

Green Supply Chain Integration in Automotive Industry

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INTRODUCTION

The world is undergoing revolution changes; from accelerating products innovation and technological changes to the increase of global market competitions and the changed on consumers' preferences and values, organizations needs to be able to response quickly to this fast changing competitive environment in order to sustain in the market place. As globalization that fuelled by technological advances has reshaped the competitive landscape which caused an individual businesses no longer compete as solely autonomous entities, but rather as supply chain. Companies are increasingly focusing on core competencies. Thus, the success of an organization no longer depends on the product itself but will depend on management's ability to integrate the organization's intricate network of business relationships (Lambert et al., 1998; Holt & Ghobadian, 2009). Finally, more and more companies are focus on the need for more robust approaches to supply chain design and management.

Hervani et al. (2005) proposed that green supply chain management (GSCM) practices which include green purchasing, green manufacturing, materials management, green distribution/marketing and reverse logistics refer to the involvement of environmental thinking into the supply chain management from the extraction of raw materials to product design, manufacturing processes, delivery of the final products to the consumers and end-of-life management (Srivastava, 2007). There are various activities involving in GSCM such as reuse, remanufacturing, and recycling which are embedded in green design, green procurement practices, total quality environmental management, environmentally friendly packaging, transportation, and various product end-of-life practices (Hervani et

al., 2005). Zhu and Sarkis (2004) also state that GSCM involves from suppliers to manufacturers, customers and reverse logistics throughout the so called closed-loop supply chain.

GSCM has emerged as an important approach to reduce environmental risks and environmental burdens in manufacturing and disposal as well as enhance profit and competitive advantages (van Hock & Erasmus, 2000). The study and management of industrial pollution has been a critical issue for society and organizations (Sarkis et al., 2011) and the study of the automotive supply chain and environmental issues is important because its scope is international (González et al., 2008). Recognizing the importance of sustainable supply chain in automotive industry, this article aims to investigate the importance of environmental issues which can be achieve by implementing green supply chain integration in the automotive industry. The review of literature will lead the direction of green supply chain integration on outcome of organization such as operational performance and competitiveness.

BACKGROUND

Environmental issues have become a critical issue for governments and organizations around the world since last decades (Vanalle et al., 2011). The global automotive companies face increasing pressures in the environmental issues (Lee & Klassen, 2008) and the impacts on the natural and human environment along all stages of the product's life cycle (Koplin et al., 2007). Automotive companies had to decrease environmental damages due to the increase of pressures in environmental issues (Geffen & Rothenberg, 2000). As a result, regulations have been created to

induce organizations to adopt sustainability strategies to improve their economic, social and environmental performances (Pusavec et al., 2010). They have to respond to increasingly strict governmental regulation and environmental and social expectations by applying management strategies (Commission of the European Communities, 2002). Many organizations have adopted environmental management system over the last decade including the application of lean production principles (King & Lenox, 2001) and pollution prevention technologies (Vachon & Kalssen, 2006) to the supply chain to address the sustainability challenge. A successful green management requires effective coordination of production design, manufacturing, delivery, distribution and a green management supports inter-organizational innovation practices throughout the supply chain (Hong *et al.*, 2009).

Overview of Automotive Industry

The automotive industry comprises a product system that directly and indirectly relates to economic wealth creation as well as impacts on the natural and human environment along all stages of the product's life cycle (Warren et al., 2001). They play an important role for the environmental and social development of our world in the context of sustainability. It has become a widely accepted concept that polluting the environment could harm the company image which could adversely affect its profitability and sales (Seuring et al., 2008). Awareness among the organizations of the propensity for environmental pollution incidents within the supply network to cost in penalties, cleanup and consumer backlash became increasing. A minimum standard of environmental performance also have become increasingly prevalent in the purchasing contracts or guidelines for the organization's suppliers in local or global (Bowen et al., 2001a; Zhu & Sarkis, 2004). This relatively is a new expectation for upstream suppliers goes beyond the more traditional requirements of their customers to reduce costs and improve quality and service (Lambert & Cooper, 2000). Organizations looked into their respective supply chains to assure that only the environmental friendly practices suppliers are being employed. For example, Ford Motor Company required all suppliers to have the ISO14001 certification and the inclusion of "supplier activities" in statements of environmental responsibility for Toyota, BMW and Mitsubishi (Young & Kielkiewicz-Young, 2001).

Green Supply Chain in Automotive Industry



A supply chain is considered sustainable or green when sustainability and sustainable development concepts are applied into the traditional operational principles, i.e., economic, environmental and social friendly practices are considered part of the operational procedures on a regular basis (Pusavec et al., 2010). There are many definitions being brought up by researcher on sustainable supply chain or green supply chain management (GSCM). Srivastava (2007) defines sustainable supply chain management or GSCM as the integration of the sustainable thinking that incorporated into the supply chain, including product design, material sourcing and selection, manufacturing processes, delivery of goods to the final products to the consumers as well as the product management after its useful life also known as reverse logistics (Vanalle et al., 2011). Zsidisin and Siferd (2001) argue that environmental supply chain management is a series of policies and actions on design, procurement, production, bulk dispatch, utilization, reutilization, and disposal, undertaken by businesses out of concern for the natural environment. Skjoett-Larsen (2000) suggested that green should include each link in the chain from initial manufacturer at the raw material stage to the end-user which including production, processing, packaging, shipping, handling, and so on. Besides, Zucatto et al. (2008) defines green supply chain management as a way of environmental improvement that can involve initiatives in purchasing, production, shipping and reverse logistics, including material suppliers, service contractors, salesmen, distributors and final users, all them working together to reduce or eliminate adverse environmental impact from their activities (Zucatto et al., 2008; Vanalle et al., 2011).

In the recent year, there are many researchers explored the influence of a customer's relationship with its suppliers as an increasing share of a firm's total expenditure accounts for purchased inputs (Lee & Klassen, 2008). The bulk of environmental risk shifts to suppliers outside the direct control of the focal firm. However, a high level of environmental performance by a focal firm may be broken down by a poor level of environmental management by its suppliers (Faruk et al., 2002; Handfield et al. 2005) and this resulting reputational risk and the firm competitiveness. Thus, foreign partners such as Ford, GM or Toyota have required the manufacturers to obtain the ISO 14001

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