THE CURRENT STATE OF WASTE REVERSE LOGISTICS IN KOREA AND ITS FUTURE

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Abstract: After the conclusion of the United Nations Framework Convention on Climate Change in 1992 and the ratification of Kyoto Protocol, global concerns for environment are rapidly increasing. As it grows, global concerns about reverse logistics for waste collecting, recycling and reusing are becoming more important. In this study, current state of reverse logistics, especially waste reverse logistics, will be investigated with related legal system. Reverse logistics are recently starting to be utilized practically with the advancement of related studies. By analyzing the current state, we will study for future improvements.

Key Words: Reverse Logistics, Waste Logistics, Green Logistics, Act on Waste

1. INTRODUCTION

After the conclusion of the United Nations Framework Convention on Climate Change in 1992 and the ratification of Kyoto Protocol, global concerns for environment are rapidly increasing. As it grows, global concerns about reverse logistics for waste collecting, recycling and reusing are becoming more important. In the case of European Union, for example, it is obligated to collect the waste products and recycle it. In the United States, reverse logistics is also a rising issue which is consider, three factors following; direct reuse, remanufacturing and recycling. In the case of Japan, reverse logistics system is established for a resource recycling society.

In this study, current state of reverse logistics, especially waste reverse logistics, will be investigated with related legal system. Reverse logistics are recently starting to be utilized practically with the advancement of related studies. By analyzing the current state, we will study for future improvements.

1.1 The Concept of Reverse Logistics

The traditional concept of logistics contains only the processes from raw material to final
product passing through the production process. But as the environmental problems become more important, people are more interested in the sustainable production process which mainly contains recycling the product wastes. As compared to the traditional logistics which we call “forward logistics”, the concept of reverse logistics which has opposite direction of the forward logistics has been raised. From the definition of the logistics by the Council of Logistics, the reverse logistics could be defined as following;

*The process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal.*

1.2 The Scope of the Study

In general, the reverse logistics contains returned product by marketing strategy, used goods, returning goods, recyclable packing materials, etc. Setting aside the various objects, the recycling, reusing and remanufacturing of the product wastes from the end users will be analyzed in this study.

2. PRESENT STATE OF WASTE REVERSE LOGISTICS

2.1 Acts related to the reverse logistics

To promote the reverse logistics, the settlement of the system and the infrastructure should be supported by the legal backup. In this section, present state of related acts will be investigated. The acts could be categorized into three groups; the act related to the waste management, the act encouraging wastes and resources recycling, and the act related to the establishment of facilities.

2.1.1 Acts related to the waste management

The acts related to the waste management are as following; the act on waste management, the act on international movement of wastes and its management, and the act on the management of radioactive waste.

The act on waste management is the first and the basic act for waste management which is enacted in 1986. It treats domestic waste, industrial waste, medical waste and specified waste. Specified waste is some part of the industrial waste which is especially disposed because it could bring about environmental and health problems. The objective of the act is to control the generation of the waste and to dispose properly the generated wastes for environment and health.

The act on international movement of wastes and its management controls the import and export of the hazardous wastes. The objective of the act is to prevent environmental pollution from international movement of the hazardous wastes and to improve international cooperation for the prevention.

The act on the management of radioactive waste is especially for the control of the radioactive wastes. It designates the appropriate disposal and the management of the wastes for public safety and environmental conservation.
2.1.2 Acts encouraging wastes and resources recycling

The acts encouraging wastes and resources recycling are as following; the act on the promotion of saving and recycling of resource, the act on recycling promotion of construction waste, and the act on the recycling of electrical and electronic equipment and automobiles.

The purpose of the act on the promotion of saving and recycling of resource is to contribute to the preservation of the environment and sound development of the national economy by facilitating the use of recycled resources by means of controlling the generation of wastes and facilitating recycling.

The act on recycling promotion of construction waste is for eco-friendly disposal of the construction waste and encouragement of its recycling. It contributes for efficient use of resources and environmental welfare.

The purpose of the act on the recycling of electrical and electronic equipment and automobiles is to promote recycling of electrical and electronic equipment and car, restrain using of hazardous material and make it easy to recycling.

2.1.3 Acts related to the installation waste facilities

The acts related to the establishment of facilities are as following; the act of Korea Environment and Resources Corporation and the act of the promotion of the waste disposal facilities installation and its assistance.

The act of Korea Environment and Resources Corporation is for establishing related corporation to build the resource cycle management system with effective achievements, including control of wastes and recycling.

The purpose of the act of the promotion of the waste disposal facilities installation and its assistance is to contribute to environmental conservation and to improve the people’s life quality by facilitating installation of waste disposal facilities. It is also for the promotion of inhabitants’ welfare of the adjacent areas through promoting the securing of sites for waste disposal facilities and support for the inhabitants of adjacent areas.

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<th>Table 1 Acts related to the waste management</th>
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waste acid, which may contaminate environments, or medical refuse, which may cause harm to human bodies

Medical refuse: the wastes specifically enumerated by Presidential Decree among the wastes discharged from public health and medical institutions, veterinary clinics, testing and inspection institutions and other similar institutions, which may cause harm to human bodies by infection or otherwise and for which it is deemed necessary to be put under special control for public health and environmental conservation such as parts and extracts of human bodies and carcasses of laboratory animals

Purpose

The purpose of this Act is to contribute to environmental conservation and to enhance the quality of life by minimizing the production of wastes and properly disposing the generated wastes

Related policy

Comprehensive national wastes Management Plan: Plan to minimize and reutilize wastes, define the role and responsibility of related organizations for effective management of the wastes.

Object


Purpose

Environment conservation and pollution-control, improving cooperation among nations by the Act on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal and matters necessary for enforcement thereof.

Object

Radioactive waste: waste defined in ATOMIC ENERGY ACT, Article 2

Purpose

The purpose of Act on the management of radioactive waste is to contribute to the improvement of citizens' living standards and the promotion of social welfare, to strive for the prevention of disaster resulting from radiation, and to ensure the safety of the general public by prescribing the matters concerning research, development, production and utilization of nuclear energy (hereinafter referred to as "nuclear energy utilization") and the safety control thereof, and promoting the advancement of science and development of the industry.

Table 2 Acts encouraging wastes and resources recycling

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<td>Encouraging wastes and</td>
<td>Act on The promotion</td>
<td>Recyclable resources: goods or by-products collected after being</td>
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resources recycling

resources recycling of saving and resource recycling of resource (1992)

disposed of in an used or unused state, which are recyclable or reusable after reconditioning (including recoverable energy and waste heat, but excluding radioactive substances and substances contaminated by radioactive substances)

### Purpose

The purpose of this Act is to contribute to the preservation of the environment and sound development of the national economy by facilitating the use of recycled resources by means of controlling the generation of wastes and facilitating recycling.

### Related policy

Extended Producer Responsibility: an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle.

### Act on recycling promotion of construction waste (2003)

Object

Construction waste: waste of more than five tons generated from construction work pertaining to the 2.4 article of Framework Act on the Construction Industry and designated by Presidential decree

Purpose

Promote efficient use of national resource as well as contribute to the national economy and enhance public welfare by simulating construction waste in an environmental safe manner.

### Act on the recycling of electrical and electronic equipment and automobiles (2007)

Object

Electrical and Electronic Equipment: machines that work with the flow of electricity and the magnetic field

Purpose

To promote recycling of Electrical and Electronic Equipment and car, restrain using of hazard material and make easy to recycling

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<th>Table 3 Acts related to the installation waste facilities</th>
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| FACILITIES | Act of Korea environment and resources corporation (1993) | **Object**
| | | Wastes
| | | **Purpose**
| | | Establish a cycling resource management system by efficiency, implementing recycling process, manage waste through establishing Act of Korea Environment and Resources Corporation
| FACILITIES | Act of the promotion of the waste disposal facilities installation | **Object**
| | | Waste disposal facilities: means the waste disposal facilities defined under Article 2 of the Wastes Control Act
| | | **Purpose**
| | | The purpose of this Act is to contribute to environmental
and its assistance (1995) and to improve the quality of national life by facilitating installation of waste disposal facilities and promotion of inhabitant welfare of the adjacent areas through promoting the securing of sites for waste disposal facilities and support for the inhabitants of adjacent areas.

2.2 Acts analysis with steps of Reverse logistics

We have found that diverse ranges of wastes are managed by policies. In this section, related acts contents will be discussed through step-by-step process of reverse wastes system.

![Waste Reverse Logistics Schema](image)

2.2.1. Wastes

In the act of waste (the act on waste management, a the act on international movement of wastes and its management, the act on the management of radioactive waste), wastes classified by its specifics into household wastes, commercial wastes, controlled wastes, medical wastes, Hazardous waste, radioactive waste, etc.

2.2.2 Collection and transport

Qualification and observance of waste collection and transport are defined in the act on waste management, the act on the promotion of saving and recycling of resource, act on recycling promotion of construction waste, the act on the Recycling of Electrical and Electronic Equipment and Automobiles.

2.2.3 Disposal (recycling and reusing)

Qualification and observance of entity are legalized same as (2). And establishment and support of disposal facilities also legalized in the promotion of installation of waste disposal facilities and assistance, etc. to adjacent area act. The comprehensive national waste management plan and act on the promotion of saving and recycling of resource represent the way of processes and define duties undertaking entity.

2.3 Limitation

By various acts, wastes are managed and recycling is supported. In this section, limitation will be discussed which wouldn’t meet present acts.
2.3.1 Management of collection and transport

In present acts, the entity collects and transports is legalized. However, because plans (schemes) are voluntarily controlled, management efficiency is declining. In view of logistics, reverse logistics should be systematized and improved efficiently through overall management.

2.3.2 Fostering professionals

Logistics require expertise in a variety of areas for its management. Reverse logistics also need expertise about specifics on wastes, disposal, recycling, transport, and etc. However, there are no powerful supporting acts to encourage fostering professionals

3. CONCLUSION

We have briefly looked over the current state and limitations of waste reverse Logistics acts. A concern of waste reverse logistics is increasing according to increase of concerns on the environment and is developing for effective management through continuous examinations and repletion.

As we have seen, it should be prepared legal support to improve efficiency and systematization through overall management of reverse logistic chain in terms of waste transportation. At the same time, if there were supports to fostering professionals, reverse logistics system will be able to develop more effectively.

This paper shows the current state of Waste Reverse Logistics on wastes recycling. Reverse logistics includes not only waste disposal but also returning goods and secondhand goods reverse. Hence, this study possibly can be of help for future studies regarding the area.

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