

Green supply chain management :A road to sustainable sourcing

MANJIT KOUR¹

Abstract

With increase in environmental concerns during the past decade, a consensus is growing that environmental pollution issues accompanying industrial development should be addressed together with supply chain management, thereby contributing to green supply chain management (GSCM) (Sheu et al., 2005). Green supply chain management has emerged as a proactive approach for improving environmental performance of processes and products in accordance with the requirements of environmental regulations. The supply chain consists of those activities associated with manufacturing from raw material acquisition to final product delivery. A green supply chain aims at confining the wastes within the industrial system so as to conserve energy and prevent the dissipation of harmful materials into the environment. Present paper is a modest attempt to give an overview of the concept and scope of Green supply chain management (GSCM). The paper would also highlight the relevance of the concept of GSCM for sustainable sourcing.

¹ Assistant Professor, Department Of Commerce, DAV College,Sec-10, Chandigarh.

Introduction

With increase in environmental concerns during the past decade, a consensus is growing that environmental pollution issues accompanying industrial development should be addressed together with supply chain management, thereby contributing to green supply chain management (GSCM) (Sheu et al., 2005). One of the bigger issues facing companies these days is the actions of suppliers. Companies today are being held accountable for environmental problems created by suppliers. The supply chain consists of those activities associated with manufacturing from raw material acquisition to final product delivery. A green supply chain aims at confining the wastes within the industrial system so as to conserve energy and prevent the dissipation of harmful materials into the environment. Green supply chain management (GSCM) which is defined as “green procurement+ green manufacturing+ green distribution+ reverse logistics”. As a more systematic and integrated strategy, GSCM has emerged as an important new innovation that helps organizations develop “win-win” strategies that achieve profit and market share objectives by lowering their environmental risks and impacts, while raising their ecological efficiency

Traditional supply chain v/s Green supply chain

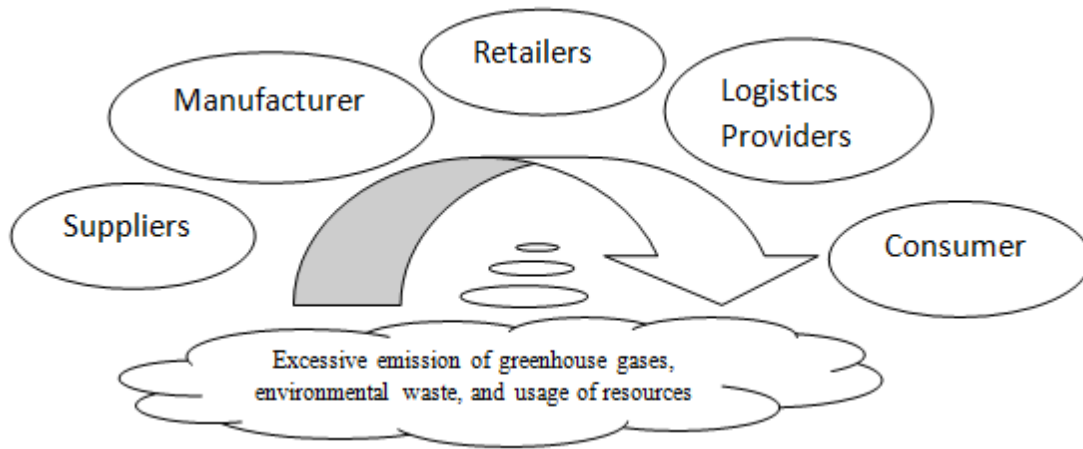
The traditional supply chain comprises five parts: raw material, industry, distribution, consumer, and waste. Each of the links in the supply chain can be a reason for pollution, waste, and other hazards to the environment.

A green supply chains aims at confining the wastes within the industrial system in order to conserve energy and prevent the dissipation of dangerous materials into the environment. It recognizes the disproportionate environmental impact of supply chain processes within an organization.

Characteristics	Conventional SCM	Green SCM
Objectives and values	Economic	Economic and ecological

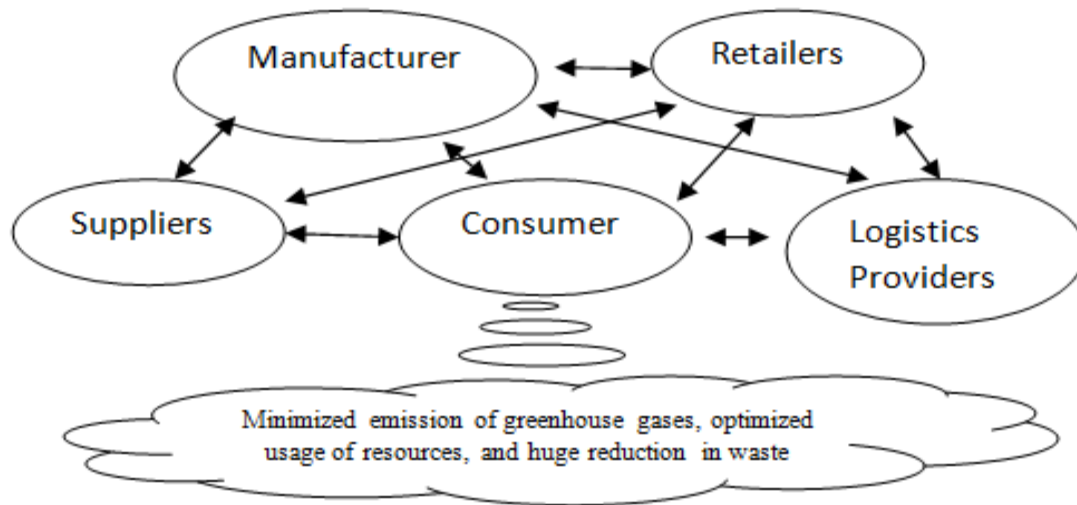
Ecological optimization	High ecological impacts	Integrated approach Low ecological impacts
Supplier selection criteria	Price switching suppliers quickly Short-term relationships	Ecological aspects (and price) Long-term relationships
Cost pressure and prices	High cost pressure Low prices	High cost pressure High prices
Speed and flexibility	High	Low

Traditional supply chain



In a traditional supply chain, the flow of materials and information is linear and from one end to the other. There is a limited collaboration and visibility. Green Supply Chains consider the environmental effects of all processes of supply chain from the extraction of raw materials to the final disposal of goods. Within the Green Supply Chain each player motivates other players to go Green and provides the necessary information, support, and guidance

Green supply chain



Approaches to GSCM implementation

A number of approaches for implementing GSCM practice have been proposed in previous literature, in which they are aimed at mitigating the risks associated with green supply chain interruptions or delays and protecting a company's reputation and brand image from damaging public controversies. Lamming and Hampson (1996) explored the concepts of environmentally sound management (e.g. life cycle analysis, waste management, product stewardship and the like) and linked them to supply chain management practices such as vendor assessment, lean supply, collaborative supply strategies, establishing environmental purchasing policy and working with suppliers to enable improvements. Lippmann (1999) proposed various critical elements for the successful implementation of supply chain environmental management. Those components include the production of written GSCM policies, supplier meetings, training, collaborative R&D, top-level leadership, cross-functional integration, effective communication within companies and with suppliers, effective processes for targeting, evaluating, selecting and working with suppliers and restructuring relationships with suppliers and customers. US-AEP (1999) improved understanding of industry approaches to supply chain environmental management (SCEM) by focusing on seven major electronics firms. Bowen *et al.* (2001) conducted an exploratory analysis of implementing patterns and inductively derived three main types of green supply. The first type, i.e. greening the supply process, represents adaptations to

supplier management activities, including collaboration with suppliers to eliminate packaging and recycling initiatives. The second type, i.e. product-based green supply, attempts to manage the by-products of supplied inputs such as packing. The third type, i.e. advanced green supply, includes more proactive approaches such as the use of environmental criteria in risk-sharing, evaluation of buyer performance and joint clean technology programs with suppliers.

Green supply chain management in companies

The field of supply chain management has more recently directed its attention to the role of the supply chain in both (a) impacts to the natural environment and (b) the generation of environmental performance change. This shift in our expectations for the supply chain has arisen from growing social pressure, legislative changes around packaging and end-of-life goods, identified supply chain risks, and increasing use of environmental requirements being cascaded from customers to suppliers. An increasing number of organizations have introduced 'greening' requirements to both upstream and downstream supply chain activity—purchasing clauses, targets, practices, and technologies. A Green Sustainable Supply Chain can be defined as "the process of using environmentally friendly inputs and transforming these inputs through change agents - whose byproducts can improve or be recycled within the existing environment. This process develops outputs that can be reclaimed and re-used at the end of their life-cycle thus, creating a sustainable supply chain." The whole idea of a sustainable supply chain is to reduce costs while helping the environment. Many people would argue that being environmentally friendly increases your costs. In the past, most companies were focused on reducing unit costs. Many companies later evolved into looking at total landed costs with the on-set of global trade. Companies also started looking at the usage costs with a piece of equipment (i.e. what are my cost per copy when using a copier). In today's "sustainable" world the thinking should be what is the life cycle costs of this part, piece of equipment or supply chain process. Sustainability could be a tremendous weapon for companies to reduce costs. Sustainability can also be profitable. GE now has an "Ecomagination program where they are focused on growing their revenue stream from environmentally friendly products". They recognize the opportunity associated with saving the environment. Many utility companies are offering customers environmentally produced power and charging a premium for that offering. Grocery stores are able to charge a higher price

on organic food because people are willing to pay a premium for food grown organically. Sustainability can be a competitive advantage for many companies. If they can develop a sustainable supply chain think of the money that can be saved by not having to dispose of harmful by-products, reducing obsolescence, decreasing the amount of money spent on scrap and the resources spent on adhering to regulatory issues from a sustainability standpoint.

GSCM practice can be viewed as the primary strategy capable of complying with the requirements of legislations and maintaining the competitive advantage. At times, the environment issues are becoming non-tariff trade barriers for the exports. Hence, industries in Europe and Japan- are shifting to environment friendly products or eco-products as the business strategy for future sustainability and competitiveness. The supply chain is comprised of a series of entities, activities, customers, cultures, and goals that frequently fail to find alignment on anything but the most basic of concerns. Very few activities in a supply chain are likely to succeed if they are not accompanied by some form of relationship control that will (a) justify the level of investment for both parties and (b) guarantee its implementation.

Companies of all sizes are further enhancing these fundamental supply chain changes by considering the environmental impact — and related bottom-line effects — of their decisions and actions. They have increased their competitiveness by engaging in such environmental performance- enhancing activities as

- Reducing the obsolescence and waste of maintenance, repair and operating (MRO) materials through enhanced *sourcing* and inventory management practices
- Substantially decreasing the costs associated with scrap and material losses
- Lowering the training, material handling, and other extra expenses associated with hazardous materials
- Increasing revenues by converting wastes to by-products
- Reducing the use of hazardous materials through more timely and accurate *materials tracking* and reporting systems
- Decreasing the use and waste of solvents, paints, and other chemicals through chemical service partnerships
- Recovering valuable materials and assets through efficient *product take back* programs.

A number of companies have successfully applied environmental accounting methods to supply chain management decisions. Some examples from well known companies include:

- GM **reduced its disposal costs by \$12 million** by establishing a reusable container program with its suppliers.
- Commonwealth Edison, a major electric utility company, **realized \$25 million in financial benefits** through more effective resource utilization.
- Andersen Corporation implemented several programs that reduced waste at its source and **had internal rates of return (IRR) exceeding 50%**.
- Public Service Electric and Gas Company **saved more than \$2 million in 1997** by streamlining its inventory process to avoid product obsolescence and disposal

Conclusion

Although green supply chain management is a new concept and there are some companies who are still struggling to understand its concept and green their supply chain for their benefit and benefit of humankind. Also methods for determining a successful green supply chain management are new and are not fully developed. However, organizations can effectively and efficiently “green” the supply chain by integrating existing environmental standards and innovation uses of new materials and new manufacturing processes. To obtain efficient and effective in GSCM, collaborative among all important stakeholders must be strongly concerned.

Bibliography

Al-Jarrah, O., and Abu-Qdais, H. “Municipal Solid Waste Landfill Siting using Intelligent System.” *Waste Management*, 2006, 26, 299-306.

Alagoz, A. Z., Kocasoy, G. “Determination of the Best Appropriate Management Methods for the Health-care Wastes in Istanbul.” *Waste Management*, 2008, 28, 1227-1235.

Birchard, K. "Out of Sight, Out of Mind, ... the Medical Waste Problem." *The Lancet*, 2002, 359:9300, 56.

Bowen, F. E.; Cousine, P. D.; Lamming, R. C.; Faruk, A. C.,(2001). Explaining the gap between the theory and practice of green supply. *Greener Manage. Int.*, 35, 41-59.

C. W. Hsu; A. H. Hu, "Green supply chain management in the electronic industry", *Int. J. Environ. Sci. Tech.*, 5 (2), 205-216, Spring 2008

Dayna Simpson, Oregon State University, and Danny Samson, University of Melbourne, "Developing Strategies for Green Supply Chain Management", *Decision Line*, July 2008

Gilbert, S. "*Greening supply chain: Enhancing competitiveness through green productivity*". Tokyo: Asian Productivity Organization, 2000.

Johnny C. Ho, Maurice K. Shalishali, Tzu-Liang (Bill) Tseng, David S. Ang," Opportunities in green supply chain management", *The Coastal Business Journal* Spring 2009: Volume 8, Number 1

J.C. Ho, M.K. Shalishali , T. Tseng, and D.S. Ang, "Opportunities in green supply chain management," *The Coastal Business Journal*, vol.8, no.1, 2009, pp.18-31. Available:http://www.coastal.edu/business/cbj/pdfs/articles/spring2009/ho_shalishali_tseng_ang.pdf

H.K. An, T. Amano, H. Utsumi, and S. Matsui, "A framework for green supply chain management complying with RoHS directive," Available:<http://www.crrconference.org/plaintext/downloads/2006kyunganamanoutsumimatsui.pdf>

Hervani, A.A., Helms, M.M., and Sarkis, J. "Performance Measurement for Green Supply Chain Management." *Benchmarking: An International Journal*, 2005, 12, 330-353.

Lockwood, C. "Building the Green Way". http://summits.ncat.org/docs/HBR_building_green_way.pdf

Modi, S., & Mabert, V. (2007). Supplier development: Improving supplier performance through knowledge transfer *Journal of Operations Management*, 25(1), 42-64.

www.cleanerproduction.com