

Green Logistics Management Issues Analysis: The Case of Deppon Express

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Abstract. At present, the development of third-party logistics in China in recent years, the development is very rapid, followed by a large number of pollution emissions, relevant data show that at present, China's logistics traffic energy consumption has accounted for more than 20% of the total social energy consumption. Carbon dioxide emissions are about 770 million tons. Developing green logistics is bound to be the future trend in China's transportation. Therefore, we take Deppon Logistics as an example to give some feasible suggestions on the green development of China's third-party logistics in packaging, trucks, and transportation system, hoping to provide some reference value for future green logistics.

Keywords: Green Logistics Management; Issues Analysis; Deppon Express.

1. Introduction

As a collaborator of enterprise operation management, an integrator of logistics services, and a contractor of logistics outsourcing, third-party logistics has become the dominant role in contemporary logistics. The logistics development process of a nation could be represented by the advancing level of its third-party logistics. Under the situation of rapid economic development across China, energetically developing modern logistics services characterized by third-party logistics is not only a critical channel to promote the economy but also an inevitable requirement for the transformation of traditional transportation and logistics enterprises. It is significant for saving enterprise and social costs and building a conservation-oriented society.

Green management is entirely in line with the ultimate goal of logistics management, which is to get the best and most effective ways to transfer the products and resources from one place to another or the customers because it is obvious that greener means fewer resources waste and consumption of energy, shorter delivery routes and so on. On top of that, green supply chain management is an effective way to attach equal importance to "environmental awareness" and "economic development" for sustainable development.

The fact that green logistics management is beneficial in cost reduction to third-party logistics companies can be shown in many ways, such as higher resource usage, fewer shipments reduction, and the shorter distance of trips. Besides, third-party logistics companies should be more compliant to adapt to the macro market environment. According to the second annual CDP Supply Chain Report, 6 percent of leading companies have already deselected suppliers who fail to manage carbon. This number is set to rise to 56 percent in the future. At the same time, the Chinese government strongly supports the "carbon Peaking and carbon neutrality" policy, and many sustainable policies have been released recently, specifically for logistics companies. Whether to comply with government regulations or meet the expectations of the customers or clients, third-party logistics are indeed required to be greener.

As a well-known third-party logistics, Deppon Express will be an example to analyze the shortcomings and drawbacks of third-party logistics companies in green logistics management and

subsequently introduce new theoretic frameworks to recover them. Moreover, the present paper aims to provide policies and recommendations for solving environmental problems and strengthening international competitive power to raise business strength.

2. Literature review

Since the early 1990s, the concept of green logistics has only been proposed by scholars, but it has soon been highly valued by the government, academia, and business world. It has become a hot spot for many scholars, and more research results have been achieved in the past three decades.

In terms of the excessive packaging of Chinese express delivery, Wang and Xin mentioned the lack of green logistics talents in China in Analysis of the Green Transformation Path of the Logistics Industry in 2022. Still, in solving this problem, they only considered introducing high-quality talents and ignored the green awareness of existing employees[1]. Liu mentioned in 2022 in Recycling Status and Green Development Suggestions of Express Packaging Waste to establish a socialized system of recyclable express boxes and the social delivery and recycling mechanism of express packaging waste[2], as well as the high-quality and inexpensive starch-based degradable plastic packaging materials mentioned by Jin *et al.* in the starch-based degradable plastic packaging materials in 2019[3]. Both have great practical application value and practical significance in solving the excessive packaging of China's express delivery.

In terms of express shipping, Sui pointed out in the 8th issue of China Logistics and Procurement 2022: It is widely believed in the industry that the new energy-heavy truck market cannot be moved into the fast lane without the enabling of national and local support policies[4]. Hao Xu in Evaluating the current perceived cost of ownership for buses and trucks in China writes that Battery swapping could reduce the overall cash outflow for BEV owners via the decrease in charging time and repower annoyance cost. This technique also optimizes annual cash flow[5].

Central warehouses are crucial for a company. It not only controls the cost of a company but also affects the sustainable development of the company. Location optimization is a decision-making process and analysis. Besides, it is a part of strategic management[6]. According to Kostikov's location-allocation modeling, Calculate minimum shipping capacity, demand and cost between multiple points. Build a mathematical model to determine the distance between outlets and the exact location of the central warehouse[7]. The gravity model from DGND divides a large area into multiple primary clusters and distributes them as needed. Calculate the distance from the central warehouse according to their demand size[8].

3. Case analysis

3.1 Deppon Express's information

Deppon express was established in 1996 in Guangzhou, and the headquarter is situated in Shanghai. The main business includes express delivery, less than truckload (LTL), warehousing, and the supply chain business. Most clients are small and medium-sized companies and partly individuals (around 65% and 35%, respectively). Deppon's overall ranking in China is around eighth or ninth, and it has one of the top logistics networks in terms of area coverage. But customer satisfaction ranks typically lower, as well as technical input.

Deppon's merits are great enterprise innovation, commendable marketing skills, and lower charges of large-scale packages. Since the company's establishment, Deppon has been engaged in significant efforts to improve its creativity which involved cooperation diversification and commercial advertisements varying, but it has to be admitted that they are pretty awful on facilities management, especially trucks and inventory equipment. Moreover, compared with other third-party logistics companies, Deppon lacks competitiveness because the enormous gap between the costs and the willingness of customers to pay is enormous.

Sustainability is mandatory for cost reduction. Meanwhile, greener mechanisms stand for higher asset utilization and satisfying demands and consumers. Thus it can optimize resource allocation and enterprise structure and gain more competitiveness by enhancing sustainable development. Nevertheless, it is imperative to deliberate the trade-off between costs and sustainability since adopting green management is costly and might reduce revenues and drag the process of enterprise operations in a short period. Thus, providing a prudent strategy before sustainable implementation of third-party logistics is inevitable.

Digging into Deppon logistics, there are three main issues: unsustainable packaging, trucks, and sub-optimized outlet distribution networks. Deppon logistics has a more than 7% package damage rate, which is much higher than the average, and the subsequent events confirmed that the company probably might have blamed it on the packaging. Therefore, Deppon logistics unwisely implemented unsustainable packaging strategies. Besides, Deppon's self-owned trucks are too old to adopt green management, mostly petrol trucks instead of electric or hybrid ones. Moreover, it is calamitous that the poorly distributed outlets have severely decreased efficiency and raised energy consumption. These problems have demonstrated the pervasive difficulty in managing third-party logistics companies, but they could be solved by applying sustainable management.

3.2 Issues analysis

3.2.1 Excessive packaging issue

In recent years, with the flourishing of e-commerce, the excessive packaging of express delivery has become an increasingly severe social problem[9]. Many packaging materials, such as cartons and tapes used in express delivery, involve resource consumption and may lead to environmental pollution.

Statistics show that China's express delivery industry consumes more than 9 million tons of paper waste and about 1.8 million tons of plastic waste yearly, showing a rapid growth trend. Due to the low recycling value, 99% of plastic waste is not used efficiently. The other side of this data set is that in China's megacities, the increment of express packaging waste has accounted for 93% of the increment of household waste, and some large cities are in 85% to 90%.

As we all know, the hardest hit area of over-packaging of express delivery lies in significant logistics companies. As far as Deppon Logistics is concerned, there are two main reasons for its excessive packaging: (1) To cope with accidental damage during transportation. In 2021, the National Bureau of Statistics released the national ranking of the complaint rate of express delivery companies. Deppon ranked third in the complaint rate, and the damage rate was as high as 7.53%, while the national average damage rate was only 0.85%. Therefore, to improve customer satisfaction and reduce its damage rate, Deppon will have to strengthen its packaging. (2) Employees lack awareness of green logistics. China's logistics industry started late, and green logistics has just emerged in recent years. Hence, people's understanding of it is minimal, and China's logistics companies are still in their infancy in terms of service level and research on green logistics. In the case of Deppon, many recruited talents of Deppon Logistics are often related to traditional logistics management business but lack sufficient understanding of innovative logistics. This also aggravates the problem of excessive packaging to some extent.

3.2.2 Un-sustainable trucks

With the rise of the logistics industry and more local regulations /standards, green logistics gradually needs to be improved in China[10]. NEVs are progressively getting popular in China especially in the truck industry. Notice on the Certification of National 6 Emission Products for Heavy-duty Diesel Vehicles shows; From July 1, 2021, all enterprises will stop producing and selling heavy diesel vehicles that do not meet the requirements of the National Six standards, which also had an impact on the truck market, where sales fell 8.5 percent year on year last year, remained low in the first two months of this year, with both production and sales falling more than 20 percent, while the performance of NEVs is different: The cumulative sales of new energy heavy trucks were 3,223 units,

with a year-on-year growth of 1,076.3% (heavy electric trucks accounted for more than 90%). Compared to NEVs, the operation cost of fuel trucks is high. So many logistics enterprises have plans to purchase new energy logistics trucks with energy-saving to replace heavy pollution and high-cost fuel trucks. However, Deppon Trucks has not done enough in this regard.

Deppon Logistics has a high cost of self-ownership of vehicles: In high season, Deppon Logistics has purchased many self-owned vehicles in emergencies. But in the off-season, lots of vehicles idle. So, can Deppon keep up with the trend of new energy trucks? How can the sustainability of trucks be improved? Deppon's numbers of green trucks cannot meet the compliance in China. And whether Deppon's green trucks can keep up with future Chinese compliance requirements.

3.2.3 Sub-optimized distribution outlets network

Deppon Express is an integrated, customer-centered logistics company providing a wide range of solutions, including Less-Than-Truckload(LTL) transportation, Full Truck Load(FTL) transportation, delivery services, and warehousing management. Deppon Express is headquartered in Shanghai. As of December 2016, Deppon has over 10000 standardized retail stores across the country, covering 34 province-level administrative regions of China with transfer centers of over 1,300,000 square meters. Meanwhile, international routes to Korea, Japan, Thailand, Singapore, Malaysia, and Vietnam have been opened, with a workforce exceeding 120,000 employees around the globe.

Deppon Express has outlets all over the country, covering all first-tier and second-tier cities, even towns and villages in county-level cities. With the rapid development of China's economy, Deppon Express has grown at an annual rate of more than 60% since its establishment in 1996. The company's outlets are developing too fast, and the distribution of east and west outlets is seriously out of balance. There are also many hidden worries behind the crazy expansion. The network in the eastern part of Deppon Express is quite dense. According to their distribution map, there are more than 190 outlets in Guangzhou. In particular, the density of outlets in the Panyu District of Guangzhou has reached 5 kilometers, while the adjacent Shanwei City has only 13 outlets. Whether from the inside or outside, the competition is exceptionally fierce, resulting in a tremendous waste of resources. The customer areas of the outlets overlap with each other. The distance between the two outlets is too close, and customers have a choice between the two points, resulting in invisible internal friction within the company. The economy wasted by internal friction should be used to develop Chinese and international markets and to enhance further the company's scale, performance, and profit level. The sub-optimized layout of the outlets in Guangzhou and Shanwei will also lead to a low vehicle utilization rate when Shanwei transports goods to Guangzhou. For example, to balance the number of delivery vehicles, the vehicles from Guangzhou to Shanwei are often not packed with goods, or the vehicles from Shanwei to Guangzhou will be full of goods, resulting in a high vehicle failure rate. If the number of delivery vehicles is not balanced, having fixed vehicles transport back and forth can result in significantly increased transport times and reduced customer satisfaction.

3.3 Suggestion

3.3.1 Excessive packaging solutions

Nowadays, Deppon Logistics has taken a series of effective actions to deal with the problem of excessive packaging, such as: (1) vigorously promoting electronic waybills; (2) The width of the scotch tape is narrowed from 50mm to 45mm, and the thickness of it is reduced from 7 μ m to 5 μ m.

However, we believe that Deppon Logistics can also take more effective measures to alleviate the problem of excessive packaging while taking these measures: (1) Improve the quality of professional talents. This is the top priority, although the logistics industry is the transportation of goods, but each of them cannot lack the participation of people. Deppon Logistics can introduce managers who have a sufficient understanding of innovative logistics and gradually guide their subordinates to pay attention to the harm of over-packaging. Still, on the one hand, the effect is relatively slow, and it is bound to increase the cost of Deppon. Therefore, Deppon can also improve the green logistics awareness of existing employees by introducing advanced management concepts. Employees can be

trained regularly, and a strict packaging implementation plan can be formulated, such as when the employee receives the package, the most economical and environmentally friendly packaging materials should be selected according to the size, specifications, quality, fragility, and other properties of the items to be couriered. (2) Set up recycling stations to establish a complete recycling system. Due to the high damage rate of Deppon Logistics, blindly reducing express packaging is not a suitable solution for Deppon. Many express delivery companies have developed many express boxes that can be recycled. Still, because of the high cost of construction and the difficulty of recycling, recyclable containers cannot be used on a large scale. Therefore, Deppon Logistics can first set up its recycling stations in some large residential areas and universities and regularly send employees to recycle. (3) Use eco-friendly and economical packaging material. Deppon Logistics can collect new packaging materials researched at home and abroad from various channels and select economical and environmentally friendly packaging materials. For example, corn's main ingredient and straw starch can reduce green environmental protection packaging bags instead of traditional plastic bags. This kind of packaging bags in the soil can be naturally degraded with time, and both can reduce oil consumption and achieve green environmental protection.

3.3.2 Un-sustainable trucks solutions

Deppon is a less-than-carload logistics company that determines its own logistics structure. The percentage of logistic transportation by cars is more than 75%, but by air is less than 25%. So Deppon Logistics attaches great importance to the performance and development of their trucks. In 2020, Deppon Express purchased 100 Foton Smart Blue New Energy M4 light trucks. Compared with fuel vehicles, the energy-saving efficiency of these vehicles can reach 5%. Deppon Express purchased a total of 450 Volvo FM series tractors this same year. Compared to a normal truck, the capacity can be increased by 12%, and the timeliness can be increased by 10%.

(1) NEVs Replacement

For compliance, Deppon needs to have a significant replacement of new energy trucks such as current electric heavy trucks and hybrid trucks. China will be the new energy vehicle as a critical development of seven strategic emerging industries. In 2016, our fiscal subsidies for new energy vehicles and reward fund of 22.37 billion yuan, plus the early r&d, etc., is expected in the investment of new energy vehicles in China has reached one hundred billion yuan above, for the new energy, truck development provides reasonable guarantee funds.

Energy saving and emission reduction can also reduce the cost of fuel consumption. Although the production and manufacturing cost of new energy trucks is high, the price gap between new and traditional trucks can be filled with the support of preferential policies of state subsidy and local subsidy. At the same time, the later operation cost is much lower than the traditional truck due to the same electricity price being relatively low.

Advantages of the right of transportation in many cities. In Beijing, Shanghai, Guangzhou, Tianjin, and other more than 20 provincial capital cities, new energy vehicles opened up a "green channel", such as Fuel trucks are restricted to some sections during the morning and evening peak hours (7:00 to 9:00 and 17:00 to 20:00) on weekdays and during the evening peak hours (17:00 to 20:00) on holidays, while there are no restrictions for new energy trucks. The full limit on the country's three emission standards for diesel trucks. Later, more cities across the country will open better road rights for new-energy vehicles.

The original scheduling mode is manual-led with system scheduling, which requires each scheduler to be familiar with the map of the entire distribution area, resulting in a significant error in vehicle allocation.

(2) Information Integration improvement

Deppon buys many trucks to meet demand during peak logistics and wastes resources by sitting idle during the off-season. Due to the current influence of e-commerce giants, the peak season significantly occurs in the fourth quarter. Deppon Logistics has its vehicle allocation optimization system and transportation route planning system but still lacks a vehicle allocation system to increase the utilization of trucks.

Construct a traffic network model with information technology. Deppon buys many trucks to meet demand during peak logistics and wastes resources by sitting idle during the off-season. Deppon Logistics has its vehicle allocation optimization system and transportation route planning system, but it still lacks a vehicle allocation system to increase the utilization of trucks.

Construct a traffic network model with information technology. Deppon needs to improve vehicle capacity and truck volume utilization and reduce turnaround times.

3.3.3 Sub-optimized distribution outlets network solutions

How to help Deppon Express reduce resource waste during transportation due to the sub-optimized distribution of outlets is an essential question for Deppon Express. There are two assumptions; They may alleviate the problem of vehicle distribution difficulties and resource waste caused by the sub-optimized distribution of Deppon Express outlets.

Firstly, Deppon Express could build central warehouses. It can help Deppon Express better-centralized management of orders, whether it is Business to Business or Business to customers, and it can significantly reduce the repeated delivery of goods between various warehouses in the region. According to the Data from their official website, Deppon Express is trying to build several central warehouses across the country. The total area of the new national transport center exceeds 920,000 square meters. Deppon Express will set up large cargo transfer bases in more than 20 economic centers across the country.

Secondly, Deppon Express could choose different cargo vehicles according to the different types and characteristics of the goods. Through reasonable planning, the surplus logistics vehicles can be effectively reduced. On the one hand, unnecessary vehicle resources can be saved, and the efficiency and speed of logistics can be continuously improved. According to documents from the Ministry of Transport of the People's Republic of China, China has a corresponding welfare policy for trucks transporting fresh agricultural products when they pass on the highway. Every highway bay will have a corresponding green channel for trucks delivering agricultural products. The establishment of the green channel is to improve the road transportation efficiency of fresh agricultural products, reduce the loss during transportation, and better solve the problem of agricultural product supply for the masses. The cost of ordinary trucks passing through the expressway is exceptionally high. The general price is around several thousand yuan. However, trucks that meet various requirements for transporting agricultural products are free when passing through the expressway.

4. Conclusion

Taking Deppon Logistics as an example, this thesis analyzes the company's over-packaging problems, unsustainable truck problems, and sub-optimized distribution network problems according to the company's actual situation. (1) In the problem of excessive packaging, by improving the quality of the company's professionals, establishing a perfect recycling system, and using high-quality and inexpensive degradable packaging materials, this series of solutions enables Deppon Logistics Company to be more environmentally friendly based on controlling costs. (2) Our trucks with gravels logistics development were analyzed, and speak to the sustainable development of China's future, and new energy truck market policies in the future, to Deppon's truck replacement on sustainable development, put forward more new energy trucks and strengthen the efficiency of methods to achieve besides green, save costs and future more long-term development. (3) Deppon Express' sub-optimized outlets' distribution has led to rising company costs and unsustainable development. Considering the existing situation of Deppon Express. one or more central warehouses are established in economically developed cities, and outlets are reasonably arranged around them. The transportation process allocates vehicles reasonably to achieve the highest resource utilization.

However, today's research is influenced by many factors and still has many limitations: (1) In terms of excessive packaging, due to today's technical limitations, the cost of suitable degradable packaging materials is still very high, so it is hoped that with the progress of science and technology in the future, relevant scholars and researchers can develop truly economical and environmentally friendly

degradable packaging materials and apply them on a large scale as soon as possible; (2) In terms of the unsustainable truck, new energy trucks will face many problems and challenges in the future: first, the efficiency of charging supply is low. For example, the number of charging piles is far from enough to meet the current electric trucks, and the energy supply stations of other new energy vehicles are even less. Secondly, the endurance capacity of new energy trucks is weak, which requires time to charge, which seriously affects the use time and efficiency of trucks in a day. (3) In terms of sub-optimized outlets distribution network, in the face of covid-19 and the downturn of the world economy in recent years, it has been impossible to build a large-scale central warehouse in recent years. There is still hope for vehicles to deliver different types of food. I hope the government can not only open up green channels for green vegetables, but also introduce different delivery strategies for different types of products.

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