reduce environmental negative impact. Efficient and effective production strategy to reduce energy consumption which includes reducing waste material.
- *Business Partners selection:* This involves electing suppliers or vendors who have proven track records on practicing lean manufacturing and using environment friendly material.
- *Logistics Design:* Efforts should be practiced to reduce fuel consumption. This we can be achieved by setting up suppliers near to the OEMs (Original Equipment Manufacturers) and its Hubs.
- *Packaging Material:* Replacing package materials which are eco-friendly can be re-used and re-cycled.
- *Information Technology:* Green IT (Information Technology) is comprised of strategies and best practices for optimizing the usage of computing resources and reducing the environmental footprint of technology.
- *Green Building:* Deploying greener practices in design, construction, and maintaining the buildings. Using energy efficient bulbs, natural lightning saves considerable energy. Water has to be recycled for day to day use.

V. BENEFITS AND CHALLENGES

The green supply chain brings more economic benefit than the conventional supply chain. Green supply chain initiatives are adopted to help reduce costs, increase efficiency, customer satisfaction, increase market share, manage risk more effectively, and increase competitiveness [4]. GSC will help gain a competitive advantage and attract customers. It is a technical improvement in products and processes intended to enhance resource efficiency.

Although customers may not be willing to pay more for green products, they would prefer them if their prices are the same as the standard ones. Barriers to GSC development include fear of large investments, cost, and the lack of knowledge. The globalization of the supply chain has affected how organizations manage their supply chains. It requires organizations to study cultures, policies, and norms throughout the world for thoughtful and competitive supply chains [5].

VI. CONCLUSION

GSC issues have drawn the considerable worldwide attention of researchers, academics, and practitioners. A green supply chain requires that suppliers to consider products and environment-related management simultaneously, thereby adding environmental value to products. Robust supply chains have great benefits and should be considered a good investment. Although governments, societies, and business organizations all over the world support GSC initiatives, GSC is still an evolving concept that will continue to be an important research agenda.

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