Effective Green Supply Chain Management in Industries

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***Abstract*— After globalization of markets, organizations are striving very hard to improve their competitiveness in a globalised market. In the recent past, supply chain management (SCM) has played very crucial role in improving efficiency of different operations across whole value chain. In present economic scenario, organizations are trying to achieve sustainable competitiveness in global markets. Sustainability incorporates the concepts of economic, social, and environmental performance. Green supply chain management (GSCM) practices comprise green design, reducing energy consumption, reusing/recycling material and packaging, reverse logistics and environmental collaboration in the supply chain. This paper highlights latest developments in implementing green supply chain management practices towards making green supply chain management more effective and environmental friendly in various industries.**

***Index Terms*— Environmentally-friendly products, socially responsible enterprise, low carbon and environmental protection, green government procurement**

I. INTRODUCTION

With the growing public awareness of environmental protection, consumers in particular are increasingly demanding environmentally-friendly products. Their viewpoint on green consumption and actions to protect the environment will promote the development and production of environmentally-friendly products, with associated benefits in resource saving and environmental protection. Consumers are regarded as the end users, their green consumption patterns will urge enterprises to implement green supply chain programs and increase their green competitiveness. Furthermore, the public's increasing recognition of green products will promote a change from the traditional procurement mode to green procurement for governments and enterprises. With huge buying power represented by government and large enterprises, green procurement can quickly promote changes in production throughout the industrial supply chain.

II. GREEN SUPPLY CHAIN MORE BENEFICIAL AS COMPARED TO TRADITIONAL SUPPLY CHAIN

Manuscript received July 21, 2015

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The green supply chain focuses on changes in the following five aspects compared to traditional types of supply chain:

[1]The goal: The traditional supply chain aims to lower the cost and improve the efficiency of supply chain enterprise so as to maximize the economic benefits. Green supply chains also seek to maximize economic benefits, to decrease the consumption of resources and energy and to reduce the emissions of pollutants – all in an effort to create a socially responsible enterprise, and to balance the economic benefits, social effects and environmental effects.

[2]Management structure of supply chain: For green supply chain management, environmental performance is included in the enterprise's internal and external management,
which is lacking in traditional supply chains?

[3]Business model: A green supply chain means a more complete business model. Elements including low carbon and environmental protection must be included in the entire logistics and supply chain to realize a complete green and low carbon supply chain system through the whole life cycle, from raw material sourcing and industrial design to production and delivery.

[4] Business process: The traditional supply chain starts with suppliers and ends with users, and the products flow is one-way and irreversible, known as "Cradle- -to-Grave". The green supply chain changes this management mode and hopefully realizes "Cradle-to-Reincarnation". In green supply chain thinking, product flow is circular and reversible and all products must be managed throughout the entire life cycle, and beyond so that "waste" finds a second life or becomes raw material available for new production or other purposes.

[5]Consumption pattern: The consumption pattern of the traditional supply chains is a voluntary initiative governed by consumer interests and business activities. Green supply chains can be promoted through green government procurement, corporate social responsibility, and sustainable consumption education and practices.

III. DESIRABLE ESSENTIAL INFORMATION REQUIRED IN VARIOUS AREAS

Supplier Management and Purchasing Essentials:-

** Must-know green purchasing policies
** Environmentally preferred purchasing
** Green inventory management and procurement plans
** Expert advice on vendor selection
** Purchasing green IT systems

Transportation, Warehousing and Distribution:-
** Green network analysis

** Key considerations for green transportation, network optimization, warehousing and distribution
** Expediting deliveries and conducting follow-up
** Green distribution and transportation with IT systems

Direct Store Delivery, Returns and Recycling:-

** Green Suppliers Network: cost-reduction opportunities & supplier sustainability scorecard
** Direct store delivery planning and processes
** Green continuous improvement process
** Green indirect purchasing
** Crucial end of lifecycle considerations

Value Enhancement Strategies:-

** Green supply chain risk management
** Pivotal supplier product and quality issues
** Important role of product origin and traceability
** Green business intelligence
** Financing and leveraging strategies for purchasing

The Green Supply Chain: Essential Strategies and Foundations :-

** Best practices in green supply chain management
** Green sustainability and carbon neutrality strategies
** Critical tools for ensuring quality
** Supplier assessments for environmental and social responsibility

Carbon Accounting, Sustainability, Renewable Energy, Greenhouse Gases (GHG),
Water and Land Use:-

** Sustainable development within the supply chain
** LEED: sustainable building and green factories
** Embracing corporate social responsibility
** Environmental and carbon accounting issues for the supply chain professional

GHG and Climate Change Regulations, Impacts and Strategies:-

**Regulatory considerations and sustainability strategies
** Imperative global warming perspectives
** Carbon credits, green power and renewable energy credits
** Consumer expectations of a green supply chain

Manufacturing, Demand, Factory, Materials and Network Planning:-

** Green manufacturing, forecasting and strategies
** Green product lifecycle management (PLM)
** Case study: corporate environmental footprint determination
** Outsourcing, building and leasing in a green world
** Green manufacturing systems

IV. Effective Communications Essentially Required For Effectiveness

Supply Chain Solution Software is a streamlined system that provides logistics, global freight, financial services, mail services and consulting to enhance customer's business performance and improve their supply chains. Effective communications throughout the world had commanded virtual world of e-business, e-integration, e making, ecommerce, e engineering, e-procurement, and e-services. General Electric, Wal Mart, Procter and Gamble use e-commerce to communicate directly with suppliers and retail stores. E-commerce requires effective operations management decisions and skills. The goal of operations management is to provide a best synthesis of technology, people and processes. Geographic Information Systems (GIS) and Global Positioning Systems (GPS) are used extensively in location, site selection, land use planning, environment science, transportation systems; trucking companies now track their tracks via GPS technology. In vehicle navigational system, vehicle location systems, emergency vehicle deployment and traffic management are using GIS and GPS for their value chains.

V. Effective Inventory Management Playing A Vital Role In The Industries

Food may spoil if not packaged properly and delivered promptly, so packaging and transportation employees play a vital role in the industry. Various activities includes freight, stock, and material movers, who manually move materials; hand packers and packagers, who pack bottles and other items as they come off the production line; and machine feeders , who feed materials into machines and remove goods from the end of the production line. Industrial truck and tractor operators drive gasoline or electric powered vehicles equipped with forklifts, elevated platforms, or trailer hitches to move goods around a storage facility. Truck driver's transport and deliver livestock, materials, or merchandise and may load and unload trucks. Driver / sales workers drive company vehicles over established routes to deliver and sell goods, such as bakery items, beverages, and vending-machine products.

VI. McDonalds Reduces Operational Waste: A Successful Example

McDonalds set up its first restaurant in the country it infused Rs 400 Crores to set up its delivery mechanism. McDonald's initiative to set up an efficient supply chain and deploy state-of-art technology changed the entire Indian fast food industry and raised the standards of performance to international levels. Today, McDonalds India works with 38 different suppliers on a long term basis and several other stand alone restaurants for its various other requirements. Through its unique cold chain, McDonalds has been able to both cut down on its operational wastage, as well as maintain the freshness and nutritional value of raw and processed food products. This has involved procurement, warehousing, transportation and retailing of perishable food products, all under controlled temperatures.

Conclusions

Green supply chain management can serve as a significant tool to realize a country's green transformation. In the long run, green supply chain management – which takes environmental protection and energy conservation into account during the life cycle of production from design, to resource extraction to manufacturing, marketing and recycling or end-of-life management – will not only reduce environmental impact but also optimize resource allocation, making it an innovative system to foster the country's green transformation.

REFERENCES

[1] [1] Burt David N., Dobler W Donald, Starling Stephen L (2005) .: World Class Supply Management, 7th Edition, Tata McGraw Hill Publishing Company Ltd, New Delhi.

[2] Croom S. R.(2000), The impact of web based procurement on the management of operating resources supply, *The Journal of Supply Chain Management*, winter 2000, pp 4-13

[3] Doherty, N.F., King, M. and Al Mushayt, O.(2003), The impact of inadequacies in the treatment of organizational issues on information systems development projects , *Information and Management*, 41(1), pp. 49- 62.

[4] Jitesh Thakkar , Arun Kanda, S. G. Deshmukh (2009), , Supply chain management for SMEs- A research introduction, *Management Research News*, 33(10), pp.970-993.

[5] Kainumaa, Y. and N. Tawarab, (2006), A multiple attribute utility theory approach to lean and green supply chain management, *International Journal of Production Economics,*101(1),pp.99-108.

[6] Pratt, K.M. (1997). Environmental standards could govern trade. *Transportation and Distribution*, 38(3), pp. 68-76.

[7] Rahimifard, S., & Clegg, A.J. (2007). Aspects of sustainable design and manufacture. *International Journal of Production Research,* 45(18), pp.4013-4019.

[8] R.K. Malviya, Ravi Kant , Enablers to implement green supply chain management: An AHP approach, Proceedings of 2nd International Conference of Industrial Engineering, 20-22 Nov.2013, pp.118-121.

[9] Ruiz-Benítez, R., & Cambra-Fierr, J. (2011). Reverse logistics practices in the Spanish SMEs context. *Journal of Operations and Supply Chain Management*, 4(1),pp.84-93.

[10] Simpson, D., & Samson, D. (2008). Developing strategies for green supply chain management, *Decision line*, 3(4) pp.12-15.

[11] [11] S.U.Bokade, D.N.Raut, B.E.Narkhede (2013), Investigations on service and effectiveness of reverse logistics of consumables and materials, *Proceedings of 2nd International Conference of Industrial Engineering,* 20-22 Nov.2013, pp.94-98.

[12] S. Vachon, R. D. Klassen (2008), Environmental management and manufacturing performance: The role of collaboration in the supply chain, *International Journal of Production Economics,* 111(2), pp. 299-315

[13] Vaidyanathna Jayaraman, Anthony D. Rose, Anurag Agrawal (2008), Role of information technology and collaboration in reverse logistics, supply chains, International journal of Logistics, research & Applications, 11(6), pp.409-425.

[14] Q. H. Zhu, J. Sarkis, (2006) An inter-sectoral comparison of green supply chain management in China: Drivers and practices, *Journal of Cleaner Production,* 14 (3), pp. 472-486.

[15] Qinghua Zhu, Joseph Sarkis, Kee-hung Lai,(2008), Confirmation of a Measurement Model for Green Supply Chain Management Practices Implementation, *International Journal of Production Economics,* 2(2), pp.1-12

[16] Zhu, Q., J. Sarkis and Y. Geng, 2005, Green supply chain management in China: Drivers, practices and performance, *International Journal of Operations and Production Management* 25(4), pp. 449-468.