Analysis of a Reverse Logistics Network Model of Electrical and Electronic Products

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Abstract. With the rapid development of science, technology and economy, electrical and electronic products have already been closely related to people's work and life. However, a large amount of waste of electrical and electronic products also warrants our attention. To truly realize nonhazardous treatment of waste of electrical and electronic products, China needs to build a perfect reverse logistics network. For this end, in this paper, we make a specific analysis of the reverse logistics network model of electrical and electronic products. Hopefully, our study could bring some inspiration to the construction of this network.

Introduction

At present, China is facing serious resource and environmental pressure. This is also the reason why our government advocates building a resource-conserving and environment-friendly society. To put this society into reality, we must draw support from the reverse logistics network of electrical and electronic products. This is also the reason why we carry out a specific study on the reverse logistics network model of electrical and electronic products.

Overview of Reverse Logistics

To complete this article with high quality, first of all we need to understand reverse logistics. Tab. 1 visualizes the characteristics of reverse logistics. From this table, we can gain a deep insight into reverse logistics.

Tab. 1 Characteristics of Reverse Logistics

Characteristic	Uncertainty	Direction	Benefit	Economy of Scale
Characteristic	Difficult to predict	Reverse	Social benefit goal	Hard to achieve
	Complex	Hybrid	Speed	Handling charge
Characteristic	More complex	High hybridity	Slow	High
	Single price	Pricing	Handling mode	Marketing mode
Characteristic	Non-single	Inconsistent	Ambiguous	Complex and diverse

With a simple knowledge of the characteristics of reverse logistics, we also need to clarify the driving factors of reverse logistics. Tab. 2 visualizes these driving factors. From this table, we can learn about the genesis of a reverse logistics network model of electrical and electronic products more intuitively and deeply [1].

Tab. 2 Driving Factors of Reverse Logistics

Driving Factor	Manifestation
Environmental Stress	A large amount of waste of electrical and electronic products tends to become e-waste due to improper disposal. The national environment will undergo great pressure and threats;
Resource Depletion	Simple disposal of the waste of electrical and electronic products often results in the depletion of a lot of resources. This conflicts with our national policy of sustainable development.
Policies and Regulations	With ever-increasing national and public environmental consciousness, the unveiling of various policies and regulations will gradually put the disposal of waste of electrical and electronic products in China on the right track.
Economic Interests	The recycling of waste of electrical and electronic products can reduce production costs and cut down material consumption. Accordingly, economic interests will emerge;

Foreign Reverse Logistics Networks of Electrical and Electronic Products

With a simple knowledge of reverse logistics, we also need to analyze foreign reverse logistics networks of electrical and electronic products in depth. Tab. 3 visualizes 5 common foreign reverse logistics networks of electrical and electronic products. From this table, we can gain a deep insight into the reverse logistics networks of electrical and electronic products.

Tab. 3 Five Common Foreign Reverse Logistics Networks of Electrical and Electronic Products

Reverse Logistics Network of Electrical and Electronic Products	Characteristic
MDCM	The manufacturer is the subject, which directly contacts consumers and realizes the recycling of old electrical and electronic products;
MDCDM	The manufacturer is the subject, which recycles old electrical and electronic products through sales channels;
MDCTM	A third-party reverse logistics service provider is the subject, who delivers old products to the manufacturer after basic treatment;
MCM	The manufacturer is the subject, which recycles old electrical and electronic products through direct sales;
MCTM	Based on direct sales, this mode belongs to a recycling mode under an open-loop supply chain.

With a simple knowledge of 5 common foreign reverse logistics networks of electrical and electronic products, we also need to understand the manifestations of these models in actual applications. Fig. 1 shows a reverse logistics network of electrical and electronic products in Georgia, the United States. From this figure, we can find out that in this model, the waste of electrical and electronic products is divided into two categories. Commercial consumers undertake all recycling fees [2].

Operation Process:

Fig. 1 A Reverse Logistics Network of Electrical and Electronic Products in Georgia, the United States

Japan, however, implements a reverse logistics network of electrical and electronic products as shown in Tab. 4. Combining Fig. 1 with Tab. 4, it is not hard to find that government support and consciousness of large-scale enterprises play a huge role in the reverse logistics network model of electrical and electronic products. But it is quite difficult to popularize this model in China.

Tab. 4 A Reverse Logistics Network of Electrical and Electronic Products in Japan

Process	Stage	Composition
Recycling Process	Primary recycling	Consumers;
	Secondary recycling	Retailers and regional autonomous governments;
	Tertiary recycling	Warehouses;
	Disassembly and reprocessing	Processing plants;
Handling Process	Reuse	Second-hand market, factories and wasteyards

The Building of a Domestic Reverse Logistics Network Model of Electrical and Electronic Products

From the above, we gain a deep insight into the reverse logistics network of electrical and electronic products. On this basis, the author identifies principles to build a domestic reverse logistics network of electrical and electronic products, i.e., environmental protection, sustainable development, legislation, integration, industrialization, marketization, closed-loop system and product life cycle. In combination with these principles, the author builds a domestic reverse logistics network model of electrical and electronic products, as shown in Tab. 5.

Tab. 5 A Domestic Reverse Logistics Network Model of Electrical and Electronic Products

Process	Stage	Content
Recycling Process	Primary recycling	Consumers, community committees, street vendors and distributors are subjects that play a role in this stage;
	Secondary recycling	Municipal departments and vendors receive electrical and electronic products;
	Tertiary recycling	Electrical and electronic products are classified according to product life cycle;
Handling Process	Reprocessing	Electrical and electronic products flow into the market again through maintenance, modification and reprocessing;
	Disassembly	Available spare parts are sold. Raw materials are processed. Finally, hazardous substances and waste are sent to wasteyards. This process must focus on nonhazardous treatment.

Conclusion

In the present study on the reverse logistics network model of electrical and electronic products, the author elaborates on concepts related to reverse logistics, foreign reverse logistics networks of electrical and electronic products and the building of a domestic reverse logistics network of electrical and electronic products. From these, we can gain a deep insight into the reverse logistics network of electrical and electronic products. Hopefully, this paper could bring some inspiration to the building of a resource-conserving and environment-friendly society in China.

References

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