



This is a peer-reviewed, final published version of the following document and is licensed under Creative Commons: Attribution-No Derivative Works 3.0 license:

**Chen, Xuezhong, Jiang, Linlin and Wang, Chengbo (2011)  
Business Process Analysis and Implementation Strategies of  
Greening Logistics in Appliances Retail Industry. Energy  
Procedia, 5. pp. 332-336. doi:10.1016/j.egypro.2011.03.056**

Official URL: <http://www.sciencedirect.com/science/article/pii/S1876610211009921#>

DOI: <http://dx.doi.org/10.1016/j.egypro.2011.03.056>

EPrint URI: <https://eprints.glos.ac.uk/id/eprint/1456>

#### **Disclaimer**

The University of Gloucestershire has obtained warranties from all depositors as to their title in the material deposited and as to their right to deposit such material.

The University of Gloucestershire makes no representation or warranties of commercial utility, title, or fitness for a particular purpose or any other warranty, express or implied in respect of any material deposited.

The University of Gloucestershire makes no representation that the use of the materials will not infringe any patent, copyright, trademark or other property or proprietary rights.

The University of Gloucestershire accepts no liability for any infringement of intellectual property rights in any material deposited but will remove such material from public view pending investigation in the event of an allegation of any such infringement.

PLEASE SCROLL DOWN FOR TEXT.

This is the final published version and is licensed under a [Creative Commons Attribution 3.0 License](#):

**Chen, Xuezhong and Jiang, Linlin and Wang, Chengbo (2011) Business Process Analysis and Implementation Strategies of Greening Logistics in Appliances Retail Industry. Energy Procedia, 5 332-336.**

Published in Energy Procedia, and available online at:

<http://www.sciencedirect.com/science/article/pii/S1876610211009921#>

We recommend you cite the published version.

The URL for the published version is <http://dx.doi.org/10.1016/j.egypro.2011.03.056>

#### **Disclaimer**

The University of Gloucestershire has obtained warranties from all depositors as to their title in the material deposited and as to their right to deposit such material.

The University of Gloucestershire makes no representation or warranties of commercial utility, title, or fitness for a particular purpose or any other warranty, express or implied in respect of any material deposited.

The University of Gloucestershire makes no representation that the use of the materials will not infringe any patent, copyright, trademark or other property or proprietary rights.

The University of Gloucestershire accepts no liability for any infringement of intellectual property rights in any material deposited but will remove such material from public view pending investigation in the event of an allegation of any such infringement.

PLEASE SCROLL DOWN FOR TEXT.



IACEED2010

# Business Process Analysis and Implementation Strategies of Greening Logistics in Appliances Retail Industry

Chen Xuezhong<sup>a\*</sup>, Jiang Linlin<sup>b</sup>, Wang Chengbo<sup>c</sup>

<sup>a</sup>*School of Economics, University of Jinan, Jiwei Road 106, Jinan 250022, China*

<sup>b</sup>*School of Management, University of Jinan, Jiwei Road 106, Jinan 250022, China*

<sup>c</sup>*Business School, Edge Hill University, St Helens Road, Ormskirk, Lancashire, L39 4QP, UK*

---

## Abstract

The whole world ecological environment worsens, and low-carbon economical and sustainable development becomes the general trend. The retail trade as the middle link of the whole economic cycle plays an important role on the relations of each essential factor in the entire economic environment. The concepts of low-carbon economy, and green logistics, and electrical appliances retail trade are discussed and the problems existing in the green logistics of the electrical appliances retail trade are explored. Based on the analysis of the business process and functions of green logistics in the electrical appliances retail trade, the system architecture of green logistics in the electrical appliances retail trade is established. Finally, the strategies and measures of greening logistics in the electrical appliances retail industry are proposed.

© 2011 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Selection and peer-review under responsibility of RIUDS

**Keywords:** Low-carbon economy; Green logistics; Electrical appliances retail; System architecture; Measures and strategies

---

## 1. Introduction

It is necessary for the human society to take the low carbon and green development path because industrialization has driven society development and has resulted in a series of environmental problems. Logistics development also should follow environmentally sustainable development. The applications of green logistics to various fields have become an important project.

---

\* Corresponding author. Tel.: +86-531-82769921; fax: +86-531-82769921.

E-mail address: [chenxvz@163.com](mailto:chenxvz@163.com).

## 2. The related literature reviewed

What is the low-carbon economy? The white book of Britain named “Our future energy: creating a low carbon economy”<sup>[1]</sup> said that low-carbon economy is an economic system with little or no greenhouse gas emissions into the atmosphere, or an economic system that the carbon footprint is close to or equal to zero. Chinese Academy of Science<sup>[2]</sup> considers that a low carbon economy is an economic model based on low energy and low pollution and low emission. Currently there is no uniform definition of low-carbon economy. Here the definition of low-carbon economy is given as follows based on the aggregation of the studies at home and abroad. The low carbon economy is an economic development model of high energy efficiency and low energy consumption and low emission. The core meanings of the low-carbon economy are the development of low carbon technologies and using alternative energy sources and promoting low-carbon consumption and establishing a low-carbon development institution and making low-carbon development policies.

The appliances retail industry mainly engaged household appliances. Appliances retail as the intermediate links of the manufacturers and consumers of household electrical appliances have an important responsibility on protecting the environment and have sufficient favorable conditions.

The green logistics emerges and develops in 1990s. H. J. Wu and S. Dunn<sup>[3]</sup>, Jean-Paul Rodrigue, Brian Slack and Claude Comtois<sup>[4]</sup> put forward their own point of view. The executive committee of reverse logistics of the United States<sup>[5]</sup> also defines green logistics. The book “Green Logistics” written by Bjorn N. and Palle Petersen in Denmark considers that green logistics is the ecological management of the former logistics and reverse logistics. “Logistics Term” (GB/T18354-2001) published in China in 2001 considers that the logistics resources can be fully used with achieving the purification of the logistics environment and no damage to the environment. EU and Japan also made relevant government policies and industry measures. UK takes green measures on supply chain management in the manufacturing. P. R. Murphy and R. F. Poist<sup>[6]</sup> put forward a green logistics strategy model. The research of green logistics in China is mainly located in the theoretical study and the specific application is less discussed.

## 3. The system architecture of green logistics in the electrical appliances retail industry

### 3.1. The problems analysis of green logistics in appliances retail industry

The market competition and homogenization of home appliances results in profit margins of home appliance retailers reducing greatly<sup>[7]</sup>. The current problems of green logistics of home appliance retail in China existed mainly in the industry environment and enterprise operations.

The problems existed in industry environment are as follows: Green awareness is weak; Industrial base is weak; People qualified to this field are short; Competitive advantage is lack.

The problems existed in enterprise operations are as follows: The retailer does not play a regulatory role on the manufacturer in procurement aspect; Most of warehouse do not meet the green requirements; Retailers cannot recycle and conserve natural resources in the packaging; Distribution arrangements are unreasonable and low efficiency and distribution vehicles do not meet environmental requirements; The waste products and packaging rarely can be recycled; Enterprises focus on economic efficiency and neglect environmental protection.

### 3.2. The system architecture of green logistics in appliances retail industry

According to the analysis of business process and problems existing in green logistics of appliances retail trade, its system architecture is constructed as shown in Figure 1.

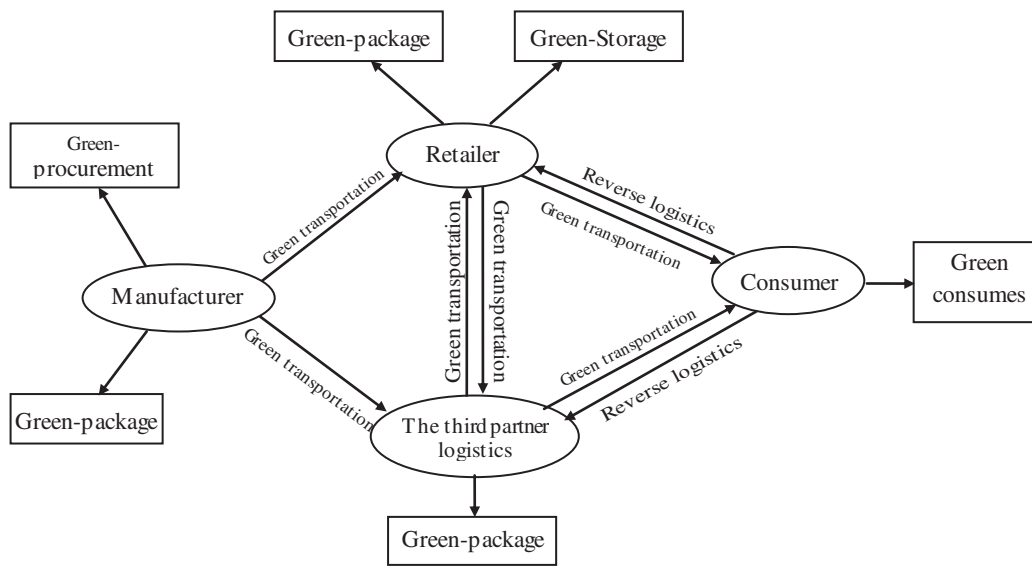


Fig. 1. The system architecture of the green logistics in electrical appliances retail industry

### 3.3. Explanations on system architecture of green logistics in appliances retail industry

The main agents of green logistics system include appliance makers and electrical retailers and consumers and third-party logistics.

The green logistics process from appliance manufacturers to final consumers include green procurement and green transportation and green storage and green packaging and reverse logistics<sup>[8]</sup>.

There are two ways of moving household electrical appliances from manufacturers to retailers. The first way is that the products are transported from manufacturers directly to retailers and the second way is through third-party logistics. In order to implement green logistics, the logistics process should be green. Manufacturers should purchase green resources and pack the product green. The third-party logistics should keep green packaging and green transport. The retailers are mainly faced with green storage.

There are two cases of moving home appliances from retailers to consumers. One is transporting goods directly from retailers to consumers and the other is through the third-party logistics. Greening logistics is reflected in retail green packaging and third-party logistics green packaging and green transport.

The reverse logistics is that consumers transport the used products to the third-party logistics or the retailers. The concept of green consumption and behavior has an important influence for this green logistics process.

## 4. The strategies and measures of greening logistics in the electrical appliances retail industry

Green logistics can reduce costs, improve efficiency, expand market, develop enterprises sustainably, and facilitate access to government support. According to the structure of green logistics system in home appliance retail, the strategies and measures are proposed as follows.

#### 4.1. Green procurement

Manufacturers should adopt green production methods and consider environmental factors when they choose raw materials. Retailers in the process of products procurement should consider the green degree including the product itself and product packaging by giving more concessions to the higher green degree of brand to urge the manufacturer to the green direction.

#### 4.2. Green packaging

Packaging of home appliances involves manufacturers, retailers and the third party logistics. Manufacturers need to consider on packaging materials and design. Retailers control purchasing power, so they should choose appliances brands having green packaging friendlier to environment. Retailers should also focus on the warehousing and distribution transport. Packaging should be easy to transport and store. It is necessary to create a new transport system and improve the packaging and use the appropriate form of new packaging to reduce the failure rate of products and breakage handling cost of goods and the energy consumption. The third-party logistics companies should choose safe packaging materials to reduce damage during transportation and think the recycling of packaging because transport and distribution are repetitive in a professional logistics and transport companies.

#### 4.3. Green transport

Green Transport of goods has four transport lines including the transport from manufacturers to retailers, the transport from manufacturers to retailers through third-party logistics, the transport from retailers to the final consumer and the transport from retailers to consumers through third-party logistics. Manufacturers and retailers and third-party logistics usually reach an agreement to jointly coordinate the logistics process to complete the transport.

Current retail distribution models include distribution of suppliers, self-distribution, third-party distribution and joint distribution. This paper argues that retail enterprises choose the delivery mode according to the different and reasonable mode of operation. Specific measures are as follows.

- Establishing an electronic information system. The situation of logistics system can be controlled through the information system of logistics. The delivery system of retailers should include location, time, personnel, cargo type, storage information, installation information, and etc. The information system can be applied to information collection, information classification, information processing, and distribution arrangement of goods<sup>[9]</sup>.

- Using green vehicles. The promotion of using green vehicles depends on both business and government support because the cost of green vehicles is higher than ordinary freight cars. Government needs to establish standards for logistics vehicles and control the use of pollution vehicle and give subsidies for green vehicles and establish relevant incentive mechanism.

- Choosing reasonable delivery mode. The reasonable model should be used to the specific circumstances in order to increase the use of intensive resources and reduce duplication of vehicle transportation and emissions.

The above three ways of green transport could be used to manufacturers and third-party logistics.

#### 4.4. Green storage

It is necessary for appliances retail to meet the general requirements of storage management and think of the special nature of home appliances.

- Creating secure storage environment.
- Building rational distribution warehouse.
- Developing an electronic inventory system.
- Arranging reasonable inventory quantity.
- Keeping safety of goods in the process of warehouse operations.

#### 4.5. Green reverse logistics

The new product packaging equipment and materials could be recycled during goods are distributed and installed to customers. The used appliances and packaging can be recycled by retailers alone or recovered by third-party logistics, and then returned to the manufacturers for re-use or concentrate.

#### 4.6. Enhance the enterprise's awareness of green logistics

Enterprises should improve the green awareness of logistics and build green corporate culture and promote the development of green logistics. Taking the social responsibility of environmental protection will enhance the corporate image.

The implementation of green logistics needs the support of institutions and standards decided by a nation. The Government should issue preferential policies and adopt preferential policies and support the implementation of green logistics of home appliances retailers. Home appliances retailer, manufacturers and third party logistics could sign the related agreements and supervise the implementation of green logistics and enhance their level of green logistics through their own norms.

### 5. Conclusions

The structure system of green logistics in the appliances retail industry and implementation strategies and corresponding measures are put forward in this paper. The further study will focus on the international comparative analysis of green logistics in home appliances retail industry and the innovations of policies and institutions to explore long-term mechanism of green logistics.

### References

- [1] Nie Yongyou, Zhang Jingru. The low-carbon adjusting of the industrial structure. *Business Weekly*, 2009,12,21
- [2] Research group of Chinese academy of energy. *China energy technology 2050 roadmap*. Beijing: Science Press, 2009
- [3] H. J. Wu and S. Dunn. Environmentally responsible logistics systems. *International Journal of Physical Distribution and Logistics Management*, 1995, Vol.25(2):20
- [4] Jean Paul Rodrigue, Brian Slack, Claude Comtois. *Green logistics*. Published in A. M. Brewer, K. J. Button and D. A. Hensher (eds). *The handbook of logistics and supply-chain management*. London: Pergamon/Elsevier. 2001
- [5] Wang Changqiong. *Green logistics*. Beijing: Chemical Industry Press, 2004
- [6] Paul R Murphy, Richard F Poist. Green logistics strategies. *Transportation Journal*, Winter, 2000,40,2
- [7] Zou Junzhou, Huang Xinmou. On the purchasing alliances of home appliance retail. *Marketing*, 2009,4
- [8] Wang Xiaoxiao. Retail chain supermarket in reverse logistics management. *Logistics Engineering and Management*, 2009,6
- [9] Mao Yanli, Liu Qiang. The common use of distribution model in small and medium retail chain. *Market Modernization*, 2009,5