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Research on Green Logistics and Pathable Path--Taking SF Express as an Example

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Abstract: With the gradual enhancement of global environmental awareness, the logistics industry as an important part of modern economic activities, its operation has a serious impact on the green logistics came into being. This paper takes SF Express as an example, and studies in depth its practice cases and possible paths in green logistics. The results show that SF Express has effectively reduced carbon emissions and improved logistics efficiency by promoting the application of green packaging, upgrading warehousing and transportation technology, and creating a series of initiatives such as a green low-carbon industrial park. In addition, SF Express also actively advocates the theory of green consumption and encourages consumers to participate in environmental protection actions by generating "carbon points" and other incentives through quantifying the effect of carbon reduction. SF Express's green logistics strategy is a reflection of its commitment to environmental protection and provides a green path for other logistics companies to follow. This study has important theoretical and practical significance for promoting green logistics.

Keywords: Green Logistics, Green Transformation, SF Express.

1. Introduction

With the gradual increase in global awareness of environmental protection, the issue has become a focus of general concern for the international community. The acceleration of industrialization and urbanization has led to the increasing prominence of resource depletion and pollution problems, bringing great threats to the survival of mankind. The logistics industry is an important part of modern economic activities, its operation has generated a large amount of waste and pollution. Therefore, it is of utmost importance to search for a logistics solution that can not only satisfy economic requirements but also minimize the environmental impact. [1]. It is against this background that green logistics has emerged. The goal of green logistics is to preserve the ecological concept throughout the entire logistics process, including logistics activities and ecological coordination [2]. It is characterized by environmental protection, economy, coordination and innovation, and aims to realize the improvement of protection and logistics efficiency through technological innovation, management innovation and other means [2].

In addition, the green logistics industry receives strong support through a series of policies and measures at the national level, which aim to provide strong support for the green logistics industry [3]. Green logistics are being gradually transformed by enterprises to improve core competitiveness, while also addressing consumer demand for environmental protection [4]. These enterprises through

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the optimization of logistics processes, improve the green level of facilities and equipment, strengthen staff training, etc., and the formation of a green logistics atmosphere of full participation. Through the use of environmentally friendly packaging, optimize transport routes, improve loading rates and other energy consumption and emissions. Nowadays, the green logistics industry continues to introduce new technologies and new equipment to improve logistics efficiency and logistics costs [5]. Green logistics can be supported by intelligent packaging design, innovative research and development of recyclable packaging containers, and the application of automated sorting systems.

As a leading enterprise in China's logistics industry, SF Express actively responds to national environmental protection policies and is committed to promoting green logistics. The main purpose of this study is to summarize the success of SF Express through its practice cases in green logistics and to provide a green path for other logistics enterprises to learn from. At the same time, this study also aims to reveal the important role of green logistics in the promotion of sustainable development and provide useful references and suggestions for enterprises and the public [6].

The origin, definition, and characteristics of green logistics are summarized in this study, which then leads to a detailed description of the practice of SF Express in green logistics. It further discusses the possible paths of green logistics of SF Express. In summary, it presents the opportunities and countermeasures that SF Express may confront in green logistics.

2. SF Green Logistics

2.1. Current Situation of Green Logistics of SF Express

Since 2021, SF has been committed to building a green and low-carbon integrated supply chain service capability, reducing the impact of greenhouse gases on the planet through the management of carbon emissions in both supply and industrial chains. In recent years, a carbon management system, a self-developed digital carbon management platform called 'Fenghe Ke Platform', has been built by the company to integrate the group's carbon emission and carbon reduction data. SF is dedicated to achieving the integration and unity of commercial and social value while consistently advancing the company's carbon target. 2023, SF has achieved a 15% increase in its carbon efficiency compared with the target base year by promoting low-carbon transportation, building a green industrial park, and researching and developing packageable packaging, which will make considerable progress. The industry's first carbon calculation model at the air waybill level has been created by SF using its carbon management chassis capability. SF also has provided customized green and low-carbon supply chain solutions and services. These solutions and services were for a number of global headline customers. SF has deeply empowered upstream and downstream industry chain partners and jointly promoted the industry's supply chain to move towards a zero-carbon future.

Specifically, the green logistics of SF Express can be divided into three stages: (1) Green Supply Chain 1.0: Create a carbon emission calculation model and ensure transparency in carbon emission data, including warehousing, packaging, transportation, and delivery. (2) Green Supply Chain 2.0: Create a service program that promotes green values through SF in warehousing, packaging, transportation, delivery, and other areas to reduce carbon emissions and enhance customer value. While doing so, we have introduced low-carbon services for individuals, advocated for the use of packaging and recycled cartons, and put in place incentive mechanisms. (3) Green Supply Chain 3.0: Collaborate with business partners in carbon management, contribute to the development of carbon emission verification and carbon asset management in the logistics sector, and promote the financialization of carbon trading. Based on the principle of green investment, SF will lay out low-carbon technologies.

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2.2. SF Express Green Logistics Strategies and Measures

SF Express has adopted some strategies in the field of green logistics, strictly controlling the management of waste in operation. It is committed to the proper treatment of waste through waste classification and resource recycling, to minimize the negative impacts [7]. The company has formulated and implemented a waste separation system, and has actively implemented waste separation measures in office areas and operational sites. For each type of waste, SF have set up clear signs for waste separation and have established specific procedures for disposal. In order to ensure that the exhaust and noise emissions comply with the relevant regulations, SF actively carries out the identification, assessment and management of the exhaust and noise, to minimize the impact on the surrounding area in the course of operation.

SF is not only concerned about the greening of its operations but also committed to promoting the greening of the entire supply chain [8]. The creation of a climate-friendly supply chain and the extension of the green value to the entire supply chain system has been made possible by SF partnering with upstream and downstream partners and customers. In this process, SF Express regards scientific and technological innovation as the key driving force to promote green logistics, and empowers itself with technology to improve the efficiency of each link in the supply chain, energy consumption and carbon emissions. In packaging, transportation, forwarding and other key links, SF introduces new technologies to optimize the operation process and achieve emission reduction.

In addition, SF also actively advocates the theory of green consumption, encourages consumers to use packaging and recycled cartons, and generates "carbon points" by quantifying the effect of carbon reduction, providing incentives such as exchanging SF coupons and participating in "SF Carbon Neutral Forest" new tree planting, etc. SF actively promotes the concept of environmental protection at the social level and is committed to raising public awareness of green protection. Through activities such as the "Box" companion program, it encourages the public to use unused courier boxes for DIY creative transformations, realizing the secondary use of cardboard boxes. This inspires the public to actively participate in environmental protection actions, enhancing the majority of users' perception of SF's green logistics services and fostering a shared commitment to low-carbon and environmentally friendly lifestyles. SF collaborates with users to promote sustainable consumption behavior and reduce carbon emissions while enhancing their perception of SF's green logistics service.

2.3. SF Express Green Logistics Objectives

SF Express has formulated a green logistics strategy based on the general background of global climate change, especially in order to realize the net-zero emission target of the Paris Agreement [9]. Its core objective is to actively promote the company's own carbon neutrality goal in the context of achieving national carbon neutrality by 2060. Furthermore, SF Express has set a specific mid-term emission reduction goal, namely, achieving a 55% increase in carbon efficiency in 2030 compared to 2021. The carbon footprint of every express parcel in 2030 will be 70% higher than it was in 2021, and SF has made a commitment to doing so. By 2050, the company has pledged to reach net zero greenhouse gas emissions along its value chain and has joined the Science-Based Carbon Targets Initiative.

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3. SF Green Logistics Based on Technological Innovation Can Path

3.1. Technological Innovation and Upgrading

3.1.1. Promoting the Application of Green Packaging

SF has promoted safe packaging solutions by introducing the power of science and technology in packaging, committing to green packaging materials, and advocating for safe packaging solutions [10]. Through intelligent packaging design, it can reduce material waste and provide scenario-based packaging solutions to meet different customer needs [11]. At the same time, SF also pioneered environmentally friendly packaging materials such as "inkless printing" cartons, which further reduce carbon emissions in the packaging process. These initiatives are a reflection of SF's commitment to environmental protection, while also providing customers with packaging options that are more environmentally friendly and safe.

SF continuously investigates and implements recyclable packaging containers that have comprehensive functions for various business scenarios in terms of packaging [10]. These containers have realized the application of containers and carriers, which has successfully increased the damage rate of products, shortened the operation time and effectively increased the operation cost [11]. Additionally, SF is actively encouraging the advancement of innovative research and development of recyclable packaging containers, and has developed a set of packages that are appropriate for 19 scenarios. SF has widely used recycled woven bags to replace disposable woven bags in the transit link, and adopted the recycled temperature-controlled packaging technology to replace disposable foam boxes with temperature-controlled recycling boxes for medicines and used the recycled heat preservation box for cold transportation to replace the white foam box, etc. These initiatives not only enhance the environmental protection of packaging but also provide customers with more high-quality and efficient logistics services while promoting its eco-friendliness.

3.1.2. Upgrading of Warehousing and Trans-shipment Technology

Based on big data, SF optimizes the allocation of warehousing resources, improves the efficiency of warehousing and transshipment, and consumes energy in the process. Through the intelligent system to carry out fine management of inventory, inventory backlog and ineffective handling, and realize the greening of warehousing link. The introduction of a fully automated sorting system and site management system by SF has resulted in improved operational efficiency and error rate. The wide application of automated equipment has improved the efficiency of transfer by manual intervention and energy consumption caused by human factors [12].

In the transportation link, SF uses logical algorithms to plan transportation routes with optimal paths by combining the time and distance of express products and other factors, which has resulted in transportation energy consumption. At the same time, integrating freight routes and capacity resources can lead to a more green and low-carbon transportation process when big data and deep learning technology are used [13]. In addition, SF also optimizes the capacity structure, the proportion of new energy vehicles to promote low-carbon transportation; upgrading the vehicle loading capacity, replacement of high axle number of vehicles to enhance transport efficiency; Retirement of high fuel-consumption models, energy consumption, and pollution to achieve more environmentally friendly land transportation. In terms of transportation, SF has increased the proportion of low-energy efficient large freighters to promote green transportation, and upgraded the proportion of new energy vehicles in the base to further reduce carbon emissions.

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3.2. Collaborative Innovation

SF actively builds a green low-carbon industrial park, based on green infrastructure construction and carbon reduction technology innovation, and promotes the green operation of the industrial park in many aspects, such as planning and design, warehouse construction, operation and management. By laying roof photovoltaic, introducing intelligent water and electricity management, optimizing the spatial layout of warehouses, etc., SF have comprehensively improved the efficiency and energy-saving benefits of the transit link, so as to reduce the impact of the transit link on the industrial park. The industrial park's operational efficiency will be improved by these initiatives, as well as the logistics services provided to customers will be more environmentally friendly and efficient.

SF Express takes a proactive approach to promoting cooperation and innovation, and collaborating with upstream and downstream enterprises in the industry chain to create a recycled packaging system together [14]. Through the integration of internal and external resources, SF has comprehensively promoted the verification and practice of the closed-loop chain from the development of the industry, technical research to the realization of express packaging recycling, optimized the plastic recycling pathway, and explored the rational reuse of recycled plastics, in order to build a complete system of "plastic packaging design - production - consumption - recycling - regeneration - high-value application", laying a solid foundation. This will lay a solid foundation for the construction of "plastic packaging design - production - consumption - recycling - recycling - high value application" [14].

Meanwhile, in the grand blueprint of achieving global carbon neutrality, SF leverages cross-sectoral exchanges and cooperation, adhering to the core value of sustainability. By participating in and organizing special seminars on green and low-carbon topics, SF is an important player in the green and low-carbon logistics industry, empowering others and promoting green and low-carbon practices throughout the industry chain [15]. By joining hands with business partners to build a green and low-carbon logistics ecosystem, SF has not only realized win-win cooperation, but also helped to promote global sustainability.

4. Opportunities and Responses

4.1. Opportunities Current

4.1.1. Dual Drive of Policy Promotion and Market Demand

With the deepening of global concern about climate change, countries have environmental protection policies to promote green logistics, which provides policy support and guidance for SF Express. Green logistics has become an essential tool for enterprises to improve their brand image and competitiveness, as consumers are increasingly demanding environmentally friendly products. SF Express can increase its brand awareness and reputation by using green logistics to meet this market's demands.

4.1.2. The Rapidity of Science, Technology and Innovation

Optimizing the logistics process, energy consumption, and carbon emissions can be achieved by incorporating technologies such as the Internet of Things, Big Data, Artificial Intelligence, and other technologies. The progress of science and technology provides more possibilities for green logistics. The research and development and application of green logistics technology can be promoted by SF Express through the use of these technological innovations to improve logistics efficiency and impact.

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4.1.3. Cooperation Between Upstream and Downstream Enterprises in the Supply Chain

SF Express, a leading logistics industry enterprise, is able to collaborate with both upstream and downstream enterprises to jointly support green logistics. Green logistics requires the joint efforts of the entire supply chain, through cooperation, to achieve resource sharing, complement each other's strengths, and the formation of a virtuous cycle of green logistics.

4.2. Responses

4.2.1. Increase R&D Investment in Green Logistics Technology

Green logistics technology, which includes green packaging materials, new energy vehicles, automated sorting systems, and other aspects, should continue to be a focus for SF Express's R&D investment. Through technological innovation, improve logistics efficiency, carbon emissions, market demand and policy requirements.

4.2.2. Promote the Green Transformation of Enterprises Upstream and Downstream of the Supply Chain

In order to promote green transformation in the supply chain, SF Express can work closely with both upstream and downstream enterprises. It can cooperate with suppliers for green packaging materials and promote new energy vehicles with transportation partners. Green logistics synergy can be formed through cooperation and the environmental protection level of the entire supply chain can be improved.

4.2.3. Strengthening Branding and Market Promotion

SF Express can enhance the brand image and market recognition of green logistics by strengthening brand building and market publicity. Publish green logistics, show SF's achievements and commitment to green logistics; carry out green logistics publicity activities to improve consumers' knowledge and acceptance of green logistics.

4.2.4. Improve the Green Logistics Management System

SF Express should establish a perfect green logistics management system, including carbon emission monitoring, energy consumption management, waste disposal and other aspects. The management system's improvement can ensure sustainability by monitoring and managing the entire green logistics process.

5. Conclusion

5.1. Conclusions of the Study

Firstly, SF Express has made remarkable progress in the field of green logistics. By promoting the application of green packaging, upgrading warehousing and transportation technology, and building a series of green industrial parks, the company has effectively reduced carbon emissions and improved logistics efficiency.

Secondly, the green logistics strategy of SF Express focuses on technological innovation and upgrading, cooperation and innovation, as well as brand building and social responsibility.

In addition, green logistics is connected to both policy promotion and market demand, as found in this study. Green logistics are guaranteed by the environmental protection policy, and enterprises are encouraged to switch to green logistics because consumers want environmentally friendly products.

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5.2. Future Prospects

For SF Express, the company should maintain its investment in R&D in green logistics technology. Through technological innovation, improving logistics efficiency, carbon emissions, market demand requirements. Actively cooperating with both upstream and downstream enterprises in the supply chain is also something that SF should do at the same time. In addition, SF should also strengthen brand building and market publicity. The company's leading position in the field of green logistics will be reinforced by this, which will enhance its brand image and market recognition of green logistics.

Relevant policies should continue to support green logistics. The government should also strengthen supervision to ensure that enterprises in logistics activities in strict compliance with environmental regulations.

In addition, green logistics will continue to evolve with new technologies and services due to the ongoing advancements in science and technology.

5.3. Research Limitations and Future Research Directions

This study has achieved some results in exploring the green logistics and path of SF Express, but there are still some limitations and shortcomings. For example, this study is mainly based on the case of SF Express, and does not involve the green logistics practices and paths of other logistics enterprises; at the same time, there are some limitations in data collection and aspects, resulting in some of the conclusions may not be comprehensive and in-depth.

In view of these limitations, future research can be expanded and deepened from the following aspects: firstly, a number of logistics enterprises can be selected as the object of research, comparing the differences and commonalities between different enterprises in the practice and path of green logistics; secondly, the collection of data related to green logistics can be strengthened to establish a more complete indicator system and thesis system; lastly, the application and influence of green logistics in the fields of supply chain management, urban planning and so on can be discussed in depth to provide richer theoretical and practical support for the comprehensive development of green logistics. In the end, green logistics can be explored in depth in the fields of supply chain management and urban planning This will provide richer theoretical and practical support for the comprehensive development of green logistics.

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