

CRITICALLY ASSESS THE DEVELOPMENT OF GREEN SUPPLY CHAIN MANAGEMENT IN THE FAST MOVING CONSUMER GOODS INDUSTRY

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ABSTRACT

The current business environment has shifted from the traditional supply chain into the Green Supply Chain initiative. The study aims to assess the development of Green Supply Chain Management (GSCM) in the Fast Moving Consumer Goods (FMCG) industry. The expected result of the study is to provide knowledge and understanding of the implementation of GSCM through collaboration efforts from procurement, material, manufacture, and logistics activities. The study uses case study with relevant sources to gain information and analysis, alongside qualitative methods. In order to complete the implementation of GSCM, green logistics and green marketing are also important to be able to promote and communicate the "Green Message" to consumers. However, the implementation of the GSCM concept requires constant action and monitoring in a systematic way for continuous improvement to maintain the quality of end products.

Key words: Green Supply Chain, Green Initiative, Green Product

1. INTRODUCTION

1.1. Green Supply Chain Initiative

In this era of global business competition in the Fast Moving Consumer Goods (FMCG) industry, the trend of the supply chain has created a business environment which is becoming increasingly larger and more complex to meet customer demands, and one of the main challenges that companies are facing is the phenomenon of "green initiatives" within their supply chain network (Mollenkopf *et al.*, 2010). The current business environment has shifted from the traditional supply chain into the Green Supply Chain concept (Wang and Gupta, 2011). Nowadays, consumers prefer green products that do not have a negative impact on the environment.

The concept of greening the supply chain is usually understood by the industry as a selection of suppliers which are concerned with the environment and conduct their business with only those who are suitable and meet the required regulatory standards (Stuart and Viviek, 2010). However, the Green Supply Chain initiative offers more than that. It is recognised that Green Supply Chain Management (GSCM) provides the

efficiency and synergy amongst the entire supply chain network in each stage, and also assists the company to enhance its environmental performance, financial performance, and reduce waste (Pochampally and Gupta, 2009). This synergy is also expected to enhance the competitive advantage, corporate image and customer focus. However, if the concept of GSCM is to be fully adopted and implemented by companies, it is necessary to have clear connections and parameters between economic performance as well as competitiveness (Kaynak and Montiel, 2009).

2. THE GREEN SUPPLY CHAIN FRAMEWORK

As the effect of environmental problems on the living conditions of the world's population becomes more apparent, an emphasis on environmental awareness has become more prominent (Stuart, 2005). The general public have started to pay more attention to the potential consequences of this global impact from the product itself (Hugos, 2011). Moreover, FMCG players in the market have been increasingly creating environmentally-friendly products to meet

the customer desire (Chopra and Meindl, 2010).

In order to gain an insight into the area of the Green Supply Chain, a basic knowledge of GSCM must first be established. The Green Supply Chain has emerged as a key approach for enterprises seeking to make their business more sustainable (Stuart, 2008). The notion of GSCM implies the insertion of environmental criteria within the decision-making context of the traditional supply chain management. This will cover all aspects including product design, purchasing, sourcing, supplier selection, and manufacturing, as well as logistics (Carter and Rogers, 2008).



Figure 2.1 The Benefits of Green Supply Chain Management

3. RESEARCH METHOD

This research used case study as part of the research design. It defines the case study method as an empirical study which analyses contemporary phenomena in the context of the current business environment and provides a clear picture of the relationship between the phenomena and an organisation, while using a proven source (Saunders, 2007). Therefore, the case study method allows the researcher to explore

phenomena which are being developed, such as a concept for new business, the newest methods, and perspectives related to the issues (Bryman and Bell, 2007).

The research presents a given amount of information from several proper related resources throughout the entire study. The qualitative approach is the basis of this study as it will cover concepts of research objects and case studies to ensure the subjectivity of the research (Collis and Husey, 2003).

4. GREEN SUPPLY CHAIN IMPLEMENTATION

Case study strategy is suited to the research, since the study will analyse and assess the phenomenon of GSCM development, which is becoming more prominent in today's business competition.

In early 2012, a number of FMCG companies attempted experiments and projects to improve their "green capability" (Chopra and Meindl, 2012). Coca-Cola Company, one of the biggest FMCG producers in the world, became the leader when they developed their mineral water product in Indonesia. As a company that has more than 100 years of experience in running its business, Coca-Cola Company have thrived and stepped forward into the future business competition. They have established long-term goals to be aware of the trends that will emerge in the beverage industry and to be more responsive towards the needs of consumers (Coca-Cola Amatil, 2012). This can be seen from several development projects which have already been completed and are to be launched by Coca-Cola Company globally.

The mineral water product developed by Coca-Cola Company Indonesia in 2012 shows the company's commitment to taking action for a sustainable environment by applying the concept of GSCM. The new product offers a positive impact for the environment and also encourages consumers to participate in order to create a safer environment by consuming its product.

4.1. Green Procurement

Due to the rising consciousness in recent decades related to environmental protection, many issues affiliated to supply chain activities have been discussed by businesses and governments at all levels (Mollenkopf *et al.*, 2010). Differing from the traditional supply chain, GSCM concerns itself with environmental impacts and material utilisation issues, which make the selection of suppliers a more complicated decision than usual (Pochampally *et al.*, 2009).

The required interface aspect for green procurement will require collaboration amongst suppliers, manufacturers, and producers to agree with the concept and production of the green initiative in the entire supply chain network (Manuj and Mentzer, 2008), with green procurement becoming the initial stage to begin. In addition, the procurement team should provide education to its suppliers, essentially to use proper and efficient materials for pollution prevention (Stuart and Barry, 2008).

The role of green procurement in the GSCM concept will require the creation of a healthy relationship with the buyers first level of suppliers and to establish a platform to build a model with which to align incentives for suppliers, manufacturers, and other service providers (Wang and Gupta, 2011). Green procurement aims at the overall expenditure of organisations, products, and services by removing or minimising the usage of "hazardous materials" in the entire supply chain (Stuart and Barry, 2008). This is also reduced in the waste treatment of end-of-life products and other products. In other perspectives, green procurement emphasises waste reduction at the source and sets up the procedure to consider this before procuring any goods (Viviek, 2008). Moreover, there are a number of reasons why green procurement should continue to be promoted within organisations and across the value chain (Corbett and Klassen, 2006).

Coca-Cola Company Indonesia are working together with their global suppliers in Thailand, Vietnam, and Mexico who are able to produce the type of green materials required to put a green element into the product (Coca – Cola Amatil, 2012). This

green procurement stage is a fundamental point where the company must collaborate with "green suppliers" (Hugos, 2011). Green procurement approaches are able to offer a number of cost savings by focusing on minimising the consumption and use of basic materials (Awaysheh and Klassen, 2010).

4.2. Green Materials

Green procurement and green manufacturing stipulate that the products designed and produced have the minimum impact on the environment (Wang and Gupta, 2011). In other words, the materials and energy consumption must be minimised, including minimising the materials' content and type, minimising the materials and energy consumed during usage, minimising scraps during production, as well as minimising disposal in the production process (Simoneau, 2008).

While the selection of materials needed to produce products to satisfy the multitude of properties both desired by consumers and demanded by market competition is complicated enough, extending the requirement to incorporate environmental needs further complicates the decision process (Wang and Gupta, 2011). Nevertheless, it is important that product designers select materials and processes which are also able to minimise the impact on the environment (Jedlicka, 2009). Furthermore, other considerations include reducing the amount of raw materials used, minimising the number of components in the product, and minimising the carbon footprint over the entire life cycle of the product (Wheatland, 2007).

Coca-Cola Company Indonesia use preform as the primary material for their mineral water product. Preform is made from PET, which is produced by the petrochemical industry using ethylene glycol and teraphthalate acid through a polymerisation process and then formed into an fpolymer (PET). PET has hygroscopic characteristics, meaning the PET easily absorbs moisture from the air and will equally distribute moisture to the surrounding air.

4.3. Green Packaging

Packaging is perhaps the most visible element of a Green Supply Chain. In most cases, a typical consumer sees the packaging long before they get to see or touch the product (Sustainable Packaging Alliance, 2012). From the packaging, we derive clues about how environmentally conscious the organisation has been during the production, procurement and logistics activities (Stuart and Barry, 2008).

Traditionally, packaging's primary function was to safeguard the product during movement and storage prior to its consumption (Wang and Gupta, 2007). However, green packaging will result in less damage for the environment than the traditional forms of packaging as packaging waste is one of the highest sources of environmental degradation. Therefore, there are enormous opportunities for research and development teams to improve this aspect (Green Blue Report, 2012). Green packaging is also able to affect the rest of the Green Supply Chain activities and any additional logistical costs can be more than recouped by the reduced consumption of raw materials for packaging use (Crane, 2006).

Stuart and Sood (2010) provide a framework for how green packaging differs from traditional packaging, as seen in Figure 4.1 below.

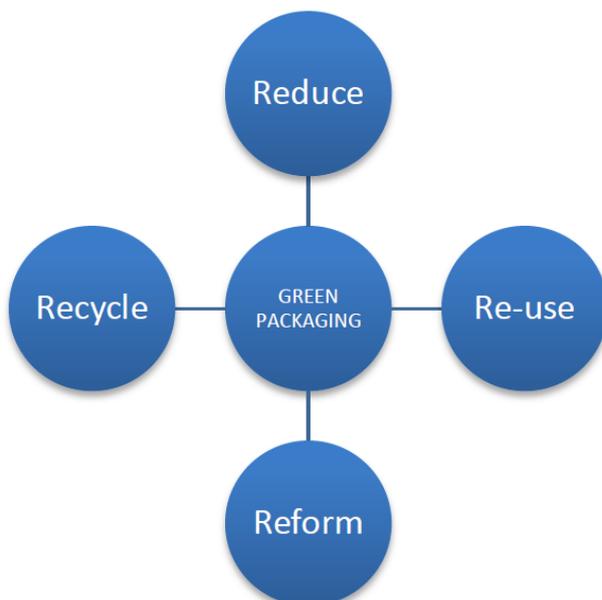


Figure 4.1 Green Packaging Framework

Reduce Packaging

Consumers increasingly have a belief that organisations are overusing packaging. This places great obligation on the consumers to dispose of the packaging in an appropriate manner and may even result in feelings of overconsumption. In addition to minimising the use of packaging to its bare minimum, there is still a need to convey a message saying that the prime reason is to reduce the environmental impact and also increase the product's acceptance by an environmentally proactive population.

Reuse Packaging

This is probably the best way to deploy packaging. In contrast to other methods, here the organisation takes full responsibility for taking the packaging from the consumer and putting it back into reuse in a closed loop chain. This is particularly relevant in products where the company is responsible for delivery of the goods to consumer premises, such as deliveries to industrial/business customers or to end-consumers for goods.

Recycle Packaging

Where the packaging cannot be collected and reused by the company due to the nature of the transaction or the packaging, then it should be easily recycled through the most efficient and environmentally sound method of putting it back into use for either the same or similar products. Recycling programmes are now operating in many countries for most recyclable products and much packaging also now carries instructions on how to recycle it.

Reform Packaging

Reforming packaging includes going to the very core of the reasoning for why packaging is used and examining just how the same function can be fulfilled without any accompanying environmental impact.

For many organisations, packaging presents one of the most readily available opportunities to both reduce costs and

reduce the overall environmental impact (Sustainable Packaging Alliance, 2002). By enabling suppliers to suggest design, material, and other related changes as a part of the sourcing process, organisations can often achieve significant savings.

However, the benefits of green packaging are not only restricted to cost reductions. Packaging is frequently the first thing that consumers notice about a product and there is a large primary impression made on the customer. This is before they see, feel, touch, or use the product itself.

The implementation of green packaging also assists the company to analyse the future business scenario and helps to adopt earlier in competition, manage risks in a systematic way, and exploit the benefit of business opportunities that may arise.

The development and implementation of short height, lightweight thread finishes by Coca-Cola Company Indonesia for the PET bottles is well advanced. CCE (US & Canada) and FEMSA (Mexico) have been early adopters of short height thread finishes within the Coca-Cola system. There are currently three major short height thread finish solutions for PET bottles:

1. **PCO 1881**: Adopted by Coca-Cola China and three beer manufacturers in Germany. This finish is expected to become the new industry standard for PET beverage bottles.
2. **PTOC** (Plastic Twist Off Crown): Adopted by CCE (US & Canada)
3. **Alcoa 1873**: Adopted by FEMSA (Mexico)

All three short height finish solutions offer PET weight savings of approximately 1.3 g and closure weight savings of approximately 0.5 g, driven through a reduction in the height of the thread finish of 4–5 mm versus the current standard PCO 1810 finish. Coca-Cola Amatil that produces ADES has adopted the PCO 1881 short height thread finish for PET bottles as part of a total PET lightweight programme. The basis of this recommendation is that this project provides an opportunity for Coca-Cola Amatil to:

1. Deliver total packaging system cost savings of \$7.0 million/year by reducing the closure and PET bottle weight.

Capital investment required is \$15.55 million.

2. Help meet its corporate sustainability goals. It is estimated that Coca-Cola Amatil will save 3,000 tons of PET and 500 tons of HDPE through this lightweighting initiative.

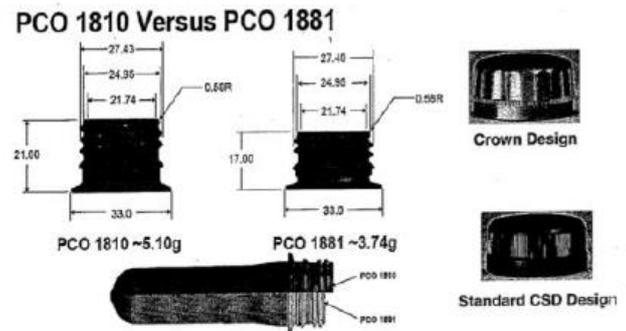


Figure 4.2 PCO 1810 versus PCO 1881

Current light-weighting initiatives are focused on the development of new lightweight, short height thread finishes which aim to reduce thread finish weights by approximately 25% (providing a 5% total resin savings on a 25 g preform).

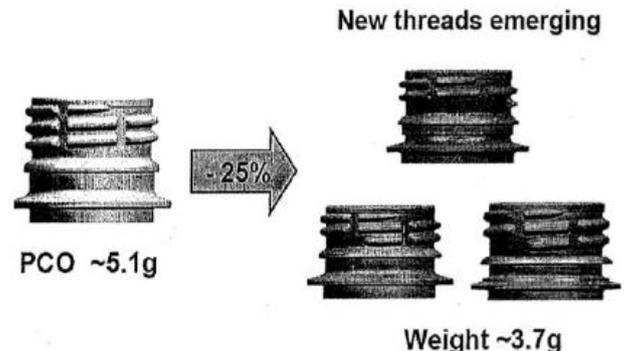


Figure 4.3 Comparing PCO 1880 with PCO 1881

PCO 1881 offers a PET weight savings of 1.3 g compared to PCO 1810, through a reduction in height of 4 mm. PCO 1881 has been tested and found to be successful for applications up to 2.5 L in CSDs, using two piece closures.

It should be noted, however, that the PCO 1881 bottles showed significantly more finish distortion than the PCO 1810 bottles in elevated temperature cycle tests conducted by Cola-Cola Company. To overcome this issue, the consensus of the ISBT sub-committee on PCO 1881 development is to increase the wall thickness of the 1881 finish

by 0.30 mm on the diameter, which would bring it back to the thickness of the 1810 finish. Beverage manufacturers that have already converted some or all of their PET beverage bottles to the PCO 1881 format include three German beer companies (Marens, Carlsberg and Harboes).

5. GREEN LOGISTICS

In order to provide another aspect in the development of GSCM, logistics play a crucial part and have a significant impact within the entire GSCM network, especially transportation. Transportation is a critical component which affects the implementation of GSCM (Mollenkopf *et al.*, 2010). In addition to the sustainability of GSCM being associated with an appropriate strategy in regards to transportation activity (Ninlawan *et al.*, 2009), it is important to ensure the maximum load capacity has been utilised on departing and returning journeys. Aligning the route of transportation will reduce the distance and the amount of movement through the overall transportation network (Hugos, 2011). Using alternative energy like Compressed Natural Gas (CNG) has also become more relevant way nowadays to provide more environmental-friendly fuel consumption.

6. CONCLUSION

There are concerns being raised related to protecting the environment, declining natural resources, global warming, climate change, increasing customer expectations of environmentally-friendly products, and the new regulations that have also encouraged companies to enhance their focus on sustainable services, and the supply chain system. Companies nowadays no longer ask why they should be “going green”, but rather ask how they should be doing it. Along with business paradigm changes, a supply chain must evolve to meet every challenge. A systematic way has to be developed to win this new game of putting environmental considerations into the decision-making process, so the company can survive to maintain its profit as well as developing

further along with green initiatives' execution.

One of the key requirements of a successful Green Supply Chain is a collaborative effort (Cuchiella and Gastaldi, 2012). Collaborative approaches to managing supply chain issues can enhance efficiency and thereby save cost as well as gain more profit for the business. Going green within a supply chain network does not mean that the organisations have to spend a lot of money on new products or solutions. All of the initiatives should be conducted through collaboration with each player within the supply chain network.

The implementation of GSCM is also associated with continuous improvement. The most effective tool to conduct continuous improvement is through Life Cycle Management (LCM) methods. Life cycle management is a fundamental point to completing the green initiatives, and is also a comprehensive approach that aims to manage the entire supply chain life cycle to implement sustainable processes (Trowbridge, 2003).

With increasing interest towards the phenomena and development in every aspect of greening the supply chain network and product development process, the challenge is how to effectively and efficiently implement and manage the initiative to achieve positive and outstanding outcomes. Nevertheless, practitioners and academics believe that GSCM is able to enhance the corporate image, improve efficiency, and yield a competitive advantage for the future (Kaynak and Montiel, 2009). Therefore, the analysis and assessment of the stages of GSCM is an intriguing topic.

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