

Research on Environmental Impact Assessment of Urban Logistics Distribution System Based on Supply Chain Management

Bin Wang

Shandong Vocational College of Light Industry, Zibo, Shandong, 255300, China

Keywords: Environmental impact assessment, Urban logistics distribution, Supply chain

Abstract: With the acceleration of my country's urbanization, urban logistics and distribution systems have become more developed. However, at present, my country does not have a unified policy and system for the development of the urban logistics and distribution industry, which has caused many problems in the free and disorderly development of the urban logistics and distribution industry, which will bring about the development of the logistics industry and the development of the city. Serious hindrance. From the perspective of life cycle, the article analyses the energy consumption and pollutants emitted by each component of the urban logistics distribution system, and then conducts an effective assessment of its environmental impact.

1. Introduction

my country is in a critical period of accelerating urbanization. With the influx of large numbers of people into cities, the scale of cities is expanding rapidly. With the development of the urban economy and the improvement of people's living standards, the rapid development of urban chain operations and e-commerce has also produced an urban logistics industry that is compatible with the urban economy and market. At present, the urban logistics industry has become an important organic part of the urban economy, and it plays a key basic role in optimizing the layout of resources and enhancing the comprehensive competitiveness of the city. For large cities such as Beijing and Shanghai, logistics activities are more concentrated. The logistics and distribution industry not only supports the economic development of the city, improves the living standards of urban residents, but also promotes the economic development and industry in the surrounding areas of the city to a certain extent. Layout optimization. In March 2009, the State Council issued the "Notice on the Adjustment and Revitalization of the Logistics Industry". The urban logistics and distribution project was listed as one of the key projects and proposed to promote the urban logistics and distribution industry to be more specialized, informatized, networked and relevant. A more environmentally friendly development idea. However, due to the late start of urbanization and modern logistics in my country, there is a lack of policy guidance and unified industry planning for the urban logistics distribution industry. For a long time, the urban logistics and distribution industry has shown a spontaneous, disorderly and extensive development trend, which is reflected in the large number of logistics and distribution enterprises, serious business overlap, repeated construction of facilities, inefficient use of resources, uneven service levels, and many more. Environmental issues, etc. This poses a challenge to the realization of the goal of building a green city and a livable city, and urgently needs to attract the attention of city management authorities, urban logistics and distribution companies and research institutions.

2. Environmental Impact of Urban Logistics Distribution System

Based on the theoretical guidance of the life cycle method, this paper conducts a detailed study on the energy consumption status of logistics enterprises and the pollution problems involved, so as to obtain and reasonably classify the energy consumption and pollutant emissions of the logistics system in the same cycle, and the impact The environmental data are listed separately, and the work of grasping the environmental impact of the urban logistics distribution system is finally completed.

According to the definition of urban logistics distribution system, this article positions the

analysis goal as analyzing the environmental impact of urban logistics distribution service system. The system has a very complex composition, involving many companies such as commodity production, transportation, terminal distribution, and retail. The final logistics distribution completed by each company follows the processes of production, handling, transportation, circulation, and sales. At this stage, the production capacity of the urban ecosystem is getting lower and lower. Therefore, the analysis of the urban logistics distribution system carried out in this article is the most typical, that is, after transportation, companies store their own products in the logistics center, and distribute them based on customer needs. The center receives the goods from the logistics center and transmits them to the customers. So far, the entire sales process of the product is completed. Based on different functions and scales, logistics centers are usually built in the outer suburbs of cities, and the corresponding distribution centers will be located in the center of the city. Based on this consideration, this article sets the scope of research and designates it as a logistics center -Distribution center-sales outlets.

In the entire analysis process, the analysis of the inventory is the most important. Specifically, all energy consumption and pollutant emissions in the system should be recorded, so as to summarize and analyze the records and statistical data, and build the corresponding database. The business process of the entire system includes transit transportation, internal processing and distribution in the distribution center. Among them, the main resources and energy consumed in the transit transportation link are gasoline, diesel, compressed natural gas and liquefied petroleum gas, and pollutants emitted include HC, CO₂, CO, NO_x, and PM. The internal links of the distribution center are further divided into loading and unloading and handling, storage and heating, 3nq- and picking and gameplay links. The main resources and energy consumed in the loading and unloading links are gasoline, diesel and electricity, and pollutants are HC and CO: CO, NO_x, PM, SO; storage of iridium (including refrigeration and freezing) and heating links mainly consume electricity, heat and air-conditioning. The pollutants emitted are HC, CO, CO, NO_x, PM, SO; The main resources and energy consumed in the reprocessing link are gasoline, diesel, and electricity. The pollutant emissions include HC, CO₂, CO, NO_x, PM, and SO₂; the main resources and energy consumed in the selection and distribution link are electricity, and the pollutant emissions include CO₂, CO, NO_x, PM, SO₂. The main resources and energy consumed in the distribution link are gasoline, diesel, compressed natural gas and liquefied petroleum gas. The pollutants emitted are HC, CO, CO, NO_x, and PM.

At this stage, an international consensus on the types of pollutants and emissions that affect the human living environment has been reached. Applying this consensus to the pollutant emission categories of urban logistics distribution systems can be classified as negative impacts on the environment, as shown in the table 2 shown. First, the emissions obtained in the analysis of the inventory link are reasonably divided based on the four environmental impact categories in Table 2, and then refer to the recommended parameter values of the IPCC to obtain the characteristic values of each environmental impact category and classify them One processing, and finally weighting and summing these normalized reference values. In this way, the comprehensive environmental impact value of each city's logistics distribution system can be obtained, and these values can be directly compared and analyzed horizontally and vertically. In the weighted summation, due to the different subjective value judgments among countries, regions, cities and industries, different weights may be assigned to them. When conducting research, you can invite some environmental protection professionals to compare the intensity of environmental impact categories and make corresponding score judgments for the construction of the judgment matrix; the premise is to meet the consensus test , Solve the eigenvectors of the judgment matrix, and standardize them, and finally get the specific weights of different environmental impact categories.

In this part, it is necessary to research and interpret the data obtained in the analysis of the impact link, and on this basis, propose relevant suggestions and problem-solving measures, and finally clarify the impact weight of various pollutants on each environmental type in the process of comparison. Take targeted measures to implement timely, reasonable and effective environmental remediation. In addition, the interpretation of the report also requires relevant personnel to have the

ability to horizontally compare the environmental impact factors of different systems and select advantageous content based on the results of the comparison to minimize the negative impact of the modern urban logistics system on the environment.

3. Environmental Impact Assessment of Urban Logistics Distribution System

The concept of the urban logistics distribution service system is to deliver the products of suppliers to customers in an appropriate way in accordance with the ordering needs of users within the city, with the urban logistics distribution center as the core, and realize the economic activities of the final allocation of resources. According to the definition, we set the goal of the study to evaluate the comprehensive environmental impact of the urban logistics distribution service system. The system involves multiple entities such as product manufacturers, transit warehouses, distribution centers, retail terminals, and service integration operators. The specific business processes include collection, loading, unloading, storage, transit transportation, circulation processing, thermal insulation and low-temperature storage and transportation. It is a complex multi-user and multi-process system with multiple links such as picking, collection and distribution, and distribution. Due to the degradation of the current urban production and manufacturing functions, what we are studying is a more common urban logistics distribution model, that is, product manufacturers transport goods from outside the city to the logistics center for storage, wait for end users' orders, and deliver goods according to user needs. It is forwarded and transported to the designated distribution center. After the selection is completed in the distribution center, it is transported to various sales terminals on the logistics distribution network. Logistics centers are generally large in scale and located on the fringes of cities, while distribution centers are generally located in urban centers and suburban areas, close to sales outlets. We define the scope of the study in the networked operation system of logistics centers, passing through distribution centers, and then to sales outlets.

This is the most critical stage in the life cycle analysis process. By distinguishing the energy, resource consumption and material emissions of each business process in the urban logistics distribution system, combined with the available data, the adjusted energy for each business link is established. Raw data on consumption and pollutant emissions. Other tasks at this stage also include data aggregation, validity testing, and the association of data with specific business links. According to the boundaries of the urban logistics distribution system determined in the first stage, and in accordance with the system operation management process, the system material analysis framework diagram is obtained. The framework considers the direct and indirect energy consumption and material emissions of the system, including various fuels (diesel, gasoline, compressed natural gas, liquefied petroleum gas, etc.) consumed by transportation and various wastes (including carbon dioxide, toxic Harmful gases and fine particles, etc.), as well as the fuel and power consumption of loading and unloading forklifts, cranes, processing equipment, etc. in the distribution center, the power consumption during storage, and the supply of electricity and cold (warm) gas. Discharge of indirect pollutants, etc. In the analysis at this stage, there are many types of emissions in the energy consumption process, and there are large uncertainties in their quantities. They are affected by multiple factors such as fuel quality, vehicle conditions, road conditions, and load. Therefore, it is necessary to reasonably simplify them. . With reference to the national standards GB18285-2005 and GB17691-2005, the emissions of transportation fuels that have a greater impact on the urban environment include HC, CO₂, CO, NO_x and PM, etc., while the emissions caused by electricity consumption are mainly CO₂, NO_x, PM and SO₂. The specific emissions are calculated according to the limits in the above two national standards, and the CO₂ emission factors of fuel and electricity are calculated with reference to related research and official statistical data. This stage is mainly to analyze and explain the results obtained in the third stage, and put forward suggestions and countermeasures. For different urban logistics distribution systems, through the analysis and comparison of the first three stages, we can find the impact intensity of different environmental impact types in the system and the key environmental load items that cause the impact, so that targeted measures can be taken to improve. In addition, the overall environmental impact of

different systems can be compared horizontally, or the environmental impact during the evolution of the system can be compared vertically to learn from each other's strengths and set an industry benchmark, thereby enhancing the environmental management capabilities of the urban logistics distribution service system.

4. Conclusion

This article analyzes the idea of applying the life cycle method to the analysis and evaluation of urban logistics systems, and afterwards studied the comprehensive environmental impact of the three urban logistics distribution systems in the chain operation industry in City A, and finally learned that joint delivery and third parties. While realizing the large-scale operation of enterprises, the professional logistics distribution service model can reduce the cost of the unit environment to a certain extent and effectively meet the operating needs of chain enterprises. This can indicate the future of urban logistics distribution in a certain sense. Development trend. Therefore, for urban managers, in the future, it is necessary to formulate corresponding systems and norms reasonably and scientifically, correctly guide the development of the logistics industry, and make it develop and improve in the direction of the third logistics and common distribution mode; for service companies. In other words, it is necessary to optimize the layout, improve product transportation, loading and sales systems, and introduce new environmental protection technologies to further realize sustainable development of the urban environment while increasing revenue.

References

- [1] Xu Wenrui. Environmental Impact Analysis of Urban Logistics Distribution System. *China Business Forum*, vol. 2, no. 2, pp. 48-49, 2017.
- [2] Zhang Yufen. Research on Optimization and Evaluation of Urban Logistics Distribution System in Hebei Province. *Chinese Market*, vol. 1, no. 15, pp.7-9, 2012.
- [3] Chen Xiaojiao, Zhang Yong, Mao Haijun, et al. Research on the travel chain mode and impact of urban distribution vehicles. *Logistics Technology*, vol. 29, no. 1, pp. 23-25, 2010.
- [4] Deng Aimin, Wang Shaomei, Wang Lijun. Research on the Optimization of Urban Logistics Distribution System. *Journal of Wuhan University of Technology (Transportation Science and Engineering Edition)*, vol. 3, no. 2, pp. 481-484, 2006.
- [5] Zhang Yingchuan, Wang Yu. Urban logistics distribution under the green supply chain system. *Logistics Technology and Application*, vol. 2, no. 8, pp.103-106, 2015.