

**GREEN LOGISTICS: ANALYSIS OF U.S. STEEL**

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**Abstract**

The United States Steel Corporation widely known as U.S Steel is an integrated producer of steel headquartered in Pennsylvania. Owing to the rising concern for global pollution, the producers of heavy and basic raw materials like iron ore, steel are struggling to meet the international standard against pollution. One major controversy that the U.S Steel is recently facing is regarding the discharge of their industry by-products like mercury into the Great Lakes, is harming the ecological balance of the environment. This paper studies the impact of such operations on the environment on a wider perspective and device a green logistics program for the U.S. Steel Corporation which can help them to mitigate impacts of their production activities on the environment.

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## **Introduction**

With an annual production capacity of about 25 million tons, U.S. Steel is the largest integrated steel manufacturer in the world. The primary operations segments of U.S. Steel are located in North America and Central Europe. The company manufactures mainly value added steel and tubular products that are used as intermediaries in the other manufacturing industries in the economy (USSteel.com, 2015). Over the years, U.S. Steel has been restructuring their business strategies and making transformations in their production operations with the changing economic circumstances in the country. However, the large scale of operation and the multiple manufacturing units of US Steel across the country make it more responsible for the environmental hazards. The fact that the U.S. Steel is the leader in the global steel market providing the best quality products to the manufacturing and other industrial sectors makes it essential for them to incorporate green logistics program in their production operations and delivery. Green logistics approach incorporates the supply chain management in a way that can reduce the impact of environmental externalities arising from their logistics activities.

### **1.0 Background**

The main vision of U.S. Steel is to provide integrated steel to the manufacturing units across the world, while complying with the core values of the companies. The main mission of the company is to provide world class steel using the finite resources of the earth judiciously, so that enough resources are left for the future generations. The company being the world leader in the steel manufacturing is committed towards sustainable management of production and logistics operations, so that the fundamental resources of the company are preserved for future use (USSteel, 2015). The company has been making efforts since past decades in reducing consumption of power, reducing emissions of harmful gases and recycling larger volumes of steel scrap as the basic step towards environmental sustainability. U.S. Steel employs nearly 35,000 workers and the long run success of the company highlights that the workers and the stakeholders are well integrated with the ethics and norms of the company (USSteel.com, 2015). They have been conducting their duties with utmost sincerity while protecting the financial as well as capital assets of the company and delivering the world class services.

## **2.0 Literature Review**

### **2.1 Introduction**

The literature review segment of the paper represents a short study about the existing views and theoretical concepts proposed by various authors in context of the subject matter. Therefore, a literature review is useful in analyzing the crucial aspects of the studies in regard to the subject matter and exploits those areas of the study which are not emphasized in the earlier studies. The concept of green logistics has been introduced in mid 1980s and since then, there has been many literary works on green logistics management (Rodrigue, Slack & Comtois, 2001). This section critically analyzes the differential concepts of various authors and highlights the facts that are still needed to be included in this perspective.

### **2.2 Environmental Sustainability in Freight Transport**

According to the Murphy & Poist (2003), environmental sustainability is the major concern for the industries in the manufacturing sector which makes green logistics programs a prime step, towards averting the harmful environmental consequences. The term logistics includes the transport, procurement, distribution and handling of raw materials and final products which are crucial part of production process of any industry. McKinnon (2010) stated that there involved huge energy consumption in the process of transportation and distribution that creates vast impact on the environment and hence, it is a crucial aspect that the industries must be concerned about. According to Sbihi & Eglese (2010), the increasing global distress of pollution and the government concern has put pressures on the industries to reduce their environmental effects of their logistics activities. The distribution of goods through the supply network in both forward and backward directions involved different modes like road and freight transport. The farther the manufacturing units are from the raw material source or the product market, the more is the pollution caused. In this context, Srisorn (2013) stated that the foremost step involved in green logistics management is the proper location choice by which impacts of pollution can be reduced to some extent. The literature work by McKinnon et al. (2015) revealed that green management involved the reverse logistic too. They argued that the resources come back to the nature after going through the vicious cycle of production, distribution and consumption. This

necessitates the use of wastes, industrial by-products and packaging residues to be recycled and reused before disposing off.

### **2.3 Externalities in Transport**

A recent review by Palmer & Piecyk (2010), demonstrates that the movement of cargoes for transportation accounted for about 14% of total world's energy consumption which corresponds to a major proportion of carbon emissions worldwide. Lin & Ho (2008) argued that sustainable use of the freight transport would only be possible if the manufacturing industries seriously think about restructuring their logistical networks in such a way that the traffic growth was controlled in the main parts of the city. Contrary to this, McKinnon (2010) said that adopting energy efficient transport (reducing the carbon content of the fuels) or reducing the intensity of freight transport operations are the ways of reducing the environmental impacts of logistics activities of companies.

### **2.4 Green Logistics in Supply Chain Management**

According to Wang & Gupta (2011), supply chain management is the incorporation of environmental strategies with the supply chain management. It is obvious that the environmental impacts of an industry can be seen in within and outside the corporate boundaries through its supply chain linkages. Srisorn (2013) stated that a company's environmental responsibility is directed towards two major aspects: green supply, purchases and reverse logistics. Recent studies conducted by Sbihi & Eglese (2010), revealed that the larger corporations who are already operating with green principles, always look for those suppliers for their purchases who have adapted the same, in the view of ensuring the environmental sustainability in their entire supply chain.

## **3.0 Findings of the Study**

The concept of green logistics is gaining importance in the operational management strategies because movement, procurement and distribution of raw materials and final products are the core business activities of the U.S. Steel. Thus, making logistics activities sustainable is essential for ensuring environmental protection. The sole objective of the U.S. Steel is to adopt logistics management in a sustainable way while maximizing their profits. The environmental hazards created by the logistics activities of the company are huge because of wide supply chain

network in forward and backward directions (USSteel, 2015). The major benefits of green logistics program are analyzed in this section and the evaluation of cost benefit analysis of such approach in the operations of U.S. Steel. Where most of the industries are emphasizing on the reduction of their logistics costs, in order to strive competition in the international market, U.S. Steel is also adopting green logistics approach.

### **3.1 Social Benefits**

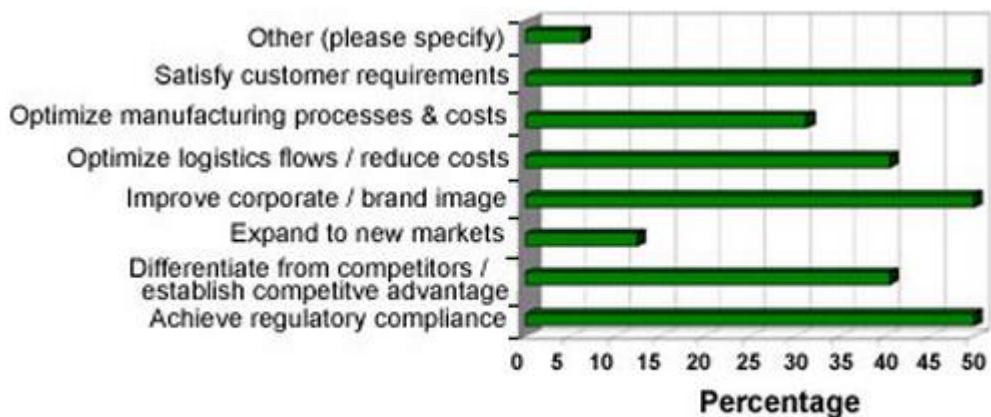
The green logistics management of the U.S. Steel will mainly focus on the sustainable use of resources of the earth. The use of freight transport system is evident in distributing products from the input source to the producer and from producer to the customers. These processes will have tremendous social impact in the form of noise, pollution, vibrations and accidents and the activities of the storage and warehousing also involved wastage of resources used for packaging and storing (Rodrigue, Slack & Comtois, 2001). The major raw materials used by the U.S. Steel are iron ore, scrap and coking coal which are transported through road, rail or water. Since its suppliers' chain is spread widely in the country including in the outskirts, it has become necessary for them to ensure the mobility of raw materials without creating unnecessary congestion in the various modes. It is important for the U.S. Steel Corporation to ensure the safety and health of the society through eco-drive support systems and optimization of transport routes between the suppliers and the market. The sustainable use of fuels in transportation which is the prime step in green logistics will not only reduce pollution, but will also conserve the vulnerable resources for usage by the future generations.

### **3.2 Economic Benefits**

There will be reduction in both economic costs as well as cost of externalities i.e. the cost of pollution and congestion to the society due to adaptation of green logistics program. The green management of the distribution and procurement of raw materials and integrated steel demands involvement of new builders, architects, suppliers and contractors who are well acquainted with the sustainability approach. This will result in creation of additional employment in the economy which can be counted as an important economic benefit of the program (Ubeda, Arcelus & Faulin, 2011).

U.S. Steel has also been engaged in energy management with the help of various environmental committees, which are conducting investigations in the production, management and operational level to create best possible solutions, reducing carbon dioxide emissions and use of energy. The company has come up recently with newest technology of reducing gaseous emissions in the transportation by introducing a CNG supported vehicles in their daily operations. This provided a boost to the production of compressed natural gas in the oil and natural gas industry because of larger scale of production of U.S. Steel (Wang & Gupta, 2011). The following figure shows the percentage increase in potential performance indicators of an industry, due to adaptation of green logistics approach.

**Figure: 1 Implementation Benefits of Green Logistics**



(Source: Ferrell, 2008)

### 3.3 Environmental Benefits

Besides, focusing on the management cost of raw materials coal, energy and scrap, U.S. Steel simultaneously requires putting huge efforts in reducing their environmental impacts. The reusing of the material generated through the production process has helped them in reducing the amount of wastes. By using the gaseous by-products released in furnaces during the production of steel as alternative fuels in other industries will not only help in conserving the exhaustible resources as well as reducing the scale of emissions. The environmental hazards arising from the manufacturing activities like disposal of harmful mercury in the Great Lakes can be mitigated if it starts incinerating its waste before disposing them off or creating proper channels of disposal.



The by-products can be used in the other commercial industries like slag generated can be used in the production of road materials (Ferrell, 2008).

### **3.4 Cost Benefit Analysis**

The green logistics approach demands application of the technology in innovating newer blast furnaces through which emission will be substantially reduced. In doing so, there will be strain on their cost of production and profits initially, but that is less in comparison to the decrease in the cost of social externalities. The other costs of green logistics approach is the delay in delivery of raw materials which may arise because of alternative delivery routes taken by them or the off peak deliveries (Dekker, Bloemhof & Mallidis, 2012). In fact, the cost associated with the green logistics is far less than the benefits arising out of it. The use of sustainable resources and environmental friendly techniques will involve huge cost in terms of their installations. The recycling and reuse of by products will on the other hand generate additional revenues or save the cost of raw materials to some extent. The use of greener management techniques will restore the quality of air, water and environment and help the company in achieving the goal of sustainable development soon.

### **3.5 Implementation of Green Logistics**

The implementation of green logistics program requires the following steps:

1. Creation of awareness among the freight traffic operators to reduce their consumption of fuel as much as possible by regularly maintaining their engines.
2. Proper collaboration with the government so as to get enough financial and mechanical support when the green logistics approach demands a modal shift in their transportation like shift from road freight to water cargoes.
3. Adopting of eco packaging which means using reused and recycled materials in packing and dispersal of final products.

### **Conclusion**

The analysis of major benefits of Green logistics program reveals that the U.S. Steel, who despite being the leading manufacturer of steel in the world, is struggling hard to implement the

real standards of pollution and hence, incorporates such a program in their operational management. Their plan must include the major aspects of the green logistics that is sustaining environmental standards in the transportation, management and operations. The strategic designing of logistics involves mainly the infrastructural management of the supply chain. There is need for constructing proper channels of distribution of raw materials to the manufacturing units, installing alternative plants for power generation, provision of space for recycling the well as disposal of wastes in a sustainable manner. The economic benefits of adopting Green logistics operations are enormous. Where most of the heavy and bulk industries are concentrating in cutting their production cost to raise their profit margin, the policy of green logistics by U.S. Steel in their management of supply chain will benefit them to a huge extent. It will help them to use procure raw materials as well as deliver final products with greater efficiency. The use of greener technologies by the company in their production and distribution will not only ensure a safe environment, but also lead to minimum utilization of resources so that enough resources are saved for the future generations.

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