Proceedings of the 4th International Conference on Business and Policy Studies
DOI: 10.54254/2754-1169/166/2025.20898

Strategies for Cost Optimization in Supply Chains with a Focus on Green Development

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Abstract: As global sustainability advances, businesses face demands in their quest for green transformation. However, in this process, companies face many cost control problems. Although researchers have conducted extensive studies on supply chain cost control strategies, there is still a lack of research on cost optimization in the context of green development. The research topic of this paper focuses on the cost optimization strategy of enterprise supply chains under the perspective of green development. Taking Sam's Club as a case study, this paper analyzes the measures implemented by the company to achieve green transformation, and then analyzes the cost management problems and proposes corresponding optimization strategies. The study found that some of the cost control measures taken increased the operating costs as well as the promotional costs of the firms. The research in this paper aims to provide a reference for enterprises to effectively carry out cost optimization under the framework of green development, to promote enterprises to achieve sustainable development, and to provide theoretical support for practice in related fields.

Keywords: Green Development, Supply Chain Cost Control, Supply Chain Management.

1. Introduction

In recent years, as global environmental problems have become increasingly severe, issues such as climate change, resource depletion and frequent natural disasters have become real challenges to the sustainable development of the global economy and society. Improving the efficiency of resource utilization, reducing carbon emissions and realizing green development have become the main direction of transforming the mode of development in various countries. As a major participant in market activities, enterprises, together with their partners, seek green transformation and promote supply chain collaboration to reduce carbon emissions, which is a necessary move to comply with the green development trend. By adding green ideas to supply chain management, supply chain enterprises can not only effectively avoid resource wastage and optimize the production mode of enterprises, but also bring more synergistic benefits to the whole supply chain [1]. Researchers at home and abroad have conducted in-depth studies on supply chain cost control strategies, but there is a lack of research on cost optimization strategies under green development. Supply chain cost management is to manage the costs formed in each link of the supply chain to maximize the reduction of various cost expenditures and improve the profitability of enterprises. It focuses on the integration and cooperation between enterprises, regards the whole supply chain as a cooperative whole, and

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realizes the overall high efficiency and low cost [2]. Should chain cost management be from a systematic global point of view of the enterprise cost management, justified to reduce the cost should be reduced, not only can reduce the cost as far as possible without affecting the enterprise for the customer's service and product quality [3]. Supply chain cost management is a supply chain management method using cost as a means. This means extending the meaning of cost to the operation of the entire supply chain. The goal of cost and transaction costs between companies is to optimize and reduce the total cost of the entire supply chain. Supply chain cost management not only reduces costs but also values the entire supply chain [4]. However, in the process of green transformation of enterprises, the cost control measures taken will bring some problems. The discussion of these problems is very meaningful to how to help enterprises better create a green supply chain.

This paper takes Sam's Club as the research object and explores the strategy of Sam's Club to create a green supply chain by analyzing the initiatives and cost control measures taken by Sam's Club in the context of green development, combined with relevant cost input data.

2. Case Study

Sam's Club is Walmart's high-end membership store. It attracts a wide range of consumers through high-quality merchandise, competitive prices, and warm and efficient member services. In the context of new retail, Sam's Club stores have taken a series of innovative initiatives, such as expanding the customer base in dual dimensions of online + offline, utilizing logistics + cloud warehouse to cover the blank areas of stores, and maintaining customer stickiness through private brands + value-added membership services [5]. In recent years, Sam's Club stores have conducted multidimensional energy-saving and emission reduction measures in promoting green development. These initiatives include digital smart management, energy-saving renovation, use of clean energy, employee energy-saving training, store waste conversion, and surplus food donation. However, these green transformation measures also pose a number of challenges. First, the use of high-efficiency, low-energy equipment and products requires high investment and maintenance costs; second, the use of cleaner energy sources faces energy storage and facility construction challenges; and finally, over-optimization of commodities and ensuring food safety may lead to additional cost pressures.

3. Operating cost analysis and optimization strategies

3.1. Operating cost analysis

3.1.1. Cost and maintenance of energy-saving retrofit equipment

By the end of 2022, Walmart China began to introduce CO2 transcritical refrigeration systems in newly opened stores to serve walk-in coolers and refrigerated freezer display cases at the store terminals, as well as all frozen and refrigerated equipment in the back of the warehouse and processing rooms. The large amount of heat generated by the refrigeration system is recovered through the water cycle and can be used for defrosting food in the store processing rooms and for hot water for staff's daily use. New refrigeration systems are different from other common refrigeration systems in that they require more specialized maintenance plans and measures, which in turn require the recruitment and training of more specialized maintenance personnel. The CO2 transcritical refrigeration system is currently a high-end advanced technology, and the introduction of this equipment requires higher acquisition costs than other equipment.

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3.1.2. Investment and challenges of clean energy storage systems

Sam's Club has installed distributed photovoltaic power generation on the roofs of four major stores in Shenzhen, Dalian and Shanghai, and is gradually purchasing clean energy in Jiangsu, Sichuan and other places. The storage of clean energy and the stable use of energy are difficulties faced by enterprises. The existing relevant technologies are not sufficient to support enterprises in comprehensively promoting the use of clean energy storage systems, because clean energy such as solar energy and wind energy is greatly affected and restricted by natural factors and cannot guarantee energy stability. At present, China's clean energy is gradually moving towards industrialization, but compared with developed countries in the West, the start is still relatively late, the degree of industrialization of clean energy development and utilization is very low, and the gap is large [6]. In addition, clean energy requires the construction of corresponding energy storage systems. The construction of energy storage systems is also restricted by geographical conditions. Detailed research and evaluation are required when selecting a location, which will also increase operating costs.

All of the above issues increase the operating costs of enterprises. Taking 2024 as an example, according to Walmart's official financial report, Sam's Club's operating expenses as a percentage of net sales increased by 46 basis points, mainly due to a decline in fuel sales and an increase in technology spending.

3.2. Optimization strategy

3.2.1. Phased investment to share costs

The initial investment in upgrading a new high-efficiency, low-energy refrigeration system is high, and companies can make a phased investment to reduce the financial risk to the organization of a single large investment. Staging lets investors abandon ventures with low early returns and thus sorts good projects from bad [7]. Make a small investment in the early stage and evaluate the project and the return on investment. If adverse consequences occur, the company can adjust the response strategy in time and change the investment direction to avoid greater losses. If the project is in good condition, the capital investment can be adjusted accordingly. This strategy provides enterprises with greater flexibility and can effectively spread costs.

3.2.2. Introducing new energy storage technologies and co-building energy storage systems

In order to improve energy efficiency, enterprises can adopt more advanced and innovative energy storage technologies or cooperate with the government and energy operators [8]. First, by establishing cooperative relationships with relevant energy operators and jointly building clean energy storage systems, enterprises can reduce the cost and investment risks of a single enterprise. Secondly, by establishing connections with the government obtaining government subsidies and independently developing clean energy storage technologies, enterprises can reduce the financial pressure of developing new technologies.

4. Promotion cost analysis and optimization strategy

4.1. Analysis of publicity costs

4.1.1. Optimize product management and streamline product categories

This strategy can effectively reduce purchase costs and inventory costs, but it also has certain problems. Over-optimization of products may increase the cost of promotion. Sam's Club offers cost-effective products in “mass-market” packaging, it requires strict selection and optimization of

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products, which narrows the range of choices for customers [9]. Some customers do not like to buy a large number of the same type of goods at one time, and reducing the variety of goods is not enough to meet the personalized needs of customers. Enterprises need to formulate corresponding marketing strategies and use highly cost-effective product characteristics to attract customers. They need to increase the investment in publicity costs to let customers understand the advantages of the products sold.

4.1.2. Surplus food donation activities

17 Sam's Club stores across the country have covered the surplus food donation project, effectively reducing carbon emissions and reducing food waste. Food will be affected by the environment during the logistics and transportation process, causing food to spoil. However, in recent years, Sam's Club has frequently encountered food safety issues, which has inevitably caused people to worry about the safety and quality of surplus food. In order to eliminate the negative impact of food safety issues, companies need to increase the publicity of positive news about proactive improvements to convince the public again, which also requires an increase in corresponding publicity costs.

In 2024, for example, Sam's Club stores grew 11% in the advertising business. It gets a strong 10% growth in membership revenue. Sam's Club is highly talked about on social media such as Little Red Book, with more than 250,000 notes, mostly positive, in search of related terms. All of the above data shows that companies are investing in social media advertising and marketing in order to achieve membership revenue growth despite the negative press.

4.2. Optimization strategy

4.2.1. Enhanced cooperation and regular advocacy assessments

To build a more sustainable and cost-effective marketing strategy, enterprises need to focus on enhancing cooperation with existing customers, utilizing existing customer networks, and strategically assessing publicity efforts. Strengthening relationships with current customers is key, and this can be achieved through membership programs, promotional events, and exclusive offers. By engaging customers in such activities, businesses not only retain loyal customers but also encourage them to share positive experiences within their networks. This word-of-mouth marketing serves as a powerful tool for attracting new customers, reducing the reliance on traditional advertising methods, and effectively lowering marketing costs.

Additionally, businesses can explore partnerships with other brands or well-established companies, such as joint product launches or collaborative marketing campaigns. These initiatives, carried out both online and offline, allow companies to share advertising costs, making promotional efforts more affordable and efficient. Such collaborations also offer the opportunity to tap into new markets and customer segments, expanding brand visibility and credibility.

Furthermore, enterprises should regularly evaluate the effectiveness of their publicity campaigns to understand customer preferences and the impact of their marketing strategies. Regular assessments enable businesses to adjust their efforts to meet evolving customer needs, ensuring funds are allocated effectively. This approach not only helps in optimizing marketing expenditures but also guarantees adaptability to market trends, ultimately maximizing return on investment.

In conclusion, a holistic strategy that strengthens customer relationships fosters partnerships, and continuously evaluates marketing performance allows businesses to achieve more effective publicity, reduce costs, and increase customer loyalty, creating a more efficient and sustainable marketing ecosystem.

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4.2.2. Strengthening internal management of enterprise

Enterprises can effectively reduce costs through the implementation of sound internal management strategies, especially when it comes to food safety and public relations management [10]. The first step in this process is to establish strict standardization for food quality management. By improving internal management practices, businesses can ensure that food safety issues are minimized, which, in turn, reduces the risk of food-related incidents that could damage the company's reputation. Food safety problems not only pose risks to consumer health but also lead to significant financial costs, especially in the form of damage control efforts such as recalls, public apologies, and compensation claims. Therefore, by proactively implementing rigorous food quality standards and enhancing internal controls, companies can fundamentally inhibit the occurrence of food safety issues, thus lowering the costs associated with public relations crises.

Another crucial aspect of cost reduction involves the precise control of operational procedures during the transportation of food products. Establishing an efficient and well-supervised transportation system ensures that food quality is maintained throughout the entire supply chain. By setting up robust supervision mechanisms, such as temperature monitoring, real-time tracking, and quality checks, businesses can minimize the chances of food spoilage, contamination, or mishandling during transit. This not only helps to maintain product quality but also prevents potential losses related to damaged goods, refunds, or additional resources required to resolve transportation-related issues.

Finally, companies must have a responsive strategy for managing negative news. In the event of an adverse situation or public relations crisis, it is essential for businesses to act swiftly in controlling the narrative. A timely and transparent apology, along with a clear action plan to address the issue, can significantly reduce the damage caused by negative publicity. By responding promptly and effectively to public concerns, companies can regain consumer trust, prevent the situation from escalating, and reduce the additional costs that may arise from prolonged media attention or a tarnished public image. In this way, businesses can mitigate the financial impact of negative publicity, ensuring that their reputation remains intact while avoiding the long-term costs of damaged brand perception.

In summary, by focusing on strict food safety management, optimizing operational procedures, and handling negative news with agility, enterprises can significantly reduce costs associated with public relations crises, product recalls, and quality issues. These proactive internal management strategies contribute to better resource allocation, enhanced consumer trust, and ultimately, a more cost-efficient business operation.

5. Conclusion

This study found that the various initiatives and cost control measures taken by some Sam's Clubs in the context of green development have increased operating costs and publicity costs. This includes issues such as the costly investment in new equipment and technology involved in energy efficiency retrofits, the use of cleaner energy sources that require consideration of energy storage and facility construction, over-optimization of commodities, and the potential for additional costs associated with food safety. Therefore, it is recommended that enterprises jointly build energy storage systems to reduce operating costs through phased investment, cost sharing, and the introduction of new energy storage technologies; Reduction of publicity costs through increased cooperation and co-branding, regular evaluations and strengthened internal management of enterprises. Scientific supply chain cost management is crucial for enterprises. The main contribution of this article is to analyze the relevant measures and cost management measures of enterprises under the background of green development and put forward suggestions for optimizing enterprise cost management.

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