

Analysis on Low Carbon Strategy of Third Party Logistics

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Abstract With the coming of low carbon economy, low carbon strategy has attracted attention of governments, organizations and institutions. 3PL firms as professional logistics services providers are under urgent needs to implement low carbon strategies. The article analyses opportunities and challenges that 3PL firms are encountering from external and internal aspects. Moreover, effective strategies are explored from angles of organizational structure, human resource management and customer relationship management to help 3PL firms achieve significant carbon reductions while cutting costs and improving the service level to customers.

Key words Low carbon economy; Carbon reduction; Low carbon strategy; Third party logistics

1 Introduction

The era of low carbon economy is coming with the continuous social attention on environmental problems. It requires a minimal output of greenhouse carbon emissions into the biosphere and less resource consumptions. Logistics, however, as a high resource consumption and carbon emission industry holds a special position in a low carbon economy. On one hand, logistics activities do harm for the environment. On the other hand, low carbon development of logistics is definitely a major contribution to the achievement of low carbon emissions objectives. Therefore, low carbon strategies are essential for the sound development of third party logistics.

Many professors have contributed much to theories and practices of low carbon strategies of logistics. Dai Dingyi (2008) defined influences of low carbon economy exerted on logistics from the angle of policy, technology and strategy. Xu Miaomiao (2008) and Gareth Kane (2010) described business strategies of carbon footprint reduction. Moreover, Professor Alan C McKinnon (1995) examined the ways in which companies can reduce the environmental impact of their logistical activities and opportunities for decarbonising the freight transport system.

Based on reams of the researches, the article begins by describing driving forces to implement low carbon strategies of 3PL firms. Challenges and opportunities that logistics firms are facing in a low carbon economy are explained meanwhile. Finally, specific strategies which 3PL firms can adopt to decrease costs and enhance competitive advantages are provided in details.

2 Connotations of Low Carbon Strategies and Third Party Logistics

2.1 Third party logistics

The Council of Supply Chain Management (CLM), one of the leading professional organizations for logistics, defines third party logistics (3PL) as follows: "A firm [that] provides multiple logistics services for use by customers. Preferably, these services are integrated, or 'bundled' together, by the provider. Among the services 3PLs provide are transportation, warehousing, cross-docking, inventory management, packaging, and freight forwarding."

Use of 3PL service providers allows a company to reduce the inherent investment risks associated with owning logistics assets like trucks and warehouses. Moreover, it helps a company access new technologies, wider distribution channels and innovative solutions according to customer's needs based on market conditions. All in all, 3PL firms can meet customer needs by delivering advantages of quality, cost, speed and flexibility.

2.2 Low carbon strategies

Low carbon strategies aim to achieve the low carbon emission objective by redesigning the organization's development pattern, product standard and managerial process. It requires the enterprise putting every effort and trying every means to decrease carbon emissions in areas of organizational structure design, industrial structure and project planning, customer service, capital management and operation, logistics and the whole supply chain management.

There are three stages of low carbon strategies which are including: energy saving and emission reduction, renewable energy exploitation and carbon capture and storage. The article focuses on discussing low carbon strategies of stage one and stage two since most of companies at the moment are

unable to realize carbon capture and storage because of the limitation of technology development.

2.3 Driving forces on low carbon strategy implementation of 3PL firms

Specifically, there are four driving forces in the market that impel logistics firms to implement low carbon strategies from external and internal aspects. They are including government policies, social responsibilities, customer requirements and cost pressure (see Figure 1). Those driving forces exert both positive and negative influences on 3PL firms and bring challenges and opportunities at the same time depending on corporate reactions to low carbon requirements.

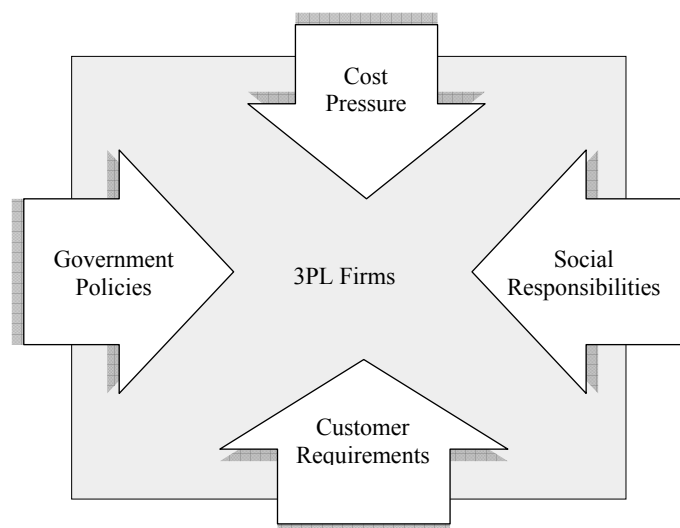


Figure 1 Driving Forces Influencing 3PL Firms in a Low Carbon Economy

2.3.1 Government policies

In response to the deteriorating living environment, the Chinese government has set ambitious targets for cutting CO₂ emissions. Since 2005, the Chinese government has set an objective that China's energy consumptions per unit of GDP should be decreased by 4% per year. And China is going to reduce the intensity of carbon dioxide emissions per unit of GDP in 2020 by 40 % to 45% of the 2005 level. Even though there is no legislation concerning carbon emission control at the moment, the government will definitely publish a combination of fiscal and regulatory policies to achieve carbon reduction objectives.

Those policies and measures will exert both positive and negative influences on the development of 3PL firms. Logistics service providers which cannot meet the legal requirements of carbon emission will be punished heavily and even be cleared out of the market. On the other hand, 3PL firms which have done measures to reduce resource consumptions and cut pollution emissions are able to take advantages of government policies by enjoying lower taxes and green allowances.

2.3.2 Social responsibilities

Enterprises are requested to take more social responsibilities in a low carbon economy. Interests of the public society should be satisfied before needs of customers, shareholders and employees are met. Logistics companies especially have strong responsibilities to make their operations greener. Therefore, 3PL firms need to make serious efforts to reduce carbon emissions and energy consumptions as soon as possible.

Consequently, for those which are unwilling or unable to decarbonize their logistics operations will be blamed for their irresponsible behavior. Conversely, logistics firms which are actively taking part in carbon reduction activities will build up good brand images and obtain higher brand values which in turn bring more market shares.

2.3.3 Customer requirements

Under the influence of a low carbon economy, customers are changing. What they want are not limit to logistics advantages they are enjoying at the moment. In addition, customers are paying more attention on environmental issues rather than their own interests. A recent survey which interviewed 7,500 customers in the global area found that customers prefer products and services provided by companies which are actively responding to climate changes. The survey also discovered that around 85% of interviewees paid close attention to climate changes, especially for customers in new emerging

nations. In addition, there were more than 80% of interviewees in new emerging nations had taken actions to reduce carbon emissions. For instance, they refused to drive private vehicles and chose to travel by train instead of taking airplane. In the survey, 90% of consumers would be willing to switch to a new product or service if it is certified as minimizing its impact on climate change. While another Accenture survey showed that 98% of Chinese consumers would pay a premium for products or services that are marketed as environmentally friendly.

According to investigation findings, business customers and consumers do have potential requirements for low carbon logistics services. Therefore, companies which are unable to satisfy customers' needs might lose market shares and competitive advantages gradually. However, 3PL firms which can provide greener logistics services are able to identify order winners and increase their chances of getting more business in the market.

2.3.4 Cost pressure

3PL firms are facing severe social resource shortage nowadays. Volatile energy and material prices become one of the major problems that 3PL firms are confronting. Furthermore, imminent carbon regulations will affect business profit as well. Profit margins of logistics company drops dramatically since operation costs are going up. Thus, driving by the cost pressure, 3PL firms have to conserve energies and cut carbon emissions.

Consequently, companies which cannot implement effective measures on energy saving and carbon emission reduction have to burden increasing cost pressure and losing profits. While, leading logistics companies will undoubtedly save resource costs and earn higher profits than their competitors by implementing low carbon strategies and measures. Moreover, the ability of energy saving and carbon reduction of 3PL firms will even become the source of competitive advantage.

3 Contents of Low Carbon Strategies of Third Party Logistics

There are several carbon reduction strategies that can be implemented immediately to save energies and cut carbon emissions. Typical strategies include organizational structure redesign, human resource management, customer-led low carbon services and customer communication (see Figure 2).

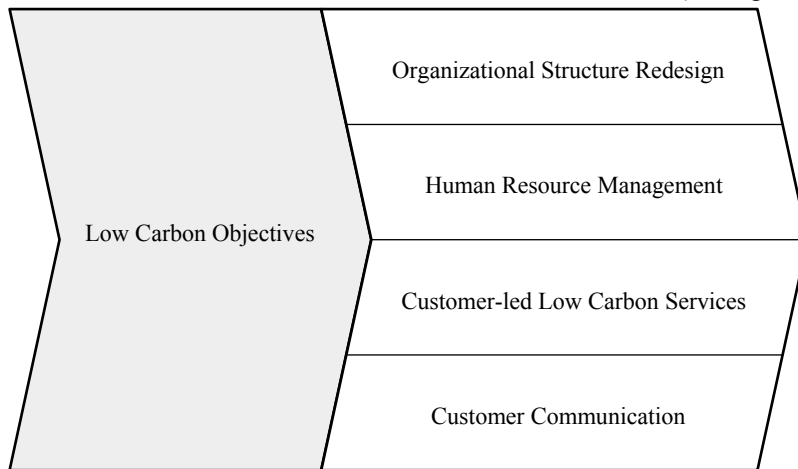


Figure 2 Contents of Low Carbon Strategies

3.1 Organizational structure redesign

The organizational structure needs to be redesigned to make sure low carbon objectives can be achieved successfully. A low carbon office which are composed by people come from different functional departments can be set up as an independent department which reports directly to top managers. It is responsible for setting carbon reduction objectives for the whole company and every operational department and providing sound suggestions to achieve objectives. In addition, the low carbon office supervises energy consumptions and carbon emissions in daily logistics and business operations and reports to top managers regularly.

Benefits can be gained from organizational structure redesign are presented in the following:

- Get support from top managers

- Obtain advices and latest data of carbon emissions of every department which are helpful for

setting reasonable carbon reduction objectives and providing feasible solutions

Let every department in the company understand its carbon reduction objectives and how to achieve them

Implement strict control on energy consumptions and carbon emissions

3.2 Human resource management

Employee engagement plays an important role in carbon reductions since all the strategies and measures are needed to be carried out by staff. In addition, the performance of employees determines the overall efficiency and effectiveness of low carbon strategy implementation.

Therefore, the human resource department should take effective measures to get the support from employees and help them do right things in the right way by:

(1) Providing short period training to increase the environment awareness of employees and help them understand objectives and requirements of low carbon strategies, thus after the training is complete, everybody knows how and what to do

(2) Creating a cross-functional team with members ranging from top facility management to first-line employees to tackle real-life issues in daily operations of the company

(3) Launching a low carbon initiative which are closely relating to logistics functions to find out more opportunities in carbon reductions and energy saving

(4) Establishing a motivation system to encourage employees' involvement in strategy implementation. The rewards that employees can obtain are related directly to the accomplishment of carbon reduction objectives. A special bounty also can be provided as a reward of leading performances on carbon reductions.

3.3 Customer communication

Having mutual communications with customers are also important for achieving low carbon emissions objectives. As we know, low carbon strategies cannot be successfully implemented only through the efforts of logistics companies, users of logistics are also key decision makers in enabling carbon reductions. Communications with customers will lead to better understanding of corporate strategies and behavior. The collaborative partnership between 3PL firms and customers can be set up to bring more energy savings and improved efficiency as well. Consequently, customers can provide feedbacks and even better solutions concerning carbon reductions and energy savings in logistics. Moreover, customer satisfactions and customer service level are also can be increased through improved communications.

There are four steps in customer communication process:

(1) Help customers understand carbon footprint of logistics activities and how they will affect the environment

(2) Inform contents and objectives of low carbon strategies to customers

(3) Ask for advices from customers to improve current strategies, measures and even strategic objectives

(4) Establish partnership with customer to achieve better customer service level and continuous carbon emission reductions

3.4 Customer-led low carbon services

With the increasing demand for clean environment of customers, logistics services are required to change according to emerging requirements of low carbon logistics. 3PL firms which can provide logistics services that consuming less energy and emitting less CO₂ than competitors will attract more customers and gain more market shares. Actually, some leading logistics firms have already provided low carbon logistics services in the market. For instance, DHL provides a service called "Green delivery" since 2008. Customers need to pay 3% of delivery expenses as the "Green fund" which are used to develop new technologies and plant trees. Maersk also designs a service called "Supply chain carbon check" to help customers redesign the current supply chain and implement carbon reduction solutions.

Specifically, there are three steps for 3PL firms to provide customer-led low carbon services in the market. At first, they need to estimate current carbon footprint that logistics activities generate. Secondly, current and potential market needs and customer requirements should be identified and finally customer-led services are designed according to customer needs.

According to data of OECD emissions and GHG Protocol emissions factors, human activity generates annual greenhouse gas emissions of around 50,000 mega-tonnes CO₂. While, logistics activities consumes 5.5% of the total, that is 2,800 mega-tonnes per year. Road freight as the most frequent used mode of transport accounts for the largest part, at around 57% of the total emissions of logistics activities. Ocean and rail freight which are regarded as the most carbon efficient transport

modes generates less carbon emissions than road. Air freight generates less carbon emissions than road but is more carbon intensive than road. Moreover, logistics buildings and package consumes around 27% of the total carbon emissions that logistics activities generate (see Figure 3).

Guided by findings listed above and customer requirements, there are some low carbon logistics services are available to adopt by 3PL firms which are listed in the following.

(1) Multimodal transportation

The use of road and ail transportation emit lots of carbon dioxide, therefore, multimodal transportation especially the increase use of ocean and rail freight can decrease carbon emissions effectively. The combination of road and ocean freight, road and rail freight will reduce transportation time and carbon emissions at the same time.

(2) Low carbon vehicles

The application of low carbon vehicles is another way to reduce carbon emissions. There are various types of low carbon vehicles. For instance, battery-powered or hybrid-fuel vehicles which utilize green energy sources can help achieve green transportation. There are also other forms of energy such as solar, hydro and biomass can be applied.

(3) Advanced vehicle tracking system and smarter route planning

The use of advanced vehicle tracking system and smarter route planning can inform vehicle drivers the latest traffic information and help them choose the best route to save time and energy. The time wasted on traffic jam can be avoided and the shortest route can be found in route planning.

(4) Low carbon warehouse management

Low carbon warehouse contributes a lot in carbon reduction. Green building technologies can be applied in warehouse management. For instance, green materials can be used to save electricity. Rain-collection and reuse system is useful to save water. The utilization of low carbon warehouse can reduce the use of electricity and water which decreases carbon emissions.

(5) Low carbon package

Recycled materials or natural materials are needed in low carbon package design. The use of plastics and wood package should be decreased and other types of green package materials are welcomed. Moreover, the package should be designed to use minimum materials to protect the safety of products in logistics activities.

(6) Low carbon supply chain management

The achievement of low carbon logistics is needed not only in individual 3PL firms but also in the whole supply chain. The low carbon supply chain management requires all the members in the supply chain should assess their carbon emissions and set carbon reduction objectives accordingly. Effective strategies should be come up from supply chain members as well. All in all, all the activities in the supply chain should be focused on carbon reduction and everyone in the supply chain must work together to achieve low carbon emissions.

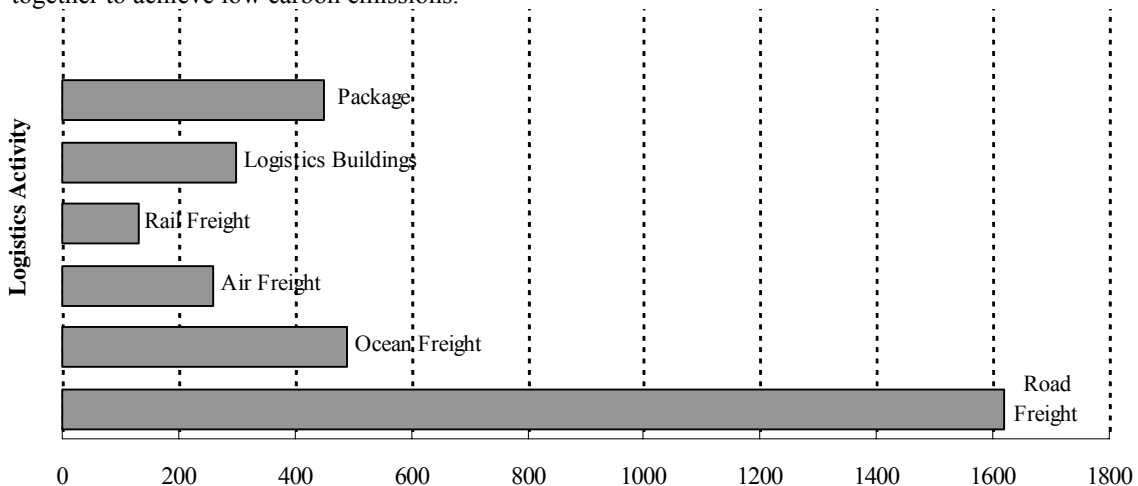


Figure 3 Emissions Share Per Logistics Activity

4 Conclusion

The article deals with the strategic analysis of 3PL in a low carbon economy. It contributes with an approach to identify challenges and opportunities that 3PL firms are encountering. Feasible low carbon strategies are provided from angles of organizational structure design, human resource management, customer and product design to help logistics companies achieve carbon reduction objectives. Further studies need to be taken to estimate carbon footprint of the whole supply chain and provide effective strategies of decarbonization. Moreover, measures of carbon capture and storage are also needed.

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