

Green Logistics Development of Express Companies in the Context of “Dual Carbon” Strategy Research

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ABSTRACT

In the context of "dual carbon", green logistics as an emerging concept type, not only plays an important role in environmental protection and sustainable economic development, but also can bring great economic benefits to express delivery companies. However, the current development of green logistics technology in China is not mature enough, resulting in the transformation of the courier company is facing the situation of opportunities and challenges. In this paper, we sort out the "dual carbon" background of the development of green logistics courier company status quo, analyze the courier company in the process of transition to green logistics problems and targeted to put forward the corresponding measures to solve them, and hope to be able to other courier company's green logistics development to provide reference and reference.

KEYWORDS

Dual carbon; Express company; Green logistics

1. INTRODUCTION

As global warming and other environmental problems are becoming more and more prominent, reducing carbon emissions has become an urgent task for all countries in the world. In today's state of rapid social development, the rapid development of the logistics industry has brought convenience to the life of the public, but at the same time, it has also caused an increase in energy consumption and carbon emissions. In order to cope with the environmental problems, in 2020, China for the first time put forward the "dual carbon" goal, China's carbon emissions strive to peak by 2030, before 2060 to achieve carbon neutrality. At the same time, with the worsening of global climate change and the popularization of the concept of sustainable development, all industries are actively seeking ways to reduce carbon emissions. The logistics industry as an important link in the global flow of goods, express delivery companies as an important part of the logistics supply chain, its carbon emission status has a direct impact on the environment of the entire logistics industry. In this context, the express delivery company how to develop green logistics in the "dual-carbon" background has become an urgent problem.

In May 2022, the notice of the "14th Five-Year Plan for Modern Logistics Development" issued by the General Office of the State Council pointed out that, "During the '13th Five-Year Plan' period, the total amount of social logistics will maintain steady growth, and in 2020, it will exceed 300 trillion yuan, with an average annual growth rate of 5.6%." In January 2024, the State Post Bureau announced the operation of the postal industry in 2023, and the volume of postal industry sending business in 2023 increased by 16.8% year-on-year, and in 2024, it is expected to increase by 8%. With the good development of China's logistics industry, it is not easy to realize the goal of low-carbon development. Express companies are faced with several challenges: on the one hand, the rapid growth of express

delivery business has led to the continuous expansion of the logistics scale, which in turn has increased the pressure on carbon emissions; on the other hand, the traditional express logistics model has high energy consumption and carbon emissions, which requires in-depth reform and innovation. In this context, the courier company as the main force to reduce carbon emissions, it is inevitable to actively seek to comply with the development of low-carbon economy of green logistics road.

2. DEFINITION OF RELEVANT CONCEPTS

2.1. “Dual Carbon” Targets

The "dual carbon" goal refers to carbon peak and carbon neutrality. Specifically, it means that China's carbon dioxide emissions will reach a maximum by 2030, and then begin to decline gradually; at the same time, through energy conservation, emission reduction, afforestation and other means of carbon reduction, we will strive to achieve a carbon neutral goal of net-zero emissions by 2060, in which carbon dioxide emissions generated by human activities will reach a balanced state with the amount of carbon dioxide absorbed by the natural world. At the same time, through energy conservation, emission reduction, afforestation and other means of carbon reduction, we will strive to balance the amount of carbon dioxide emissions generated by human activities and the amount of carbon dioxide absorbed by nature in 2060, and realize the carbon neutral goal of net zero emissions. The proposal of the "dual-carbon" goal has a positive effect on the response to global climate change and sustainable development, as well as an important impact on China's domestic industrial and economic transformation and development. To realize the requirements of the "dual-carbon" goal, China needs to carry out in-depth reform of the traditional high-carbon economic model and promote the green and low-carbon development of various industries. By accelerating the development of clean energy, promoting energy conservation and emission reduction, and innovating green technologies, we will promote the transformation and upgrading of China's economic structure. The formulation of the "dual-carbon" goal is aimed at addressing climate change, promoting sustainable development and facilitating economic transformation and upgrading, the realization of which will provide China's economy with a solid foundation for long-term sustainable development.

2.2. Green Logistics

From the perspective of management, green logistics refers to the process of green economic management activities to customer satisfaction as the goal, linking the green demand body and green supply body, overcoming space and time constraints for efficient green logistics services. Green logistics throughout the logistics, such as packaging environmental protection, green warehousing, green logistics and transportation. Green logistics can reduce the pollution of logistics activities on the environment, reduce resource consumption, protect the ecological environment, and promote sustainable circular development. It adopts green materials and production technology, reduces dependence on high-carbon energy and high-carbon emissions, realizes green supply chain management, and at the same time strengthens the collaboration of upstream and downstream enterprises in logistics, introduces the Internet of Things and big data technology to form an intelligent and eco-logistics system, and jointly promotes sustainable development and the "dual-carbon" goal by means of supply chain management, transportation optimization, and improvement of warehousing and distribution. "The development of green logistics is therefore not only an important part of the logistics industry, but also an important part of the logistics industry. Therefore, the development of green logistics is not only a necessary way to improve the quality and efficiency of the logistics industry, but also a necessary means to realize the low-carbon development of the country.

2.3. Courier Companies

Courier companies, that is, companies engaged in postal services, door-to-door logistics activities derived from the postal function of the service category of companies, mainly to provide express parcel collection, transportation, delivery and other services. Common domestic courier companies are mainly divided into state-owned courier companies, private courier companies, cross-border e-commerce courier companies, logistics integrated service providers and logistics platforms. Courier companies generally through the railroad, road and air transportation and other means of rapid delivery of customer goods. The main object of the courier company for personal services, each shipment has a courier single number, used to classify each product, the courier from various outlets door-to-door delivery delivery, but also to facilitate customer inquiries on the courier information. China's major courier companies are EMS, Jingdong Logistics, SF Express, Rhyme Express, Home Delivery and so on.

3. "DUAL CARBON" BACKGROUND OF THE EXPRESS COMPANY GREEN LOGISTICS DEVELOPMENT STATUS QUO

Green logistics has developed relatively early in foreign countries and has achieved greater results. Many countries and regions have formulated stringent environmental regulations and standards, requiring enterprises to reduce carbon emissions and adopt green and sustainable logistics methods, which are mainly reflected in the optimization of transport and distribution systems, the promotion of clean-energy means of transport, and the reduction of packaging and waste. Some enterprises have also introduced intelligent technologies and green innovations into their logistics networks to improve efficiency and reduce carbon emissions. At the same time, international cooperation and experience-sharing in green logistics exist to promote the development of global green logistics.

Relative to foreign countries, China's green logistics development is still in its infancy, and the express delivery industry is still in a high carbon emission stage. In June, the study report "Carbon Emissions from China's Express Delivery Industry" was released, and the study found that China's express delivery industry's carbon emissions increased sharply from 18.37 million tons in 2017 to 55.65 million tons in 2022, an increase of more than 200% in this five-year period.

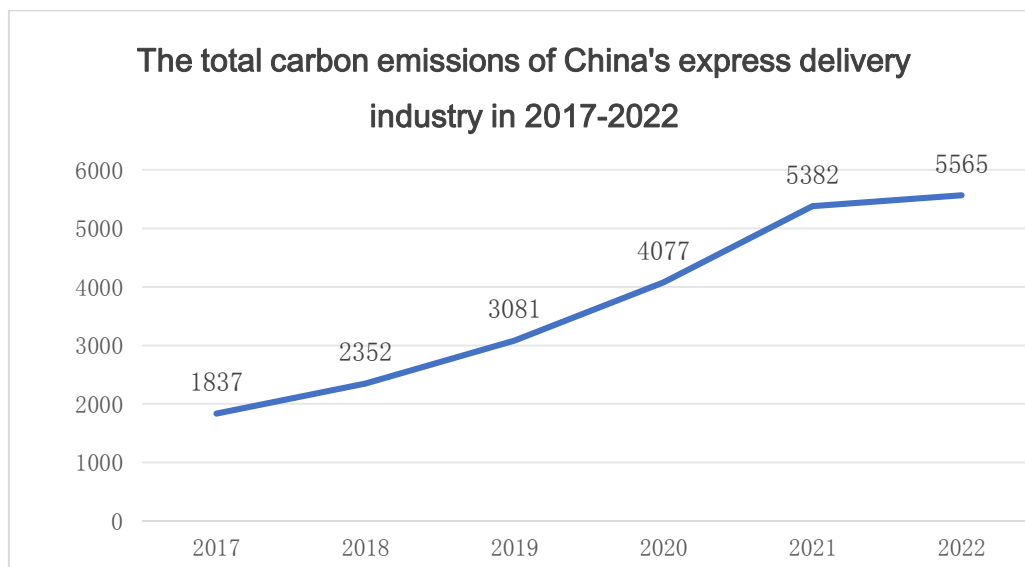


Figure 1. The total carbon emissions of China's express delivery industry in 2017-2022

The carbon emissions of the express delivery industry run through the entire chain, mainly including the storage, transportation and packaging links. According to the study, compared with the packaging and warehousing links, the carbon emissions of the transportation link are more prominent in absolute

volume and growth rate. On the one hand, from 2017 to 2022, the transportation link accounts for more than 50% of the total carbon emissions each year, and the share in 2022 is as high as 62.7%; on the other hand, during these five years, the carbon emissions of the transportation link grew by about 221%, which is much higher than that of the packaging and storage links. Transportation greening is the top priority of green logistics development.

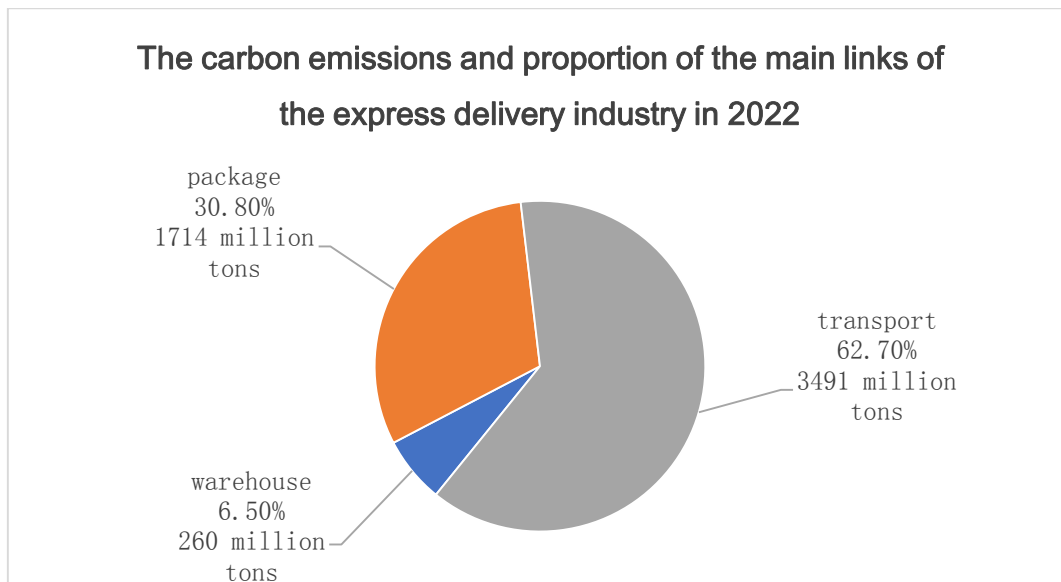


Figure 2. The carbon emissions and proportion of the main links of the express delivery industry in 2022

Since the "dual-carbon" goal was put forward, China's express delivery companies have been increasing awareness of environmental protection, and the Government has also introduced relevant policy support in accordance with the law. On the one hand, China's express delivery companies are gradually aware of the importance of low-carbon, environmental protection, began to take a series of measures to reduce energy consumption and carbon emissions, such as optimizing transport routes, promote electric vehicles, improve the cargo loading rate. On the other hand, the government has also introduced a series of policy support and incentives to encourage enterprises to carry out green logistics transformation and innovation. At the same time, China is also actively promoting the research, development and application of green technologies, such as driverless logistics vehicles and logistics drones.

Express companies have begun to build logistics intelligent industrial park. Jingdong "Asia One" Xi'an Intelligent Industrial Park is one of the largest intelligent logistics centers in Northwest China, which will be put into use in 2019, and all the roofs in the park are equipped with photovoltaic power generation equipment with a capacity of 9MW. Data shows that only from January to October, it is able to generate about 8,500MWh of electricity, equivalent to the electricity consumption of nearly 4,000 ordinary households in a year, which saves nearly 2,600 tons of coal compared to thermal power generation, and reduces carbon emissions by about 5,670 tons compared to purchasing municipal electricity. Meanwhile, through carbon trading and value chain optimization, the company will offset its own greenhouse gas emissions and achieve "net-zero" carbon dioxide emissions in the park. In addition, express delivery companies have shifted from high-carbon to low-carbon packaging, increasing the proportion of 3-layer corrugated cardboard boxes and ensuring that the weight of 3-layer corrugated cardboard boxes does not exceed 400 grams, which greatly saves the use of paper pulp; carrying out a "slimming" treatment of sealing tape, requiring that its width be less than 45mm, and prohibiting multi-layer winding to avoid waste; gradually realizing paperless operations in warehouses; and realizing a "net zero" emission of carbon dioxide through carbon trading and value chain optimization. The operation in the warehouse gradually realizes paperless and electronic face

sheet, greatly reducing the consumption of paper and contributing to the low-carbon economic development and sustainable development of China.

4. "DUAL CARBON" BACKGROUND OF THE EXPRESS DELIVERY COMPANY GREEN LOGISTICS DEVELOPMENT PROBLEMS

4.1. Low Level Of Logistics Intelligence Construction

The realization of logistics intelligent construction can lay the foundation for the intelligent integration of the enterprise's logistics system, production system, procurement system and sales system, to achieve information sharing, thereby reducing the cost of the logistics industry, helping to accelerate the development of the green logistics industry, and to provide information technology support for green logistics, but at present, many logistics enterprises are still lacking in motivation for the intelligent construction. On the one hand, the collision of intelligent logistics and traditional mode logistics makes the transition of the courier company in a dilemma. Emerging courier companies often use the most advanced machines in the industry to ensure high time efficiency in logistics transportation. With the rapid development of the information society, the timeliness of information is getting higher and higher, customers in the choice of courier companies will not follow the old ways, but will choose a higher timeliness of the emerging logistics companies, which makes the transition of the courier company is facing a huge challenge. Courier companies want to replace manpower as soon as possible with machines to achieve logistics intelligence, but abandon the traditional logistics model will produce a lot of waste of resources, but also need a strong capital chain to maintain the transformation and upgrading of enterprises. On the other hand, the courier company's R & D capability and innovation ability is insufficient to lead to a low level of intelligence. Express companies due to insufficient innovation ability in the research and development of optimized packaging materials structure and other aspects of the process is slow. Green packaging materials are far more environmentally friendly than low-end materials, but the cost of high-end packaging materials is twice as much as the cost of low-end materials, courier companies lack of R & D capabilities and can not produce new green technology and increase the amount of manufacturing, so that the use of green materials accounted for a lower percentage of the waste of resources.

4.2. Inadequate Allocation Of Transport Resources

In the research report "Carbon Emissions in China's Express Industry", it is shown that the transportation link accounts for more than 50% of the total carbon emissions every year, and the carbon emissions of the transportation link will grow by about 221% during 2017-2022, and the rational allocation and optimization of transportation resources have become imminent. On the one hand, express delivery companies lack integrated planning for transportation vehicles, transportation personnel and transportation routes. For the distribution of transportation vehicles, the current degree of informationization of most express delivery companies is not high, and they can't deploy vehicles and personnel at the same time, which will lead to uneven distribution of vehicles between regions, with excess vehicles in some regions and insufficient vehicles in others, and it is also difficult to carry out reasonable personnel and vehicle deployment according to the size of the transportation volume, and there will be a surplus of manpower and unloaded vehicles, which will not enable the resources to be reasonably distributed and Utilization. On the other hand, the express delivery vehicles need to consume a lot of energy, although the country has increased the investment of financial and material resources in the express delivery industry, but still unable to meet the rapidly growing demand for express delivery brought about by the volume of transportation. At present, the express transportation is to enhance the use of green energy accounted for, accelerate the input and use of new energy vehicles, but due to the limited technical conditions in the country, the use of new energy has not yet been popularized in large quantities, the main share of energy use is still oil, which produces a large

amount of exhaust gas, polluting the environment. In the express delivery link, the vast majority of the use of electric tricycles, the lack of uniform specifications and management of such vehicles, for the quality of the distribution staff is not high, increasing the difficulty of the express delivery company on the management of transportation.

4.3. Packaging Materials Are Not Environmentally Friendly Enough And The Recycling Rate Is Low

With the rise and prosperous development of e-commerce, China's express delivery business is growing rapidly, the demand for packaging materials in the express delivery industry is rising year by year. In order to cope with the huge demand for packaging materials, China has begun a special treatment of express packaging, accelerate the promotion of express packaging innovation, but there are still many problems in green packaging. First of all, the courier from the merchant to the hands of consumers will go through a number of handling, in order to protect the goods, to avoid violent handling of the goods lead to problems and disputes with consumers, merchants tend to increase the commodities through the plastic sealing, internal filler, tape winding, etc. on the goods for over-packaging, these packages are very short-lived, can only play a protective role in transit, when the consumer receives the goods, these packages are basically useless and difficult to recover! Basic no use and difficult to recover. Secondly, most of the main materials of the express internal filler EPE, bubble bags, these plastic materials can not be used twice, there is no unified recycling point, most of the direct disposal in the natural environment, can not biodegradation, greatly aggravating the environmental pollution. In addition, China's express delivery packaging is also difficult to recover the problem. On the one hand, the lack of uniform packaging specifications. Most of the green packaging is the courier company independent research and development, internal use, green packaging is not in the market to form a unified standard, it is difficult to recycle and utilization. On the other hand, the recovery cost and recycling cost is high. The cost of recycling and disposal of express packaging is high, and enterprises will greatly increase the average cost of the use of corporate express packaging if it is recycled at a lower cost.

4.4. Scarcity Of Talents In The Field Of Green Logistics

The accelerated development of the courier industry so that more and more people have an understanding of the courier, want to cross into the courier industry, but the existing training of talents can not keep up with the speed of development of the courier industry. On the one hand, the courier industry is a lack of professionals. Most of the express delivery practitioners have not received relevant professional education, making the overall quality of the express delivery industry practitioners is not high. Courier companies in order to save employment costs, rarely choose highly educated people for grass-roots positions, the grass-roots post of the level of service has never been able to improve, affecting the company's service quality. On the other hand, green logistics is a new industry characterized by big data, cloud computing interconnection, express delivery companies are only responsible for recruitment and hiring, the lack of internal training for practitioners, has not yet formed a complete green logistics personnel training system, ignoring the role of sustainable development of green logistics. This will make the company's personnel lack of service awareness, do not attach importance to the quality of courier services and service attitude, resulting in the growth of complaints, expanding the contradiction between consumers and enterprises, is not conducive to the benign development of green logistics.

4.5. Outstanding Environmental Issues In Green Warehouse Construction

With the "dual-carbon" goal put forward, intelligent warehousing has become an important element of the development of green logistics courier companies, enterprises need to focus on the development of warehousing construction from the traditional type into a green type, reduce energy consumption,

improve the efficiency of warehousing, but in the process of transformation of the courier industry is also faced with a number of problems. The first is the location of the warehouse, many enterprises do not have a reasonable location of the warehouse, the lack of comprehensive consideration of the origin and destination of goods, so that the transportation of goods is more inefficient, increasing the carbon emissions of the transportation link. Secondly, the internal construction of warehousing, the current business of warehousing delivery routes, storage space, etc. has not reached the optimal planning, increasing the internal operation of the equipment operating energy consumption. Due to the high cost of electric forklifts, there are still many enterprises using traditional internal combustion forklifts, which usually use diesel, gasoline or natural gas as the main fuel, causing environmental pollution in warehousing and high carbon emissions.

5. "DUAL CARBON" BACKGROUND OF THE EXPRESS COMPANY GREEN LOGISTICS HIGH-QUALITY DEVELOPMENT STRATEGY

5.1. Improve The Level Of Logistics Intelligence And Actively Transform To Green Logistics

In the context of the "dual carbon", to actively transform to green logistics, we must vigorously improve the level of intelligence and innovation capacity of logistics, and promote the sustainable development of green logistics. On the one hand, it is necessary to enhance the technological innovation capacity and reduce the cost of the transformation of express delivery companies. The state's contribution to the realization of the "dual-carbon" goal of the express delivery company to strengthen human, financial and material resources, improve the enterprise's innovation and financing capacity and research and development capabilities, the formation of national and corporate synergy, the implementation of technological innovation results to reduce the cost of enterprise development. On the other hand, it is necessary to strengthen digitalization construction to provide technical support for green logistics development. Digital construction includes artificial intelligence, Internet of Things, big data analysis, etc., to promote the participation of intelligent equipment into the various processes of logistics, to produce a scaling effect, and to provide effective cost control for all aspects of logistics. At the same time, it is necessary to improve the technical level of the staff, change the ideological concepts, improve the use of intelligent equipment by employees, so that intelligent equipment is truly integrated into the courier company to promote the development of green logistics and reduce carbon emissions.

5.2. Rationalize The Allocation Of Transport Resources And Increase The Proportion Of New Energy Vehicles In Use

In recent years, China's logistics and transportation link carbon emissions growth is rapid, rational allocation of transportation resources to reduce carbon emissions has been imminent, the state has also introduced relevant policies to support, accelerate the logistics industry into the ranks of green low-carbon transportation. First, the distribution of transport resources to be reasonable, we must improve the utilization rate of transport resources and transport lines, reasonable management and scheduling of transport vehicles, combined with intelligent equipment, vehicle planning in advance, real-time mastery of the use of vehicles, to achieve resource sharing, and improve the efficiency of the use of transport resources. At the same time the courier company needs to transport vehicles for the reasonable development of transport routes, but also to improve the quality of transport personnel, to be able to maintain the correct transportation routes. Second, to vigorously promote the application of new energy, improve the use of new energy vehicles accounted for. Can change the structure of the vehicle to create a more lightweight transportation vehicles, reducing the consumption of resources; in the late use of vehicles, you can carry out the new energy car battery recycling, etc., to reduce the waste of resources.

5.3. Actively Introduce Green Technology And Strengthen Packaging Material Recycling Management

In terms of express delivery packaging, not only should we consider the environmental protection of packaging materials, but also take into account the portability and maneuverability of packaging recycling. Express companies should choose low-carbon green packaging materials, not only in the use of the environment will not bring harm, but also recycling. Vigorously promote the use of biodegradable packaging materials, conducive to decomposition in a natural state; renewable packaging materials can be directly or through the transformation of reuse, to extend the life of the packaging sub ah chat, reduce pollution of the environment. In express packaging design, to improve the use of packaging materials, design can be recycled and reuse of packaging, promote the development of recycling work. The first is to improve the structure of the outer packaging, the design of removable and splicable packaging, reduce the use of tape, such as zipper sealing, drawstring bags, etc., easy to use. The second is that the packaging can be printed on the recyclable logo and express packaging information QR code, including packaging materials, packaging specifications, recycling methods and other information, to facilitate the development of packaging recycling.

5.4. Strengthen Talent Training And Adapt To The Needs Of The Green Logistics Industry

Strengthening the training of logistics talents is an important initiative to promote the development of the logistics industry, which will help to improve the competitiveness and innovation capacity of the entire industry and promote the development of the logistics industry in the direction of green, low-carbon and sustainable development. On the one hand, the state should pay attention to the cultivation of high-tech talents in green logistics, especially the cultivation of professional talents in universities and enterprises. The government should encourage colleges and universities to set up relevant majors, cultivate industry counterparts, carry out more school-enterprise cooperation, set up practice bases in colleges and universities, combine theory with practice, and jointly cultivate professionals. At the same time, enterprises can set up relevant scientific research institutions, enhance the capital investment in scientific research, through scientific research institutions to cultivate high-tech talents needed by enterprises, research and development of green low-carbon express delivery packaging materials. On the other hand, the courier and courier customer service is a direct communication with the consumer group, directly affecting the consumer's impression of the quality of service of the courier company, the enterprise needs to strengthen the courier knowledge training of such employees, improve the overall quality of employees and learning ability, establish a reasonable staff incentive mechanism, retain internal talents.

5.5. Actively Develop Green And Intelligent Warehousing And Rationalize The Layout

With the development of technology, the establishment of smart warehousing has become a necessary measure to achieve the "dual-carbon" goal, is now the logistics industry to the green direction of transformation and development of the inevitable choice. Promote the courier company from the traditional type to the green intelligent transformation and upgrading of the logistics industry has an important significance of low-carbon sustainable development. First of all, to rationally plan the location of warehousing. Warehousing location site selection determines whether the transportation is efficient, related to commodity transportation from the origin to the destination of the route selection. Reasonable warehousing site selection can improve the efficiency of logistics and transportation, and effectively reduce the carbon emissions of the means of transportation. Secondly, optimizing the internal layout of the warehouse is also an important means of reducing carbon emissions. Through reasonable planning of the warehouse, improve the utilization rate of the warehouse interior, join the use of AGV, RFID and other information technology equipment to reduce

the energy consumption of equipment operation inside the warehouse. Finally, the green construction of the warehouse exterior also plays an important role in energy saving and emission reduction. Accelerate the photovoltaic power generation technology in the logistics park, with energy storage facilities to obtain continuous renewable power, the maximum use of on-site renewable green energy instead of traditional energy; through carbon trading and value chain optimization, to offset their own greenhouse gas emissions, to achieve the park's carbon dioxide "net-zero" emissions.

6. SUMMARY

Based on the background of "dual carbon" and green logistics, this paper analyzes the status quo and problems in the development of green logistics in China's express delivery companies. The study found that, with the progress of science and technology in China, the logistics industry to green, intelligent transformation is being strengthened, but due to the technology is not mature enough, carbon emissions remain high, the study is mainly reflected in the lower level of logistics intelligence, inadequate allocation of transportation resources, packaging materials are not environmentally friendly enough, the scarcity of talent in the field of green logistics, warehousing and construction of environmental protection problems are prominent in these five aspects. In the future, we should improve the level of logistics intelligence and actively transition to green logistics, rational allocation of transportation resources, strengthen the management of packaging material recycling, strengthen the training of personnel, and actively develop green intelligent warehousing and other ways to energy saving and emission reduction, reduce the carbon emissions of the express delivery company, reduce costs and increase efficiency, and promote China's express delivery company to the direction of green, low-carbon development.

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