

# 2016 Modularization of Korea's Development Experience: Waste Resources Management and Utilization Policies of Korea

2016



Ministry of Strategy  
and Finance



KRIHS

Korea Research Institute for  
Human Settlements



---

2016 Modularization of Korea's Development Experience:

**Waste Resources Management  
and Utilization Policies of Korea**

## 2016 Modularization of Korea's Development Experience

# Waste Resources Management and Utilization Policies of Korea

<b>Title</b>	Waste Resources Management and Utilization Policies of Korea
<b>Supervised by</b>	Ministry of Strategy and Finance (MOSF), Republic of Korea
<b>Prepared by</b>	Korea Research Institute for Human Settlements
<b>Author</b>	Pan-Ki Cho, Research Fellow, Korea Research Institute for Human Settlements (KRIHS) Syung-Uk Lee, Associate Research Fellow, Korea Research Institute for Human Settlements (KRIHS)
<b>Advisory</b>	Kee-Young Yoo, Senior Research Fellow, The Seoul Institute Jong-Ho Hong, Professor, Seoul National University
<b>Research Management</b>	KDI School of Public Policy and Management
<b>Supported by</b>	Ministry of Strategy and Finance (MOSF), Republic of Korea

Government Publications Registration Number 11-1051000-000755-01

ISBN 979-11-5545-185-4 95320

ISBN 979-11-5545-179-3

Copyright © 2016 by Ministry of Strategy and Finance, Republic of Korea

Knowledge  
Sharing  
Program



Government Publications  
Registration Number

11-1051000-000755-01

Knowledge Sharing Program

2016 Modularization of Korea's Development Experience

# Waste Resources Management and Utilization Policies of Korea

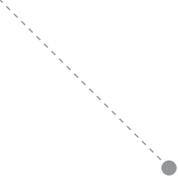


Ministry of Strategy  
and Finance



**KRIHS**

Korea Research Institute for  
Human Settlements



# Preface

The study of Korea's economic and social transformation offers a unique window of opportunity to better understand the factors that drive development. Within approximately a single generation, Korea transformed itself from an aid-recipient basket-case to a donor country undergoing fast-paced and sustained economic growth. What makes Korea's experience even more remarkable is that the fruits of Korea's rapid growth were relatively widely shared.

In 2004, the Korean Ministry of Strategy and Finance (MOSF) and the Korea Development Institute (KDI) launched the Knowledge Sharing Program (KSP) to assist partner countries in the developing world by sharing Korea's development experience. To provide a rigorous foundation for knowledge exchange engagements, KDI School has accumulated case studies through the KSP Modularization Program since 2010. Over the past six years, the Modularization Program has amassed 144 such case studies, carefully documenting noteworthy innovations in policy and implementation in a wide range of areas including economic policy, administration-ICT, agricultural policy, health policy, industrial development, human resources, land development, and the environment. Individually, the case studies convey practical knowhow and insights in an easily accessible format; collectively, they seek to share Korea's prosperity by illustrating how the country was able to kick-start and sustain its remarkable economic growth.

Building on the program's success over the past six years, we are pleased to present an additional installment of four new case studies and four e-content clips. The 2016 Modularization Program products were chosen based on the results of the careful analysis of topics in greatest demand in the KSP consultation program and comprehensive consultations with related ministries and specialists. The four new case studies discuss Korean experiences in the promotion of electronics industry, electronic commerce in advancing Korea's industrial structure, facilitation of resource management policies, and the developments in special economic zones.

In a further contribution to global knowledge sharing, the e-content topics feature Korean experiences in the development of Korea's major industries, including the automotive, electronic, shipbuilding, and cosmetics industries. Moreover, a total of 14 e-content modules have been uploaded to the World Bank's Open Learning Campus (OLC) in order to share Korea's knowledge with the international community.

I would like to express my gratitude to all those who were involved in the project this year. First and foremost, I would like to thank the Ministry of Strategy and Finance for its continued support for the Modularization Program. I would also like to express my heartfelt appreciation to the contributing researchers and their respective institutions for their dedication to research, to the former public officials and senior practitioners for the keen insight and wisdom they so graciously shared in their roles as advisors and reviewers, and also to the members of the KSP Executive Committee for their expert oversight of the program. Last but not least, I am thankful to each and every member of the Development Research Team for their sincere efforts to ensure the successful conclusion of the research project, as well as to Professor Taejong Kim for his supervision.

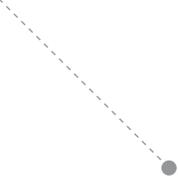
As always, the views and opinions expressed by the authors who have contributed to the body of work presented here do not necessarily represent those of the KDI School of Public Policy and Management.

December 2016

Joon-Kyung Kim

President

KDI School of Public Policy and Management



# Contents | LIST OF CHAPTERS

Summary.....	14
--------------	----

## Chapter 1

Introduction.....	17
-------------------	----

## Chapter 2

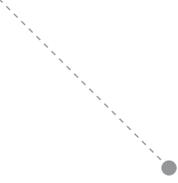
Waste Resources Management in Korea and Paradigm Shifts .....	21
1. Concept and Classification of Wastes .....	22
2. Current State of Waste Generation, Treatment in Korea and Changes in Trends.....	23
2.1. Current State of Waste Generation .....	23
2.2. Current State of Waste Treatment .....	24
3. Paradigm Shift in Waste Resources Management in Korea .....	27
3.1. Before 1990's .....	27
3.2. 1990's .....	28
3.3. After 2000.....	29
3.4. Present.....	31

### Chapter 3

Major Systems of Waste Resource Management in Korea .....	37
1. Major Systems of Waste Management in Korea .....	38
1.1. Discharger Responsibility System .....	40
1.2. Producer Responsibility System .....	47
1.3. Type-Based Waste Management System .....	62
1.4. System Certification of Lawful Treatment of Wastes (Allbaro System) .....	77
2. Measures for Managing Conflicts in Areas Surrounding Waste Treatment Facilities .....	81
2.1. Reasons for Conflict .....	81
2.2. Measures to Respond to Conflicts .....	83

### Chapter 4

Outcomes of Korea's Waste Management Policies and Comparison with Foreign Countries .....	95
1. Comparison with Foreign Waste Management Policies .....	96
1.1. Comparison Between Systems of Legislations .....	96
1.2. Comparison of "Waste Treatment Legislations" and "Recycling Legislations" Systems .....	98
1.3. Structure of the "Waste Reuse" Legislation System .....	99
1.4. Comparison of Whether a "Framework Act on Resource Circulation" Exists .....	100
1.5. Other Systems of Laws .....	104
1.6. Comprehensive Analysis .....	105
1.7. Comparison of Current State of Waste Generation and Treatment in Korea and Foreign Countries .....	107



## Contents | LIST OF CHAPTERS

2. Achievements and Limitations of Korea's Waste Management Policies.....	109
2.1. Achievements and Limitations of the Volume-Rate Disposal System .....	111
2.2. Extended Producer Responsibility (EPR).....	117

### Chapter 5

Policy Proposal for National Solid Waste Management .....	127
1. Basic Direction .....	128
2. Policy Proposal for each Phases .....	131
2.1. Stable and Sanitary Waste Treatment Phase .....	131
2.2. Waste Reduction and Recycle Phase.....	136
2.3. Resource Circulation Phase.....	143

### Chapter 6

Conclusion .....	147
------------------	-----

References .....	150
------------------	-----

Appendices.....	154
-----------------	-----

# Contents | LIST OF TABLES

## Chapter 2

Table 2-1	Paradigm Shift in Waste Policies .....	33
Table 2-2	Paradigm Shift in Korean Waste Management Policies throughout Years .....	34

## Chapter 3

Table 3-1	Differences between Waste Deposit System and Extended Producer Responsibility for Recycling System .....	48
Table 3-2	Categories of Objects Subject to Extended Producer Responsibility.....	49
Table 3-3	Role of Each Actor in the Extended Producer Responsibility System .....	51
Table 3-4	Mandatory Rate of Recycling in 2016 for Each Category of Product and Packaging Materials and Long-Term Target Recycling Rates (2017) .....	54
Table 3-5	Methods of Sorted Discharge .....	56
Table 3-6	Flow of Operation of Levying of Waste Levy and Payment Thereof.....	58
Table 3-7	Outcome of Waste Fee Collection.....	60
Table 3-8	Industrial Site Waste Dischargers whose Sector and Scale are Subject to the Business Waste Reduction Measure .....	64
Table 3-9	Types of Medical Wastes (Attached Table 2 of Article 4 of the Enforcement Decree for the Wastes Control Act) .....	66
Table 3-10	Standards for Method of Packaging for Each Type of Products.....	76
Table 3-11	Gyeonggi Province Name Changes for Household Waste Treatment Facilities .....	83
Table 3-12	Details of Incentive Provisions, Size and Methods .....	85
Table 3-13	Voluntary Entry Incentives Offered by Jeonju, North Jeolla .....	86

## Contents | LIST OF TABLES

### Chapter 4

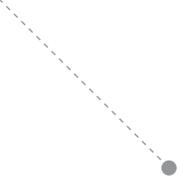
Table 4-1	Comparative Analysis of Legislation on Waste Management	97
Table 4-2	Comparison of Waste Management Policies of Korea and Foreign Countries (Treatment Law and Recycling Law Systems)	98
Table 4-3	Comparison of Waste Management Policies in Korea and Foreign Countries (Existence of a Framework Statute on Resource Circulation)	99
Table 4-4	Comparison of Waste Management Policies in Korea and Foreign Countries (Recycling Law System)	100
Table 4-5	Policy Tools of Each Country for Each Phase of Economic Activity	102
Table 4-6	Comparison of Waste Management Policies in Korea and Foreign Countries (Other Systems of Laws)	105
Table 4-7	Comparative Analysis of Systems of Legislations	106
Table 4-8	Yearly Reduction in Cost of Treatment of Domestic Waste and Accumulated Reduction	112
Table 4-9	Total Economic Value Due to Implementation of Volume-Rate Disposal System (1995-2012)	114
Table 4-10	Answers to Whether Sorted Discharge Causes Annoyance	115
Table 4-11	Changes in Yearly Recycling Outcomes	118
Table 4-12	Generation of Economic Value through Recycling	120
Table 4-13	Reduction of Costs of Landfill Burying (Incineration) Treatment	121
Table 4-14	Advancing the EPR System	124

## Chapter 5

Table 5-1	Implementation Measures By Phase .....	129
Table 5-2	Contents Included in Korea's Basic Plan for Waste Treatment and the Comprehensive Management Plan .....	133
Table 5-3	Research Categories on Sources of Waste Generation, Etc. (The Enforcement Rule for the Waste Management Act, Article 7, Clause 1).....	142
Table 5-4	Research Categories on Sources of Waste Generation, Etc.(The Enforcement Rule for the Waste Management Act, Article 7, Clause 2).....	142
Table 5-5	Expansion of Waste Related Budget in Korea.....	144

## Chapter 6

Table 6-1	Developmental Process of Waste Management Legislations of Korea .....	149
-----------	---	-----



# Contents | LIST OF FIGURES

## Chapter 1

Figure 1-1	Flow of Research .....	20
------------	------------------------	----

## Chapter 2

Figure 2-1	Current State of Domestic and Industrial Site Waste Generation .....	24
Figure 2-2	Current State of Domestic Waste Management .....	25
Figure 2-3	Current State of Industrial Waste Management .....	26
Figure 2-4	Changes in Waste-Related Policies and Systems in Korea .....	36

## Chapter 3

Figure 3-1	Major Systems of Waste Management in Korea .....	39
Figure 3-2	Volume-Rate Disposal Bags .....	42
Figure 3-3	Flow of Operation of Levying Waste Levies and Payments Thereof .....	59
Figure 3-4	System of Implementation of the Industrial Site Waste Reduction System .....	63
Figure 3-5	RFID Processing System .....	69
Figure 3-6	Chronology of the Allbaro System .....	78
Figure 3-7	Allbaro System's Operational System and Composition .....	79
Figure 3-8	Visitation to an Advanced Environmental Facility .....	84
Figure 3-9	An Example of a Resident Observation Agent during a Visitation Trip .....	84
Figure 3-10	Thermal Power Plant (Incineration Facility) of Pyeongchon New Town .....	91

Figure 3-11	Guri Resource Reclamation Facility.....	92
Figure 3-12	Guri Tower .....	93
Figure 3-13	Guri Citizen Sports Center.....	94

#### Chapter 4

Figure 4-1	Quantity of Waste .....	107
Figure 4-2	Rate of Recycling .....	108
Figure 4-3	Rate of Landfill.....	108
Figure 4-4	Comparison Current State of Waste Policies, Waste Generation and Treatment Methods.....	110

#### Chapter 5

Figure 5-1	Waste Management Goals.....	130
Figure 5-2	EPR (Extended Producer Responsibility) .....	139
Figure 5-3	Allbaro System Homepage.....	140

---

## Summary

The purpose of this research is to arrange and introduce Korea's waste management policies in order to modularize Korean knowledge and experience in this field, thereby establishing customized knowledge content that may be used as basic materials in Knowledge Sharing Projects for developing countries and other cooperative projects for development. In this chapter, an overall introduction is made on this research, including its background, purpose, and the method of implementation.

First, Korea's resource management and policies are introduced to developing countries. To enable developing countries to behold Korea's waste policies thus far in a single glance, overall policy paradigm shifts are introduced, centered on related legislation and policies. Next, Korea's waste management systems are distinguished into the discharger fee system, producer fee system, systems for each type of wastes, and the system of certification for the lawful treatment of wastes, whereupon the background surrounding their introduction and enactment will be introduced in specific terms. Furthermore, the causes of conflicts surrounding the selection of sites for waste treatment facilities, which developing countries are interested in understanding, will be analyzed, and the resolutions thereof will be explained through perspectives on cases in Korea.

---

Second, Korea's waste management and utilization policies will be compared with other advanced countries such as Europe, Japan, and the USA to find the present status of Korean policies. Also the outcomes and limits of the Volume-Rate Waste Disposal System and Extended Producer Responsibility (EPR) are introduced as representative Korean policies.

Finally, policy proposals for developing countries will be made, distinguished into waste treatment, waste reduction and recycling, and the resource circulation phase. These will be established into a body of waste-related knowledge content for developing countries so as to allow them to benchmark their own Integrated Solid Waste Management systems.



2016 Modularization of Korea's Development Experience  
Waste Resources Management and Utilization Policies  
of Korea

# Chapter 1

## Introduction

---

# Introduction

As developing countries increasingly demand to benchmark Korea's experience in successful economic development, the Korean Government implemented the Knowledge Sharing Program in 2004. The Knowledge Sharing Program is a tailored support program for policy research, policy consulting, and capacity building designed in accordance with the demands and conditions of the partner country and is based on Korea's experience and knowledge in the development of diverse fields.

In developing countries, management of solid waste is an important issue that has emerged as a national-level problem due to increases in the generation of waste following population growth. In response, developing countries have been trying to establish a sustainable and comprehensive solid waste management system to establish a national-level policy and system; however, current policies and systems are insufficient in terms of implementation. As such, it is necessary to establish a system through which Korea's verified experience in comprehensive and systematic solid waste management can be transmitted to developing countries.

In the case of Korea, the quantity of domestic waste generated as of 1994 was 58,118 tons. As for the methods of treatment of this waste, 81.2% consisted of burying in landfill sites, 3.5% consisted of incineration, and 15.4% consisted of recycling. Like developing countries, most domestic waste was buried in landfill sites. However, as of 2014, Korea's domestic waste has not only been reduced to 49,915 tons, but an astounding change has also been witnessed in terms of the methods of treatment. Landfill has been reduced to 15.6%, while recycling rose to 59.1%. In particular, the recycling percentage for all wastes, including industrial waste, is up to 83.9%.<sup>1</sup>

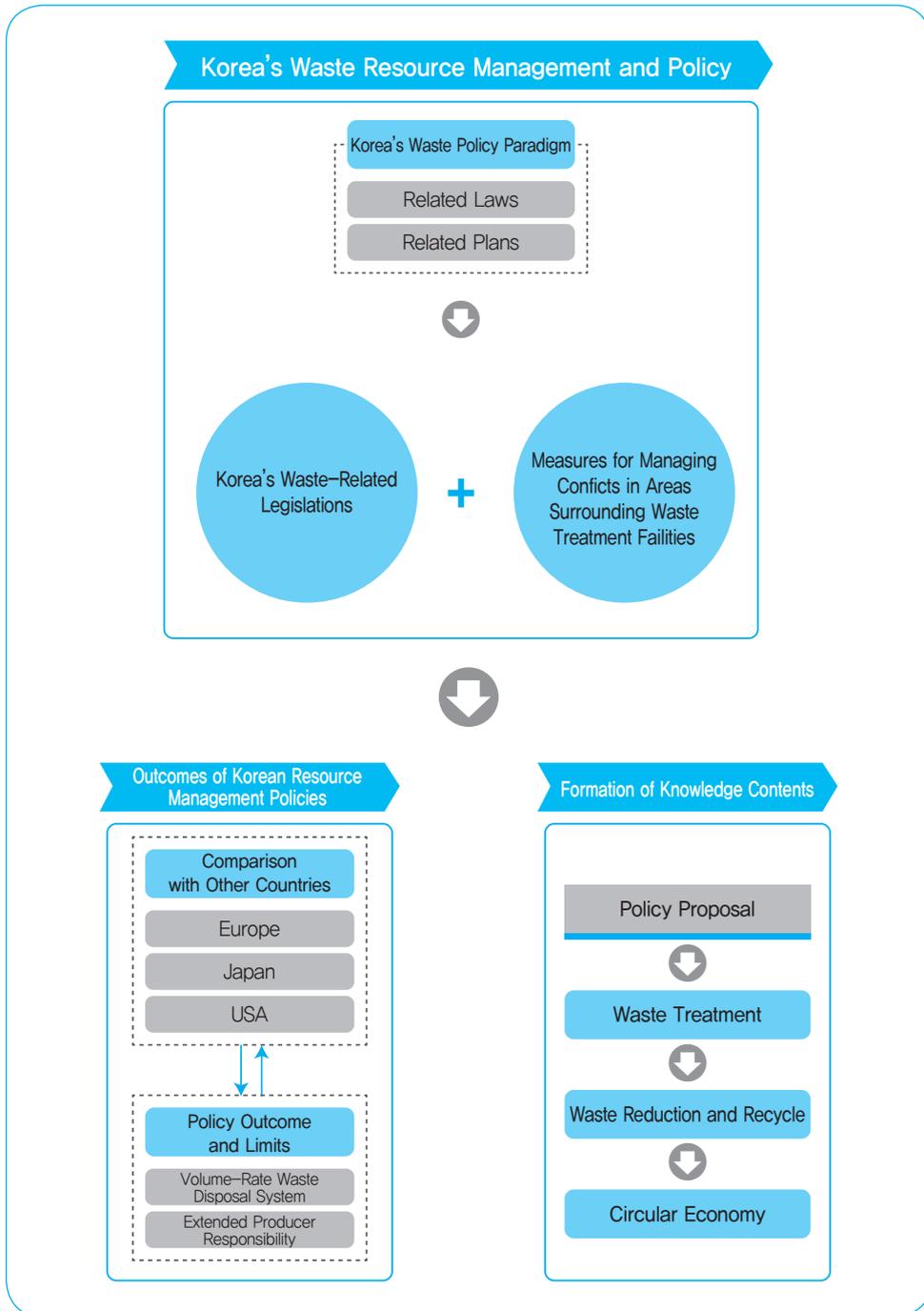
Such change has been brought about largely thanks to the recycling policies that have been in effect since 1995, such as the volume-rate disposal system, and the policies that promote foundation of a 'resource-circulating economic and social system' through means such as Extended Producer Responsibility (EPR), which promotes the reduction, reuse, and recycling of waste by producers. In addition, as the basic premise of realizing a resource-circulating (or Zero-Waste) society that goes beyond simple recycling, Korea now recognizes that "All Wastes = Resources that can be circulated 100%", thus setting a course towards an Upcycling system that enhances value of resources and goes beyond a simple quantitative circulation.<sup>2</sup>

As such, this research seeks to present, in an organized manner, the paradigms of Korea's waste management policies, and to introduce Korea's representative waste management policies and systems, such as the volume-rate disposal system and the Extended Producer Responsibility system. In addition, the purpose of this research is to modularize Korea's knowledge and experience in waste management policy in order to establish a body of customized knowledge content that can be used as basic materials for the Knowledge Sharing Program for developing countries and other cooperative development projects (consulting, development of educational programs, etc.)

1. The specifics of Korean waste generation and treatment quantity are detailed in part 2.

2. Ministry of Environment, 2016, Environment White Paper.

Figure 1-1 | Flow of Research



Source: Directly prepared by the author.

2016 Modularization of Korea's Development Experience  
Waste Resources Management and Utilization Policies  
of Korea

## Chapter 2

### Waste Resources Management in Korea and Paradigm Shifts

1. Concept and Classification of Wastes
2. Current State of Waste Generation, Treatment in Korea  
and Changes in Trends
3. Paradigm Shift in Waste Resources Management in Korea

---

# Waste Resources Management in Korea and Paradigm Shifts

This chapter introduces the paradigm shifts in Korea's waste resources management. First, the changes in waste generation and treatment thereof in Korea have been explained through statistics, and Korea's waste management legislations and plans will be presented on a yearly basis. Korea's waste-related legislations, plans and systems have been evolving in a diverse and complex manner following the country's economic and social changes, and this chapter focuses on introducing the overall policy directions, with an emphasis on legislations and plans (that are introduced in Chapter 3). Individual legislations and plans are introduced in detail in "Appendix 2".

## 1. Concept and Classification of Wastes

The current 「Wastes Control Act」 provides that, "The term "wastes" means such materials as garbage, burnt refuse, sludge, waste oil, waste acid, waste alkali, and carcasses of animals, which have become no longer useful for human life or business activities;" (Article 2 of the Act).<sup>3</sup> At the first level, wastes are distinguished into domestic wastes or industrial site wastes depending on the source of generation, at the second level, depending

3. Ministry of Environment, 2016, Environment White Paper.

---

on toxicity, into regular industrial waste and designated waste, and at the third level, into industrial site domestic wastes, facility wastes discharged from industrial sites, construction wastes, and medical wastes, depending on the characteristics of their generation.

Under the current Act, an object is classified as waste if the discharger intends to dispose of it, and even if the disposed waste retains utility value and is sold to a third person, the said object is still classified as waste if the discharger does not need it.

For example, even if materials or wastes generated in the course of manufacturing of a product are used as materials for another manufacturing process, they are not excluded from being classified as waste; accordingly, they should be either appropriately treated in accordance with the treatment criteria provided for in the 「Wastes Control Act」, or recycled through use or a recycling method.<sup>4</sup>

## 2. Current State of Waste Generation, Treatment in Korea and Changes in Trends

### 2.1. Current State of Waste Generation

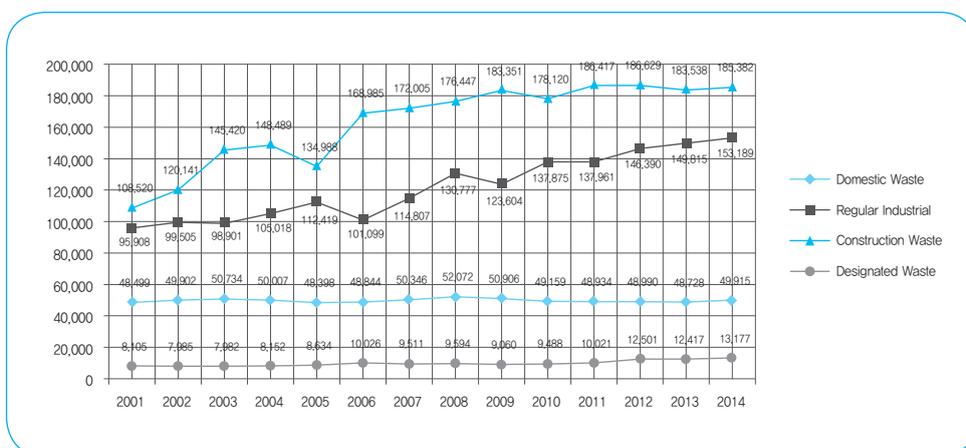
A look at the changing trends in the generation of waste of each type shows that while the quantity of domestic waste generation was 58,118 tons in 1994, was reduced to and maintained at 44,583 tons in 1998 due to the implementation of the volume-rate disposal system, and was further reduced beginning in 2008, eventually reaching 49,915 tons in 2014.

Such reductions in waste generation are perceived to be rooted in the implementation of the volume-rate disposal system and the policy of separate discharge of recyclable products and food waste.

4. Ministry of Environment, 2016, Environment White Paper.

In contrast, industrial site waste generation has been on a continuous trend of increase, and reflects the speed of Korea's economic growth. In particular, due to the construction boom from the end of 1990s to the end of 2000's, generation of construction waste increased significantly, and in conjunction with the size of the economy, the quantity of discharged planning waste has shown a trend of continuous increase. Designated wastes too are on a trend of continuous increase due to growth of industry.<sup>5</sup>

**Figure 2-1 | Current State of Domestic and Industrial Site Waste Generation**



Source: Ministry of Environment, 2015, 2014 Current State of National Waste Generation and Treatment, 2014 Current Statement of Generation of Designated Waste and Treatment.

## 2.2. Current State of Waste Treatment

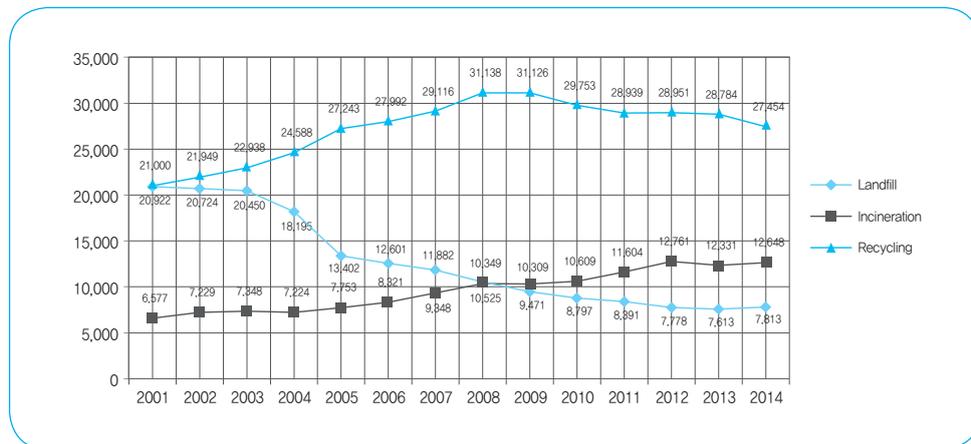
As of 2014, 9.4% of all wastes, including domestic and industrial site wastes, were landfilled, 6.1% incinerated, 83.9% recycled, and 0.4% discharged to the sea. While the rates of incineration and recycling are on an upward trend, the rates of landfill and discharge at sea are decreasing; in particular, discharge at sea decreased as discharge of sewage

5. Ministry of Environment, 2016, Environment White Paper.

sludge, waste liquid generated in the process of recycling food waste (henceforth ‘food waste liquid’), and livestock waste liquid were prohibited in 2012 and 2013, with most of such waste being treated with incineration and recycling.

While the rate of landfilling domestic waste is decreasing continuously, the rate of incineration is continuously increasing, and as wastes that were previously simply recycled became subject to energy reclamation treatment such as incineration, etc. due to energy reclamation policy, the rate of recycling decreased after 2009, maintaining 59.1% since 2011. Thanks to the implementation of the volume-rate disposal system, recycling policy, and the policy of energy reclamation from waste resources, the structure of waste management is shifting from a simple landfill structure to a resource-circulating system in which waste resources are being circulated.<sup>6</sup>

**Figure 2-2 | Current State of Domestic Waste Management**



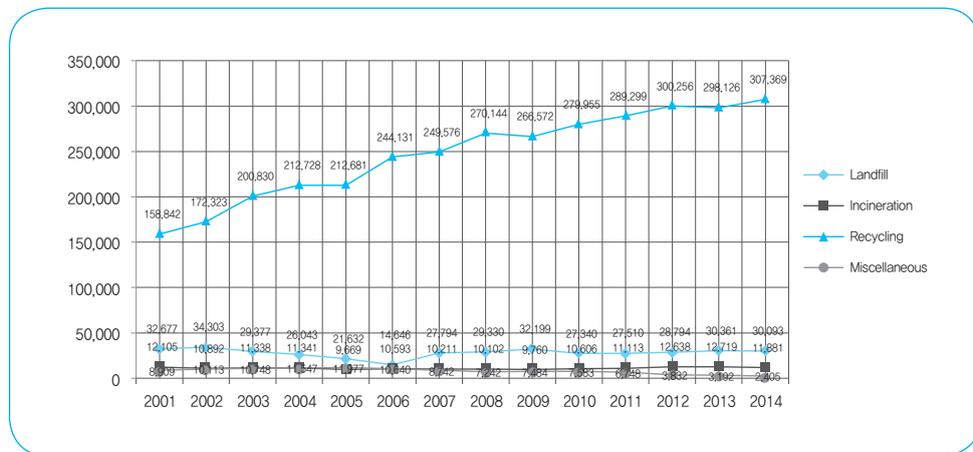
Source: Ministry of Environment, 2015, 2014 Current State of National Waste Generation and Treatment.

6. Ministry of Environment, 2016, Environment White Paper.

Landfill of industrial waste has been decreasing since 2008, while recycling has been increasing. For each type of industrial site waste, 97.9% of construction waste was recycled, 0.5% was incinerated, and 1.6% was landfilled; as for discharged planning wastes, 77.3% was recycled, 16.1% was landfilled, 5.7% was incinerated, 0.9% was discharged at sea; as for designated wastes, 57.3% was recycled, 16% was incinerated, 19.2% was landfilled, while the remainder, 7.5%, was stored. Pursuant to the London Convention (1972) and the London Protocol (1996), sea discharge of sewage sludge and livestock excreta was prohibited in 2012, that of food waste liquid, excreta, and excreta sludge in 2013, and that of waste water and waste water sludge was prohibited in 2014.

Of all industrial site wastes, a significant portion consists of construction waste, and as they are mostly recycled, the rate of recycling of industrial site waste is high at 87.4%, while discharged planning waste and designated waste are also increasingly recycled as demand for resources and energy increases.<sup>7</sup>

**Figure 2-3 | Current State of Industrial Waste Management**



Source: Ministry of Environment, 2015, 2014 Current State of National Waste Generation and Treatment.

7. Ministry of Environment, 2016, Environment White Paper.

---

## 3. Paradigm Shift in Waste Resources Management in Korea

A summary of Korea's waste management policies may be thus: In the 1980's, emphasis was placed on the safe treatment of wastes, while from the 1990s to the early 2000s, emphasis was placed on recycling, followed by another shift of emphasis after the mid-2000s to resource circulation. Throughout this time, Korea's waste resource management policy changed along with Korea's economic development and lifestyle changes for the Korean people. Alongside social changes in Korea, many waste-related legislations and systems were repealed, revised or supplemented, developing in a very complex manner. As such, in order to allow developing countries to easily understand Korea's waste resource management system, Korea's waste resource management policies have been distinguished and categorized into legislations, plans and systems prior to 1990, those of 1990s, those after 2000, and those of the present time.

### 3.1. Before 1990's

The rapid economic growth, urbanization and industrialization of the 1970's and 80's also led to significant increases in waste generation, and waste management became a social issue. A suitable legal system was not in place during that time and due to the capacity limit of the Nanjido Landfill Site, new waste treatment facilities were required. However, because of the NIMBY(Not In My BackYard) phenomenon, construction of new waste treatment facilities was not easily accomplished.

Prior to 1986, waste management policies were managed under a bifurcated system involving domestic waste and industrial waste under the 「Refuse Cleaning Act」 and the 「Environment Conservation Act」, but in 1986, this management system was unified into a single system under the 「Wastes Control Act」, followed by the implementation of a diverse

---

set of policies and systems. From 1986 to 1992, the notion of deterring waste generation, the deposit system, regional management, and follow-up management were applied to the 「Wastes Control Act」.<sup>8</sup>

### 3.2. 1990's

As a fundamental solution to these problems, a transition from the reactive waste management scheme which existed prior to 1990 to a preventive waste management scheme was carried out.

As the 「Recycling Promotion Act」 became effective in 1992, policies and systems designed to promote recycling, such as deterring the generation of packaging materials, regulations on single-use products, the waste deposit system and waste fee system, cultivation of recycling industries, etc., were implemented.

In 1995, the 'Volume-Rate Disposal System', which is a system of deterring waste generation that applies the principle of pay-as-you-throw, was implemented. This system, evaluated as the representative market-incentive regulation in Korea, represents a shift from the former system in which a fixed fee was charged regardless of the volume of waste disposal, to a system where a proportional fee is applied to the volume discharged, and thus provides an incentive to reduce the volume of discharge and to increase recycling through sorted discharge.

Furthermore in 1995, the 「Promotion of Installation of Waste Facilities and Assistance, Etc. to Adjacent Areas Act」 was enacted to prevent in advance NIMBY phenomenon due to installation of incineration facilities, etc., and as well as to resolve and mediate social conflicts through means such as assistance projects to residents of impacted adjacent areas, etc.<sup>9</sup>

8. Ministry of Environment, 2016, Environment White Paper.

9. Ministry of Environment, 2016, Environment White Paper.

---

Since the Wastes Control Act was enacted in 1986, the First National Master Plan for Waste Management (1993~2001) was implemented. Separately from the above, ever since the First Framework Plan for Resource Recycling was established and implemented in 1993 under the Resource Recycling Act, a total of four Framework Plans for Resource Recycling have been instituted and implemented.

### 3.3. After 2000

In the 2000's, establishment of a framework for a resource-recirculation society was pursued, under which wastes were not simply treated, but recycled as a resource. Currently, Korea pursues a “Zero Waste” policy which seeks to utilize wastes as a source of resources, in addition to minimizing waste generation

In 2002, the Second National Master Plan for Waste Management (2002~2011) was established, and in 2007, a revised plan incorporating the changes in circumstances up to that time was established and implemented.

In 2003, the “Deposit System” was changed to an “Extended Producer Responsibility” system, and as the 「Construction Waste Recycling Promotion Act」 was newly enacted, a foundation of demand for recycling construction waste and recycled products was established. Along with such policies, the volume-rate disposal system (1995) and the prohibition on direct landfill burial of food waste (2005), etc., were enacted, introducing a system of reduction and resource utilization of waste through deterring waste generation.

As hazardous materials from electrical and electronic equipment and motor vehicles, etc., and the recycling of these products emerged as an important social issue starting from the mid-2000s, the 「Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles」 was enacted (in 2007), implementing an environmental safety assurance system.

---

Furthermore, from the late 2000s onwards, reducing greenhouse gases has been required due to rapid increases in the prices of resources and energy, along with global warming, etc., with a special emphasis placed on the need for resource and energy recovery from waste. In response, a measure for waste and biomass energy was established in 2008, and is currently being implemented through the establishment of waste-energy towns in regions throughout the country; in 2009, a measure for recycling waste metal resources was established in order to strengthen recycling policies on waste metal resources.<sup>10</sup>

Afterwards, as pan-governmental strategies and plans for the formation of a resource-circulating society were required, relevant agencies including the Ministry of Environment, the Ministry of Public Administration and Security, the Ministry for Food, Agriculture, Forestry and Fisheries, the Ministry of Knowledge Economy and the Ministry of Land, Transport and Maritime Affairs together presented the First Framework Plan for Resource Circulation (2011~2015) in 2011.

As for the marine discharge of sewage sludge, livestock excreta was prohibited in 2012, and as marine discharge of food waste leachate was also prohibited in 2013, on-ground treatment and resource utilization were simultaneously implemented, allowing sewage sludge to be dried then used as a source of energy for thermal power plants, while food waste leachate, etc. is utilized as energy through conversion into bio gas.<sup>11</sup>

Korea is currently implementing a ‘zero waste’ policy that aims to utilize waste as a resource and minimize waste generation. The ‘Framework Act on Resource Circulation’<sup>12</sup> will be implemented on January 1, 2018.

10. Ministry of Environment, 2016, Environment White Paper.

11. Ministry of Environment, 2016, Environment White Paper.

12. Rather than simply disposing of resources by landfill burying or incineration, the ‘Framework Act on Resource Circulation’ aims to maximize reuse and recycling through the maximum use of ideas and technologies to eventually build a sustainable ‘resource-circulating society’.

---

### 3.4. Present

Despite being poor in resources and energy, Korea is highly urbanized and industrialized, and therefore consumes much energy and resources, 96% of which is imported. In 2015, the total amount of foreign currency paid solely for energy imports was 100 billion dollars, which is an astounding amount equal to the overall total of Korea's main exports – semiconductors and automobiles. Furthermore, the quantity of waste generated per unit of area is fourth-highest among OECD countries, a relatively high quantity.

In response, the Ministry of Environment is implementing policies to shift away from a social structure that uses the resources and energy gathered from nature only once, to a resource-circulating society in which landfill burying of untreated waste is minimized, recycling is maximized, and natural resources and energy are circulated within the productive cycle of economic activities for as long as possible.

Already, developed countries such as the members of OECD, Germany, Japan, etc. are strongly pursuing resource circulation policies as a means of securing resources and energy; Germany has converted its Wastes Control Act to a Resource Circulation Economy Act, while Japan has enacted the Framework Act on Formation of a Circulation Society, thereby converting the entire social structure to a system in which resources are circulated in a virtuous cycle. Furthermore, in European countries, etc., landfill burying of bio-degradable wastes is strongly regulated, virtually eliminating the landfill burying of non-treated waste, while a diverse set of systems and policies are being formulated in order to recover resources and energy during the process of waste treatment.

---

In response to such tendencies, in September 2011, the Ministry of Environment established the First Framework Plan (2011~2015) for Resource Circulation in order to form a foundation for upcycling waste resources and thereby promote green growth. The plan's basic presumptions about how a resource-circulating (zero-waste) society is formed is acknowledging that, "[all waste = resources that may be 100% circulated,]" and transitioning from a simple quantitative circulation system to an upcycling system in which the value of resources is enhanced. Furthermore, the Measure for Promotion of Transition to a Resource Circulation Society (2013), which promotes the collection and transportation of recyclable resources through means such as free-of-charge collection of large-sized domestic electronic equipment waste, consolidation of the sorting system, increased installation of facilities for energy utilization of waste resources, etc., and other such foundations of a recycling society, as well as the creation of a market for recycled products and support for the industries thereof, was announced, while the Framework Act on Resource Circulation (2018) is to be enacted in order to form a foundation for the implementation of these policies. In order to do so, tasks are currently being carried out to re-organize, distinguish and integrate the current system of legislations, which consists of individual legislations, etc., that were enacted since 1986 with unclear notions of treatment and recycling, and legislations that overlap.<sup>13</sup>

---

13. Ministry of Environment, 2016, Environment White Paper.

**Table 2-1 | Paradigm Shift in Waste Policies**

Category	Policies Thus Far	New Policy Direction
Policy Conditions	Worsening environmental pollution due to waste	Climate change, depletion of raw materials and energy resources
Objective	Formation of a comfortable living environment	Establishment of a resource-circulating society
Implementation Strategy	Reduction → Recycling → Treatment	⇒ Efficient production-consumption → matter recycling → energy recovery → advanced treatment
Major Goals	Implementation of volume-rate disposal system, extended producer responsibility and installation of treatment facilities	⇒ Use as energy and regionalization of treatment, such as evaluation on resource circulation, certification of recycled product status, waste resources, etc.
Core Concepts	Waste	

Source: Ministry of Environment, 2016, Environment White Paper.

The following is a summary of Korea’s waste management policies and systematic paradigms for each era.

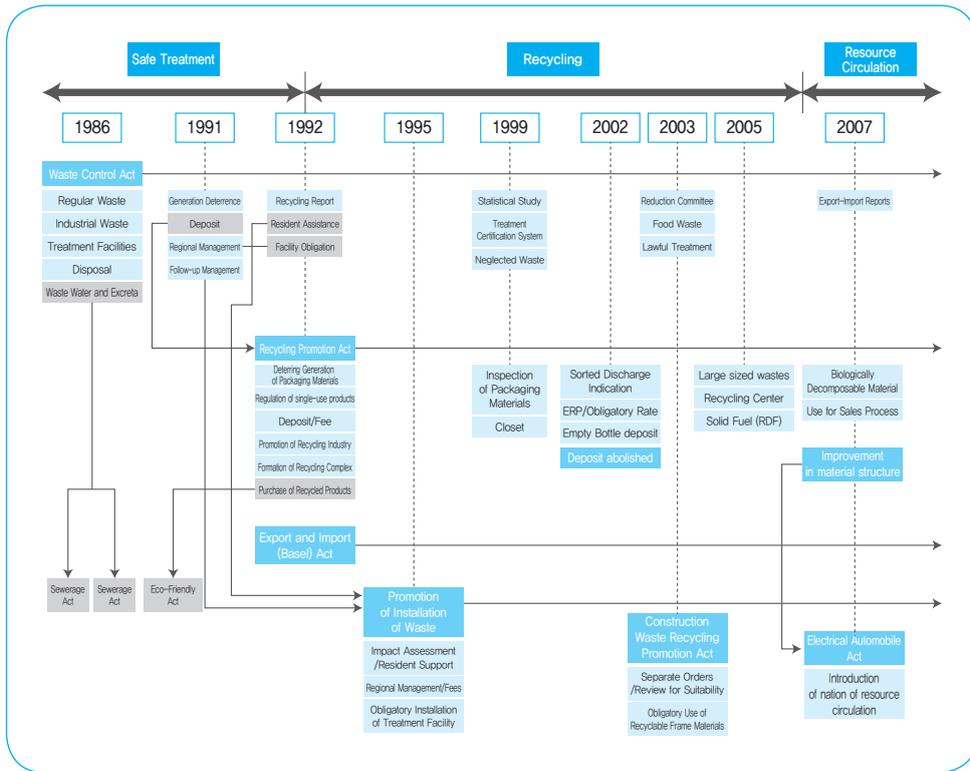
**Table 2-2 | Paradigm Shift in Korean Waste Management Policies throughout Years**

	Year	Major Policies (Legislation · System)	Major Details
Prior to 1990: Follow-up waste management policies	1986	Thanks to the enactment of the 「Wastes Control Act」, the waste management system was unified, and various policies and systems were enacted	<ul style="list-style-type: none"> <li>- Waste management policies prior to 1986 maintained a bifurcated structure in which wastes were distinguished into two categories of domestic wastes and industrial wastes under the 「Refuse Cleaning Act」 and the 「Environment Conservation Act」, but this system was now unified.</li> <li>- In the 「Wastes Control Act」 the principles of waste generation deterrence, deposit system, regional management, and follow-up management were applied</li> </ul>
1990s: Preventive waste management policies based on waste reduction and promotion of recycling	1992	As the 「Recycling Promotion Act」 went into effect, systems and policies for recycling were enacted	<ul style="list-style-type: none"> <li>- As the 「Recycling Promotion Act」 was announced, systems and policies such as control of the generation of packaging materials, regulation of single-use products, waste deposit and waste fee systems, promotion of the recycling industry, etc., were enacted</li> </ul>
	1995	The volume-rate-disposal system, which is a waste generation deterrence system utilizing the principle of requiring causers of waste generation to pay the fee, was enacted.	<ul style="list-style-type: none"> <li>- The waste volume-rate-disposal system, which is considered an exemplar market-incentive waste management policy, represented a shift from a method where a fixed fee was levied regardless of the quantity of discharged waste, to a system where a fee proportional to the quantity discharged, thus providing incentives to decrease the quantity of discharge and to recycle wastes through sorted collection of wastes</li> </ul>

	Year	Major Policies (Legislation · System)	Major Details
		The 「Promotion of Installation of Waste Disposal Facilities and Assistance, Etc. to Adjacent Areas Act」 was enacted	- In order to resolve social problems due to installation of basic environmental facilities such as those for incineration (NIMBY phenomenon, etc.), established a legal basis on which the residents of surrounding areas may receive assistance, so that social conflicts may be resolved and mediated
After 2000: policies for circulation of waste as resources	2003	The Deposit System was changed to the Extended Producer Responsibility system, and as the 「Construction Waste Recycling Promotion Act」 was newly enacted, basis of demand for recycling of construction wastes and recycled products was established	- Along with such policies, in 2005, direct landfill disposal of food wastes was prohibited, thus promoting decrease of wastes through deterrence against generation, and as well as resource utilization of wastes
	2007	The 「Act on Resource Circulation of Electrical and Electronic Equipment」 was enacted	- Was enacted as hazardous materials from electrical equipment and automobiles, etc., and recycling thereof, etc., became a social issue starting in the mid-2000s, and this period was when the resource recycling paradigm was introduced in earnest
Present : Zero-waste policy	2018	Pursuit of zero-waste, as the 「Framework Act on Resource Circulation」 is scheduled to be enacted	- Rather than simply disposing of resources by landfill burying or incineration, maximization of reuse and recycling through maximum use of ideas and technologies, to eventually build a sustainable 'resource-circulating society'

Source: Ministry of Environment materials from 2016 re-arranged.

Figure 2-4 | Changes in Waste-Related Policies and Systems in Korea



Source: Ministry of Environment, 2016.

2016 Modularization of Korea's Development Experience  
Waste Resources Management and Utilization Policies  
of Korea

## Chapter 3

### Major Systems of Waste Resource Management in Korea

1. Major Systems of Waste Management in Korea
2. Measures for Managing Conflicts in Areas Surrounding  
Waste Treatment Facilities

---

# Major Systems of Waste Resource Management in Korea

In the previous two chapters, the policy paradigm shift in waste resources management in Korea was examined. As mentioned above, Korea's waste management policies consist of a very diverse and complex system, and the paradigm shifts were explained with an emphasis on legislations and plans; meanwhile, in this chapter, an introduction is made on the major Korean policies for the management of waste resources, with an emphasis on the major systems that developing countries will actually need and be able to benchmark.

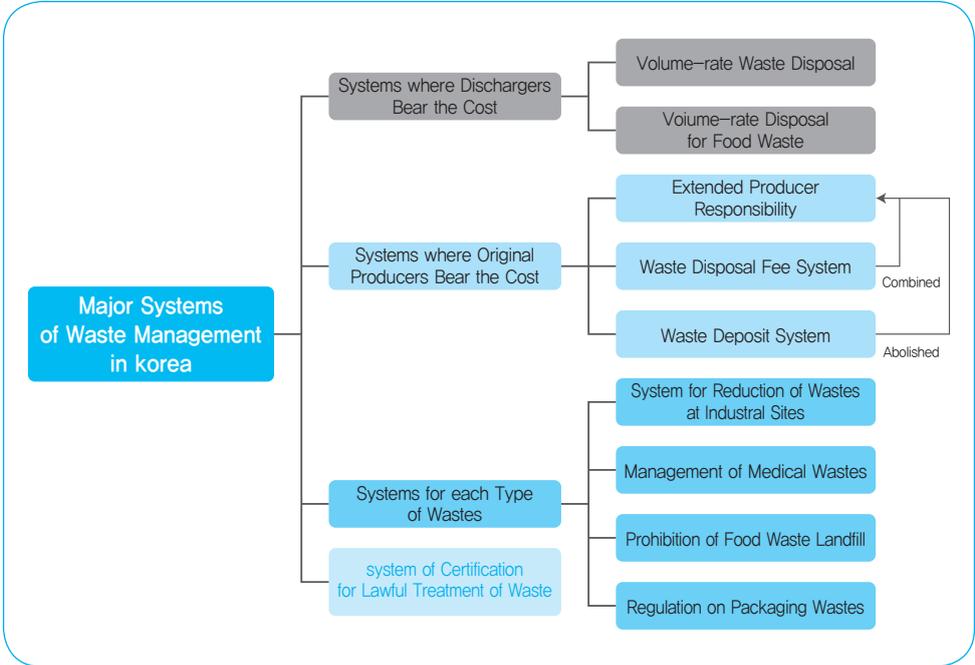
## 1. Major Systems of Waste Management in Korea

While the major systems of waste management in Korea are very diverse and are interlinked in a complex manner, they can be largely classified into systems where consumers bear the cost of waste treatment, ones in which producers bear the cost, management systems based on types of waste, and the system of certification of lawful treatment of waste (Allbaro).

As for systems in which consumers bear the cost, the 'volume-rate disposal system', which is applied mostly to domestic waste, is the most representative example. The 'Extended Producer Responsibility' system, which is a representative example of systems in which producers bear the cost, is a supplemental system that applies to waste types that

are not easily handled only with the volume-rate disposal system, such as tires, lubricants, batteries, fluorescent light bulbs, electrical and electronic equipment, resin packaging materials, etc..

Figure 3-1 | Major Systems of Waste Management in Korea



Source: Directly prepared by the author.

---

## 1.1. Discharger Responsibility System

### 1.1.1. Volume-Rate Waste Disposal System

#### a. Overview

The volume-rate disposal system is a system that applies the principle of ‘Pay-As-You-Throw’ and is a policy whose objective is to reduce waste generation at the source and promote the sorted discharge of waste, and represents a transition from the previous fixed-fee system based on property taxes and building areas, etc. to a proportional fee system based on the volume of discharge (volume of volume-rate bags used).

The volume-rate disposal system, which was enacted in January 1995, is applied to domestic waste and industrial-site waste whose characteristics are similar to those of domestic waste and therefore may be collected, transported, stored and treated through the standards and methods used for domestic waste, while the detailed provisions needed for implementation have been provided in the ‘Guideline for Implementation of the Volume-Rate Disposal System’ (amended 2015).<sup>14</sup>

Previously, a pre-determined trash fee was charged based on property tax or building area, regardless of the actual quantity of trash discharged. Since it was a system where a fixed fee was paid regardless of how much trash was actually discharged, households saw no need to reduce the quantity of trash they discharged, thus precluding any expectation of waste reduction. Under the volume-rate-disposal system however, recycled products are collected by the City or the County without a separate fee only if they are separately discharged. As such, consumers are compelled to separately discharge recyclable wastes and reduce as much as possible the wastes that have to be discharged in volume-rate bags, in order to save the cost of purchase under the volume-rate-disposal system.

---

14. Ministry of Environment, 2016, Environment White Paper.

---

## **b. Main Details**

The consumer is compelled to save the cost of bags in the volume-rate waste disposal system by separately discharging recyclable wastes, thereby minimizing the quantity of waste discharged in volume-rate-disposal system bags.

While only domestic wastes were subject to the system in the initial phases of implementation, the system was then applied to those industrial site wastes whose characteristics are similar to domestic wastes (dischargers who discharge 300kg or less per day). Under the volume-rate waste disposal system, wastes are discharged in designated bags manufactured by local self-governing entities and sold in general stores, while recyclable objects (paper·scrap metal·bottles·plastic, etc.) are collected without additional cost by the self-governing entity if discharged at designated place and time.<sup>15</sup> Large wastes such as waste furniture and waste domestic electronic equipment, etc., are required to be discharged with a separate sticker, which must be purchased at an additional cost, while trash that is hard to contain in the bags for the volume-rate waste disposal system, such as broken glass, are required to be discharged in designated bags and sacks.<sup>16</sup>

15. Ministry of Environment, 2008, Environment White Paper.

16. Ministry of Environment, 2016, Environment White Paper.

Figure 3-2 | Volume-Rate Disposal Bags



### c. Major Outcomes

This system achieved a high rate of participation, reaching a 100% rate of participation in only 1~2 months after the initiation, and was rapidly adopted by the country's citizens. Thanks to the implementation of the system, the total quantity of waste discharged, which was 58,118 tons per day in 1994, decreased by 23% to 44,583 tons in 1998, while the quantity of recyclable objects discharged rose by 74% from 8,927 tons in 1994 to 15,566 tons.

In 2014, the number of volume-rate disposal bags manufactured was 1,096,826, a reduction of 186,666 units (14.5%) from the 1,283,492 units of 2013, while the cost of manufacturing these bags was 67,052 million won, which was reduced by 4,629 million won (6.5%) from the 71,681 million won cost of 2013.

In 2014, the number of volume-rate disposal bags sold was 1,055,066 units, a reduction of 17,143 units (1.6%) from 1,072,209 units, while the sales proceeds from 2014 was 509,845 million won, a reduction of 15,868 million won (3.0%) from the 525,713 million won sales proceeds of 2013; the average sales price of domestic volume-rate disposal bags is 231 won per unit for 10L bags, and 462 won per unit for 20L bags.

As for regional districts currently implementing the volume-rate disposal system, in 2014, out of a total of 3,469 Eups, Myeons, Dongs, 3,495 such districts, or 99.9%, implement the system, and out of a total of 20,724 thousand households, 20,704 thousand households comply with the volume-rate disposal system.<sup>17</sup>

#### **d. Social Changes (Consumers · Corporations · Social Aspects)**

Changes occurred in consumers as well; when purchasing products, consumers favored products that generate less waste, such as refill products, and exhibited a growing culture of green consumption, evidenced by the use of shopping baskets, etc.; in addition, exchange of used goods became popular, and a culture of thriftiness was created where recycling centers for domestic electronic equipment and furniture, as well as recycling stores, were more actively used.

In terms of corporations, as more recyclable objects, such as paper, cans, plastic, etc., were collected, a more abundant supply of raw materials for recycling became available, which has led to an increase in recycling companies and the development of excellent technologies; at the same time, manufacturing and retail industries also started to restrain excessive packaging and underwent a transition to a sales system designed to reduce waste through means such as the development of recyclable packaging materials, etc.

17. Ministry of Environment, 2016, Environment White Paper.

---

As the volume-rate disposal system became consolidated, the sanitary conditions of storage sites and transshipment sites were improved, reducing the generation of bad odor and hazardous insects; in addition, the collection system was transitioned from a system where residents directly load wastes onto trucks to a system where cleaners would collect trash bags placed in front of doors, thus improving resident services in terms of the administration of trash collection.

#### **e. Improvement of the Volume-Rate Waste Disposal System**

As some practical problems emerged after the introduction of the volume-rate disposal system, improvement measures were formulated and implemented in 2002. First, the chemical composition of the volume-rate disposal system bags was changed so that bio-degradable bags, in which bio-degradable materials such as aliphatic polyester and starch, were added to the existing high-density polyethylene, which does not easily degrade, at a ratio of at least 30% where introduced; and in response to complaints that the volume-rate-disposal system bags were weak, the thickness of the bags was increased (on average by about 17%). Also, discharge stickers for large wastes were made available for purchase not only at local neighborhood (dong) offices but also at regular stores that sell bags; in addition, professional collection firms were designated to introduce a visitation collection system. Since the urban trash collection system was not suitable to agricultural and fishing regions due to their regional characteristics, trash collection in these regions were changed to a system where trash would be discharged through town-level trash collection boxes, rather than in volume-rate disposal bags, and at the same time, a town-level volume-rate disposal system, in which treatment fees would be imposed depending on the town-level quantity of collection, was introduced.

In order to improve the problems identified in the 2005 implementation assessment of the volume-rate disposal system, system improvements have been continuously implemented; for example, the implementation Directive on waste fee volume-rate disposal system was

recently amended (July 10, 2007), the central focus of the amendment being making the necessary supplements to the criteria for the installation, operation and management of an automatic domestic waste gathering system, and expansion of the scope of free collection of briquette ash. Also, since 2002, in order to reduce the use of single-use bags at supermarkets or marts, the development and use of ‘reusable volume-rate disposal bags’, which can be used as shopping bags, has been implemented; however, the outcome thereof has been insignificant, and as such, measures to vitalize this policy were formulated in 2008 and have been implemented ever since. It has also been pointed out that, due to door-front discharge of volume-rate-disposal bags, the bags would accumulate on the streets and thus not only cause bad odor and hazardous insects but also create a negative impact on urban aesthetics. In response, starting in 2007, sorted containers for the collection of domestic wastes were installed in certain places such as parks, parking lots, playgrounds, etc., of Jeju Island, with national financial support, to facilitate and implement an advanced point-oriented collection system utilizing automated loading vehicles, which is currently being implemented. The plan is to expand such an advanced system of collection throughout the entire nation; it is expected that such a system would significantly improve urban aesthetics in tourism-oriented cities, and it is also expected that, if implemented in agricultural regions, currently rampant illegal landfilling and incineration would be dramatically reduced.

Through the August 2015 amendment of the ‘Guideline for Implementation of the Volume-Rate Disposal System’, an improvement was made so that even after moving to another self-governing municipal entity, the volume-rate disposal bags that were previously in use may be exchanged with volume-rate bags of the new local government or continuously used by affixing a certification mark, etc. Furthermore, by giving due consideration to the trash discharge pattern of small households, such as those consisting of 1~2 persons, 3L and 5L-sized bags are now manufactured and sold in convenience stores and supermarkets as well, in addition to the existing 10L and 20L reusable bags which were previously sold

---

mainly in large supermarkets. Furthermore, by restricting the weight of waste that may be discharged in a 100L bag to 25kg, the illegal use of compressors has been prevented (2016, Ministry of Environment).

### **1.1.2. Food Waste Volume-Based Disposal System**

#### **a. Overview**

In 2010, the ‘Master Plan for Reduction of Food Waste’ was formulated through the joint work of related departments and agencies, through which viable alternatives suitable for each phase and source of distribution are being discovered, along with systematic improvements to provide support thereto, in order to implement the policy of deterring the generation of food waste.<sup>18</sup>

Along with the domestic waste volume-rate disposal system, the food waste volume-rate disposal system is an exemplary economic incentive system in the field of environment conservation, whose basic notion is the principle that dischargers should bear the cost of collection and treatment in proportion to the quantity of discharge, and its ultimate objective is to change consumption patterns and discharge habits so that the generation of food waste may be reduced.

#### **b. Main Details**

There are 3 methods for food waste volume-rate disposal system: designated bags, RFID, and payment chips (stickers), and these methods are selected depending on the circumstances of each local self-governing entity. In the designated bag method, the discharger is required to purchase bags designated for food waste (payment of fee in advance) in order to discharge. Under the payment-chip sticker method, the discharger should purchase a ‘payment chip’

---

18. Ministry of Environment, 2016, Environment White Paper.

etc. and attach it on the collection container before discharging. The RFID method is a method where information on the source of discharge is collected through electronic tags containing information, based upon which fees are levied after the weight of the discharge is measured.<sup>19</sup>

## 1.2. Producer Responsibility System

### 1.2.1. EPR: Extended Producer Responsibility

#### a. Overview

Extended producer responsibility (EPR) is a system to promote reduction, reuse, and recycling of wastes and establish a ‘resource-recycling economic and social system’ by inducing the producers of products to engage in eco-friendly economic activities in all phases, spanning from design and production to distribution, consumption and disposal.

In order to improve the shortcomings of the waste deposit system, which was initially implemented in 1992 and further strengthened the responsibilities of producers, the 「Act on the Promotion of Saving and Recycling of Resources」 was wholly revised (February 2002), abolishing the existing waste deposit system and implementing the ‘EPR’ instead (January 2003).<sup>20</sup>

19. Ministry of Environment, 2016, Environment White Paper.

20. Ministry of Environment, 2016, Environment White Paper. Problems with the waste fee system and the reasons for the abolishment of the waste deposit system will be separately explained after the Extended Producer System explanation.

**Table 3-1 | Differences between Waste Deposit System and Extended Producer Responsibility for Recycling System**

Waste Deposit System	EPR
<ul style="list-style-type: none"> <li>▶ Deposit required for 100% of products delivered</li> </ul>	<ul style="list-style-type: none"> <li>▶ Recycling duty imposed on some of the delivered products, based on consideration for recycling conditions</li> </ul>
<ul style="list-style-type: none"> <li>• Indirect recycling duty (passive bearing of cost)               <ul style="list-style-type: none"> <li>- After manufacturer of product packaging material deposits a certain balance, deposit returned based on the outcome of recycling</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Direct recycling duty (active producer responsibility)               <ul style="list-style-type: none"> <li>- Recycling duty imposed on producers of products and packaging</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Mediocre enhancement of recycling rate due to significant burden               <ul style="list-style-type: none"> <li>- Businesses burdened because deposit is required for the entire quantity of products delivered</li> <li>- Due to low rate of deposit, recycling incentive effect was insignificant</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Possible to enhance rate of recycling, given that the burden is minimal               <ul style="list-style-type: none"> <li>- Through imposition of achievable recycling duty, producers are burdened less and rate of recycling can be enhanced</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Cultivation of recycling industry was insignificant               <ul style="list-style-type: none"> <li>- As non-returned deposit was appropriated into the state treasury (about 55%) support for recycling industry was insignificant</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Maximized cultivation of recycling industry               <ul style="list-style-type: none"> <li>- Maximized cultivation of recycling industry, as producers directly provides support to recycling businesses</li> </ul> </li> </ul>

The extended producer responsibility system is a system where producers are induced to reduce, reuse and recycle wastes throughout all phases encompassing design, production, distribution, consumption, disposal, etc. to promote a resource-recycling socioeconomic system. The system was first introduced in Germany and is currently introduced and being implemented in 15 European countries, including Britain, France, Hungary, etc. and 4 Asian countries, including Japan, Taiwan, Australia, etc., and Latin American countries including Mexico, Brazil, etc.

## b. Major Details

Goods subject to the EPR are largely distinguished into products and packaging materials.

From 2008, when the 「Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles」 was enacted, electrical and electronic equipment among EPR categories were transferred to be subject to the said Act, leading to further strengthening of advance management, such as the regulation of hazardous substances, etc.<sup>21</sup>

**Table 3-2 |** Categories of Objects Subject to Extended Producer Responsibility

Category	Subject Products
Products	Tires, grease, batteries (mercury batteries, silver-oxide cells, nickel-cadmium batteries, lithium first battery, manganese-alkaline batteries, nickel-hydrogen batteries), fluorescent light, electronic equipment (TV, computer, refrigerator, air conditioner, washer, mobile phone, audio, printer, copier, facsimile), vending machine, electronic water purifier, electronic oven, microwave, food waste treater, dish dryer, electronic bidet, air purifier, electronic heater, electronic rice cooker, softener, humidifier, electronic iron, fan, mixer, vacuum cleaner, video player), aquaculture buoy, laver drying screen, bailage film
Packaging	Metal cans, glass bottles, paper packs, synthetic resin packaging materials used on food and drinks, agricultural, aquatic, livestock products, detergents, medicines, cosmetics

Note: Products subject to the Extended Producer Responsibility System are not ordinary waste; rather, they are product categories that cannot be handled solely through the volume-rate disposal systems for certain types of waste.

Source: Ministry of Environment, 2016, Environment White Paper.

The main-producer responsibility system is used as the criteria to determine which producers will be obliged to recycle and which producers will be exempt. While ‘producer’ in EPR is very widely defined to incorporate raw material traders, product manufacturers, packaging material manufacturers, retailers, etc., it is practically impossible to uniformly divide the responsibilities of these producers, and as such, Korea uses the main-producer responsibility system. That is, the producer who possesses actual authority over design and

21. Ministry of Environment, 2016, Environmental White Paper.

---

production of the product and packaging material is designated as the main-producer and thus bears the duty to recycle.

Under this main-producer responsibility system, the producer obligated to recycle will be, in cases of general products (lubricant, tires, batteries, etc.), manufacturers who manufacture the products and importers of such products; in cases of electronic equipment, the manufacturers, importers and sellers; in cases of packaging (paper packs, metal cans, glass bottles, synthetic resin packaging materials), the producer (filer) of the product that uses the packaging, and the importer of such a product. As an exception to this principle, in cases of holding saucers for agricultural, fishery and livestock products whose producers are unspecified and small-scale, the person who manufactures the container or packaging should, as a matter of necessity, bear the relevant obligation.

Meanwhile, as for packaging materials, given that many producers are small businesses, a consideration has been made for their practical ability to bear responsibilities and as well as administrative costs; a criteria for exemption (those who sold less than 1 billion won in previous year, imported less than 300 million won or ships less than 4 tons per year, or imports less than 1 ton per year, etc.).

The quantity of recycling responsibility is re-computed and notified every year, while recycling dues are levied on a graded basis in accordance with the rate of non-implementation of recycling. The Minister of Environment sets the annual mandatory rate of recycling for every category of products subject to EPR, and this mandatory rate is determined based on a comprehensive consideration of the responsible producer's quantity of delivery, quantity of sorted collection, recycling outcome, etc. Once the mandatory recycling rate is computed, the mandatory quantity of recycling for each individual producer is determined in proportion to the market share of each producer; however, for electrical and electronic equipment, as the recycling target management system was introduced in 2014, the mandatory recycling quantity is now computed based on yearly recycling target quantity, population, and previous year's delivery quantity for performance of obligation.

Meanwhile, in cases where a producer subject to recycling duty does not achieve the mandatory quantity of recycling, a recycling due is levied; the due is levied on a graded basis based on the rate of non-performance, and is 130% or less of the actual cost of recycling per each category of good, and is adjusted every year in conjunction with the yearly rate of inflation. In cases where a producer achieved more than the target, the excess may be used as a ‘bank’ for the performance of obligations for the following 2 years, thus allowing producers to alleviate risk due to fluctuating economic conditions as much as possible.<sup>22</sup>

**Table 3-3 | Role of Each Actor in the Extended Producer Responsibility System**

<b>Consumer (Resident)</b>	<ul style="list-style-type: none"> <li>Sorted discharge of products and packaging materials</li> <li>- Separate discharge of products and packaging subject to recycling duty so that they may be recycled</li> </ul>
<b>Producer</b>	<ul style="list-style-type: none"> <li>Performance of recycling duties (if not performed, recycling dues must be paid)</li> <li>Sellers of electronic equipment should collect without charge the waste electronic equipment of purchasers of new equipment</li> <li>Attachment of separate-discharge-mark on the packaging materials</li> </ul>
<b>Self-Governing Entities (City · County · District)</b>	<ul style="list-style-type: none"> <li>Sorted collection of products and packaging materials that are discharged separately</li> <li>Promotion to local residents concerning sorted discharge</li> <li>Establishment of a foundation for sorted collection, such as installation of sorted collection bins, etc.</li> </ul>
<b>Korea Environment Corporation</b>	<ul style="list-style-type: none"> <li>Matters related to implementation of the system, such as transfer and approval of producer’s delivery quantity, and plan for performance of recycling duty, and levying of recycling dues, etc.</li> <li>Inspection of state of performance of recycling responsibilities</li> </ul>
<b>Government (Ministry of Environment)</b>	<ul style="list-style-type: none"> <li>Enactment and amendment of related legislations</li> <li>Computation and notification of mandatory recycling rate for each category of good for every year</li> <li>Granting of permit for establishment of recycling industry mutual aid association</li> </ul>

Source: 2002-2011, Gyunggi-do Framework Plan on Waste Management.

22. Ministry of Environment, 2016, Environmental White Paper.

---

### **c. Major Outcomes**

Thanks to the implementation of the EPR, the recycling outcome continuously increased every year, reaching a recycling quantity of 1.38 million and 9 thousand tons in 2007, a 48.1% increase from 2002, prior to implementation; and as the categories of products subject to the system continued to expand, the number of producers subject to recycling duty increased by 108% in 2007, reaching a total of 5,703 businesses. Along with this, the number of related recycling businesses rose by 32% (418 → 548), exhibiting a positive effect throughout the overall recycling industry. Furthermore, thanks to the implementation of the EPR, a total of 6.06 million 7 thousand tons were recycled throughout 5 years, saving a total of 1 trillion 249.7 billion won (nominal value) in landfill and incineration costs, while 1 trillion 14.6 billion won of recycled product value was created, thus creating a total economic benefit of 2 trillion 644.3 billion won. Deducting from this amount 1 trillion 182.5 billion won, which was the cost for creating the economic benefit in the form of recycled products, it is estimated that the net economic value created was 1 trillion 81.8 billion won.

The recycled quantity of products subject to EPR was 1,619,378 tons in 2014, and represented a 73% increase from the 938,000 tons of 2002, thus evidencing quantitative growth of the recycling industry. However, there were also problems, such as a low rate of collection and the submission of false reports on recycling outcomes, etc. In order to improve on this situation and implement necessary supplements, the Act on the Promotion of Saving and Recycling of Resources was amended in 2013; in cases of domestic packaging materials whose routes of discharge and collection are identical, mutual aid associations established for each type of material composition was unified into a single mutual aid association in the form of a non-profit foundation, thus enhancing the efficiency and public functionality of mutual aid associations.<sup>23</sup>

---

23. Ministry of Environment, 2016, Environmental White Paper.

---

#### **d. Improvements Made**

To allow corporate producers to establish systematic recycling plans based on a long-term perspective, a system for setting and providing notifications of long-term recycling target rates was introduced in 2008, whereby long-term recycling rates, which producers must meet in the coming 5 years for products subject to EPR, are set and notified.<sup>24</sup>

The mandatory rates of recycling that producers must comply with in 2016 are as follows, for each category of products. The mandatory rates of recycling for individual producers in 2016 is determined by the notified mandatory rate of recycling for 2016 multiplied by the volume of deliveries made by each individual producer in 2016.<sup>25</sup>

24. Ministry of Environment, 2016, Environmental White Paper.

25. Ministry of Environment, 2016, Environmental White Paper.

**Table 3-4 | Mandatory Rate of Recycling in 2016 for Each Category of Product and Packaging Materials and Long-Term Target Recycling Rates (2017)**

Product Category		Mandatory Rate for 2016 (%)	Long-Term Recycling Target Rate (2017) (%)	Remarks	
Metal cans (steel cans)		80.8	83.1		
Metal cans (aluminum cans)		79.7	81.6		
Glass bottle		76.3	79.3		
Paper pack		35.0	36.0		
Synthetic packaging	PET bottle (not colored)		81.8	83.0	
	PET bottle (not colored)		82.9		
	PET bottle (not colored)		81.8		
	Porous synthetic resin		80.7	80.5	
	Single-material PSP		42.3	42.3	
	PVC		73.5	73.3	
	Other synthetic materials	Single-material container · tray	88.3	84.5	
		Synthetic materials, film · sheet	65.2	67.5	
	Lubricant container		79.3	79.0	
Lubricant		72.8	73.0		
Tires		76.7	77.0		
Fluorescent light		35.6	39.4		
Buoys for fishery farming		28.1	27.7		

Product Category		Mandatory Rate for 2016 (%)	Long-Term Recycling Target Rate (2017) (%)	Remarks
Battery	Mercury battery	60.0	60.0	
	Silver oxide battery	67.0	56.0	
	Lithium battery	72.6	65.0	
	Nickel cadmium battery	40.3	40.0	
	Manganese · alkali manganese battery	21.6	21.3	
	Nickel hydrogen battery	20.7	15.3	
Balage film		30.0	29.0	
laver-drying screen		79.8	80.0	

Source: Ministry of Environment, 2016, Environment White Paper.

In addition, in order to enhance the rates of recycling for electrical and electronic equipment, the recycling target management system was introduced in 2014, through which per-capita annual recycling targets are set. As such, the per-capita recycling target of electrical and electronic equipment for 2016 was set and notified as 4.8kg/person for 2016 and 6.0kg/person for 2018.

Furthermore, for electronic equipment such as refrigerators, washing machines, computers and mobile phones, re-collection through the store of sale was made mandatory. That is, in cases where a buyer buys new electronic equipment and requests to return used waste equipment of the same type (including products made by other manufacturers or sold by other importers), the seller of said electronic equipment is required to collect the equipment without charge.

Furthermore, as for the sorted discharge marking system for products subject to EPR, which was introduced in January 2003 and has been in effect ever since, the markings were changed to inscriptions in Korean beginning in January 2011, allowing citizens to easily recognize the figurative design indicating sorted discharge<sup>26</sup>

**Table 3-5 | Methods of Sorted Discharge**

Example of Figurative Design	Inscription within the Figure	External Color of the Figure	Compositional Material Indicated
	PET	Yellow	-
	Plastic	Blue	HIDE, LDPE, PP, PS, PVC, OTHER
	Vinyl	Purple	
	Cans	Gray	Steel, aluminum
	Paper	Black	-
	Paper Packs	Green	-
	Glass	Orange	-

Source: Ministry of Environment, 2016, Environment White Paper.

## 1.2.2. Waste Levy System

### a. Overview

The waste levy system is a system designed to deter the generation of wastes and waste of resources, in which a certain amount of fees are imposed on products, materials and containers that contain hazardous substances and are therefore difficult to recycle, thus controlling market supply and demand. That is, the system induces producers and importers of the products subject to this fee to restrain the generation of wastes starting from the production phase and to improve the composition of the products.

26. Ministry of Environment, 2016, Environmental White Paper.

This waste deposit system, in which the cost of environmental conservation is imposed on products that cause high environmental pressure in accordance with the polluter-pays-principle, induces companies to voluntarily reduce waste generation at the production and distribution phases and to efficiently collect and treat wastes that are already generated, and is thereby contributing to reducing the cost of environmental conservation that arises from waste management. The waste levy collected is considered part of tax revenue accounted for in the Government's special accounting system for environmental improvements, and is used for the purchase and storage of recyclable resources, projects for the recycling of wastes, installation and support for waste treatment facilities, efficient use of wastes, research and technical development for waste reduction, waste collection from local self-governing entities, provision of support for recycling cost, etc., and other uses as decreed by Presidential Decree.<sup>27</sup>

#### **b. Main Details**

As the Enforcement Decree for the Act on the Promotion of Saving and Recycling of Resources was amended in March 2007, the rate of fee imposition was upwardly adjusted starting in January 2008, and the method of imposition for finishing processing and importation of subject plastic goods will be transitioned into a volume-rate system, just as for manufacturing.

Persons subject to waste levy obligations include manufacturers, importers and wholesale and retail sellers of insecticide (glass and plastic containers), poisonous substances (metal cans, glass bottles, plastic containers) antifreeze, gum, single-use diapers, tobacco (including electronic tobacco),<sup>28</sup> persons who produce plastic-based products in manufacturing sectors specified in Appendix 1-2 or and such products manufactured or imported by a wholesale or retail business ※ Provided, synthetic resin textile products are excluded.

27. Korea Environment Corporation, Waste Costs.

28. Ministry of EnvironmentDKorea Environment Corporation, 2016 Wastes Cost Sharing.

**Table 3-6 |** Flow of Operation of Levying of Waste Levy and Payment Thereof

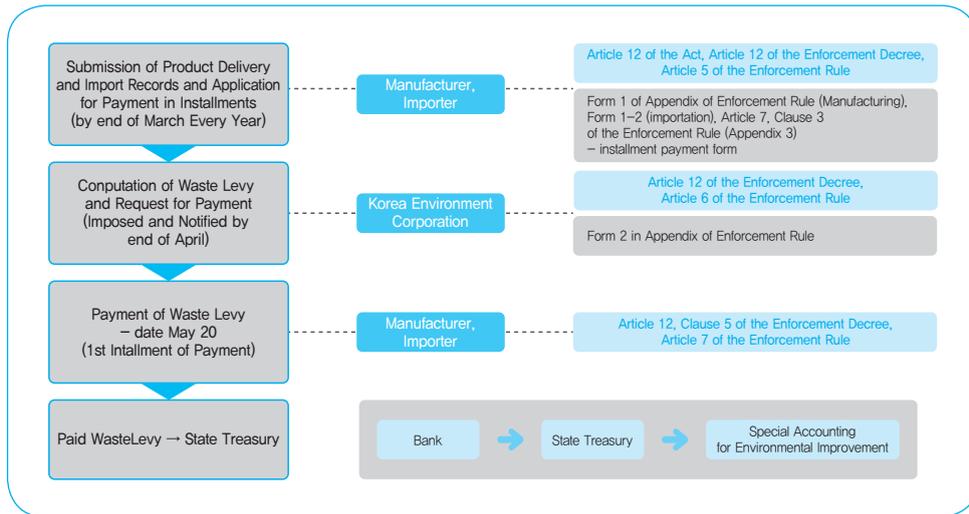
Product Category	Type and Specification
1. Insecticide, poisonous products	A. Plastic containers <ul style="list-style-type: none"> <li>• 500mℓ or less</li> <li>• More than 500mℓ</li> </ul> B. Glass bottles <ul style="list-style-type: none"> <li>• 500mℓ or less</li> <li>• More than 500mℓ</li> </ul> C. Metal cans <ul style="list-style-type: none"> <li>• 500mℓ or less</li> <li>• More than 500mℓ</li> </ul>
2. Antifreeze	Antifreeze
3. Gum	Gum
4. Single-use diaper	Single-use diaper
5. Tobacco	Tobacco (excluding tobacco whose sale price is or less than 200 won and tobacco for which tobacco consumption tax is exempt or refunded in accordance with Article 53, 54 and 63 of the 「Local Tax Act」)
6. Plastic products	Construction-purpose (Including plastic pipes and insulation)
	Regular-purpose (Other plastic products or imports manufactured using plastic)

Source: Ministry of Environment · Korea Environment Corporation, 2016 Wastes Cost Sharing.

### **c. Flow of Operation of Levying of Waste Levy and Payment Thereof**

Producers and importers who are required to pay the waste levy should submit materials concerning previous year’s delivery and importation of products, materials, and containers by March 31 of every year, as determined by Ministry of Environment Decree, to the Korea Environment Corporation, based on which the waste levy will be imposed, in accordance with the computational criteria of waste levy specified in 「Article 12, Clause, Appendix 2」.

**Figure 3-3 |** Flow of Operation of Levying Waste Levies and Payments Thereof



Source: Ministry of Environment · Korea Environment Corporation, 2016 Wastes Cost Sharing.

#### **d. Major Outcomes**

Starting in 2008, in order to promote the recycling of waste plastic, waste fees are exempted for producers who have concluded a voluntary agreement with the Minister of Environment for recycling waste plastic and have reached the rate of waste plastic recycling provided for in the agreement.

A 2014 review of the outcome of the agreement system showed that, the total quantity of recycling was 289,608 tons, creating an approximate economic benefit of 213.5 billion won. Furthermore, it was also estimated that about 341,601 tons of greenhouse gas (CO<sub>2</sub>), which may be generated due to landfill burying or incineration, were reduced (2016, Ministry of Environment).<sup>29</sup>

29. Ministry of Environment, 2016, Environment White Paper.

**Table 3-7 | Outcome of Waste Fee Collection**

Year	2008	2009	2010	2011	2012	2013	2014	2015
Amount Collected	46,476	56,189	60,515	86,995	94,485	114,500	141,670	169,240

Year	2008	2009	2010	2011	2012	2013	2014	2015
Amount Imposed	48,570	58,138	64,452	89,385	97,886	117,442	136,309	139,540

Source: Ministry of Environment, 2016, Environment White Paper.

### 1.2.3. Waste Deposit System

#### a. Overview

Upon the wholesale amendment of the 「Waste Control Act」 in 1991, the deposit system for cost of waste collection and treatment was introduced. The waste deposit system is a deposit-refund system in which, for many containers and products that are generated in large quantities, manufacturers and importers of products for which collection and recycling are convenient after use are required to deposit the cost of waste collection and treatment, after which the deposit is refunded depending on the outcome of appropriate collection and treatment.<sup>30</sup>

The objective of this system is to impose a waste treatment cost on products that generate wastes, and to reduce waste generation and promote the production of recycle-friendly products through the automatic imposition of per-unit deposits based on the extent of collection and recycling, and thereby ultimately promote the prevention of environmental pollution, save resources, and promote the efficient use of resources through recycling generated wastes.

30. 「Act on the Promotion of Saving and Recycling of Resources」.

---

This system is the first policy example in which the original producer of wastes discharged by consumers are required to bear the responsibility of waste collection and treatment. Deposits that are not returned are appropriated into the waste management fund formed in accordance with the 「Recycling Act」 (later assimilated into the special accounting for environmental improvement) and are thereby used as funds for the recycling of waste and appropriate treatment thereof.

#### **b. Main Details**

Categories of goods subject to deposit are goods that contain hazardous materials, materials that are not easily degraded, produce a large quantity of wastes after use, those from which the reclamation of energy and resources is convenient, and those with economic value. Goods in a same category are subject to different rates of deposit depending on possibility of recycling, availability of alternatives, difficulty in treatment-disposal. Categories of containers subject to deposit include paper packs, metal cans, glass bottles, PET bottles, etc., while products include batteries, tires, greases, television, washers and air conditioners, etc.

#### **c. Major Outcomes and Limits**

While the deposit system contributed to the reduction of waste generation at the source and the promotion of recycling, the rate of return of the deposit funds was around merely 10%, and the deposit system was thus operated as a semi-tax, in contrast to initial expectations. Businesses subject to deposit forfeited the deposits after paying, since the rate of deposit was lower than the actual cost of collection and treatment of wastes. Besides the problem that the rate of deposit was significantly lower than the actual cost of treatment, it was difficult to carry out objective verification of collection, treatment and recycling, which was compounded by various problems in terms of implementation, such as the fact that the social infrastructure for the collection of wastes was not available, etc.

---

In 2002, the deposit system was abolished when the ‘Extended Producer Responsibility’ system, which is fundamentally equivalent to the deposit system but with a strengthened recycling system for each industrial sector producing the relevant goods, was introduced.

## 1.3. Type-Based Waste Management System

### 1.3.1. Industrial Waste Reduction System

#### a. Overview

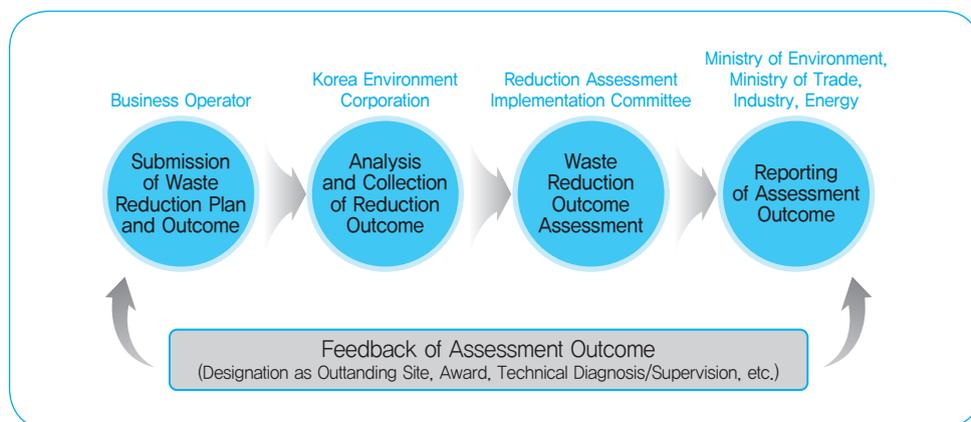
Upon the 1995 amendment of the 「Wastes Control Act」, the industrial site reduction system was introduced, and in December 1996, the Ministry of Environment and the Ministry of Trade, Industry and Energy started to conjointly notify and implement the ‘Industrial Site Waste Reduction Directive’. Amended in December 2012, it applies to industrial sites that produce 100 tons or more of designated wastes per year, and industrial sites that produce 1,000 tons or more of wastes other than designated wastes. The industrial site waste reduction system purports to reduce or recycle waste at the source of generation, such as product manufacturing process, etc., and thereby reduce generation of waste per each unit of production.

#### b. Main Details

As for industrial sites subject to reduction, industrial sectors and scale of businesses subject to compliance with waste generation deterrence are specified in Appendix 5 of Article 9 of the Enforcement Decree for the Wastes Control Act. Each industrial site that falls under this are required to implement, based on its characteristics, process analysis, analysis of factors of reduction, and an analysis of recycling possibility, an industrial site waste reduction plan that incorporates matters such as reduction target rate, method of reduction, etc.

Industrial sites with excellent reduction outcomes will be designated as outstanding sites and are provided incentives such as exemption from supervisory inspection under the Wastes Control Act and additional points when being considered designation as an eco-friendly company and financial support for facility improvement, etc. Business subject to application must submit their waste reduction plan and implementation outcome, etc. to the electronic treatment system ([www.allbaro.com](http://www.allbaro.com)) by the end of February every year ([www.allbaro.or.kr](http://www.allbaro.or.kr)). In addition, the waste reduction implementation outcomes must be collected and analyzed, and reported to the Ministry of Environment and the Minister of Trade, Industry and Energy. Waste reduction implementation outcomes, etc. will be evaluated, after which designation as an outstanding site will be conferred, along with the Waste Wise Award and public announcements thereof. A Waste Reduction Assessment and Consideration Committee, whose goal is to assess waste reduction outcomes, supervise technical diagnosis, etc., has been formed and is being operated, in addition to various support systems related to industrial site waste reduction.

**Figure 3-4 |** System of Implementation of the Industrial Site Waste Reduction System



Source: Ministry of Environment · Korea Environment Corporation, Waste Reduction System Information, Allbaro homepage: [www.allbaro.or.kr](http://www.allbaro.or.kr).

**Table 3-8 | Industrial Site Waste Dischargers whose Sector and Scale are Subject to the Business Waste Reduction Measure**

**Sector and Scale of Dischargers who are Subject to Compliance with Waste Generation Deterrence Obligations (Concerning Article 9)**

1. Sector: Each of the following sectors among intermediate classification sectors under Korean Standard Industrial Classification in accordance with Article 22 of the 「Statistic Act」
  - A. Food manufacturing
  - B. Drink manufacturing
  - C. Textile manufacturing (excluding clothes)
  - D. Clothes, clothing accessory and fur product manufacturing
  - E. Cokes, briquette and refined petroleum product manufacturing
  - F. Chemical substance and chemical product manufacturing (excluding medicines)
  - G. Medical substances and medicines manufacturing
  - H. Rubber and plastic product manufacturing
  - I. Non-metal mineral product manufacturing
  - J. Primary metal manufacturing
  - K. Metal craft manufacturing (excluding machines and furniture)
  - L. Other machines and equipment manufacturing
  - M. Electrical equipment manufacturing
  - N. Electrical components, computer, audio, acoustic and communications manufacturing
  - O. Medical, precision, optical devices and time piece manufacturing
  - P. Vehicle and trailer manufacturing
  - Q. Other transportation equipment manufacturing
  - R. Electrical, gas, steam and air conditioning provider
  
2. Scale
  - A. Persons who, based on the annual average for the latest 3 years, discharge 100 tons or more of the designated wastes
  - B. Persons who, based on the annual average discharge for the latest 3 years, discharge 1,000 tons or more of wastes other than the designated wastes

---

Source: Ministry of Environment · Korea Environment Corporation, Waste Reduction System Information, Allbaro homepage: [www.allbaro.or.kr](http://www.allbaro.or.kr).

---

## 1.3.2. Management of Medical (Infectious) Wastes

### a. Overview

Medical wastes were initially managed by the Ministry of Health and Welfare, and then were transferred to the Ministry of Environment in 2000. For a while after that, extract wastes were managed as infectious wastes under the 「Wastes Control Act」, and upon the 2007 amendment of the Wastes Control Act, they were renamed as medical wastes.

Medical wastes are defined as wastes generated at and discharged from health, medical facilities, animal hospitals, testing, and examination facilities for which it is recognized that special management is necessary for maintenance and protection of health and environment, including extractions such as human organs, carcasses of experiment subject animals, etc., as designated by Presidential Decree.

---

**Table 3-9 | Types of Medical Wastes (Attached Table 2 of Article 4  
of the Enforcement Decree for the Wastes Control Act)**

---

1. Quarantine medical wastes: All wastes generated from medical measures conducted on persons who were quarantined in order to protect other persons from infectious diseases specified in Article 2, Clause 1 of the 「Infectious Disease Control and Prevention Act」
2. Hazardous medical wastes
  - A. Organ wastes: Part or whole of human or animal tissues, organs, system, animal carcass, blood, pus and blood-generated substances (serum, plasma, blood derivatives)
  - B. Pathological wastes: Culture medium used in tests, exams, etc., medium containers, stored culture collection, used test tubes, slides, cover glass, used culture medium, used gloves
  - C. Damage-causing wastes: syringe needle, suture needle, surgical blade, acupuncture needle, dental needle, damaged glass-made testing devices
  - D. Bio-chemical wastes: used vaccine, used anti-cancer compound, used chemical treatment substances
  - E. Blood contaminant waste: used blood bags, wastes used during blood dialysis, and other wastes that contain blood that may leak and thus require special management
3. General medical wastes: Cotton clothe, bandage, gauze, single-use diaper, menstrual pad, single-use syringe, and infusion sets containing blood-bodily fluid-secretion-excrement

Remarks

1. Those non-medical wastes that are mixed with medical wastes or have come into contact with medical wastes shall be considered as same wastes as the mixed or contacted medical wastes.
2. Test tubes and container, etc. that contain blood used in blood-drawing test shall be considered as organ wastes specified in Clause 2, Item A.

---

Source: Ministry of Environment · Korea Environment Corporation, Waste Reduction System Information, Allbaro homepage: [www.allbaro.or.kr](http://www.allbaro.or.kr).

## **b. Main Details**

In August 2002, the Enforcement Rule for the 「Wastes Control Act」 was amended to shorten the period of storage of infectious wastes, add funeral houses as infectious-waste generating facilities, and as well to partially improve the real-name placenta discharge system and other systems for management of infectious wastes. In 2004, the 「Wastes Control Act」 was also amended to add medical facilities of prisons, detention centers, and juvenile correctional facilities, corporate medical facilities, medical corps of military units, nursing home for the elderly, and fee-charging nursing homes for the elderly, etc. as infectious waste generating facilities.<sup>31</sup>

Standards for the collection, transportation, storage and treatment of medical wastes are established. During collection and transportation, the wastes must be placed in designated containers and must be collected and transported in designated vehicles in while packed airtight. Collection transportation vehicles must equip refrigeration equipment that maintain a temperature of 4 degrees Celsius or less, and must operate it during transportation; also, an airtight cargo box must be installed, and the vehicle itself must be painted white; in addition, on both sides of the cargo box, the figure of the medical waste, name of the business and telephone number must be indicated, while on the rear side, the figure of the medical waste must be attached or indicated.<sup>32</sup> Medical wastes must be placed and stored in designated containers upon moment of their generation (when the relevant checkup, treatment, testing and examination has been completed). A designated container in use must be managed so that the waste contained inside will not leak out, and as for used designated containers, the internal synthetic resin pocket must be closed, while the outer container must be sealed airtight, and reuse is prohibited. In addition, the designated container (figure and color), storing facility (temperature for storage), and period of storage must be indicated for each type of waste.

31. Ministry of Environment, Enforcement Rules of the Wastes Control Act revised.

32. 「Medical Wastes Management System」.

---

Conditions for permitting infectious-waste treatment businesses, enhancement of other technical standards, and the attachment of electronic tags and electronic tag readers will be made mandatory in order to implement real-time management of discharged waste. Information on the discharge, transportation and treatment of medical wastes are transmitted on real-time basis through electronic tags and electronic tag readers attached on designated discharge containers to the electronic data system ([www.allbaro.or.kr](http://www.allbaro.or.kr))<sup>33</sup> In order to prevent the illegal treatment of medical wastes, a waste transfer and transference system based on wireless recognition methods will watch, on a real-time basis, each step of discharge, collection, transportation, and treatment of medical wastes.

#### **RFID (Radio Frequency Identification)**

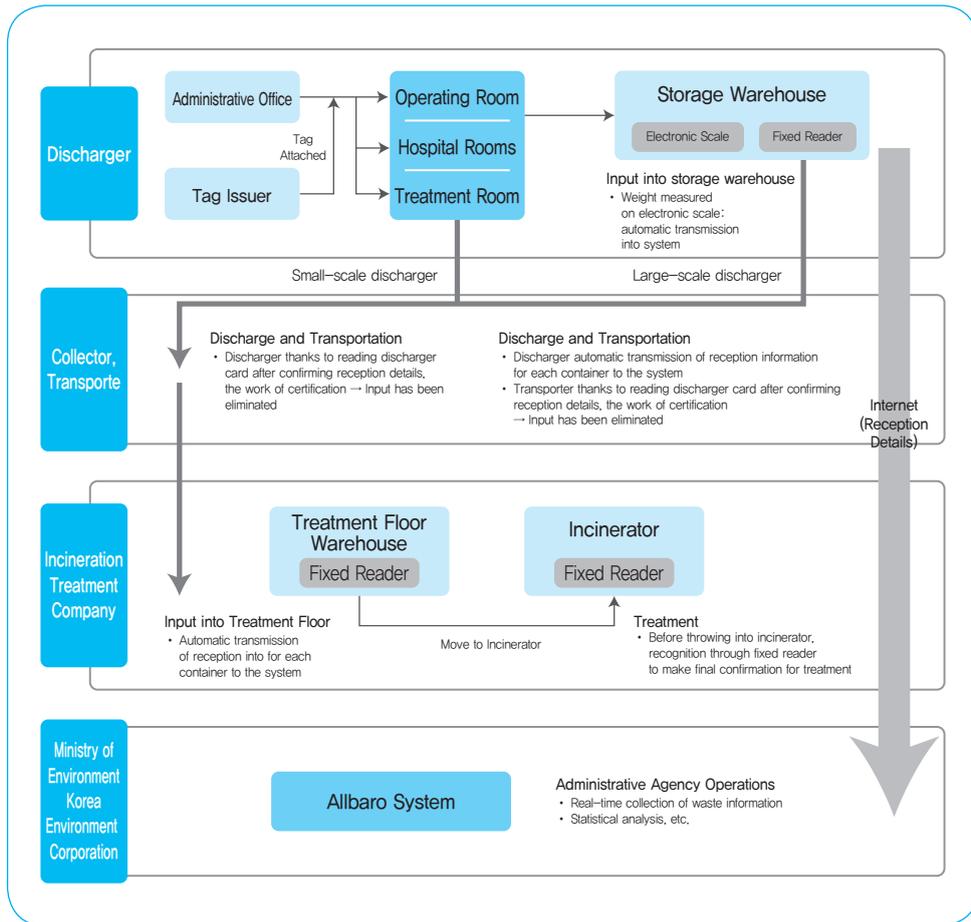
Technology where electronic tags that can transmit and receive information through wireless frequencies are attached on objects to be read by readers during the distribution process so that all information on the said object can be comprehended on a real-time basis.<sup>34</sup>

As the details of waste handling are now transmitted to the Allbaro system using RFID, preparation of hand-written records has now become unnecessary.

33. 「Implementation Guidelines for the Medical Wastes Management System」.

34. Ministry of Environment, Guidelines for Implementing a RFID based Medical Wastes Management System.

Figure 3-5 | RFID Processing System



Source: Ministry of Environment · Korea Environment Corporation, Waste Reduction System Information, Allbaro homepage: [www.allbaro.or.kr](http://www.allbaro.or.kr).

Medical wastes should be disposed in incineration facilities installed for the specific purpose of treating medical wastes, or in sterilization and pulverization facilities; after sterilization and pulverization, the remains should be incinerated, while the remains after incineration should be buried in landfill.

---

### 1.3.3. Prohibition on Food Waste Landfill

#### a. Overview

Along with the economic growth of 1970s and 1980s and accompanying rapid industrialization and urbanization, population moved en masse into cities, leading to a dramatic increase in urban wastes, with the percentage of food waste among these wastes increasing. Most of Korea's food waste, which traditionally consists mostly of water, was not appropriately treated and was discharged into rivers and streams along with sewerage, leading to worsening water pollution.

In 1996, when discharge of food waste in capital area landfill sites was prohibited, society's sense of alarm regarding food waste was high. Knowing that the direct landfill of food waste into landfill sites causes secondary environmental pollution such as bad odors, hazardous insects and leachate, as well as shortening the landfill site's lifespan, the Ministry of Environment amended the Enforcement Rules for the Wastes Control Act in 1997 and thereby prohibited direct landfill discharge of food waste generated in urban areas, starting on January 1, 2005.<sup>35</sup> In this year, the Environmental Conservation Committee (chaired by the Prime Minister), reviewed and confirmed the 'Master Plan for Food Waste Reduction' in order to fundamentally reduce food waste and utilize such waste as resources, upon which the Ministry of Environment started to establish and implement the necessary subordinate implementation plans.

#### b. Main Details

In 2002, when Korea held the World Cup games, the everyday rules for food waste reduction were established, thereby instituting efforts to propose and implement methods to reduce food waste at households, restaurants (business operators, consumers) and mass meal providers. Following the prohibition on direct landfill discharge of food waste,

---

35. Seoul Food Wastes Conflict News ([www.naver.com](http://www.naver.com)).

---

sorted collection of food waste was expanded, and as such, while food waste was simply recycled through traditional natural methods such as use as food for livestock or manure in agricultural areas prior to 1997, the ‘Ordinance Regulation for Collection, Transportation and Promotion of Recycling of Food Waste’ was established (1997) and then amended (1999, 2002). The major details of the enactment and amendments are as follows.

- Provision of designated containers or bags for sorted discharge of food waste
- Levying of fees for collection, transportation and recycling of food waste
- Setting of standards for collection, transportation, storage of food waste

Furthermore, due to the amendment of the Enforcement Rules for the Wastes Control Act and the specification of sorted collection (amended in August 1999), state financial support was provided for the procurement of designated collection vehicles for food waste. Starting from 2005, expenses for the purchase of vehicles that clean designated collection containers for food waste have been provided. In order to procure more food waste treatment facilities and enhance these facilities, a 30% state financial support project was carried out for more than 100 public food waste treatment facilities, while a recycling industry cultivation loan of 28.4 billion won was provided to 59 private food waste treatment facilities.

### **c. Improvements in Legislation and System**

Diverse legislative and systematic improvements were made, such as the 1997 enactment of the ‘Ordinance Regulation for Collection, Transportation and Promotion of Recycling of Food Waste’, specification of sorted collection provisions (August 1999 amendment of the Enforcement Rule for the Wastes Control Act), etc. Furthermore, in order to enhance the management of installation and operation of food waste resource reclamation facilities and ensure product quality, the “Directive on Installation and Operation of Food Waste Reclamation Facilities” was enacted and delivered (2002).

---

Also, in order to promote recycling of food waste, the Control of Livestock and Fish Feed Act, and the Fertilizer Control Act, etc. was amended, while an inspection system for the efficient management of the treatment facilities was introduced, along with a strengthened installation criteria (August 2004 amendment of the Wastes Control Act).

#### **d. Concurrent Implementation of Promotional Education for Reduction of Food Waste**

In order to reduce food waste at the origin, a campaign for food waste reduction was concurrently conducted along with improvement in legislative and policy systems, and the procurement of facilities. As such, TV campaign advertisements encouraging the reduction of food waste were broadcast, and food waste management and treatment workshops were held, including the presentation of operational examples such as, ‘Day without Food Waste’ (Jeju City), inspection of the current state of implementation in restaurants that voluntarily entered into an agreement to consolidate an eco-friendly food culture, in conjunction with the designation and promotion of environment-friendly restaurants (YWCA, 7~11), an assembly for a resolution to implement the “Day without Food Waste” campaign (6.2) and the campaign itself, which were simultaneously held in Seoul, 5 Metropolitan Cities and 15 other Cities; in addition, the 「Sudanal – meaning Wednesdays are days when we eat everything」 campaign was carried out to 10,000 mass food providers throughout the country, accompanied by the campaign to improve the wedding reception culture; furthermore, education was implemented to reduce water waste while promotional materials (posters, etc.) for the reduction of food waste and sorted discharge were printed and distributed, along with sending the Minister’s letters to consolidate the prohibition on direct landfill of food waste, notification of the prohibition on direct landfill discharge, and as well as outdoor electronic displays providing information on sorted discharge on 114 display boards throughout the country (January 2005), etc., among other such diverse promotion and educational campaigns.

---

### 1.3.4. Packaging Waste Regulation

#### a. Overview

Packaging wastes are wastes that are discharged after being used as packaging materials that protect the product inside during the process of distribution; as the standard of living continues to increase, diverse arrays of packaging materials are being developed, and their use is also increasing rapidly, placing a significant burden on waste management. As such, policies have been implemented in order to deter the generation of packaging waste and to promote the reuse and recycling of packaging materials. Policies and systematic devices to decrease the quantity of packaging wastes and promote qualitative improvement of packaging materials, such as the replacement of packaging materials with eco-friendly materials and restrictions on use of materials that are difficult to recycle, etc., have been established and enacted.

#### b. Main Details

In August 1993, Article 15 of the 「Act on the Promotion of Saving and Recycling of Resources」 and rules on the method of packaging products and the composition of packaging materials, etc. were enacted in order to implement regulations on the excessive packaging of products and the composition of packaging materials. In August 1995, the ‘Directive on the Reduction of Synthetic Resin Buffer Materials for the Packaging of Domestic Electronic Equipment’, which sought to reduce buffer materials for packaging of domestic electronic equipment, was proclaimed, and in July 1996, the ‘Directive on Yearly Reduction of Synthetic Resin Packaging Materials’, which sought to reduce synthetic resin packaging materials, was proclaimed<sup>36</sup> as well.

36. Rules on the Standards for Wrapping and Wrapper Materials for Waste Products.

---

In February 1999, the ‘Mandatory Packaging Inspection System’, which requires inspection by an expert agency for products whose excessive packaging is recognized, and ‘Recommendation to Indicate Packaging’, which encourages indications of the ratio of packaging and space, material composition, and frequency thereof, were introduced.<sup>37</sup>

In February 2002, as the Act on the Promotion of Saving and Recycling of Resources was entirely amended, the existing “Rules for Method of Product Packaging and Composition of Packaging Materials, Etc.” was amended to the “Rules on Standards of Product Packaging Material and Packaging Method, Etc.” in April 2003.

Recently, the Operational Directive on Deterrence on Generation of Packaging Wastes, etc. was enacted (Ministry of Environment Established Rule No. 484, enacted July 1, 2013), and the objective of this Directive is to determine the matters necessary to implement the tasks for deterring the generation of packaging wastes pursuant to Article 9 of the ‘Act on the Promotion of Saving and Recycling of Resources’, Article 7 of the Enforcement Decree of the said Act and the ‘Rules on Standards of Product Packaging Material and Packaging Method, Etc.’.

### **c. Substance of Packaging Waste Generation Deterrence Policy**

#### *a) Regulation on Packaging Materials*

The packaging waste generation deterrence policy implements the following 3 policies: regulation of the material composition of packaging, regulation of packaging methods, yearly reductions of packaging materials made of synthetic resin materials, etc. The regulation on material composition of packaging is a regulation on materials that are difficult to recycle – starting in September 1993, use of foamed polystyrene materials was prohibited for toy dolls and all other integrated products, while starting in January 2001, packaging materials made of PVC shrink-wrap, materials combined with PVC and materials on which PVC

---

<sup>37</sup> Hanwa Environment Research Institute.

is coated, was prohibited; and starting from January 2004, polyvinyl chloride packaging was prohibited on packaging of eggs, quail eggs, fried food, kimbab, hamburgers and sandwiches.<sup>38</sup>

*b) Regulation on Packaging Methods*

Regulation on packaging methods is a policy that limits excess space (package-space ratio) within a product package box to a certain ratio in order to deter excessive packaging and regulates the number of multiple packaging (number of packaging), and applies to 7 individual products and 23 product categories, including food, cosmetics, detergents, miscellaneous articles, sanitary aid, clothes, integrated products, etc., for which standards for the packaging methods for each product type were established.<sup>39</sup> In addition, in applying the packaging-space ratio, in cases where a saucer or buffer made of composite synthetic materials, PVC, synthetic resin material for which recycling is difficult, the packaging-to-space ratio is reduced (-5%), while the packaging-to-space ratio is expanded (+5%) in cases where paper materials such as pulp mold, etc. are used, thus promoting replacement to eco-friendly materials.<sup>40</sup>

*c) Yearly Reduction of Packaging Materials made of Synthetic Resin Materials*

Yearly reduction of packaging materials composed of synthetic resin material is a system where yearly standard is imposed in order to reduce the use of packaging materials made of synthetic resin and promote replacement with eco-friendly packaging materials.<sup>41</sup>

38. Act on the Promotion of Saving and Recycling of Resources.

39. Seosan City, 2013, Seosan City Waste Disposal Framework Research Services.

40. Chunan City 3<sup>rd</sup> Waste Disposal Framework.

41. Act on the Promotion of Saving and Recycling of Resources.

**Table 3-10 | Standards for Method of Packaging for Each Type of Products**

Type of Product			Standard	
			Packaging-to-Space Ratio	Frequency of Packaging
Unit products	Food and drinks	Processed food	15% or less	2 times or less
		Drinks	10% or less	1 time or less
		Alcoholic beverages	10% or less	2 times or less
		Pastries	20% or less (For decoration cakes, 35% or less)	2 times or less
		Health supplements	15% or less	2 times or less
	Cosmetics	Cosmetics (including air freshener)	10% or less (excluding perfume)	2 times or less
	Detergents	Detergents	10% or less	2 times or less
	Miscellaneous items	Toys, dolls	35% or less	2 times or less
		Stationery items	30% or less	2 times or less
		Miscellaneous personal items (limited to wallets and belts)	30% or less	2 times or less
Sanitary aids	Sanitary aids	20% or less	2 times or less	
Clothes	Shirts and undershirts	10% or less	1 time or less	
Integrated products	Primary items, processed drinks, alcoholic beverages, pastries, health supplements, cosmetics, detergents, miscellaneous personal items		25% or less	2 times or less

Source: Su Il Kim, Packaging Development Research Institute.

---

## 1.4. System Certification of Lawful Treatment of Wastes (Allbaro System)

### 1.4.1. Overview

Based on the 「Wastes Control Act」, in order to prevent illegal treatment of industrial wastes, especially those that are highly hazardous, advance reporting of relevant matters to the Provincial Governor was required starting in 1986, for the transportation and treatment of certain wastes (later designated wastes).

In 1991, the 「Wastes Control Act」 was amended, and it was thereby mandatory to issue 6 copies of statements, including detailed information such as type, characteristics, transportation, treatment, etc. of wastes, for each case and transportation vehicle, so that all processes spanning from discharge and transportation to treatment, etc. were reported to the local Director of Agency of Environment. However, since the preparation of all statements was done by hand, rendering verification or interpretation virtually impossible, this system was maintained in name only without any real effect.

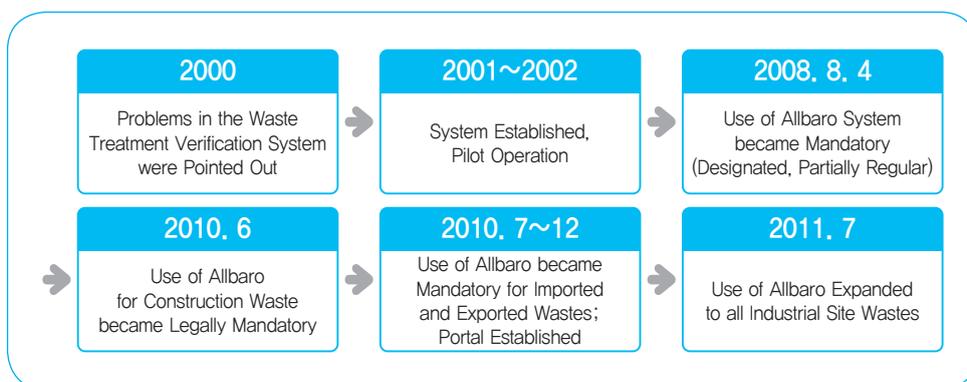
In order to improve this situation, starting in August 2008, an automatic management system (Allbaro) that manages the waste delivery statements (paper statements), that were previously handled by hand, between waste dischargers, transporters, treaters and administrative agencies, etc., in the form of online electronic information, was introduced in order to appropriately and transparently manage the entire process, spanning from discharge of waste to final treatment. The Allbaro system is an integrated waste management system designed to be the ideal system that treats ALL wastes in an appropriate and efficient manner, which is thus the most ideal BARometer for waste treatment.

## 1.4.2. Main Details

In 1999 the 「Wastes Control Act」 was amended, requiring businesses that discharge wastes to prepare and submit a waste treatment plan statement when starting the business, in addition to submitting a report of change every time a different company is commissioned to carry out treatment.

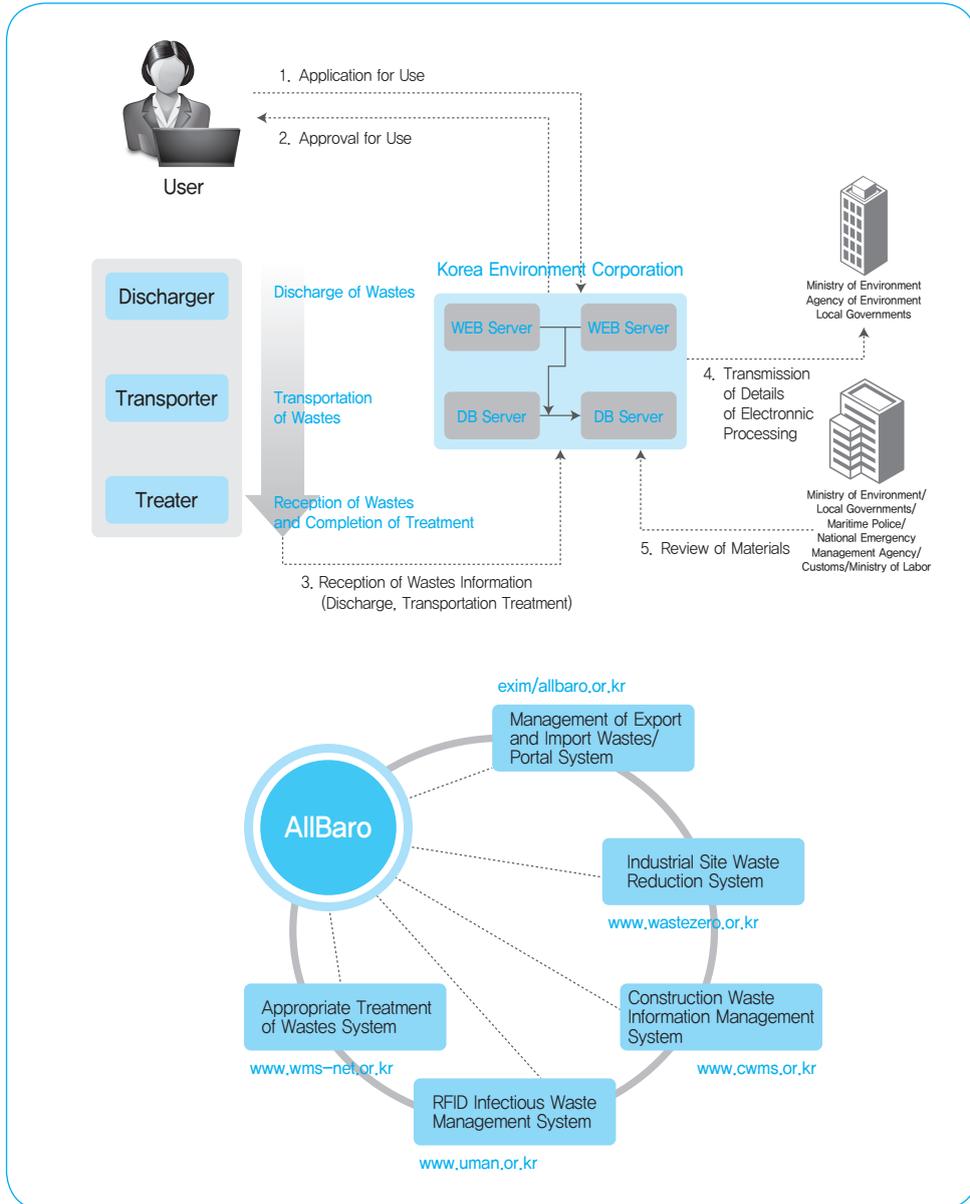
### a. Chronology of Allbaro System

Figure 3-6 | Chronology of the Allbaro System



## b. Allbaro System's Operational System and Composition

Figure 3-7 | Allbaro System's Operational System and Composition



Source: Ministry of Environment · Korea Waste Association, 2013, 2013 Wastes Disposal Head Judiciary Education.

---

### **c. Allbaro System**

#### *a) Waste Transfer Management System*

Checks whether the generated waste is appropriately and transparently transferred from the transporting company to the treatment company and whether all processes thereof were appropriately and transparently carried out; in order to do so, the outcomes of final treatment of wastes are compared and contrasted, through which irregularities in the treatment process are automatically analyzed and checked, with the records thereof automatically managed as well.

#### *b) Waste approval and permit system*

To minimize the administrative processes related to issuance of approval and permit of wastes for the petitioner, 24 approval and permit tasks, including those for designated treatment plan statements, etc., are processed in a unified system online.

#### *c) Waste analysis system*

Analyzes designated waste treatment plan statements and waste transfer materials to analyze waste generation trends, outcomes in terms of plans, etc., to use as policy materials.

### **d. Legislation Related to Allbaro System**

The system is related to a diverse array of related legislation, such as the Wastes Control Act, the Construction Waste Recycling Promotion Act, the Act on the Transboundary Movement of Hazardous Wastes and their Disposal, Notification on Operation and Use of Program for Electronic Processing of Information on Waste, etc.

---

**e. Expected benefits of electronic preparation of transfer statements through Allbaro system**

Through electronic processing of waste treatment, costs have been reduced, the administrative process has been simplified, and corporate competitiveness has been enhanced; thanks to the establishment of an information system in the field of waste treatment, information availability has been expanded, while reliable statistical information on matters such as the current state of industrial site waste generation and treatment, etc. is being generated.

Through electronic monitoring of the current state of implementation, supervisory operations, waste transfer information from waste generation to final disposal, and comparison with basic information on waste, the appropriate treatment of waste is being promoted.

## **2. Measures for Managing Conflicts in Areas Surrounding Waste Treatment Facilities**

### **2.1. Reasons for Conflict**

#### **2.1.1. NIMBY Phenomenon**

Installation of shunned facilities often faces much difficulty due to the so-called NIMBY(Not In My Back Yard) phenomenon, where people do not want such facilities in their neighborhoods. The most commonly raised concerns about the installation of such facilities are losses to property value due to decreases in the value of the area's land, fears of environmental damage and pollution, impediments to regional development caused by usage limitations and the loss of living environment, all of which lead to the widespread perception that being chosen for such facilities presents no positive aspects.

---

### **2.1.2. Mistrust in the Administrative System**

Significant anxiety and mistrust in the administrative system with regard to site selection are present. In conjunction with the circumstances of the times when even large-scale national projects meet much mistrust, the basic perception is that the level of trustworthiness of local governments is very low.

### **2.1.3. Failure to Perform Prior Agreements with Local Residents**

In cases where prior agreements with local residents, such as resident participation in the site selection process, and other demands are not carried out, serious conflict may arise. All residents will ultimately find out about site selection, and therefore prior agreements must be made in order to prevent serious conflicts.

### **2.1.4. Insufficient Compensation and Assistance**

The Promotion of Installation of Waste Disposal Facilities and Assistance, Etc., to Adjacent Areas Act requires the implementation of local resident assistance funds and assistance projects for surrounding towns if they are included in the areas influenced by incineration and landfill facilities. Forceful installation of facilities shunned by residents demand burdensome sacrifice to the relevant region and is likely to cause local residents' anger and dissatisfaction, which may evolve into resident protests and conflicts.<sup>42</sup>

42. Yong Hwan Lee, Gyeonggi Development Research Institute, October 2008, Study on Conflict Resolutions for Ostracized Facilities and Resident Support Measures.

## 2.2. Measures to Respond to Conflicts<sup>43</sup>

### 2.2.1. Overcoming NIMBY

#### a. Promotion and Education for Local Residents for the Formation of Friendly Conditions

##### a) Use of Environment-Friendly Descriptions, Such as “Public Utility Facility”

With regard to site selection for basic environmental facilities, the existing facility names such as trash landfill site, trash incineration facility, and comprehensive waste disposal site strengthen the existing negative perception of these facilities and therefore, the use of an environmentally friendly name that presents a more positive image, as recommended by the Ministry of Environment, is needed. For example, the Gyeonggi Province submitted a proposal in which it will change ‘food waste disposal facility’ → ‘remaining food resource utilization facility’, ‘incineration facility’ → ‘resource reclamation facility’, ‘landfill site’ → ‘environment stabilization facility’, to the Ministry of Environment.

**Table 3-11 |** Gyeonggi Province Name Changes for Household Waste Treatment Facilities

Before Change	After Change
Food Waste Disposal Facility	Remaining Food Resource Utilization
Household Trash Landfill Facility	Environment Stabilization Facility
Household Trash Incineration Facility	Resource Reclamation Facility

Source: Ah, Seong-hee, Environmental Resource Department, Name Change of Household Waste Treatment Facilities in the Province, Gyeonggi Province Home Page, <http://www.gg.go.kr/archives/1397952>.

43. Development Research Institute, Oare not a result of nationwide policy; they are experimental outcomes obtained in some local municipalities.

*b) Advance Field Visitations to Existing, Advanced Environment Facilities*

In order to combat the negative popular conception of outdated landfill sites and incineration sites, field trips to recently built comprehensive waste treatment facilities for local residents and the local leadership before and during the site selection process are needed. Furthermore, through conversations with fellow local residents working as resident observation agents in the facilities, fears and anxiety about environmental damage may be eliminated, in addition to providing effective promotion and education about basic environmental facilities.

**Figure 3-8 |** Visitation to an Advanced Environmental Facility



**Figure 3-9 |** An Example of a Resident Observation Agent during a Visitation Trip



Source: Ministry of Environment, 2005, Conflict Resolution Workshop for Waste Treatment Facilities.

**b. Provision of Significant Incentives Through Local Resident Assistance**

By providing significant incentives through significant resident assistance through decisions made in city mediation councils, not only will damage caused by site selection be canceled out, but a long-term blue print for local development will be also proposed.

**Table 3-12 |** Details of Incentive Provisions, Size and Methods

Assistance Details		Methods of Assistance	Remarks
Resident Assistance Fund	Raised funds	Decision through resident assistance conference association	
	Collected waste fees	Since the year of facility usage initiation and end of use	
Local Prize Project		Highest priority accorded	For each sphere of influence
Appointment of Paid Resident Observation Agents		Appointment from the start of facility construction through the end of facility use	Salary paid
Awards for National Service Merit Recipients		Provided to individuals or organizations after site selection confirmation, pursuant to service merit levels	

Source: Yi, Yong Hwan, Gyeonggi Development Research Institute, October 2008, Resolving Conflicts Due to Regional Residents' Rejection of Facilities and Research into Methods of Obtaining Residents' Support.

**c. Publicized Voluntary Entrance to Site Selection Candidacy with Resident Participation**

For site selection, a publicized, voluntary entrance to site selection candidacy, with promise of incentive provisions, that allows residents to volunteer their region for facility site selection instead of a unilateral selection by the installing authority, may enable the fundamental elimination of resident protest caused by the NIMBY phenomenon. In a case similar to above, when the City of Jeonju in North Jeolla Province faced difficulty in site selection for its incineration facility project initiated in February 2000 due to resident protests, the city changed its project policy and held a publicized voluntary entry program with promise of incentives, to which four towns applied, and a site was selected in April, 2002. The construction started in April 2004.<sup>44</sup>

44. Yong Hwan Lee, Gyeonggi Development Research Institute, October 2008, Study on Conflict Resolutions for Ostracized Facilities and Resident Support Measures, p.81.

**Table 3-13 |** Voluntary Entry Incentives Offered by Jeonju, North Jeolla

Incentives
<ul style="list-style-type: none"><li>- Up to 5 billion KRW in assistance to incineration facility site town</li><li>- Welfare facilities (swimming pool, welfare center, fitness centers) free of charge</li><li>- Domestic heat provided through use of incineration heat</li><li>- Construction of entry road and 5% of waste entry fees transferred to local residents support council</li></ul>

Source: Yi, Yong Hwan, Gyunggi Development Research Institute, October 2008, Resolving Conflicts Due to Regional Residents' Rejection of Facilities and Research into Methods of Obtaining Residents' Support.

## 2.2.2. Alleviation of Administrative Mistrust

### a. Formation and Operation of Expert-Civilian Joint Site Selection Committee

According to the provisions of the Promotion of Installation of Waste Disposal Facilities and Assistance, Etc., to Adjacent Areas Act, a site selection committee must be formed at the time of site selection proceedings. In order to enhance the level of administrative trust with regard to site selection, disinterested local representatives of various sectors should be chosen as committee members. And the chairperson of the committee should be a neutral individual with considerable expertise in the field in order to enhance the level of local residents' trust on fairness of the process.

### b. Implementation of an Objective and Fair Feasibility Study and Procedures

For the selection of a professional research agency to carry out a site-selection feasibility study, an objective contract criteria should be established under the leadership of the committee; a feasibility study that is fair and objective to all parties should be implemented in order to prevent complaints about the results of the study and eliminate mistrust in the administrative process.

---

### 2.2.3. Advance Consultation with Local Residents

#### a. Formation of Resident Organizations

Resident organizations related to the waste management facility installation include the local resident support council, which is a legally recognized entity, and discretionary entities such as local resident response committees. In case of large-scale landfill facilities, local government ordinances provide a legal basis for the formation of resident support councils, but for small-scale facilities, discretionary entities elicit local government support through their activities.

Local resident support councils are formed through recommendations from city councils, and their roles include selection of professional research agencies for the study of the environment impact of waste treatment facility, consultation on installation of welfare facilities for local residents, consultation on resident assistance for adjacent influenced areas, consultation on resident assistance projects and recommendations for the appointment of resident observation personnel. These councils have formed a nationwide network and possess national-level organizations; they exchange information and perform comparisons on each other's circumstances, which may yield materials necessary for negotiation with local governments on issues such as scope and method of assistance.

Residents related to waste treatment facilities are many in number and are dispersed throughout various towns; resident organizations representing them serve as windows of communication with local governments and therefore a cooperative relationship with such resident organizations is very important. In the case of Cheonan City, which is a self-governing municipality in Korea, keeping good relations with the local resident council led to a situation where the resident council acted as a mediator, contributing significantly to the alleviation of conflict.<sup>45</sup>

45. Nam Geol Kim, Dankook University, 2011, Study on Conflicts Related to Waste Treatment Facility Site Selection and Operation: With Focus on Cheonan Household Waste Treatment Facility.

---

### **b. Clear and Scientific Project Explanation to Civic and Environmental Organizations**

Civic and environmental organizations have a tendency to oppose the installation of waste treatment facilities, despite their awareness that such facilities are necessary for social utility. In order to resolve this, it is necessary to offer scientific explanations for site selections and clearly explain the justifications for the implementation of the project.

In Incheon, for example, resident information sessions at the time of feasibility study and environmental impact evaluation provided justification for the construction of the Cheongna incineration facility and reduction measures for expected damage, ample explanations about the flawlessness of the prevention systems and disclosure of operation processes; this process ultimately enabled resolutions of civic petitions.

### **2.2.4. Procurement of NIMBY Facilities Through the Development of New Towns**

It is very difficult to install NIMBY facilities in old cities. Having to simultaneously overcome the issues of procurement of land for installation of the facility and local opposition reduces project efficiency, and increases the likelihood of project abandonment. However, if a new town is built, installation of NIMBY facilities becomes more convenient. If installation of NIMBY facilities is planned in the planning stage and is appropriately deployed in conjunction with the land use of surrounding areas, the problems of procurement of land and resident opposition can be overcome.

In late 1980s, Korea carried out development of 5 new towns (Bundang, Ilsan, Pyengchon, Sanbon, Jungdong) in the capital area in order to overcome housing shortages and various urban problems. In the 「Directive on Handling Works on Development of Residential Land」, which was prepared for the development of new towns such as the 5 new capital area towns, standards for the installation of public facilities necessary to secure the town's self-sufficiency were drawn up. The provisions in the 「Directive on Handling Works on

---

Development of Residential Land<sub>」</sub> related to installation of public facilities<sup>46</sup> are as follows.

- ① The Appointer shall procure public facilities of appropriate scale, pursuant to the installation criteria of related Acts and Statutes, such as the 「National Land Planning and Utilization Act」, etc.
- ② The Appointor may, in cases where a public facility other than the installation criteria in Clause 1 is deemed necessary for the sound development of the town and securement of the region's self-sufficiency capacity, install the said public facility.
- ③ The Appointor may, in order to secure self-sufficiency capacity of the project region, form land sites for the installation of facilities provided for in Article 2, Clause 3 of the Decree; in these cases, the project implementer shall designate the said site within a scope of 10/100 of the entire region, but when considered inevitable given the scale of the region and regional characteristics, etc., the said site may be designated within 20/100 of the region. Provided, agricultural land for the procurement of replacement cultivation land shall be treated separately.

Furthermore, criteria for the deployment of heat-providing facilities (incineration facilities) shall be established, to ensure that facilities are installed based on a consideration for the use of the surrounding land.

46. Public Facility Land, Article 19 of the Directive on Handling of Works on Development of Residential Land.

---

The determination criteria for heat-providing facilities as provided for in the legislation<sup>47</sup> are as follows:

1. Heat-producing facilities shall be installed with consideration for the land use in surrounding areas, in order to prevent damage due to accidents, etc.
2. Heat-producing facilities shall be installed only in Type 2 Exclusively Residential Zones · Type 2 Regular Residential Zones · Type 3 Regular Residential Zones · Semi-Residential Zones · Exclusively Industrial Zones · Regular Industrial Zones · Semi-Industrial Zones · Natural Green Land Zones and Planned Management Zones
3. Heat-producing facilities that generate heat through the incineration of waste shall be installed with consideration for various environmental pollution issues, such as air and water pollution, and shall be installed in areas where vehicles may approach easily.
4. Heat-transferring facilities shall be installed on a route that can minimize the distance between the provider and customers in order to improve efficiency of heat transportation
5. Heat facilities shall be installed with consideration for surrounding roads and underground equipment in order to avoid unnecessary overlap during construction
6. Buffer green zones shall be installed in order to reduce damage to surrounding areas due to inflammability and bad odors
7. The site shall be determined with consideration for population and the distribution of industrial complexes, etc.
8. Shall be installed in regions with low possibility of natural disasters, such as flooding and landslides, etc.

47. Article 74 of the 「Rule on Standards of Determination, Structure and Installation of Urban and Military Planned Facilities」.

**Figure 3-10 |** Thermal Power Plant (Incineration Facility) of Pyeongchon New Town



### **2.2.5. NIMBY Facilities Linked with Various Neighborhood Convenience Facilities<sup>48</sup>**

#### **a. Guri Resource Reclamation Facility**

The Guri Resource Reclamation Facility was completed in December 2001, and currently treats 200 tons of waste from Guri and Namyangju every day. The problem of incinerating facilities is that they discharge poisonous substances; however, the Guri Incineration Facility is unique in that it completely prevents the discharge of such substances and therefore causes no harm. That is, by separately collecting wastes such as plastic, paper, vinyl, scrap metal, batteries, used fluorescent light bulbs, etc. depending on their characteristics, and recycling

48. Refer to Guri City website(<http://www.guri.go.kr/main/cityhall>).

---

them as resources, environmental problems and waste problems are simultaneously resolved. The Guri Resource Reclamation Facility is popular as a study trip destination, is the object of benchmarking by various institutions, groups and foreigners, and receives tens of thousands of visitors every year.

**Figure 3-11 |** Guri Resource Reclamation Facility



**b. Guri Tower**

Within the Guri Resource Reclamation Facility, there is an observation tower (Guri Tower) built within a 100-meter high chimney in which one may observe the beautiful surrounding scenery of the Han River and Acha Mountain, etc. Using the chimney of an incineration facility previously shunned by residents, a 100m observation tower was built. Through the Tower's 48-degree glass windows, the streaming Han River, quietly laden hills, and a night view of Seoul when the red evening sun is hanging around the window, may be observed for free.

Figure 3-12 | Guri Tower



**c. Guri Citizen Sports Center**

On a 37,512m<sup>2</sup> (about 11,347 pyong) site surrounding the Guri Resource Reclamation Facility is a sports and recreational complex consisting of a year-round indoor swimming pool, sauna facilities, artificial grass soccer grounds (page 1), gate-ball grounds (page 3), and a roller-skate track also used as a basketball court (page 1), etc. This site, along with a 200 tons-per-day super-modern incineration facility, is being used as a neighborhood utility facility for the rest and recreation of the citizens.

---

**Figure 3-13 |** Guri Citizen Sports Center



2016 Modularization of Korea's Development Experience  
Waste Resources Management and Utilization Policies  
of Korea

## Chapter 4

### Outcomes of Korea's Waste Management Policies and Comparison with Foreign Countries

1. Comparison with Foreign Waste Management Policies
2. Achievements and Limitations of Korea's Waste Management Policies

---

# Outcomes of Korea's Waste Management Policies and Comparison with Foreign Countries

In this chapter, a comparison is made with the policies of foreign countries (Europe, Japan, USA) in order to understand the outcomes of waste management policies of Korea. Furthermore, emphasis has been placed on the main outcomes and limitations of the “volume-rate disposal system” and the “Extended Producer Responsibility” system as the representative policies of Korea, so as to set forth the implications for developing countries.

## 1. Comparison with Foreign Waste Management Policies

### 1.1. Comparison Between Systems of Legislations

A review of the systems of legislations of the European Union, the United States, and Japan shows that these countries have all established a system of legislation based on the perspective of matter circulation, the link between which is enhanced through the organic division of roles between legislation on waste treatment. For example, Japan has been reforming its system of legislation in systematic fashion, starting from the Waste Treatment Act → the Act on the Promotion of Valid Use of Resources (including individual legislations on recycling) → the Framework Act on Formation of a Circulation Society, etc.

Korea has also been enforcing the 「Wastes Control Act」, which is legislation for safe treatment of waste, and the 「Recycling Promotion Act」, which is legislation for reduction of waste and promotion of recycling; in addition, the 「Framework Act on Resource Circulation」, which is legislation for circulated use of waste, is scheduled to be enacted, giving Korea a system of legislation similar to those of foreign countries.

**Table 4-1 | Comparative Analysis of Legislation on Waste Management**

Category	Japan	EU	USA
Framework Legislation	Basic Measures - Framework Act on Formation of a Circulation Society (2002) - Ideology: Formation of a circulation society and division of work between involved parties	- EU Council Resolution - General Waste (91/156/EEC) - Designated Waste (94/31/EC) - Framework Measure on Waste (2008/98/EC)	- Resource Conservation and Recovery Act (RCRA) - Hazardous Solid Waste Act - Reduction and management of hazardous waste
Subordinate Statutes (Guidelines)	Act on Valid Use of Resources Individual recycling legislations for packaging, food, vehicles, etc.	- Waste Oils - Incineration of waste - End-of-life vehicles, etc.	- CFR (designation of hazardous waste) - State legislations (legislations of electrical and electronic equipment, etc.) * Domestic waste governed by state law
Priorities	- Deterrence on generation of waste, reuse, regeneration, appropriate treatment	- Deterrence on generation of waste, reuse, recycling (including energy recovery), appropriate treatment	- Deterrence on generation of waste, recycling, incineration, appropriate treatment
Direction of Resource Circulation Policy	- Deterrence on discharge, reuse, regeneration, appropriate treatment - Promotion on circulatory use of resources (industry and category of products designated in the decree)	- Per the pay-as-you-pollute principle, manufacturers, importers, distributors and consumers burdened with specific responsibilities in accordance with deterrence on discharge of waste, recycling, treatment.	- In order to promote recycling, a method, in which appropriate exceptions in the form of legislations on hazardous waste are made from waste and recycling projects

Source: Ministry of Environment, 2013, Research on Preparation of Measures for Reformation of Waste Management System.

## 1.2. Comparison of “Waste Treatment Legislations” and “Recycling Legislations” Systems

A comparison of Korea’s waste treatment and recycling system with that of other countries shows that in Japan, treatment laws and recycling laws are separated, and are operated with mutual linkage through concepts of waste. Germany handles recycling and treatment in integrated legislation, through its 「Act on Management of Circulation and Waste(KrW-/AbfG)」, and the United States maintains an integrated system on the federal level, while some States maintain a separated system, with others maintain an integrated one.

While Korea handles waste treatment legislations and recycling legislations under a single unified Act called the 「Wastes Control Act」, and therefore has a system similar to that of Germany, it also maintains individual legislation on recycling called the 「Act on the Promotion and Recycling of Resources」, thus resembling Japan’s divided system, in addition to a form where mutual links exist based on concepts of waste.

**Table 4-2 | Comparison of Waste Management Policies of Korea and Foreign Countries (Treatment Law and Recycling Law Systems)**

State	Main Substances
Korea	<ul style="list-style-type: none"> <li>- Integrated legislation</li> <li>- Handles recycling and treatment together in the 「Waste Control Act」</li> <li>- For recycling, there is also a separate legislation, called the 「Act on the Promotion of Saving and Recycling of Resources」</li> </ul>
Japan	<ul style="list-style-type: none"> <li>- Treatment law and recycling law separated</li> <li>- Mutually linked through concepts of waste</li> </ul>
Germany	<ul style="list-style-type: none"> <li>- Integrated legislation</li> <li>- Handles recycling and treatment together in 「Act on Management of Circulation and Waste」</li> </ul>
U.S.	<ul style="list-style-type: none"> <li>- Federal: integrated</li> <li>- States: some separated system</li> </ul>

Source: Re-arranged by the Ministry of Environment, 2009, Measures for Improvement of System of Legislations on Waste and Reorganization of Statutes.

### 1.3. Structure of the “Waste Reuse” Legislation System

As for the system of legislation regarding the ‘reuse of resources’, Japan maintains a separated system in which separate recycling legislations exist for each category of waste and products, while Germany provides for general matters in its 「Act on Circulation Management and Wastes」, with provisions for each individual material provided for in their respective enforcement decrees. In the United States, some States maintain a separated system.

In the case of Korea, the system of legislation for recycling and the treatment of waste consists of individual legislation for each category of materials such as construction waste, electrical and electronic equipment, vehicles, etc.

**Table 4-3 | Comparison of Waste Management Policies in Korea and Foreign Countries (Existence of a Framework Statute on Resource Circulation)**

Country	Main Substances
Korea	- 1 <sup>st</sup> Framework Plan for Resource Circulation - Framework Act on Resource Circulation (to be enacted on 2018.01.01.)
Japan	- Framework Act for Formation of a Circulation Society - Provides framework principle, framework plan, framework policy, etc. - Separate provisions for treatment and recycling
Germany	- The 「Act on Management of Circulation and Waste」 exhibits characteristics of a framework statute, and concurrently handles treatment and recycling
U.S.	- No framework statute

Source: Re-arranged by the Ministry of Environment, 2009, Measures for Improvement of System of Legislations on Waste and Reorganization of Statutes.

---

## 1.4. Comparison of Whether a “Framework Act on Resource Circulation” Exists

As for the ‘Framework Act on Resource Circulation’, which is for waste resource circulation policy, Japan provides its framework principles, framework plan, framework measures, etc. in its 「Framework Act on Formation of a Circulation Society」, and separately provides for treatment and recycling. In the case of Germany, its 「Act on Circulation Management and Wastes」 is in its nature a framework act, and conjointly provides for recycling and treatment. The United States currently does not have a framework statute.

While Korea has been implementing the First Framework Plan for Resource Circulation, the 「Framework Act on Resource Circulation」 is scheduled to be enacted in 2018.

**Table 4-4** | Comparison of Waste Management Policies in Korea and Foreign Countries (Recycling Law System)

Country	Main Substances
Korea	- Array of individual legislations for individual materials
Japan	- Maintains a separate system for each type of waste and category of products
Germany	- Handles general matters in the 「Act on Management of Circulation and Waste」 - Individual materials handled in enforcement decrees
U.S.	- Some States: separated system

Source: Re-arranged by the Ministry of Environment, 2009, Measures for Improvement of System of Legislations on Waste and Reorganization of Statutes.

---

Furthermore, according to a source which distinguishes the resource circulation policies currently being implemented in OECD countries based on the entire process of economic activity consisting of ‘production-distribution-consumption-disposal’ and compares them with Korea’s resource circulation policies, most of resource circulation policies in major OECD member countries have been introduced in Korea as well. Furthermore, in order to facilitate a zero-waste society, which is currently being either considered or partially implemented, and to introduce economic incentives for minimization of landfill burying and prohibition on landfill burying, etc., the 「Framework Act on Resource Circulation」 is set to be enacted in 2018.

**Table 4-5 | Policy Tools of Each Country for Each Phase of Economic Activity**

Major Policy (Introduced in Korea)	Phase of Economic Activity	Material extraction	Transportation	Production	Consumption	Recycling	Final disposal	Remarks
zero waste	-	○	○	○	○	○	○	Scotland
green tax shift	-	○	○	○	○	○	○	
Integrated Product Policy	-	○	○	○	○	○	○	Denmark, USA, etc.
Eco-design	Evaluation on resource circulation	○	○	○	○	○	○	
green public procurement	Green buying	○	○	○	○	○	○	
energy using products	Energy efficiency	○	○	○	○	○	○	EU
pay by use	volume-rate disposal	○	○	○	○	○	○	Germany, France, etc.
detoxification	Criteria of treatment	○	○	○	○	○	○	
SCP	Deterrence on packaging, etc.			○	○			EU
dematerialisation	Deterrence on generation	○	○	○	○	○		Germany, Netherland
sound material-cycle society	Resource- circulating society	○	○	○	○	○	○	Japan
industrial ecology	Specialized complexes, etc.	○	○	○	○	○	○	Canada, UK
trading schemes	Circulated resource exchange					○	○	UK
landfill bans	-					○	○	EU, USA, etc

Major Policy (Introduced in Korea)	Phase of Economic Activity	Material extraction	Transportation	Production	Consumption	Recycling	Final disposal	Remarks
disposal levies & taxes	-					○	○	EU, UK, Japan
deposit-refund system	Empty- container deposit					○	○	
EPR	EPR			○	○	○	○	
product bans	Restriction on use of refrigerant	○	○	○	○	○	○	Montreal- Stockholm Agreement
product levies	Waste fee	○	○	○	○	○	○	Denmark, Belgium
eco-labelling	Marking of sorted discharge, etc.	○	○	○	○	○	○	EU, Canada
minimum product standard	-	○	○	○	○	○	○	
EPA's 2020vision	Framework plan for resource circulation	○	○	○	○	○	○	Belgium, USA
green flag award	Day of resource circulation				○	○	○	

Source: Ministry of Environment, 2013, Research on Preparation of Measures for Reformation of Waste Management System.

---

## 1.5. Other Systems of Laws

A comparison Korea's system of other waste-related laws (the Basel Agreement Act · the Promotion of Installation of Waste Disposal Facilities and Assistance, Etc. to Adjacent Areas Act · Construction Waste Recycling Promotion Act · the Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles) with other countries shows that Korea has laws governing inter-border movement of wastes, and as well as the Promotion of Installation of Waste Disposal Facilities and Assistance, Etc. to Adjacent Areas Act · Construction Waste Recycling Promotion Act · the Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles, etc.

Japan has the Basel Agreement Act, the Act on Prevention of Maritime Pollution, the Act on Recycling of Packaging Containers, Certain Household Devices, Food, Construction Materials, Livestock Excreta, Etc. Germany has the 「Act on Movement of Waste (AbfVerbrG)2007. 7. 19」, the 「Act on Electrical and Electronic Equipment Act (Elektro- und Elektronikgerätegesetz)」; the United States does not have a Basel Agreement Act, Promotion of Installation of Waste Disposal Facilities Act, nor a Construction Waste Recycling Promotion Act, while some States have a legislation for recycling of electronic waste.

**Table 4-6 | Comparison of Waste Management Policies in Korea and Foreign Countries (Other Systems of Laws)**

Country	Main Substances
Korea	<ul style="list-style-type: none"> <li>- Act on the Transboundary Movement of Hazardous Wastes and Their Disposal</li> <li>- Waste Disposal Facility Installation Act, Construction Waste Recycling Act, Electronic Equipment Act</li> </ul>
Japan	<ul style="list-style-type: none"> <li>- Basel Agreement Act</li> <li>- Act on Prevention of Maritime Pollution</li> <li>- Act on Recycling of Packaging Containers, Certain Household Devices, Food, Construction Materials, Livestock Excreta</li> </ul>
Germany	<ul style="list-style-type: none"> <li>- 「Act on Movement of Waste(AbfVerbrG)2007. 7. 19」</li> <li>- 「Electrical and Electronic Equipment Act (Elektro- und Elektronikgerätegesetz)」</li> </ul>
U.S.	<ul style="list-style-type: none"> <li>- Has not ratified the Basel Agreement</li> <li>- Does not have a Waste Disposal Facility Installation Act or a Construction Waste Recycling Act</li> <li>- Some States have legislations for recycling of electronic waste</li> </ul>

Source: Re-arranged by the Ministry of Environment, 2009, Measures for Improvement of System of Legislations on Waste and Reorganization of Statutes.

## 1.6. Comprehensive Analysis

A comparative analysis of waste-related systems of legislation of Korea and foreign countries (Japan, Germany, USA) shows that, with the exception of the United States, Korea, Japan and Germany have transitioned from a simple waste treatment policy system to a system of waste recycling and resource circulation. Provided, while Korea's system of legislations has evolved into a diverse and complex set of legislations, including the 「Wastes Control Act」, the 「Recycling Promotion Act」, the 「Framework Act on Resource Circulation」 and various individual legislations and plans, Germany maintains its waste management system under a single piece of legislation, the 「Act on Circulation Management and Wastes」.

Due to its rapid economic and social changes thus far, Korea has come to possess a complex set of individual legislations on waste management. As a result, even though improvements have been made in the system through a process of repealing and combining the many legislations, the need for a framework Act that is able to provide comprehensive management as a supra-ordinate statute while mounting an active response to the needs of the time, such as climate change, remains desperate. In response to this need, the 「Framework Act on Resource Circulation」, which provides a comprehensive systemization of legislations related to formation of a resource-circulating society, is set to be enacted.

**Table 4-7 | Comparative Analysis of Systems of Legislations**

Category	Korea	Japan	Germany	USA
Legislations for Treatment of Waste and Recycling	「Wastes Control Act」 「Recycling Promotion Act」	Separate	「Act on Circulation Management and Wastes」	Federal: Combined States: some States separate
Legislations for Waste Recycling	Individual legislations for each category of materials	Separated based on category of waste and products	「Act on Circulation Management and Wastes」	State: some separate
Framework Act on Resource Circulation	‘First Framework Plan for Resource Circulation’ 「Framework Act on Resource Circulation」 (to be enacted 2018)	「Framework Act on Formation of a Circulation Society」	「Act on Circulation Management and Wastes」	None

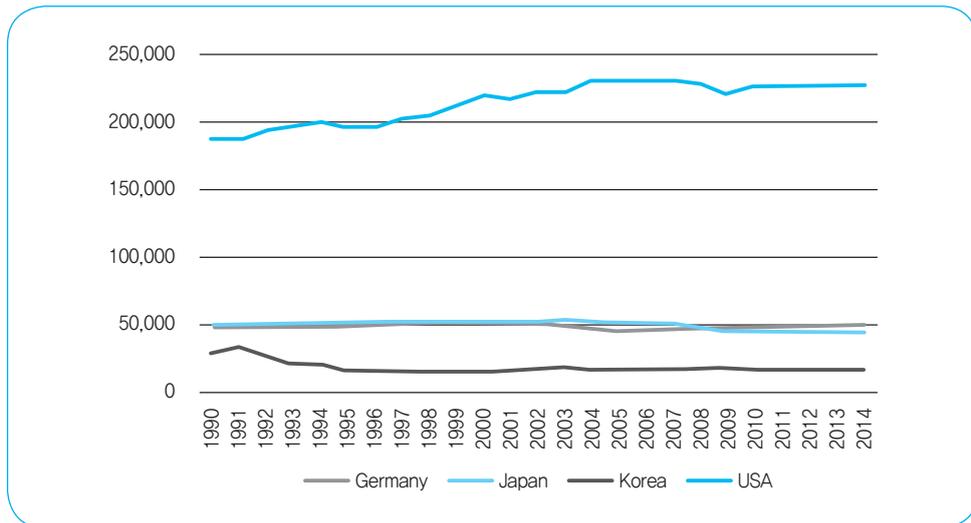
Source: Re-arranged by the Ministry of Environment, 2009, Measures for Improvement of System of Legislations on Waste and Reorganization of Statutes.

## 1.7. Comparison of Current State of Waste Generation and Treatment in Korea and Foreign Countries

Using OECD statistics, the current state of quantity of trash discharge and treatment in Korea, Japan, Germany and the United States was analyzed, in order to compare the current state of waste generation and treatment in Korea with those of foreign countries.

First, the quantity of trash discharged was, in a descending order, United States, Japan, Germany and Korea, with Korea exhibiting a slight downward trend since 1990s.

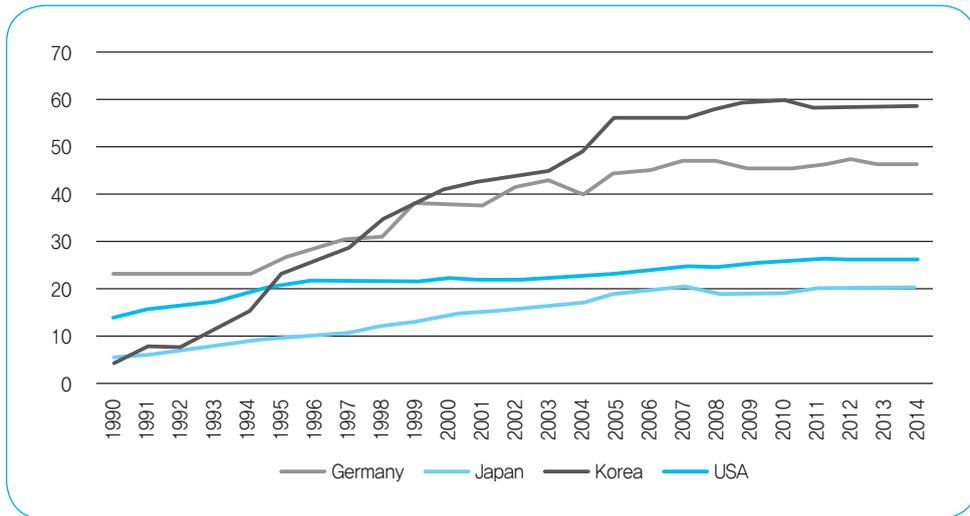
Figure 4-1 | Quantity of Waste



Source: OECD Stats, Municipal Waste Generated.

As for the rate of recycling, Korea has been exhibiting a sustained upward trend since 1990s, showing a rate close to 50% in 2000's.

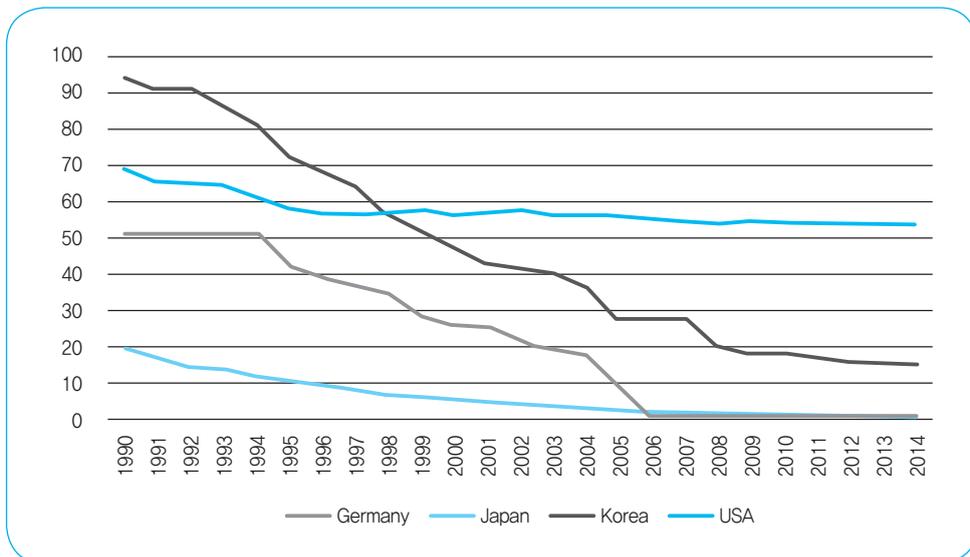
Figure 4-2 | Rate of Recycling



Source: OECD Stats, Municipal Waste Treatment Recycling(%).

While Korea's rate of landfill in 1990 was overwhelmingly high compared to other countries, it has been exhibiting a sustained downward trend.

Figure 4-3 | Rate of Landfill



Source: OECD Stats, Municipal Waste Treatment Landfill(%).

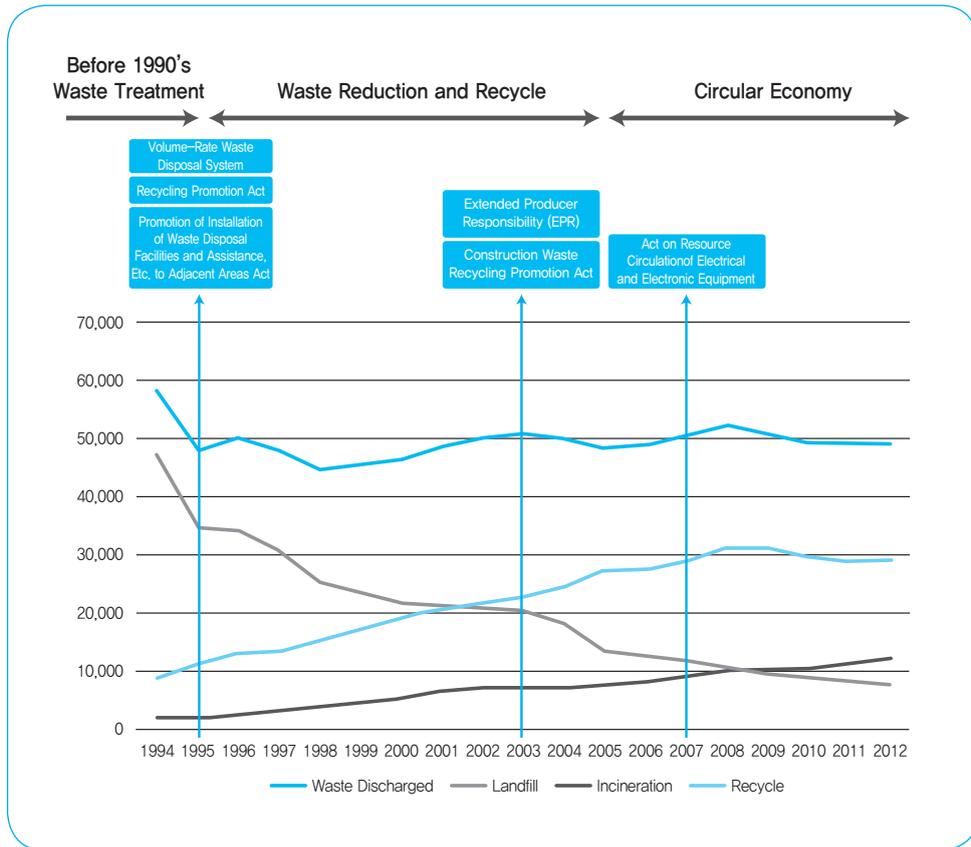
---

## 2. Achievements and Limitations of Korea's Waste Management Policies

A summary of the major waste resource management policies of Korea may be as follows: prior to 1990, Korea enacted the 「Wastes Control Act」 as a policy of follow-up management of wastes and safe treatment thereof, thereby unifying its waste management system. Afterward, through legislation and systems such as the 「Recycling Promotion Act」, the volume-rate disposal system, and the 「Promotion of Installation of Waste Disposal Facilities and Assistance, Etc. to Adjacent Areas Act」, Korea evolved from a follow-up waste management system to a preventive waste management system, with a focus on waste recycling. Furthermore, systems that incentivize producers to reduce, reuse and recycle waste, such as the Extended Producer Responsibility system and the 「Construction Waste Recycling Promotion Act」, etc., were introduced. Recently, the objective has been to establish a resource-circulating society through zero-waste policies such as the 「Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles」 and as well as the soon-to-be-enacted 「Framework Act on Resource Circulation」.

A review of the current state of waste (domestic waste) generation and treatment in Korea shows that, in the mid-1990s, when recycling policies began to be enacted in earnest, the method of waste treatment shifted from landfill burying to recycling. After the implementation of the 'Extended Producer Responsibility' in 2000's and the enactment of the 「Construction Waste Recycling Promotion Act」, the rate of recycling surpassed the rate of landfill burying, and this gap is still increasing. While it brings dismay to see that statistical insufficiencies prior to 1990 preclude a comparison with the era prior to implementation of recycling policies, it may be said that Korea's transition from landfill burying to recycling has been implemented successfully. Furthermore, the current Zero-Waste policy will bring about an era in which wastes are transformed into energy from simple trash.

**Figure 4-4 | Comparison Current State of Waste Policies, Waste Generation and Treatment Methods**



Source: Directly prepared by the author.

Next, is a specific examination of the achievements and limitations of the most representative waste management policies of Korea, namely the ‘volume-rate disposal system’ and the ‘Extended Producer Responsibility’ system.

---

## 2.1. Achievements and Limitations of the Volume-Rate Disposal System

### 2.1.1. Major Achievements

For domestic waste, the volume-rate disposal system has been in enforcement since 1995. In 2014, out of a total of 3,496 Eups, Myeons, Dongs, 3,495 such districts, or 99.9%, were implementing the system, and out of a total of 20,724 thousand households, 20,704 thousand households are complying with the volume-rate disposal system.<sup>49</sup>

According to the ‘Evaluation of 20-Year Outcomes of the Volume-Rate-Based Waste Fee System and Research on Measures for Improvement’ issued by the Ministry of Environment in the 2014 ‘Evaluation of 20-Year Outcomes of the Volume-Rate-Based Waste Fee System and Research on Measures for Improvement’, the quantity of domestic waste generated has been reduced vis-a-vis population-based estimations of discharge after the volume-rate disposal system was implemented. As for the scale of reduction of domestic waste generation, expressed as the difference between the actual quantities generated and the quantity of BAU generated in terms of the population in the district under management for domestic waste management, it was about 103 billion tons for the period from 1995 to 2012. The economic benefit due to reduction of domestic waste was tantamount to 14,830 billion won, from 1995 to 2012.<sup>50</sup>

49. Ministry of Environment , 2016, Environment White Paper.

50. Ministry of Environment, 2014, Evaluation of 20-Year Outcomes of the Volume-Rate-Based Waste Fee System and Research on Measures for Improvement.

**Table 4-8 |** Yearly Reduction in Cost of Treatment of Domestic Waste and Accumulated Reduction

Year	Domestic waste reduced (1000 tons/year)	Cost of treatment per ton, such as cost of collection, transportation (won/ton)	Reduction in domestic waste treatment cost (billion)	Interest rate of 1-year national treasury bond	Cost of treatment of domestic waste, as of 2012 Amount of Reduction (billion)
1995	4,256	50,782	216	12.78%	622
1996	3,725	58,323	217	11.23%	555
1997	4,685	71,423	335	11.65%	768
1998	6,239	78,068	487	12.33%	1,001
1999	6,158	72,892	449	7.08%	822
2000	6,065	75,391	457	7.69%	782
2001	5,570	81,949	456	5.45%	724
2002	5,202	88,321	459	5.19%	692
2003	5,052	93,290	471	4.42%	674
2004	5,454	104,233	568	3.92%	779
2005	6,137	137,152	842	3.97%	1,110
2006	6,117	118,386	724	4.68%	918
2007	5,724	113,033	647	5.19%	784
2008	5,370	119,963	644	5.12%	742
2009	5,721	126,649	725	2.91%	794
2010	6,821	128,755	878	2.95%	935
2011	7,160	137,238	983	3.42%	1,016
2012	7,243	153,431	1,111	3.12%	1,111
Cumulative	102,699	-	10,671	-	14,830

Note: 1) For the interest rate of 1-year national treasury bond, refer to the National Treasury Bond (1 Year) provided for in the Bank of Korea Economic Statistics System (<https://ecos.bok.or.kr/>).

2) For the period prior to 1999, as materials on the interest rate of 1-year national treasury bond are not available, the rate of 3-year national treasury bond was applied, with the difference between the 3-year national treasury bond rate and the 1-year treasury bond rate being uniformly deducted for the entirety of the said period.

Source: Ministry of Environment, 2014, Evaluation of 20-Year Outcomes of the Volume-Rate-Based Waste Fee System and Research on Measures for Improvement.

---

The 2014 report issued by the Ministry of Environment includes, among the diverse recycled products, only the five recycled product categories of paper, glass bottles, cans, plastic and scrap metal in the computation of the value of recycled products. From 1995, when the volume-rate disposal system was implemented, to 2012, the economic value generated from increased recycling of these 5 categories of materials was at least 4,730 billion won. Provided, the quantity of increase in recycled products is also being compared through a comparison of the total (actual) quantity recycled and the hypothetical BAU recycled quantity.<sup>51</sup>

The economic value of the implementation of the volume-rate disposal system has turned out to be at least 19,560 billion won, for the period from the year when the volume-rate went into effect to 2012. The total economic value is seen in the economic effect of reducing total domestic waste and increasing recycling through the implementation of the volume-rate disposal system.

51. Ministry of Environment, 2014, Evaluation of 20-Year Outcomes of the Volume-Rate-Based Waste Fee System and Research on Measures for Improvement.

**Table 4-9 | Total Economic Value Due to Implementation of Volume-Rate Disposal System (1995-2012)**

(Unit: Billion Won)

Year	Cost of Treatment Reduced Due to Reduction of Domestic Waste as of 2012	Value of Regeneration Generated Due to Increased Recycling as of 2012	Total Economic Value
1995	622	243	865
1996	555	456	1,011
1997	768	389	1,157
1998	1,001	357	1,358
1999	822	326	1,147
2000	782	326	1,108
2001	724	336	1,060
2002	692	344	1,035
2003	674	362	1,037
2004	779	321	1,100
2005	1,110	309	1,419
2006	918	279	1,198
2007	784	190	974
2008	742	166	908
2009	794	170	964
2010	935	88	1,023
2011	1,016	13	1,029
2012	1,111	54	1,165
Total	14,830	4,730	19,560

Source: Ministry of Environment, 2014, Evaluation of 20-Year Outcomes of the Volume-Rate-Based Waste Fee System and Research on Measures for Improvement.

wA 2014 Ministry of Environment study on citizen perceptions of sorted waste discharge has shown that most citizens perceive sorted discharge positively. A survey on the ‘Degree of Annoyance Due to Sorted Discharge of Waste’, recorded responses of ‘Not So (42.2%)’ and ‘Very Not So (23.1%)’, showing that about 65.3% thought of ‘sorted discharge’ positively.

**Table 4-10 |** Answers to Whether Sorted Discharge Causes Annoyance

Category	Number of Persons (Ratio:%)
Very So (Very Annoyed)	4 (2.3%)
Yes	16 (9.2%)
To an Extent	40 (23.1%)
Not So	73 (42.2%)
Very Not So (Not Annoying at All)	40 (23.1%)
No Answer	0 (0%)
Total	173 (100%)

Source: Ministry of Environment, 2014, Evaluation of 20-Year Outcomes of the Volume-Rate-Based Waste Fee System and Research on Measures for Improvement.

## 2.1.2. Problems and Limitations

### a. Low Level of Independence of the Sanitation Budget Due to Low Fees

The basic principle of the volume-rate waste disposal system is that the discharger directly bears the cost of collection, transportation and treatment; as such, the price of the volume-rate disposal bag is supposed to reflect the cost of collection, transportation and treatment of domestic waste. However, due to the low price of volume-rate disposal bags, proceeds from the bags are insufficient to cover the cost of collection, transportation and treatment of domestic waste, thus lowering the level of independence of the sanitation budget.

---

Since insufficiencies in budget are appropriated from other budget areas, difficulties have begun to emerge in the implementation of other sanitation administration services. In particular, because some municipalities fail to reflect the rate of inflation and the rate of increase in public fees in the price of their volume-rate disposal bags, the bags are being sold at low prices, leading to residents shouldering low levels of the obligation. While the need to increase the price of the bags to an extent sufficient to resolve the budget insufficiency has been pointed out, the price of the bags is a price category under watch for the stabilization of prices pertinent to the lives of mid-to-low-income groups, thus making such an increase difficult.

#### **b. Stunted Implementation of Town-Level Volume-Rate Disposal System**

The town-level volume-rate disposal system is a system implemented in regions with an insufficient system of waste collection and where low population density prevents appropriate sorted discharge and collection, of which rural and fishing towns are main subjects. Implementation of this system has been lagging behind because of the difficulty involved in sorted discharge and the usual practice of burning trash in the house furnace, and expensive sanitation fees, etc. The poor level of implementation of the town-level volume-rate disposal system is also linked directly to illegal disposal, such as illegal incineration and illegal discharge.

#### **c. Problems with Reusable Bags**

Reusable bags are bags that are purchased in large retail stores for the purpose of restraining the use of single-use bags, which may be used as shopping bags in lieu of such single-use bags, and later used as volume-rate disposal bags. Unlike ordinary volume-rate disposal bags, these reusable bags may be used everywhere in the same administrative district.

In cases where the district of purchase of the reusable bag and the district of waste discharge are different, an imbalance in sanitation budgets is caused. For example, a case where a resident of A District purchases a reusable bag in B District and discharges waste back in A District, B District raises revenue while A-District raises no revenue while having to pay the cost of treatment for said waste, resulting in an imbalance of sanitation budget. In cases where the price of reusable bags is cheaper than the price of ordinary volume-rate disposal bags, residents only use reusable bags, thus bringing about the aforementioned imbalances in sanitation budget.

#### **d. Problem of Differing Categories of Large Wastes**

Large wastes are wastes that are difficult to contain in volume-rate disposal bags, and are wastes for which recognition of unit quantity and product category are possible; lists of items considered to be such wastes are specified in the Guideline for Implementation of the Volume-Rate Disposal System, the Guideline on Sorted Collection of Resources that May be Used as Resources, etc. Based on such standards, the head of each local municipality determines the list of items considered to be large wastes, and issues the list in an ordinance; however, because differences exist between municipalities in terms of number of items considered to be such wastes, residents are facing inconvenience.

## **2.2. Extended Producer Responsibility (EPR)**

### **2.2.1. Major Achievements**

The 2010 Ministry of Environment evaluation of the implementation of EPR in Korea has shown that, after the system was implemented, the volume of delivery per citizen increased by more than 13%, from 46.62 kg in 2003 to 52.66kg in 2007, while the quantity recycled rose by 30.7%, from 1,047,000 tons in 2003 to 1,368,000 tons in 2007.<sup>52</sup> This is interpreted as a result of systematic support, such as improvements to the sorted collection system following the implementation of EPR, procurement of additional recycling

52. Ministry of Environment, 2010, Evaluation of 10-Year Outcomes of EPR and Research on Direction of Development.

facilities, upward adjustment of mandatory target recycling rates, etc., and enhancements to the citizens' perception of sorted collection and the active efforts of manufacturers and recycling companies.

**Table 4-11 | Changes in Yearly Recycling Outcomes**

(Unit: 1000 tons)

Category	Deposit System Implemented	EPR Implemented						
	2002	Total	2003	2004	2005	2006	2007	2008
Total	938	7,435	1,047	1,123	1,249	1,264	1,384	1,368
Rate of Increase/Decrease	-	-	116%	73%	112%	12%	95%	△12%
Packaging Materials	583	4,670	643	701	798	796	866	866
Rate of Increase/Decrease	-	-	103%	90%	138%	△03%	88%	00%
Products	355	2,765	404	422	451	468	518	502
Rate of Increase/Decrease	-	-	138%	45%	69%	38%	107%	△31%

Source: Ministry of Environment, 2010, Evaluation of 10-Year Outcomes of EPR and Research on Direction of Development.

---

During the 6-year period from 2003 to 2008 after EPR was first implemented, the economic benefit generated from recycling the total of 7,435 tons during said period was about 2 trillion and 936.4 billion won, with the number of jobs generated thereof estimated to be at least 15,700. Total economic benefits, including reductions in the cost of burying (incineration), which was about 15,495 million won, and the value generated from recycled products, which was about 13,869 million won, were about 2 trillion and 936.4 billion won; even if the direct cost of 1 trillion and 329.4 billion won, consisting of cost of collection, transportation and treatment necessary for recycling, is deducted, the net economic benefit is estimated to be 1 trillion and 607 billion won, and it is estimated that if various intangible social values (benefits) such as lengthened usage years of landfill sites, import-substitution of raw materials, etc., are taken into consideration, even more net socio-economic benefits have been generated.

**Table 4-12 | Generation of Economic Value through Recycling**

(Unit: 1000 tons, million won)

Category	Total economic value of recycled products	2003D=		2004		2005		2006		2007		2008		
		Quantity Recycled	Economic value of recycled products	Quantity Recycled	Economic Value of Recycled Products	Quantity Recycled	Economic Value of Recycled Products	Quantity Recycled	Economic Value of Recycled Products	Quantity Recycled	Economic Value of Recycled Products	Quantity Recycled	Economic Value of Recycled Products	
Total	1,386,896	1,047	163,181	1,123	184,747	1,249	206,322	1,264	215,221	1,384	245,088	1,368	372,337	
packaging material	Subtotal	996,845	643	109,060	701	127,136	798	146,972	796	155,312	866	177,641	866	280,724
	Paper packs	24,016	15	2,986	19	3,767	22	4,369	20	3,988	20	4,001	19	4,905
	Glass bottles	109,339	295	16,610	324	18,171	363	20,392	348	19,631	361	20,427	334	14,108
	Metal cans	39,391	161	22,187	131	17,982	145	19,936	136	18,777	132	18,281	136	69,342
	Synthetic resin	696,985	172	67,277	227	87,216	268	102,275	292	112,916	353	134,932	377	192,369
Products	Subtotal	390,051	404	54,121	422	57,611	451	59,350	468	59,909	518	67,447	502	91,613
	Tires	50,622	195	7,600	193	7,492	215	8,360	225	8,786	240	9,400	228	8,984
	Lubricant	254,422	151	38,938	160	41,097	152	39,106	146	37,720	164	42,500	156	55,061
	Batteries	4,624	0136	267	0206	379	0365	684	0353	667	0303	588	1065	2,039
	Electronic equipment	80,195	58	7,316	66	8,614	80	11,161	93	12,697	110	14,920	112	25,487
	Fluorescent light	188	0	0	3	29	4	39	4	39	4	39	5	42

Source: Ministry of Environment, 2010, Evaluation of 10-Year Outcomes of EPR and Research on Direction of Development.

Furthermore, it was revealed that, thanks to the recycling of products subject to EPR, a total of 10,388 thousand tons of greenhouse gas (CO<sub>2</sub>), that would have been generated were said products buried in landfills or incinerated throughout the 6-year period between 2003 and 2008, was prevented.<sup>53</sup> Converting this prevented amount to its equivalent cost in electricity shows that the total amount of money saved throughout the 6-year period through recycling all product categories was 2 trillion and 790.2 billion won.

53. Ministry of Environment, 2010, Evaluation of 10-Year Outcomes of EPR and Research on Direction of Development.

**Table 4-13 | Reduction of Costs of Landfill Burying (Incineration) Treatment**

(Unit: Million Won)

Category		Treatment Cost Reduced (Million Won)						
		Total	2003	2004	2005	2006	2007	2008
Total		1,549,471	204,107	229,245	256,096	263,429	296,857	299,737
Packaging Materials	Subtotal	1,064,227	131,816	153,301	176,844	182,396	207,019	212,851
	Paper Pack	16,100	2,100	2,660	3,080	2,800	2,800	2,660
	Glass Bottles	283,500	41,300	45,360	50,820	48,720	50,540	46,760
	Metal Cans	117,740	22,540	18,340	20,300	19,040	18,480	19,040
	Synthetic Resin	646,887	65,876	86,941	102,644	111,836	135,199	144,391
Product	Subtotal	485,244	72,291	75,944	79,252	81,033	89,838	86,886
	Tires	181,440	27,300	27,020	30,100	31,500	33,600	31,920
	Lubricant	226,676	36,844	39,040	37,088	35,624	40,016	38,064
	Batteries	490	27	41	74	71	60	217
	Electronic Equipment	72,618	8,120	9,240	11,186	13,034	15,358	15,680
	Fluorescent Light	4,020	0	603	804	804	804	1,005

Source: Ministry of Environment, 2010, Evaluation of 10-Year Outcomes of EPR and Research on Direction of Development.

However, despite the outcomes achieved throughout 6 years of EPR implementation, the rates of recycling of such EPR-target categories as paper packs (31.1%), fluorescent lights (23.8%), batteries (25.5%) and electronic equipment (16.6%) were shown to be relatively low; an analysis of the causes thereof has shown that, because paper packs are often discharged along with ordinary waste paper, the rate of recycling was shown to be low

---

even, though recycling has actually been carried out fairly well; as for electronic equipment, the rate was low because the quantity that is re-used in civilian sector or exported as used equipment is not accounted for in the statistics showing the rate of recycling. As for batteries, the rate was shown to be low because they are small and therefore are often thrown out together with clocks, toys, and electronic equipment, or are otherwise discharged while mixed with other trash; as for fluorescent lights, they are often thrown out together with other, ordinary wastes because of problems in the sorted collection system in single-house neighborhoods and low marketability in large-scale discharge sites.

In addition to these, the outcomes achieved through implementation of EPR are very diverse, and their total value is so immense that its accurate estimation is difficult. After EPR was implemented, the perception of the government, corporations and citizens on waste recycling saw a profound growth compared to the era prior to the implementation of EPR, and the general consensus has been that Korea's living environment has also benefited significantly thanks to the implementation of EPR. Furthermore, after the implementation of EPR, use of PVC and synthetic resin has decreased considerably in plastic, while mobile-phone charging cradles have disappeared, and methods of charging homogenized.

Foreign evaluations of Korea's environment-related systems and policies after the implementation of EPR have been that they are very advanced and rapidly improving, relative to the country's per-capita GDP. It is believed that such an outcome has been possible because perception of companies and citizens on environment has improved significantly, leading to active cooperation with the government's implementation of policies and systems.

---

## 2.2.2. Problems and Limitations

### a. Need to Advance the EPR System

Examples of advancement in the EPR system include expansion and adjustment of target products, securement of efficiency and transparency in operation of the mutual aid cooperative, improvement of the operational system and improved efficiency in collection and transportation systems. Some examples of advancement in the expansion and adjustment of list of target products are: preparation of measures to expand the list of EPR-target products based on a consideration of recycling conditions, improvements to the level of developed countries through the improvement of the system of imposition of mandatory rate of recycling, and a system of ‘graduation’ from EPR for products with high marketability and therefore are unlikely to cause environmental pollution even without government intervention.

As for advancement in the EPR operational system, examples may include an information-based system consisting of the installation and operation of a management system that preserves in a database format information on recycling outcomes, transportation information, etc., to secure operational convenience and transparency for producers and recycling companies while maintaining a link with the management system being operated by the mutual aid cooperative in order to share information such as quantity of delivery and quantity recycled, etc., thus ensuring economic efficiency in the verification of outcomes and enhancement of the accuracy of materials; in addition, an improved system of management of recycling companies, such as a system in which recycling companies are graded by their excellence, with highly graded recycling companies provided with incentives such as reduced numbers of inspections on recycling outcomes, etc., may be considered an example of advancement in the EPR operational system.

**Table 4-14 | Advancing the EPR System**

Category	Details of Change
Expand/create product categories	<ul style="list-style-type: none"> <li>-Prepare way to expand products subject to EPR</li> <li>- Modify method of imposing obligation to recycle</li> <li>- EPR graduation system</li> </ul>
Increase efficiency and transparency of the system of incentives	<ul style="list-style-type: none"> <li>- Create the foundation for sharing information such as discharge volume and recycling status</li> <li>- Improve recycling business management system through measures such as providing incentives based on actual performance according to the category of recycling business</li> </ul>
Modify the operating system and improve the collection/ transportation system	<ul style="list-style-type: none"> <li>- Form a database for actual recycling information, transportation status, etc.</li> <li>- Gain improvements to convenience and transparency for producers and recyclers</li> <li>- Connect with the cooperative management system</li> </ul>

Source: Ministry of Environment, 2010, Evaluation of 10-Year Outcomes of EPR and Research on Direction of Development, rearranged.

### **b. Need for Expanded Participation in Extended Producer Responsibility**

Examples of measures to expand producer participation and responsibility may include enhancement of environment-friendliness in product development phase, rational determination of the mandatory recycling rate, and implementation of incentive policies as mentioned above. Also, an advance-evaluation system on packaging material composition may be introduced; through advance evaluation of whether packaging materials use environment-friendly raw materials and whether they contain hazardous materials, improvements may be promoted; and in order to facilitate a systematic and quantitative implementation of the current “advance evaluation system”, evaluation criteria and methods should be developed. And by providing incentives to companies with high level of evaluation, environment-friendliness at product development phase may be enhanced.

---

Also, allowing corporations more discretion by enabling them to set their own mandatory recycling rate within the scope of the long-term recycling target based on considerations of their own conditions for recycling (quantity of sorted collection, scale of recycling facility, level of technical development, etc.) will make possible rational determinations of the mandatory target recycling rate.

### **c. Method of Imposition of Mandatory Recycling Rate**

The current mandatory recycling rate is computed based on the annual quantity of delivery of recycle-target products and packaging materials vis-a-vis the mandatory rate of recycling, and the mandatory rate of recycling, based on consideration of the responsible producer's recycled quantity, recycling outcome, and conditions for recycling, is announced prior to the beginning of the relevant year; the problems are that, due to monotonous increases in the mandatory recycling rate, the concept of a suitable quantity of recycling as the final target has lost much of its original significance while the method of computation of the mandatory rate does not reflect the actual quantity recycled, and that the responsible producers care only about reaching the annual target rate and participate only half-heartedly.<sup>54</sup> As measures in response to this situation, a measure in which the computation of the mandatory recycling rate is left to the discretion of the companies so that they make take into consideration their own corporate conditions and recycling condition, may be considered while also ensuring that a conciliar body composed of responsible producers and recycling companies would be formed and engage in consultation with the Ministry of Environment, so that hearing of opinions of involved parties for determination of target rates, etc. would be possible.

54. Ministry of Environment, 2010, Evaluation of 10-Year Outcomes of EPR and Research on Direction of Development.

---

#### **d. Mandatory Recycling System**

There are three means through which a responsible producer may fulfill his or her recycling obligations: self-recycling, commissioned recycling, and joining the mutual aid cooperative. Major administrative tasks related to implementation of the task include the submission of a statement of a plan for the performance of recycling obligations and the report of outcomes of performance of recycling obligation; a controversy alleging unfairness has emerged concerning the commission of this task, with allegations of discrimination in terms of obligation of submission between producers who recycle through commission or through the mutual cooperative. This is so because under current law, for a producer who has joined the mutual aid cooperative, the cooperative performs the submission of the performance plan and outcome reports in lieu of the producer, while producers who recycle through a commission may not delegate this task to the commissioned recycling company. While fairness calls for the equal exemption of submitting the statement of plan for performance of recycling obligations, obstacles such as managerial and supervisory problems, and the impossibility of advance evaluation of the suitability of the method of performance as reported by the responsible producer, compounded by the fact that the method in which an individual company commissioned for performance is fundamentally consistent with the Extended Producer Responsibility System, which imposes recycling obligations on producers who are accountable for generation of waste in accordance with the principle of pay-as-you-throw. For such numerous reasons, it is difficult to exempt or allow third-party commission of submission of performance plan of individual responsible producers, and this problem eventually leads to the issue of multiplication of mutual aid cooperative; given a reality where a fundamental resolution of the problem is difficult through multiplication of the cooperatives, the alternative is to improve the efficiency of management and supervision of recycling-responsible producers and recycling companies and thereby cause recycling processes other than those through the mutual aid cooperative to bear the equal public costs as those through the mutual aid cooperative.

2016 Modularization of Korea's Development Experience  
Waste Resources Management and Utilization Policies  
of Korea

## Chapter 5

### Policy Proposal for National Solid Waste Management

1. Basic Direction
2. Policy proposal for each phases

---

# Policy Proposal for National Solid Waste Management

The quantity of waste discharged from developing countries is similar to other advanced countries. Although waste generators have less financial burden because a volume-rate disposal system has not been adopted, environmental pollution caused by wastes has intensified and the government shows an increased interest in the prevention of further pollution. As such, policies and system improvement measures should take into consideration the current situation in developing countries; time duration for adoption and implementation is categorized into phase(stable and sanitary waste treatment-reduction and recycle-resource circulation), and specific issues such as actual adoption time and methods must be determined through a separate research process that takes into consideration the overall relevant conditions in developing countries.

## 1. Basic Direction

In order to derive the optimal alternative to conceptual planning for the comprehensive national solid waste management plan, a distinction between phase based plans (safe disposal – reduction and recycling – resource circulation) is made, a basic direction for each plan is determined, and implementation schemes are derived. The basic directions for the comprehensive national solid waste management are as follows.

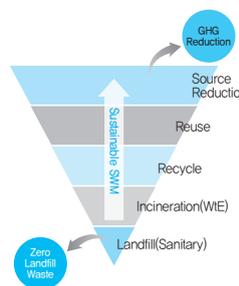
- Clarification on priorities of waste management policy
- Materialization of management plan goals of each phase and proposal for implementation schemes

More than anything, it is necessary to establish priorities in terms of waste policy. It is necessary to shift the focus from the current goal of waste treatment to the goal of recycling or resource recovery. Also, it is necessary to shift perception to a system that prevents the very generation of wastes and enables reuse. In terms of waste treatment facilities, treatment measures such as sanitary landfills rather than unsanitary landfills, recycling, composting, and energy utilization rather than simple dumping, are required.

The concepts and basic directions for implementation scheme for each phase are as follows.<sup>55</sup>

**Table 5-1 | Implementation Measures By Phase**

Category	Major Goal
Waste Generation Deterrence	Establishment of waste management vision
Minimization of Generation	Establishment of minimization policy in production, distribution and consumption phases
Reuse	Stronger reuse regulations, support for cultivation of reuse businesses
Recycling	Stronger recycling regulations, support for cultivation of recycling businesses
Energy Reclamation	Establishment of energy reclamation infrastructure



Source: Ministry of Strategy and Finance, 2015, 2014 Knowledge Sharing Program(KSP) Policy Consultation III (Sri Lanka Green City Infrastructure Development Policy Consultation: Focus on Solid Waste Management).

55. Ministry of Strategy and Finance, 2015, 2014 Knowledge Sharing Program(KSP) Policy Consultation rection of Developmenty Infrastructure Development Policy Consultation: Focus on Solid Waste Management.

When setting the waste management goals, it is important to plan and implement objectives for each phase; for first plan, reduction of wastes and expansion in recycling must be set, and as second plan, gradual development into a resource circulating society needs to be set.

**Figure 5-1 | Waste Management Goals**



Source: Directly prepared by the author.

- Suggestions for Waste Policies and Systems at each phase

1. Suggestions for stable and sanitary waste treatment phase

- Establishment of foundation for stable and sanitary waste treatment and establishment of operational and management measures
- Establishment and implementation of five year plans for waste management for each developing countries.
- Action Plan Establishment

2. Suggestions for waste reduction and recycle phase

- Strengthening the waste collection system network
- Establishment of regional waste management systems

- User Fee System
- Establishment of database
- Improvement in citizen awareness through national education and promotion

### 3. Suggestions for resource circulation phase

- Increase in waste management budget
- Research waste management technology suitable for developing countries

## 2. Policy Proposal for each Phases

### 2.1. Stable and Sanitary Waste Treatment Phase

#### 2.1.1. Establishment of a Foundation for Stable and Sanitary Waste Treatment and the Establishment of Operational and Management Measures

The wastes that are collected, transported and treated must undergo final disposal; therefore, at the dumping sites, operation and management should be carried out as efficiently and environment-friendly as possible.

Currently, wastes are haphazardly dumped in landfill sites. However, if dumping is carried out in a concentrated and gradual manner by sector, while taking into consideration factors such as climate and properties of wastes, environmental problems such as leachate generation, harmful insects, dust, trash blowing in the wind, unpleasant odor and greenhouse gases can be resolved, in addition to significantly reducing operation and management costs.

Among intermediate treatment methods, composting is the most economic, efficient and excellent treatment method for wastes that contain high quantities of organic materials in warm regions such as developing countries. Composting facilities are most properly

---

managed in developing countries, and composting technology is currently developing countries' representative waste treatment technology. Furthermore, thanks to the Pilisar Program, composting facilities are being installed throughout developing countries. Therefore, considering the property of the wastes, expanded securement of bio-drying facilities, which allow for time and space savings and is therefore suited to developing countries' circumstances, is needed, rather than that of simple compositing facilities which require large space areas.

Medical wastes need special management for health and environmental reasons and therefore in Korea, they are separated as designated wastes and are specially managed, and all medical wastes are disposed of in incineration facilities. Developing countries also need to transition from landfill to incineration for the disposal of medical wastes for health and environmental reasons. Therefore, it seems necessary to perform a detailed study on the treatment of medical wastes through a separate research agenda.

### **2.1.2. Establishment and Implementation of Five Year Plans for Waste Management**

Waste management plans that incorporate the circumstances of each local government should be established, and the most efficient, feasible measures should be established based on understanding and experience on the conditions of the field.

Each local government should pursue its own vision, goals, annual implementation plans and should establish its own implementation scheme, outcome report and evaluation systems, and should engage in voluntary implementation and evaluation thereof; advance education is needed for facilitation of basic conceptual understanding in waste management, and external support and feedback are necessary to ensure continuance in the right direction.

In Articles 9 and 10 of the Wastes Control Act, Korea indicates its waste management plans and matters that should be included. Furthermore, it is indicated that waste treatment and management plans should be re-established for every 10 years and revised after every 5 years.

**Table 5-2 | Contents Included in Korea's Basic Plan for Waste Treatment and the Comprehensive Management Plan**

---

**Article 9 (Basic Plans for Waste Management)**

- ① The Mayor/Do governor shall prepare a basic plan for proper management of wastes generated from his/her jurisdiction once every ten years in compliance with the guidelines prescribed by the Minister of Environment, subject to the approval of the Minister of Environment. The foregoing shall also apply to a revision to any matter approved of. In this case, the Minister of Environment shall, whenever he/she approves a basic plan or a revision thereto, consult with the heads of central administrative agencies concerned.
- ② The head of Si/Gun/Gu shall prepare a basic plan for management of wastes generated from his/her jurisdiction once every ten years and submit it to the Mayor/Do governor.
- ③ The basic plan under paragraphs (1) and (2) shall contain the following details;
  1. Overview of the population, residential patterns, industrial structure and distribution, geographical environment, etc. within his/her jurisdiction;
  2. The quantity of wastes generated by categories and the estimated quantity of wastes in the future;
  3. Current status of and future plan for waste management;
  4. Matters concerning reduction, recycling, and conversion of wastes into resources;
  5. Current status of and future plan for installation of waste disposal facilities;
  6. Matters concerning collection, transportation, and storage of wastes and improvement of equipment and containers for wastes; and
  7. Plan for securing financial sources.

---

**Article 10 (Master Plans for Waste Management)**

- ① The Minister of Environment shall prepare a master plan for nationwide waste management based on the basic plans for waste management under Article 9 (1) and the results of statistical researches on wastes under Article 11 (hereinafter referred to as a "master plan") once every ten years for proper management of wastes generated throughout the country.
- ② The Minister of Environment may review the feasibility of the master plan for revision once every five years after the date on which the master plan is finalized.
- ③ If the master plan is revised under paragraph (2), the Mayor/Do governor shall also revise the basic plan for waste management under Article 9 (1), reflecting the revised details of the master plan in the basic plan, and submit it to the Minister of Environment for approval.
- ④ The master plan shall contain the following details:
  1. Evaluation of the previous master plan;
  2. Circumstances and prospects for waste management;
  3. Basic principles of the master plan;
  4. Policy on waste management by sectors; and
  5. Plan for securing financial sources.

---

Source: Ministry of Government Legislation, Wastes Control Act, <http://www.law.go.kr>.

---

### 2.1.3. Action Plan

The action plan seeks to offer specific action directions under the above described short, medium and long term policies for the comprehensive national solid waste management plan. In other words, detailed directions concerning waste generation, segregation/discharge, collection/transportation, and treatment and action measures thereof; as such, the following detailed measures are proposed.

#### **a. Improvement in Waste Collection and Transportation System**

Waste discharge and collection are carried out during the time of day when subject regions are most active. Therefore, daytime traffic congestion makes waste collection less efficient. Furthermore, due to aging of collection vehicles and insufficient number of collection vehicles, stable and consistent collection is not being performed. Because of long neglect of discharged wastes, various social problems such as deterioration of urban environment and sanitation (odor) have arisen. Improvement of waste collection and transportation system is therefore an urgent imperative.

The following are details on for optimal collection times and improvement measures for collection routes.

#### **b. Waste Treatment Facility Infrastructure Improvement**

Currently developing countries depends much on landfill facilities, but as waste characteristics are expected in the future, suitable treatment facilities and infrastructure must be established.

Developing countries current waste management policy, based largely on landfill, is expected to face increasing waste quantities due to rapidly progressing urbanization. Increase in waste generation leads to increase in wastes that have to be dumped in landfill sites and ultimately leads to insufficient landfill capacity. Therefore, comprehensive waste treatment facilities (recycling, incineration, resource-reclamation and sanitary landfills) are needed in order to establish stable waste treatment foundation.

---

### **c. Enhancement in MSW-related Education**

Developing countries has published a waste management and operation manual and presently holds regular waste management seminars and forums, but has faced limitations because of low citizen awareness on the issue. Furthermore, medium and long-term training plans for waste management experts are insufficient and waste management related instructions are not provided in regular educational curricula.

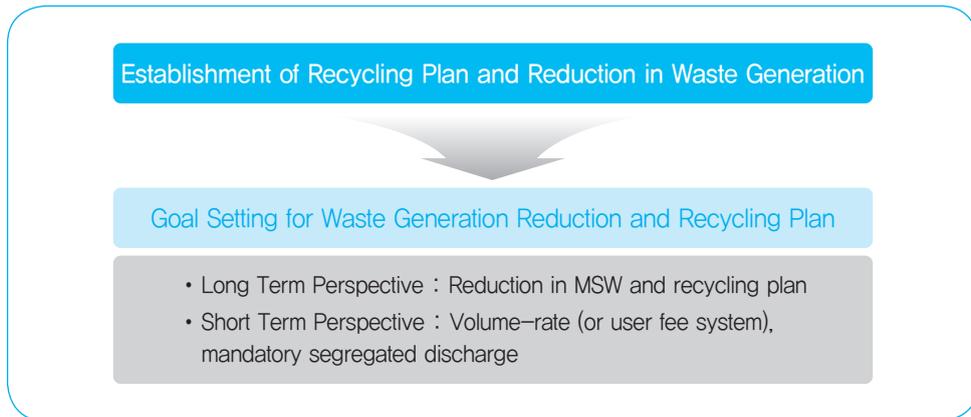
It is necessary to establish an educational system for related officials, treatment providers and residents for improvement from the initial waste discharge phase to the final disposal phase.

In addition, it is necessary to persistently produce and adopt administrative promotional programs upon enactment of new waste related policies and regulations in order to enable stable settlement and application of the newly attempted and applied policy.

### **d. Establishment of Solid Waste Management Plan**

Most of the developing countries has recently been facing increased budget expenditure for and difficulties in waste management as a consequence of urbanization and the resultant rapid expansion in waste generation.

As such, a solid waste management plan must be established. Also, it is necessary to establish detailed goals through volume-rate system, mandatory sorted discharge and promotion of recycling, and waste generation deterrence should be pursued from a long-term perspective.



### **e. Characteristics of Wastes and Gathering of Statistics**

In order to facilitate rational waste management in developing countries, waste statistic data system is needed. Waste statistic data should be gathered regularly and maximize the efficiency of waste management. The following shows the Korean example of statistics system establishment.

## **2.2. Waste Reduction and Recycle Phase**

### **2.2.1. Strengthening the Waste Collection System Network**

Because the waste collection service is a critical factor in waste management, waste collection measures appropriate for the circumstances of each local government should be identified and applied. Most waste collection services fail to adhere to schedules and are often delayed; as such, street dogs damage trash bags discharged from households and cause problems such as unpleasant odor, traffic congestion, and the deterioration of aesthetical conditions.

---

Collection services are currently carried out during daytime. This causes traffic congestion and collection efficiency is therefore significantly reduced. Establishment of a stable waste collection and transportation network will be possible if each region proposes and implements solutions to these problems. Therefore, efficient waste collection measures suited to the realities of local governments should be implemented, and realistic responses, such as a change in trash containers and a strict adherence to schedules, are needed.

### **2.2.2. Establishment of a Regional Waste Management System**

Educational programs that incorporate waste management priorities and strategies, comprehensive perspectives on waste management and the environment, challenges and methods for deriving effective solutions, and practical waste management skills relevant in the field should be carried out.

The goal of such educational programs is to build capacity for the implementation of waste management suited to local circumstances, and such educational programs should be suitable for local circumstances. Educational programs that focus on trips to developed areas or overseas observation present limitations in terms of waste management, and programs should be developed through external support and should be implemented by experts.

Korea's Ministry of Environment currently carries out education on waste policies, matters on related laws, and treatment systems, and booklets and promotion materials necessary for this are displayed on the Ministry of Environment website.

### **2.2.3. User Fee System**

Currently, 30~50% of local government budgets are used for waste management, so the necessary finances for waste management should therefore be provided through the user fee system. As such, in order to ensure the stable consolidation of the user fee system currently being tried in the West, government-level awareness increasing programs should be continuously carried out. Afterwards, nation-wide implementation of the system should be attempted.

---

As a specific measure, waste generation sources and sectors that show high participation rates allowing for easy management due to the low number of members and that offer the possibility of a fast and solid outcome should be chosen for the initial implementation of the user fee system, and the implementation of the system should gradually expand. The commercial sector, businesses, hotels, and restaurants should be the subjects of initial application and the system should ultimately expand to households. Korea uses a user-fee system and utilizes the waste volume-rate system, extended producer responsibility (EPR), as well as the Allbaro system.

This is a policy where treatment fees are automatically charged as a function of waste discharge quantity and therefore, if more wastes are discharged, more treatment fees are charged. The Ministry of Environment shifted from the previous system, in which waste treatment fees were charged based on building area and property tax, to this system, where treatment fees are charged based on the actual quantity of discharge, based on the principle that the polluter should bear the burden; the pilot implementation of this policy started in April 1999. As a result, the amount of waste generation decreased by 30~40% and the amount of recycling goods collected increased by more than twofold, representing a significant success. As such, the Ministry of Environment started to implement the waste volume-rate system throughout the country starting on January 1, 1995.

EPR (Extended Producer Responsibility) is a system in which the producer of a good or the producer of a good using packaging materials is required to recycle certain amount of the said good or packaging material; if such recycling is not carried out, recycling penalties which are more than expenses needed for recycling are charged against the producer.

This means that, whereas the previous system required the producers only to improve product quality and composition, they are now responsible even for recycling wastes generated after use by consumers.

Figure 5-2 | EPR (Extended Producer Responsibility)



Source: EPR website ([www.iepr.or.kr](http://www.iepr.or.kr)).

While the legal duty of waste recycling is placed on producers, this does not mean that producers are directly responsible for all phases of recycling starting from collection; rather, consumers, municipal governments, producers and the government divide the roles between themselves to a certain extent, while producers, who have the biggest decision making power in terms of product design and choice of packaging materials, are charged with performing the central role in the recycling system.

This is not an entirely new policy concept in Korea; rather, this is an improvement of the money deposit system which started in 1992, which was based on the principle of producer responsibility, and has been in force since January 1, 2003.

The work on waste discharge, transportation, and treatment certification are performed through the Allbaro system, which seeks to reduce social and economic costs and promote resource utilization of wastes and contribute to environmental conservation through the securement of transparency and reliability of waste treatment certification, proper waste treatment, and simplification of administrative work through reductions in the waste certification process.

The Allbaro system is being implemented for industrial wastes, and is an IT-based comprehensive waste management system which controls the entire waste treatment process through the internet, from discharge, transportation and to final treatment, and combines the entire waste management process throughout the lifecycle of wastes through deterring waste generation, recycling, and proper treatment.

Figure 5-3 | Allbaro System Homepage



Source: Allbaro System homepage (<http://www.allbaro.or.kr>).

## 2.2.4. Database

Currently, most of the developing countries face difficulty in assessing detailed situations in waste management due to the non-implementation of database construction for national waste statistics, so are unable to quantify waste generation in each source and region, and therefore encounter challenges in waste management.

---

For regular inspection and property analysis of discharged wastes, local governments should implement a waste statistics database through adjustments to inspection categories and the interval and scope of each phase, while taking regional circumstances into consideration.

Considering local circumstances, it is realistically infeasible for all local governments to perform an identical waste property study; therefore it is appropriate to allow local governments to adjust research categories, intervals and the scope for each phase. In addition, research methods, database management, and analytical skills must be transferred to field personnel through education and training.

In the case of Korea, waste statistics are gathered pursuant to Article 11 of the Wastes Control Act, and in order to secure the basic materials necessary to establish waste policy, the Minister of Environment, heads of cities and provinces or mayors, county executives, and district heads research the current state of waste generation and treatment for each kind of waste, the current state of related industries such as waste treatment businesses, and issues related to the improvement of resource productivity, such as the rate of waste recycling. Furthermore, the Korea Environment Corporation, Mayor of the Special City, Mayors of Metropolitan Cities, Heads of Provinces and Heads of Special Self-Governed Provinces or mayors, county executives and districts heads must perform the following waste statistical inspections.

- Inspection of sources of waste generation: prepared for every 5 years based on field inspections
- Inspection of current state of waste generation and treatment: prepared for every year based on written materials, including reports from discharge and treatment companies

---

The following are categories to be researched for current state of waste generation and treatment, as indicated in the Wastes Control Act. In Korea, reports on waste generation and treatment are prepared every year based on written materials, such as reporting materials from discharge and treatment companies, and are posted on the website of the Ministry of Environment.

**Table 5-3 | Research Categories on Sources of Waste Generation, Etc.**

[The Enforcement Rule for the Waste Management Act, Article 7, Clause 1]

- 
- A. Original unit of seasonal waste generation in household and non-household sectors
  - B. Seasonal composition ratio of household and non-household sectors
  - C. Analysis on water, inflammable material, ash content, heat generation quantity and elements for wastes from each source of generation and season
  - D. Elemental analysis on carbon, hydrogen, methane and others for wastes for each source of generation and each season
  - E. Current state of installation and operation of waste disposal facilities and recycling facilities
  - F. Other matters necessary for establishment of waste policy
- 

Source: Ministry of Environment, 2013, Legal Education for Officials in Charge of Waste Treatment.

**Table 5-4 | Research Categories on Sources of Waste Generation, Etc.**

[The Enforcement Rule for the Waste Management Act, Article 7, Clause 2]

- 
- A. Current state of waste generation of each kind for each Special City, Metropolitan Cities, Provinces, Special Self-Governed Provinces (henceforth 'City, Province') or for each City, County, District
  - B. Current state of waste treatment for each kind of waste for each City, Province, and each City, Province, and County
  - C. Current state of waste treatment facility, recycling facility and related businesses in each City, Province and in each City, Province, and County
  - D. Current state of waste management, including domestic waste management district and management budget
  - E. Other matters necessary for establishment of waste policy
- 

Source: Ministry of Environment, 2013, Legal Education for Officials in Charge of Waste Treatment.

---

### **2.2.5. Improvement in Citizen Awareness through National Education and Promotion**

In waste management, systematic management at the source of discharge should be given priority. If measures such as sufficient separation of recyclable wastes are carried out at the source of discharge, waste generation may be reduced. Through this, reductions in the costs of waste collection and facility installations may be achieved as well. It is therefore necessary to provide regular waste management promotion materials, hold promotion seminars and various events and tournaments designed to increase awareness of waste management issues, in conjunction with regular educational sessions in schools and local communities designed to increase citizen awareness.

## **2.3. Resource Circulation Phase**

### **2.3.1. Increase in Waste Management Budget**

A governmental linkage system for waste management is insufficient so proactive local governmental policy is difficult to implement. Facility investment plans suitable for distance and temporal investment costs are needed, and the securement and expansion of a budget for each phase and agency-specific subordinate implementation plans are necessary. The user fee system, described above in the short-term policy section, has to be executed in advance in order to secure financial resources. Also, cost reductions through efficient management and operation of facilities is also an important factor.

The following <Table 5-5> shows pursuits to expand waste treatment budgets.

**Table 5-5 | Expansion of Waste Related Budget in Korea**

Category	Contents
Waste fee portion pursuant to development of housing site	Payment of share of waste fees pursuant to purchase of land and installation of facilities
The Han River Drainage System Fund	Charging water use fees to each city and province that uses the Han River water in order to enable smooth pursuit of the policy for water quality conservation of the Han River area and other water policies
Waste Fee Policy	Policy in which the producers or importers of goods, materials and packaging that contain harmful substances, are difficult to recycle and may cause problems in terms of waste management are charged with fees necessary for treatment of such wastes in order to deter generation of wastes and prevent waste of resources
EPR	System in which the producer of a good or the producer of a good using packaging materials are required to recycle certain amount of the said good or packaging material; if such recycling is not carried out, recycling penalties which are more than expenses needed for recycling are charged against the producer.
Allbaro System	The Allbaro system is being implemented for industrial wastes, and is an IT-based, comprehensive waste management system which controls through the internet the entire waste treatment process from discharge, transportation and to final treatment and combines the entire waste management throughout the lifecycle of wastes through deterrence of waste generation, recycling and proper treatment.

Source: Ministry of Government Legislation homepage (<http://www.law.go.kr>), The Han River Area Environmental Authority homepage (<http://www.me.go.kr/hg>), Budamgum homepage (<http://www.budamgum.or.kr>), EPR homepage (<http://www.iepr.or.kr>), Allbaro homepage (<http://www.allbaro.or.kr>).

---

### **2.3.2. Research and Development in Waste Management Technologies**

Developing countries' economic growth and increases in tourism has led to higher budget expenditures for waste management and has given rise to more waste management-related problems; also, the material properties of wastes may rapidly change in the future as well, and response measures with consideration to these circumstances are therefore necessary.

As non-biodegradable materials such as vinyl and plastic and recyclable materials such as paper, metal, and glass increase in quantity, the proportion of organic materials may relatively decrease. Local governments should carry out comprehensive waste management plans and implementations from a long-term perspective, while preparing responses to changes.

To prepare for circumstances where the quality of compost produced in composting facilities deteriorates, or where sources of demand in the agricultural sector are hard to come by, diversification in compost usage, including use for earth-restoration agents for landfill sites and as top dressing for street trees should be considered in advance.

The quantitative increase of recyclable materials must be accompanied by recycling based on sorted discharge and collection, and necessary systems such as waste collection systems, fee charging, and civic participation and management should be researched and prepared.

Also, considering such diverse elements of social change, it is necessary to form a joint institution composed of civic, government and academic participants in order to study the characteristics of future waste generation in developing countries. Such an institution should research and establish plans for future waste property change and the installation of treatment facilities, and therefore prevent the repetition of unsuccessful waste management facility plans and policies of other countries (both developed and developing countries).



2016 Modularization of Korea's Development Experience  
Waste Resources Management and Utilization Policies  
of Korea

## Chapter 6

Conclusion

---

## Conclusion

Since Korea's wastes are evidence of changing lifestyles in the midst of a trend toward a convenience-oriented life (single-use products, convenient goods, instant food, etc.) and an abundant capitalist socioeconomic environment (mass consumption, mass production), the current state of waste management in Korea faces a turning point where a paradigm shift from a convenience-oriented society (single-use product society) to a society oriented toward resource conservation (resource-circulating society) is occurring. That is, wastes have a close relationship with each country's life and cultural patterns, and with changes in society, patterns of waste generation and treatment thereof change as well.

A summary of the evolution of Korea's system of legislations for waste management will show, as in the table below, that this evolution has been taking place alongside the flow of developmental processes in Korea, and each developing country needs to introduce waste policies suitable for its current economic and social conditions.

**Table 6-1 |** Developmental Process of Waste Management Legislations of Korea

Category	Main Details
Early Joseon Dynasty, under King Taejo(1292)	8 <sup>th</sup> Jeong Grade Officer in Charge of Sanitation
Refuse Cleaning Act (1961~1977)	Setting of sanitation zones following urbanization
Environment Conservation Act(1978~1986)	Active treatment of domestic waste, management of industrial waste
Waste Control Act (1986~1992)	Change in system of classification, introduction of recycling
Division of the Resource Circulation Act, etc. (1993~ )	Implementation of volume-rate disposal system and sorted collection system; establishment of a sustainable resource-circulating society

As waste management systems change along with changes in social and economic conditions, it is hoped that an Integrated Solid Waste Management (ISWM) system, which comprehensively takes into account all relations between functional elements in the waste management system, social efficiency, and economic viability, etc., will be benchmarked.

- 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015). 2011. Joint work of related departments and agencies.
- 2013 Current State of National Wastes Generation. 2015. Ministry of Environment.
- 2013 Wastes Disposal Head Judiciary Education. 2013. Ministry of Environment.
- 2013 Wastes Disposal Head Judiciary Education. 2013. Ministry of Environment, Korea Waste Association.
- 2014 Current State of Designated Wastes Generation and Disposal. 2015. Ministry of Environment.
- 2014 Current State of National Wastes Generation and Disposal. 2015. Ministry of Environment.
- 2014 Knowledge Sharing Program(KSP) Policy Consultation III (Sri Lanka Green City Infrastructure Development Policy Consultation: Focus on Solid Waste Management. 2015. Ministry of Strategy and Finance.
- 2016 Wastes Cost Sharing. 2016. Ministry of Environment, Korea Environment Corporation.
- 3<sup>rd</sup> Waste Disposal Framework. Chunan City.
- 4<sup>th</sup> Framework Plan for Recycling. 2008. Ministry of Environment.
- Che, YungGun. 2009. Problems and Solutions for Wastes Related Legal Systems. Environmental Law Research Vol. 31 Issue 2. Korea Environmental Law Association.
- Current State of National Wastes Generation and Disposal (2013). 2014. Ministry of Environment.
- Domestic Wastes Incineration Facility Installation and Operation Guidelines. 2014. Ministry of Environment.
- Environment White Paper. 2016. Ministry of Environment.

---

Evaluation of 10-Year Outcomes of EPR and Research on Direction of Development.  
2010. Ministry of Environment.

Evaluation of 20-Year Outcomes of the Volume-Rate-Based Waste Fee System and  
Research on Measures for Improvement. 2014. Ministry of Environment.

Guidelines for Implementing a RFID based Medical Wastes Management System.  
Ministry of Environment.

Guri city Homepage: <http://www.guri.go.kr/main/cityhall>.

Gyeonggi-do, Gyeonggi-do Framework Plan on Waste Management(2002-2011). 2002.

Gyeonggi-do Homepage: <http://www.gg.go.kr/archives/1397952>.

Implementation Guidelines for the Medical Wastes Management System. Ministry of  
Environment.

Kim, NamGeol. 2011. Study on Conflicts Related to Waste Treatment Facility Site  
Selection and Operation: With Focus on Cheonan Household Waste Treatment Facility.  
Dankook University.

Korean Legislation Homepage: <http://www.law.go.kr>.

- 「Act on the Promotion of Saving and Recycling of Resources」.
- 「Enforcement Rules of the Wastes Control Act」.
- 「Guidelines for Implementing Housing Site Development」, Article 19. Land for  
Public Facilities.
- 「Medical Wastes Management System」.
- 「Rules on the Standards for Wrapping and Wrapper Materials for Waste Products」.
- 「Rules Regarding the Determination, Composition, and Installation Standards for City  
and Gun Planned Facilities」, Article 74.

Korea Trade-Investment Promotion Agency: <http://www.kotra.or.kr/>.

Lee, YongHwan. October, 2008. Study on Conflict Resolutions for Ostracized Facilities  
and Resident Support Measures. Gyeonggi Development Research Institute.

- Measures for Improvement of System of Legislations on Waste and Reorganization of Statutes. 2009. Ministry of Environment.
- Methods of Instituting Major Changes to the Seoul City Domestic Wastes Collection and Transport System. 2011. Seoul Research Institute.
- Ministry of Environment. Homepage: <http://www.me.go.kr>.
- Ministry of Foreign Affairs: <http://www.mofa.go.kr/>.
- Municipal Waste Compost Program in Sri Lanka. REPORT No.: CDM-2011-010. 2012. Korean Standards Association.
- National Master Plan for Waste Management. 1996. Ministry of Environment.
- OECD Stats: <http://stats.oecd.org/>.
- Report Materials from the Proclamation and Establishment of a Resource Circulating Society. 2016. Ministry of Environment.
- Research on Preparation of Measures for Reformation of Waste Management System. 2013. Ministry of Environment.
- Research into Modifying/Supplementing Basic Guidelines for Investigations of Preliminary Feasibility. 2014. Korea Development Research Institute.
- Ryu, GiYoung. 2010. Zero Waste City, Seoul's New Project, SDI Policy Report No. 61, Seoul. Seoul Research Institute.
- Ryu, GiYoung & Kim, BumShik. 2010. A Citizen Support Model for a Resource Circulation Form of Domestic Wastes Disposal. Seoul Research Institute.
- Seosan City Waste Disposal Framework Research Services. 2013. Seosan City.
- Seoul Food Wastes Conflict News: [www.naver.com](http://www.naver.com).
- Son, Hyun. 2013. Analysis of the Sorting System Under the 'Wastes Control Act'. Legal Research Vol.41, Korea Legal Research Institute.

- 
- Suh, DongChun. 2014. Return Report: Asia Foundation Sri Lanka Regional Economic Development Governance (LEG) Business Professional Dispatch.
- Transitioning to a Resource Circulating Society, Choices for the Future of Society. 2015. Ministry of Environment.
- Waste Costs. Korea Environment Corporation.
- Waste Reduction System Information. Ministry of Environment, Korea Environment Corporation. Allbaro homepage: [www.allbaro.or.kr](http://www.allbaro.or.kr).
- Workshop for Resolving Conflicts Regarding the Installation of Wastes Disposal Facilities. 2005. Ministry of Environment.
- Yi, JungIm, et al. 2013. Methods of Establishing the Foundations of a Zero Waste City. GRI Policy Research No. 63, Gyeonggi. Gyeonggi Development Research Institute.

## Appendix 1) Classification of Wastes

<p><b>Wastes</b> Such materials as garbage, burnt refuse, sludge, waste oil, waste acid, waste alkali, and carcasses of animals, which have become no longer useful for human life or business activities'</p>	<p><b>Domestic Wastes</b> 'Domestic wastes' refers to waste other than industrial site waste</p>	<p><b>Industrial Site Regular Wastes</b> Industrial wastes, excluding designated wastes and construction wastes</p>	<p><b>Industrial Site Domestic Wastes</b> Wastes generated at industrial sites that produce, on average, 300kg of wastes or more per day, or industrial sites that produce 5 tons or more of wastes due to a series of construction (excluding construction of buildings) or work (refers to the quantity of wastes generated from the point of start of the construction or work to the point of completion of thereof)</p>
<p><b>Industrial Site Wastes</b> 'Wastes generated at industrial sites that have installed and operate discharging facilities in accordance with the 'Clean Air Conservation Act', the 'Water Quality and Aquatic Ecosystem Conservation Act', or the 'Noise and Vibration Control Act', and other industrial sites designated by Presidential Decree'</p>	<p><b>Industrial Site Domestic Wastes</b> Wastes generated at industrial sites that produce, on average, 300kg of wastes or more per day, or industrial sites that produce 5 tons or more of wastes due to a series of construction (excluding construction of buildings) or work (refers to the quantity of wastes generated from the point of start of the construction or work to the point of completion of thereof)</p>	<p><b>Discharging Facility Wastes from Industrial Sites</b> Wastes generated at discharging facilities provided for in the 'Clean Air Conservation Act', the 'Water Quality and Aquatic Ecosystem Conservation Act', the 'Noise, Vibration Control Act', or the final waste water treatment facilities in accordance with Article 48, Clause 1 of the 'Water Quality and Aquatic Ecosystem Conservation Act', communal sewage treatment facilities as provided for in Article 2, Clause 9 of the 'Sewerage Act', waste treatment facilities as provided for in Article 2, Clause 11 of the 'Sewerage Act', and waste treatment facilities as provided for in Article 29, Clause 2 of the 'Act on the Management and Use of Livestock Excreta'</p>	<p><b>Discharging Facility Wastes from Industrial Sites</b> Wastes generated at certain facilities, corrosive wastes, wastes containing hazardous substances, waste organic solvent, waste paint and waste lacquer, waste oil, waste asbestos, wastes containing polychlorinated biphenyl, waste hazardous substances, medical wastes</p>
<p><b>Designated Wastes</b> Those industrial site wastes that may pollute surrounding environment, such as waste oil and waste acid, and hazardous substances such as medical wastes, etc., that may harm human health, as designated by Presidential Decree</p>	<p><b>Designated Wastes</b> Those industrial site wastes that may pollute surrounding environment, such as waste oil and waste acid, and hazardous substances such as medical wastes, etc., that may harm human health, as designated by Presidential Decree</p>	<p><b>Medical Wastes</b> Those wastes generated at and discharged from health, medical facilities, animal hospitals, testing and examination facilities for which it is recognized that special management is necessary for maintenance and protection of health and environment, including extractions such as human organs, carcasses of experiment subject animals, etc., as designated by Presidential Decree</p>	<p><b>Medical Wastes</b> Those wastes generated at and discharged from health, medical facilities, animal hospitals, testing and examination facilities for which it is recognized that special management is necessary for maintenance and protection of health and environment, including extractions such as human organs, carcasses of experiment subject animals, etc., as designated by Presidential Decree</p>
<p><b>Construction Wastes</b> Wastes of 5 tons or more that are generated at construction site a construction falling under Article 2, Clause 4 of the 'Framework Act on Construction Industry,' (only includes wastes that are generated from the point of start of construction to completion), as designated by Presidential Decree</p>	<p><b>Construction Wastes</b> Wastes of 5 tons or more that are generated at construction site a construction falling under Article 2, Clause 4 of the 'Framework Act on Construction Industry,' (only includes wastes that are generated from the point of start of construction to completion), as designated by Presidential Decree</p>	<p><b>Construction Wastes</b> Wastes of 5 tons or more that are generated at construction site a construction falling under Article 2, Clause 4 of the 'Framework Act on Construction Industry,' (only includes wastes that are generated from the point of start of construction to completion), as designated by Presidential Decree</p>	<p><b>Construction Wastes</b> Wastes of 5 tons or more that are generated at construction site a construction falling under Article 2, Clause 4 of the 'Framework Act on Construction Industry,' (only includes wastes that are generated from the point of start of construction to completion), as designated by Presidential Decree</p>

Source: Enforcement Rules for the Wastes Control Act.

---

## Appendix 2) Korean Waste Management Law and Plans

### 1. Korean Laws on Waste Management

Currently, Korea's system of waste-related legislations is a multi-legislation system consisting of a number of legislations concerning the treatment of wastes and recycling, etc. After the Refuse Cleaning Act was enacted in 1962 and waste regulation thus began with an emphasis on the disposal of trash, the Wastes Control Act, which regulates not only domestic wastes but also industrial wastes, was enacted in 1986, thus establishing a modern waste management system.

Upon its enactment in 1986, the Wastes Control Act was by its nature a framework act on waste regulation. However, as the Waste Water, Excreta and Livestock Waste Water Act, resource recycling system, the policy for promotion of installation of waste disposal facilities, and the system for exportation and importation of wastes, etc., were separated from the Wastes Control Act and established as separate legislations after 1990, the Wastes Control Act was narrowed in scope to concern only the treatment of wastes. The 「Act on Saving and Recycling of Resources」, which was separated from the Wastes Control Act in 1993, (henceforth “Resource Recycling Act”) was again separated into the 「Construction Waste Recycling Promotion Act」 and the 「Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles」, etc., in the 2000's.

The Resource Recycling Act assumed a position as central legislation on wastes, as the focus of waste policy shifted from appropriate treatment to deterring generation and circulating waste resources. When the Act was amended in 2008, the notion of resource circulation was introduced along with the major policy visions of the Act. (Chae, Younggeun, 2009). Furthermore, as the Framework Act on Low Carbon, Green Growth was enacted in 2010, the greenhouse gas reduction and energy saving target management system was

introduced, and as of the end of 2014, the Act on the Transition to a Resource Circulating Society, which seeks to facilitate more efficient use of resources from the production of goods, etc. to distribution, consumption and disposal, minimize the generation of wastes and thus reduce the pressure on the environment, and promote the circular use of resources and thereby establish a foundation of a society in which resources are circulated, has passed the State Council.

### 1) Wastes Control Act

The objective of the Wastes Control Act, which was enacted in 1986, is to appropriately treat wastes to maintain a clean, natural, and livable environment, and thereby contribute to national health and the conservation of the environment. The Act was established with the purpose of providing in a single act the matters necessary for management of wastes (excreta, trash, industrial wastes), which were previously managed under a bifurcated structure separated into the Environment Conservation Act and the Refuse Cleaning Act, and thereby reinforce management based on composition and characteristics of wastes, and to require the Director of the Agency of Environment (currently the Minister of Environment) and executive heads of Cities and Provinces to establish framework plans for treatment of wastes, in order to appropriately treat wastes.<sup>56</sup>

The major substances of the Wastes Control Act, enacted in 1986, may be arranged into the following 10 areas.

- Wastes were distinguished into, and separately managed as, regular wastes and industrial wastes
- Established the role of Mayors, County Executives and the State
- Required the Director of the Agency of Environment (currently the Minister of Environment), Mayors and Provincial Governors to establish a framework plan for the treatment of wastes

<sup>56</sup>. Dong Ha Kim, 2006, *Sludge Reduction and Preconditions for Creating High Value Biogas*.

- 
- Implemented a licensing system for regular waste treatment businesses
  - Implemented a permit system for the installation of excreta treatment or trash treatment facilities
  - Required the installation of livestock waste water purification facilities
  - Implemented a reporting system for industrial sites that discharge industrial wastes
  - Authority for the installation and operation of regional industrial waste treatment facilities
  - Implemented a permit system for industrial waste treatment businesses
  - Implemented obligatory residence of technical managers

In accordance with Article 10 of the Wastes Control Act, the state is required to establish a master plan for waste management for every 10 years. Currently, the 1<sup>st</sup>, 2<sup>nd</sup> and 2<sup>nd</sup> revised master plans for waste management have been established. The master plan for waste management constitutes a subordinate plan under the master national plan for environment, and constitutes a super-ordinate plan over the Framework Plan for Resource Recycling, the Framework Plan for Construction Waste Recycling and the Framework Plan for Treatment of Wastes.<sup>57</sup>

57. 2<sup>nd</sup> Framework Plan for the Treatment of Wastes.

## 2) Act on the Promotion of Saving and Recycling of Resources

The objective of the 「Act on the Promotion of Saving and Recycling of Resources」, which was enacted in 1993, is to conserve the environment through the efficient use of resources, deter the generation of wastes, promote saving and recycling of resources, and thereby contribute to continued economic growth and enhancement of national welfare. As traditional waste treatment methods have reached a limit due to a rapid increase in the quantity of waste generation and difficulty in securing landfill sites, the Act seeks to fundamentally reduce waste generation and to promote recycling of generated wastes, and thereby promote the saving of resources and the conservation of the environment.<sup>58</sup>

The main substances of the Act on the Promotion of Saving and Recycling of Resources may be arranged into the following 5 items.

- Imposition of an obligation on the state, local self-governing entities, businesses and citizens to save resources and promote recycling
- Mandatory establishment of a framework plan for recycling resources by the Director of Agency of Environment (currently the Minister of Environment)
- Provision of field-specific recycling measures for industries and product groups related to resource recycling, and operation thereof
- Introduction of a fee-payment system and the use of waste management funds established through said system
- Role of the state or local self-governing entities in the cultivation of the recycling industry

The 「Act on the Promotion of Saving and Recycling of Resources」 requires the establishment of framework plans related to resource circulation, and currently, the 1<sup>st</sup> framework plan for resource circulation and the 4<sup>th</sup> framework plan for resource recycling have been established.

58. [Research into legislation to promote resource circulation and switchover business organization.](#)

---

### 3) Construction Waste Recycling Promotion Act

The objective of the Construction Waste Recycling Promotion Act, which was enacted in 2003, is to appropriately treat construction wastes generated due to construction of buildings, etc., in an eco-friendly manner and promote the recycling thereof, and thereby not only promote the efficient use of national resources, but to also contribute to the advancement of the national economy and enhance public welfare. The Act was enacted in order to appropriately treat construction wastes that are generated in large quantities at a single instance, to facilitate the production of high-quality recyclable frame materials that may replace natural frame materials, and thereby promote not only the efficient use of national resources but also advance the national economy and enhance public welfare.<sup>59</sup>

The main substances of the 「Construction Waste Recycle Act」 can be arranged into the following 8 areas, which promotes recycling construction wastes.

- Consideration of measures concerning promotion of recycling of construction wastes, and inclusion of expenses for sorted discharge of construction wastes, storage, treatment, recycling, etc. in construction expenses.
- Along with appropriate eco-friendly treatment of construction wastes, sorted discharge of such wastes based on characteristics and types.
- The Minister of Environment, in order to appropriately treat construction wastes in an eco-friendly manner and to promote recycling, is required to, through consultation with the Minister of Construction and Transportation, and hearing the opinions of heads of related central administrative agencies and Mayors and Provincial Governors, establish a framework plan for recycling for every 5 years, while the heads of related central administrative agencies, Mayors and Provincial Governors are required to establish and implement yearly implementation plans.

59. Dong Ha Kim, 2006, *Sludge Reduction and Preconditions for Creating High Value Biogas*.

- Explicitly set forth a permit system for persons who seek to engage in the construction waste treatment industry.
- Determined necessary criteria, such as quality standards for recyclable frame materials for each use and planning and construction Directives, etc., and enabled the granting of certifications in order to secure the quality of recyclable frame materials
- Persons who initiate construction shall, for construction where the Act on Contracts to Which the State is a Party applies, require the constructor, when placing an order for a construction of certain structures and scale and for which use of recyclable frame materials is mandatory, use recyclable materials that satisfy the quality criteria
- Dischargers of construction wastes must, upon completion of the relevant construction, manage the outcomes of treatment of construction wastes and recycling, and must submit said outcomes to the person who licensed or permitted said construction, or to the person with authority for approval
- After an operator of a construction waste treatment business prepares the necessary equipment and facilities and thereby receives a permit for a construction waste treatment business, the said operator is required to, prior to filing a report for initiation of the operation, implement necessary measures that guarantee the performance of treatment of neglected wastes, such as paying dues to the mutual aid association or enrolling in a guarantee insurance that guarantees treatment of neglected wastes, etc.<sup>60</sup>

The Construction Waste Recycling Promotion Act requires that a framework plan for construction waste recycling to be established for every 5 years, and currently, the 2<sup>nd</sup> framework plan for construction waste recycling has been established and is being implemented.

<sup>60</sup> Dong Ha Kim, 2006, *Sludge Reduction and Preconditions for Creating High Value Biogas*.

---

#### **4) Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles**

The objective of the 「Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles」 is to restrain the use of hazardous substances and to implement recycle-friendly manufacturing process in order to promote the recycling of electrical and electronic equipment and vehicles, and to appropriately recycle the wastes thereof, and to thereby establish a resource circulation system that efficiently uses resources, and to thus contribute to the conservation of the environment and the sound advancement of the national economy. The 「Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles」 was enacted in 2008 in order to promote the restrained use of hazardous substances and encourage recycle-friendly manufacturing processes in order to promote the recycling of electrical and electronic equipment and vehicles, and to appropriately recycle the wastes thereof, and thereby establish a resource circulation system that efficiently uses resources to protect the country's environment and pro-actively respond to environmental regulations, which are currently being reinforced internationally.

The 「Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles」 was enacted based on 5 major notions: Limitations on the use of hazardous substances during the manufacturing phases of electrical and electronic equipment and vehicles, observation of recyclable rates, improvement of composition and structure through the use of materials that enable easy recycling, self-confirmation and evaluation based on criteria on the inclusion of hazardous materials and proclamations thereof, and the consequent restrictions on the use of hazardous substances and observation of recyclable rates, etc. The Act also implements compulsory provision of recycling information by requiring manufacturers and importers of electrical and electronic equipment and vehicles to provide recycling information such as the compositional materials of the products, information

on hazardous substances, and methods of disassembly, etc., to the operator of recycling facility, to enable recycling based on said information. The provision under the 「Act on the Promotion of Saving and Recycling of Resources」 that required manufacturers and importers of electrical and electronic equipment to collect and recycle at least a certain percentage of sold electrical and electronic equipment was transferred to this Act, while the substance of said provision was partially revised for implementation, thus imposing an obligation of collection and recycling on manufacturers and importers of electrical and electronic equipment.

The Act also requires manufacturers and importers of vehicles to develop and supply recycling techniques, as well as financial and technical support thereof, while vehicle operators, vehicle disposal businesses, businesses that recycle crushed remains of disposed vehicles, and businesses that recycle byproducts of vehicle crushing process are required to collect recyclable materials as much as possible and recycle them, as well as determine methods and criteria for recycling disposed vehicles and thereby ensure that recycling is carried out appropriately; the Act therefore provides for the division of labor between manufacturers and importers of vehicles, etc., and also provides for recycling operations and criteria thereof. By requiring businesses that engage in vehicle disposal operations to separate and store substances that may cause climate and ecological change and businesses that recycle the crushed remains of disposed vehicles to separate and discharge the residues of the crushing process, while allowing expenses for said treatment and recycling to be appropriated from the price of the disposed vehicles, the Act provides for the separation and storage of environment polluting substances and for the expenses of treatment and recycling thereof.<sup>61</sup>

61. Ministry of Environment, 2016, Environment White Paper.

---

## Waste Management Legislations and Related Plans

Related Legislations	⇒	Related Plans
Wastes Control Act		National Master Plan for Waste Management (2 <sup>nd</sup> )
Act on the Promotion of Saving and Recycling of Resources		Framework Plan for Resource Circulation (1 <sup>st</sup> ) Framework Plan for Resource Circulation (4 <sup>th</sup> )
Construction Waste Recycling Promotion Act		Framework Plan for Recycling of Construction Wastes (2 <sup>nd</sup> )

Source: Ministry of Strategy and Finance, 2015, 2014 Knowledge Sharing Program(KSP) Policy Consultation III (Sri Lanka Green City Infrastructure Development Policy Consultation: Focus on Solid Waste Management).

Chronological List of Waste Laws and Policies

1980's	⇒	1990's ~ early 2000's	⇒	Mid 2000's
Safe Treatment		Recycling		Resource Circulation
		Act on the Promotion and Recycling of Resources ('92) Act on the Transboundary Movements of Hazardous Wastes and Their Disposal ('94) Promotion of Installation of Waste Disposal Facilities and Assistance, Etc. to Adjacent Areas Act ('95) Construction Waste Recycling Promotion Act ('03)		
Wastes Control Act (1986)		Master Plan for Waste Management (1 <sup>st</sup> · 2 <sup>nd</sup> ) Framework Plan for Resource Recycling (1 · 2 · 3 <sup>rd</sup> )		Master Plan for Waste Management (2 <sup>nd</sup> Revision) Framework Plan for Resource Recycling(4 <sup>th</sup> ) Comprehensive Measure for Waste Energy Utilization ('08) Measure for Resource Recycling of Waste Metals ('09)
Installation of Basic Facilities		Deposit/Fee Policy, Mandatory Sorted Discharge ('92) Deterrence of Use of Disposable Goods ('94) License System for Waste Exports and Imports ('94) Volume-Rate Disposal ('95) Producer Recycling Responsibility Policy ('02) Suitable Waste Disposal System ('02) Mandatory Use of Recycled Aggregates ('04)		Prohibition on Direct Burial of Food Wastes ('05) Certification Policy for Recycled Aggregates ('07) Report on Waste Exports and Imports ('08) Policy Requiring Warranty of Environment-Friendliness of Electronic Products('08)

Source: Ministry of Strategy and Finance, 2015, 2014 Knowledge Sharing Program(KSP) Policy Consultation III (Sri Lanka Green City Infrastructure Development Policy Consultation: Focus on Solid Waste Management).

---

## 5) Framework Act on Resource Circulation

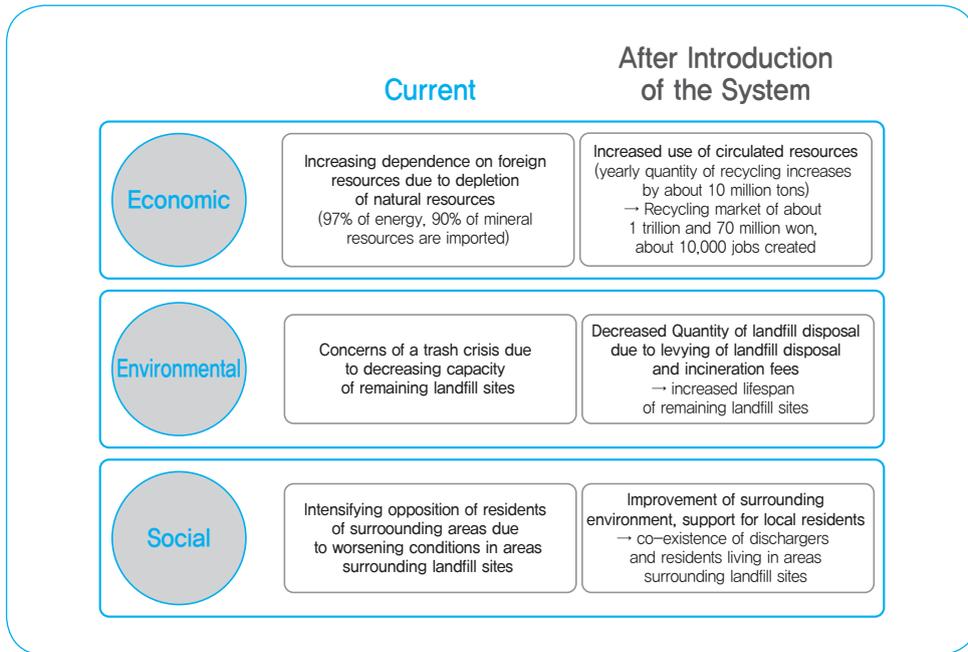
The objective of the Framework Act on Resource Circulation is to, rather than simple landfill disposal or incineration of wastes, maximize recycling through the maximum employment of ideas and techniques, thereby establishing a sustainable ‘resource-circulating society’. Even among wastes that are disposed of in landfills or through simple incineration, 56% are wastes from which energy may be reclaimed, representing a serious waste of resources; as such, the Resource Circulation Act was established in order to specifically propose a measure for a paradigm-shift to realize a resource-circulation society, along with policy measures to provide support for a resource-circulation industry.<sup>62</sup>

Under the 「Waste Disposal Fee System」, from January 1, 2018, Mayors, County Executives and Heads of Districts or dischargers of industrial wastes must, in cases where they simply incinerate or dispose in landfills useful resources and thereby permanently dispose of them, pay an expense equivalent to the expenses needed for recycling the said resources, as a waste disposal fee. The Resource Circulation Act goes into effect on January 1, 2018.<sup>63</sup>

62. Ministry of Environment, Proclamation and Establishment of a Resource Circulating Society.

63. Ministry of Environment, Proclamation and Establishment of a Resource Circulating Society.

Economic, Environmental and Social Impact of the Framework Act  
on Resource Circulation

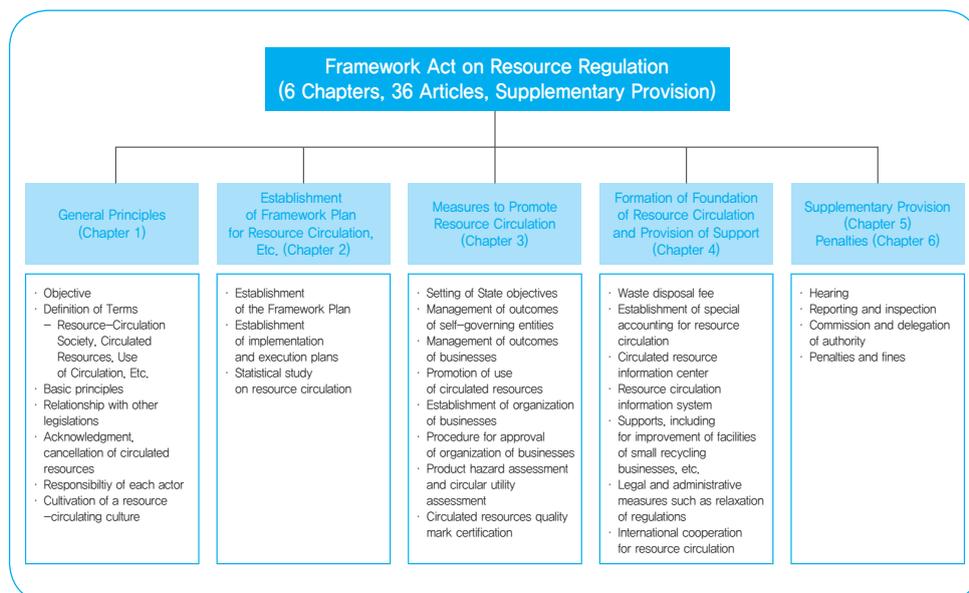


Source: Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

As the Ministry of Environment seeks to transform the existing mass-production, mass-consumption society to a sustainable resource-circulation society through enactment of the Resource Circulation Act, it plans to materialize a system consistent with Government 3.0 through communication and cooperation with various interest groups.<sup>64</sup>

64. Ministry of Environment, Proclamation and Establishment of a Resource Circulating Society.

## Compositional Structure of Major Legislations under the Framework Act on Resource Recycling



Source: Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

The main substance of the legislation focuses on the establishment of a virtuous cycle of resource circulation, cultivation of a resource circulation industry, and support for small and mid-sized recycling companies.

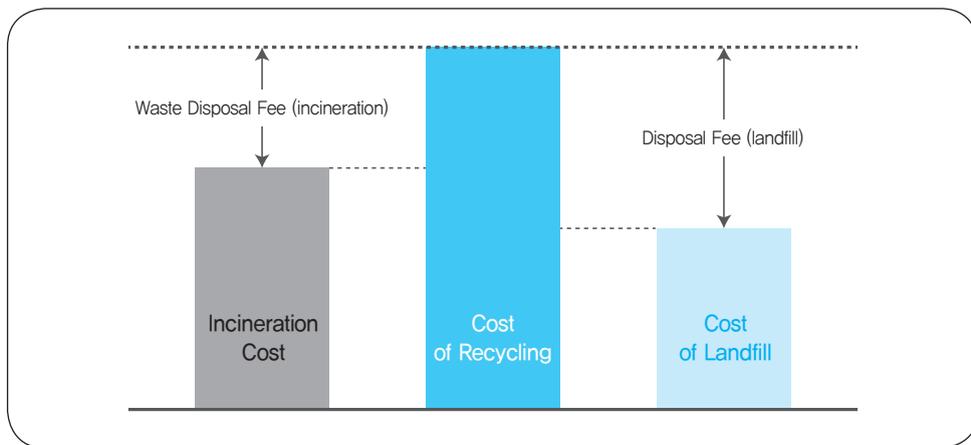
- (Chapter 1 General Principles) Statement of basic principles for a resource-circulating society, statement of responsibilities of each actor, and an introduction acknowledging a circulated resources (termination of wastes) system.
- (Chapter 2 Establishment of a framework plan for resource circulation, etc.) Proposition of mid-to-long term policy goals and direction for resource circulation for the expansion of use of circulated resources, establishment of implementation plans by local self-governing entities

- (Chapter 3 Measures for promotion of resource circulation) Management of resource circulation outcomes and support thereof, assessment of product hazard and circulation utility
- (Chapter 4 Formation of a foundation for resource circulation and support) Implementation of a waste disposal fee system, support for industries related to resource circulation, etc., for transition to a resource-circulating society

Circulation use is an activity in which wastes are employed and used as resources through physical treatments such as collecting, sorting, selecting, crushing, pressurizing, extracting, etc. and chemical, aerobic, anaerobic and biological treatments such as neutralization, acidification, reduction, transposition, etc., or where energy is reclaimed from wastes, or where wastes are turned into a condition such that energy may be reclaimed.

Waste disposal fee is the imposition of a social cost, incurred due to disposal, on persons who dispose of wastes through means such as incineration or landfill, despite the fact that said wastes may be circulated and used as resources.<sup>65</sup>

Concept of A Waste Disposal Responsibility Fee



Source: Ministry of Environment, 2016, Report Materials from the Proclamation and Establishment of a Resource Circulating Society.

65. Joint work of related departments and agencies, 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011-2015).

---

## 2. Waste Management Plans of Korea

### 1) National Master Plan for Waste Management

The Master Plan is a long-term master plan based on the provisions of Article 8-2 of the 「Wastes Control Act」, and is simultaneously a subordinate plan of the waste management field under the ‘National Plan for Environment’ pursuant to the 「Framework Act on Environmental Policy」, and a superordinate plan above ‘Framework Plan for Resource Recycling’, ‘Framework Plan for Construction Waste Recycling’, and ‘Framework Plan for Treatment of City and Provincial Wastes’.

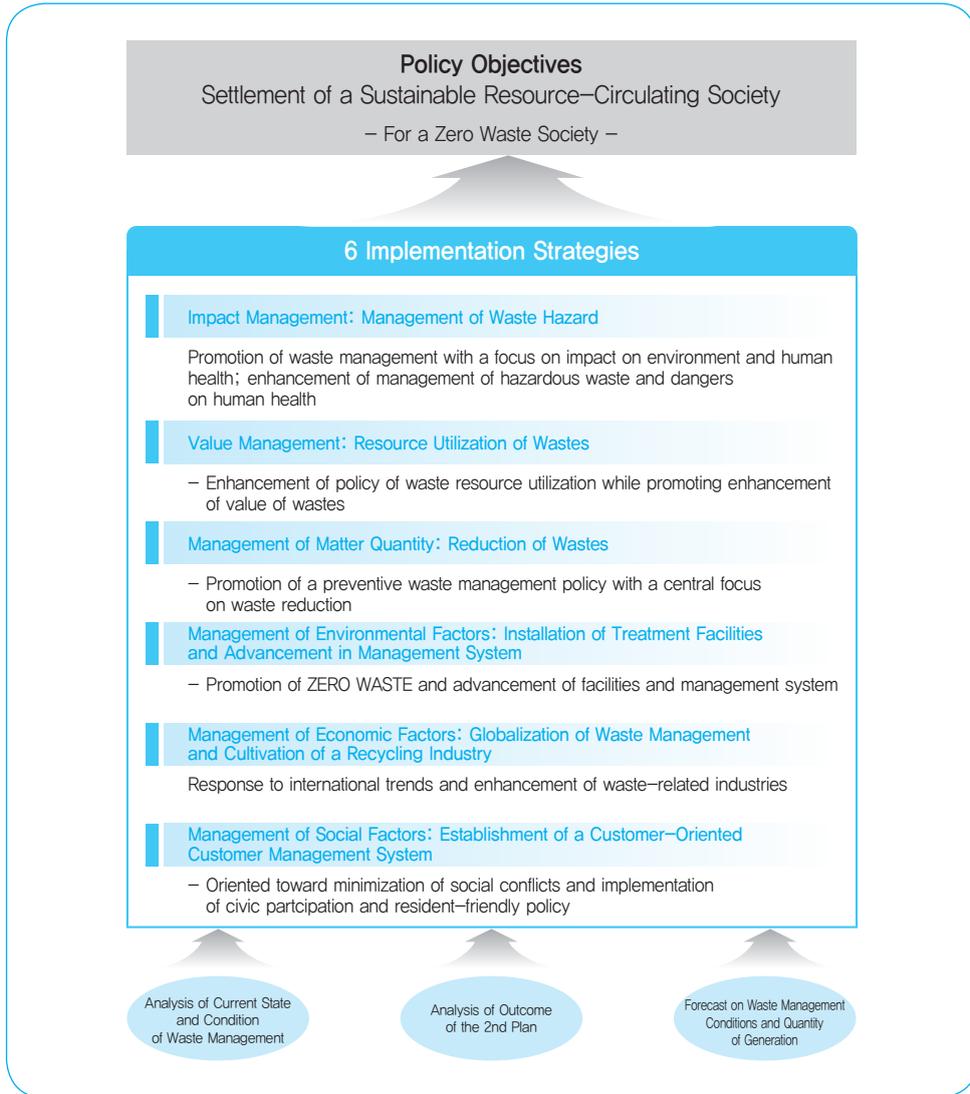
The policy objectives of the 1<sup>st</sup> (1993~2001) and 2<sup>nd</sup> National Master Plan for Waste Management (2002~2011) were to establish a foundation for a sustainable resource-circulating society, and the policy objectives of the 2<sup>nd</sup> Revised National Master Plan for Waste Treatment (2007~2011) was to constructively continue securing a socioeconomic foundation for a sustainable resource-circulating society, and to propose a big-picture framework and direction for the national waste management policy.<sup>66</sup>

The role of the 2<sup>nd</sup> National Master Plan for Waste Management and the Revised Plan is to propose a long-term national policy direction in order to overcome the internal limiting factors in national land environment and to actively respond to external international environmental regulations. Throughout the overall waste management field, the Revised Plan maintains the fundamental spirit of minimization of wastes, utilization of wastes as resources, safety management, and responses to international trends that were proposed in the 2<sup>nd</sup> Plan. The Plan carries out its role as a Directive on the government, local self-governing entities, producers, consumers, and citizens to accept environmental changes in a global information age while promoting the conservation of the national land environment and enhancing quality of life.<sup>67</sup>

66. 2<sup>nd</sup> Framework Plan for Wastes Management (2007~2011).

67. 2<sup>nd</sup> Framework Plan for Wastes Management (2007~2011).

System and Major Details of the Master Plan



Source: Ministry of Environment, July 1996, National Master Plan for Waste Management.

## Policy Goals, Action Goals and Subordinate Implementation Plans of the 1<sup>st</sup>-2<sup>nd</sup> National Master Plans for Waste Management

Category	1 <sup>st</sup> Master Plan	2 <sup>nd</sup> Master Plan	2 <sup>nd</sup> Revised Plan
Policy Objectives	Establishment of foundation of a sustainable resource-circulating society		Settlement of a sustainable resource-circulating society
Action Goals and Subordinate Objectives	Waste Minimization <ul style="list-style-type: none"> <li>• Implementation of volume-rate-disposal system</li> <li>• Regulation of single-use products</li> <li>• Reduction of packaging and food waste</li> </ul>	Waste Minimization <ul style="list-style-type: none"> <li>• Minimization at production phase</li> <li>• Minimization at distribution phase</li> <li>• Minimization at consumption phase</li> <li>• Minimization at disposal phase</li> </ul>	Impact Assessment: <ul style="list-style-type: none"> <li>• Reinforcement of designated wastes</li> <li>• Advancement in waste hazard assessment and management system</li> <li>• Enhancement of medical waste management</li> <li>• Formation of measures to limit hazardous materials in electrical and electronic equipment and vehicles</li> </ul>
	Use of wastes as resources <ul style="list-style-type: none"> <li>• Implementation of deposit and fee systems</li> <li>• Formation of and support for recycling industry</li> <li>• Securement of foundation for a comprehensive recycling system through introduction of EPR</li> </ul>	Support for waste policies <ul style="list-style-type: none"> <li>• Consolidation of EPR</li> <li>• Securement of recycling infrastructure</li> <li>• Enhancement of recycling industry competitiveness</li> </ul>	Value Management: Use of wastes as resources <ul style="list-style-type: none"> <li>• Use of wastes as energy</li> <li>• Promotion of re-use of high-value wastes</li> <li>• Consolidation of EPR / vitalization</li> </ul>
	Safe Management of Wastes <ul style="list-style-type: none"> <li>• Formation of a foundation for incineration/landfill facilities</li> <li>• Implementation of re-arrangement of discharge standards for pollutants such as leachate and dioxin</li> </ul>	Safe management of wastes <ul style="list-style-type: none"> <li>• Continued securement of waste treatment facilities</li> <li>• Safe management of hazardous wastes</li> <li>• Prevention of secondary environmental pollution through reinforced management of waste treatment facilities</li> </ul>	Management of matter quantity: reduction of wastes <ul style="list-style-type: none"> <li>• Reduction at manufacturing phase</li> <li>• Reduction at production phase</li> <li>• Reduction at consumption phase</li> </ul>
	Securement of waste management infrastructure <ul style="list-style-type: none"> <li>• Re-arrangement of waste management laws                             <ul style="list-style-type: none"> <li>- Certification system for lawful treatment of wastes</li> <li>- System for guarantee of treatment of neglected wastes</li> </ul> </li> <li>• Re-arrangement of waste management foundation                             <ul style="list-style-type: none"> <li>- Implementation of a national waste census</li> </ul> </li> </ul>	Advancement in waste management <ul style="list-style-type: none"> <li>• Informational and scientific management of wastes</li> <li>• Securement of base technologies for waste management</li> <li>• Reinforcement of foundation for civic participation and cooperation                             <ul style="list-style-type: none"> <li>- Guarantee system for treatment of neglected wastes</li> </ul> </li> <li>• Re-arrangement of foundation of waste management                             <ul style="list-style-type: none"> <li>- Implementation of national waste census</li> </ul> </li> </ul>	Installation of treatment facilities/ advancement of management system <ul style="list-style-type: none"> <li>• Safe treatment of wastes/ advancement in management</li> <li>• Rationalization of waste treatment (economic incentives)</li> <li>• Informational and scientific treatment of wastes</li> </ul>

Category	1 <sup>st</sup> Master Plan	2 <sup>nd</sup> Master Plan	2 <sup>nd</sup> Revised Plan
	-	Response to International Trends <ul style="list-style-type: none"> <li>• Response to Basel Treaty and OECD provisions</li> <li>• Active response to Climate Change Treaties, etc.</li> <li>• Consideration of South-North Korea cooperation for waste management</li> </ul>	Globalization of waste management/ Cultivation of a recycling industry <ul style="list-style-type: none"> <li>• Reinforced management of waste imports and exports</li> <li>• Active response to international environmental treaties</li> <li>• Cultivation of waste recycling industry</li> </ul>
	-	-	Establishment of a customer-oriented waste management system <ul style="list-style-type: none"> <li>• Establishment of a waste management governance</li> <li>• Response to NIMBY phenomenon against installation of treatment facilities</li> </ul>

Source: Ministry of Strategy and Finance, 2015, 2014 Knowledge Sharing Program(KSP) Policy Consultation III (Sri Lanka Green City Infrastructure Development Policy Consultation: Focus on Solid Waste Management).

## 2) Framework Plan for Resource Recycling

The Framework Plan for Resource Recycling is a 5-year framework plan that proposes national resource recycling policy objectives and policy directions in accordance with Article 7 of the 「Act on the Promotion of Saving and Recycling of Resources」. Since its initial establishment and enactment in 1993, a total of 4 Framework Plans for Resource Recycling had been implemented by 2012.

In order to achieve the settlement of a sustainable resource-circulating society, which is the ultimate objective of the National Master Plan for Waste Management, it was necessary not only to reduce the use of resources, but to also create a strategy to enhance the efficiency of resource use through means such as re-use of already used resources and recycling, etc. The respective visions of the 2<sup>nd</sup> and 3<sup>rd</sup> Framework Plans for Resource Recycling are “Establishment of a Resource-Circulating Socioeconomic Structure” and “Promotion of a Sustainable Resource-Circulating Socioeconomic System”, and are thus similar.

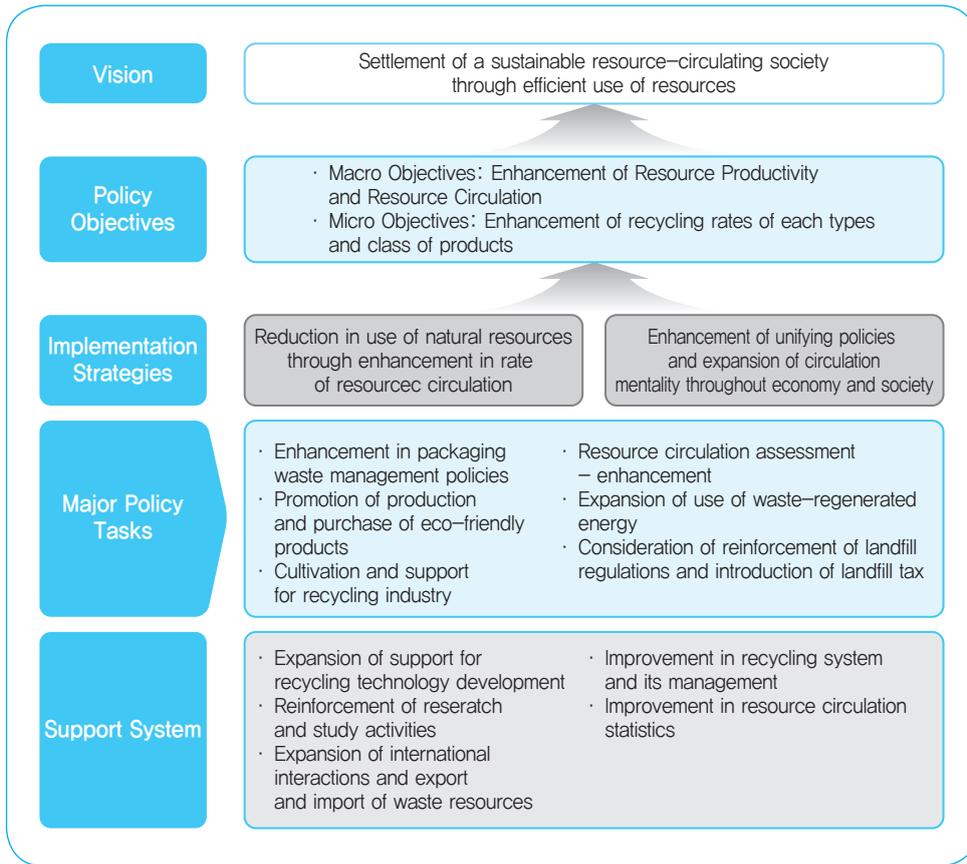
---

In the 2<sup>nd</sup> Framework Plan, emphasis was made on polluter responsibility and promotion of consumption of recycled products, while in the 3<sup>rd</sup> Framework Plan, emphasis was made on the introduction of policies that emphasize producer responsibility and management throughout from the discharge of recyclable resources to the final phase.

The policy direction of the 3<sup>rd</sup> Framework Plan for Recycling exhibited a more advanced form, in which even phases prior (reduction) to the generation of wastes were included in policy considerations, evidenced by the introduction of the 3R notion, etc., and also introduced policies with a strengthened emphasis on environmental responsibilities of producers, such as the EPR system.

The policy objectives of the 4<sup>th</sup> Framework Plan for Recycling are distinguished into macro and micro objectives; the macro objectives are set as the enhancement of 「Resource Productivity」 and 「Resource Circulation」, thus maintaining consistency as national framework plans.

Systematic Chart of the 4<sup>th</sup> Framework Plan for Resource Recycling



Source: Ministry of Environment, April 2008, 4<sup>th</sup> Framework Plan for Resource Recycling.

---

The implementation strategies of the 4<sup>th</sup> Framework Plan for Recycling are being implemented as a comprehensive policy in which the use of circulated resources is enhanced in order to improve resource productivity and resource circulation, while natural resources are replaced to use resources efficiently, accompanied by the expansion of a circulation mentality in each field of economy and society, with a consideration for resource circulation for the establishment and implementation of policies in each sub-field. Reduced use of natural resources enables reductions in the input and consumption of resources in production, distribution and consumption processes, and enhances resource productivity at phases prior to disposal through the efficient use of resources, while also promoting changes in production and consumption patterns through the expansion of a resource circulation mentality. In order to reduce the negative environmental impact caused by use of natural resources, it is necessary to introduce a policy based on a consideration of the link between economic growth, use of resources, and generation of wastes.

Basic Directions and Main Implementation Measures of Previous Plans (1<sup>st</sup>~4<sup>th</sup>)

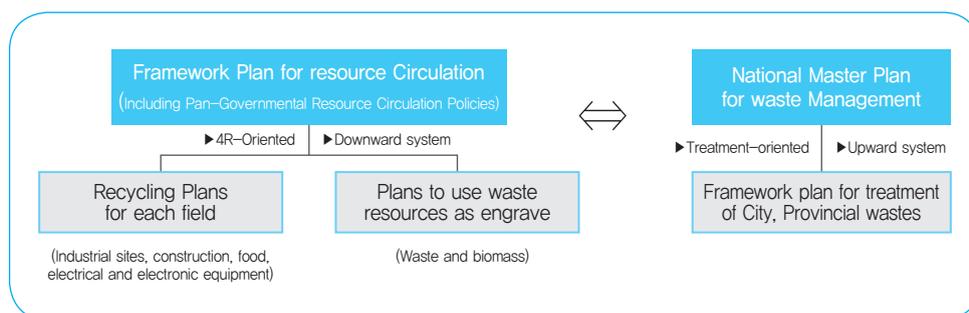
Category	Basic Direction	Implementation Focus
1 <sup>st</sup> Plan (1994-1997)	<ul style="list-style-type: none"> <li>• Establishment of a resource-circulating society through increased recycling</li> <li>• Resolution of trash treatment crisis and formation of a comfortable living environment</li> <li>• Enhanced competitiveness of recycling industry through efficient use of resources</li> </ul>	<ul style="list-style-type: none"> <li>• Transition to a production system that gives a consideration for recycling</li> <li>• Rationalization of collection and distribution of recycled products</li> <li>• Enhanced market competitiveness of regeneration industry</li> </ul>
2 <sup>nd</sup> Plan (1998-2002)	<ul style="list-style-type: none"> <li>• Establishment of a resource-circulating society through balanced development of all phases of recycling</li> <li>• Through reinforcement of polluter responsibility, promotion of maximum recycling through roles of each economic actor and division of responsibilities</li> <li>• Along with a supply-oriented policy of expansion of recycling facilities, significant enhancement of demand-oriented recycling policy through increased consumption of recycled products</li> </ul>	<ul style="list-style-type: none"> <li>• Enhancement in efficiency of sorted discharge and collection system of recycled products</li> <li>• Advancement in distribution system of recycled products</li> <li>• Enhancement in competitiveness of recycling industry</li> <li>• Policy enhancement for expansion of consumption of recycled products</li> <li>• Improvement of systems related to recycling</li> </ul>
3 <sup>rd</sup> Plan (2003-2007)	<ul style="list-style-type: none"> <li>• Promotion of reduction, re-use, and recycling of wastes and thereby promote a sustainable resource-circulating socio-economic system</li> <li>• Consolidation and development of EPR</li> <li>• Sorted discharge of recyclable resources, proposition of measures for examination and development for all phases from collection, recycling and to final consumption</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of the Sharing Market Movement as a civic cultural life participation movement for the entire nation</li> <li>• Consolidation of EPR system, proposition of direction of development</li> <li>• Re-arrangement of the sorted collection system</li> <li>• Establishment of foundation for the recycling industry</li> <li>• Securement of demand for recycled products</li> <li>• Development of resource recycling technologies</li> <li>• Carry out a statistical study of recycling industry</li> </ul>
4 <sup>th</sup> Plan (2008-2012)	<ul style="list-style-type: none"> <li>• Reduced input of natural resources through increased resource circulation</li> <li>• Reinforcement of a unifying policy, such as expansion of circulation mentality in economic and social fields</li> <li>• Consolidation of a sustainable resource-circulating society through efficient use of resources</li> </ul>	<ul style="list-style-type: none"> <li>• Reinforcement of packaging waste policies</li> <li>• Enhancement in resource circulation</li> <li>• Promotion of production and purchase of eco-friendly</li> <li>• Expanded production of waste energy</li> <li>• Cultivation of recycling industry</li> <li>• Reinforcement of landfill regulations and introduction of landfill tax</li> </ul>

Source: Ministry of Strategy and Finance, 2015, 2014 Knowledge Sharing Program(KSP) Policy Consultation III (Sri Lanka Green City Infrastructure Development Policy Consultation: Focus on Solid Waste Management).

### 3) The First Framework Plan for Resource Circulation

The Framework Plan for Resource Circulation is a 5-year statutory plan for national resource circulation policy direction, established in accordance with Article 7 of the 「Act on the Promotion of Saving and Recycling of Resources」. The Plan is an action plan in the field of resource circulation to achieve the low carbon, green growth objectives of the 5-Year Plan for Green Growth in the field of environment. For each sub-field, the Plan provides recycling plans, plans for waste resources and use of biomass as resources, a master plan for waste management, etc., and other such mid-to-long term plans for resource circulation.<sup>68</sup>

#### Relationship between the Framework Plan for Resource Circulation and Related Plans



Source: Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

The 1<sup>st</sup> Framework Plan for Resource Circulation comprehensively manages field-by-field implementation goals in order to promote resource circulation in all the phases of matter circulation (production · consumption · disposal · circulation). This Plan includes its role as a Directive on implementation of pan-governmental resource circulation, a mid-to-long term vision in the field of resource circulation linked to 5-Year Plan for Green Growth, objectives, and implementation strategies.<sup>69</sup>

68. Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

69. Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

Major Resource Circulation Policies

Category	Major Resource Circulation Policies
Ministry of Environment	<ul style="list-style-type: none"> <li>• Overall management of 4R (reduction, re-use, recycle, reclamation of energy) policies, cultivation of resource circulation industries under jurisdiction, development of technologies to promote use of waste resources as energy and promotion of industrialization thereof</li> </ul>
Ministry of Public Administration and Security	<ul style="list-style-type: none"> <li>• Formation of green-energy self-sufficient towns, utilization of livestock excreta as resources and energy reclamation therefrom</li> </ul>
Ministry of Food, Agriculture, Forestry and Fisheries	<ul style="list-style-type: none"> <li>• Promotion of use of biomass as energy (pilot formation of low-carbon green town)</li> </ul>
Ministry of Knowledge Economy	<ul style="list-style-type: none"> <li>• Cultivation of resource circulation industries under jurisdiction, distribution and development of technologies for new energy regeneration and industrialization thereof, vitalization of urban mines, establishment of ecological industry complexes, vitalization of re-manufacturing industry, improvement in resource productivity (including objective management), promotion of transition to a resource-circulating industrial structure</li> </ul>
Ministry of Land, Infrastructure and Transport	<ul style="list-style-type: none"> <li>• Reduction of land wastes discharge to sea (monitoring of details of waste discharge)</li> </ul>

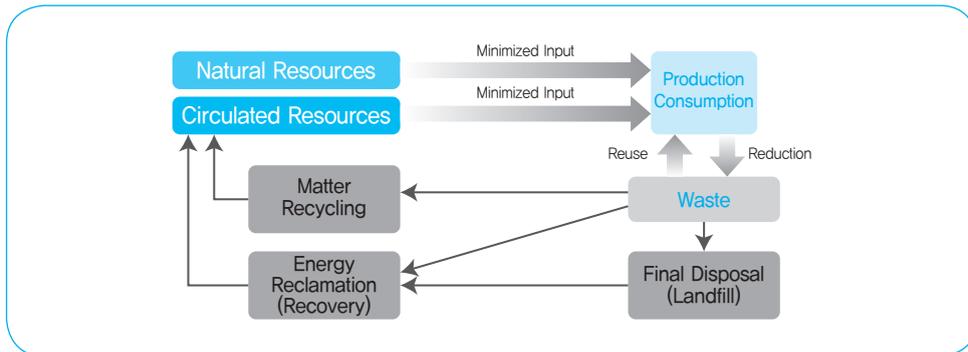
Source: Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

□ **Conceptual Map of Resource Recycling and Resource-Recycling Society**

Resource circulation refers to eco-friendly management of resource circulation, which consists of processes such as deterrence on generation of wastes, appropriate recycling of generated wastes, collection, treatment, etc.<sup>70</sup>

70. Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

## Conceptual Map of Resource Recycle and Resource-Recycling Society



Source: Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

### □ Shift in Policy Paradigm

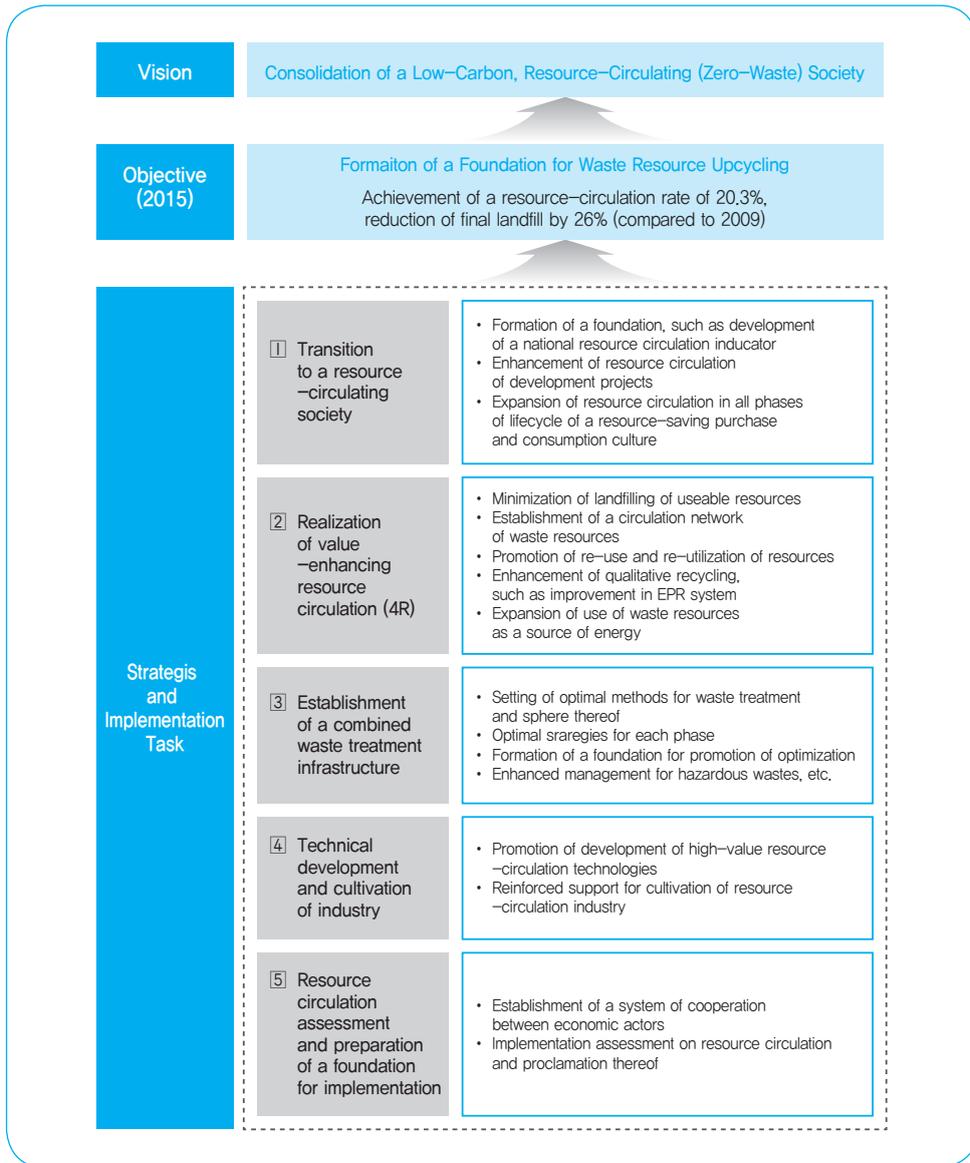
The basic presumption for a Zero-Waste society is that “All Wastes = may be circulated 100%”; the goal is to outgrow the simple quantitative circulation method and to transition to an Upcycling system where the value of the resources increase.

### Shift in Policy Paradigm



Source: Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

### Vision and Objective of the 1<sup>st</sup> Framework Plan for Resource Recycling



Source: Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

□ **Preparation of a Foundation for Implementation, such as National Resource Circulation Assessment, Etc.**

In order to form a resource-circulating society, a system of division of work between the public sector (state, local self-governing entities) and the private sector (corporations, citizens, civic groups) has been established. In this system of division of work, the responsibility of the polluter or discharger has been strengthened, while discretion for each actor regarding the performance of responsibilities has been expanded.<sup>71</sup>

Role of Each Actor

STATE (Central Government)	<b>Ministry of Environment</b> <ul style="list-style-type: none"> <li>• Establishment of basic plan and implementation assessment</li> <li>• Setting and management of resource circulation objectives</li> <li>• Proposition of objectives and guidelines for resource circulation for each economic actor</li> <li>• Policy and budget support</li> </ul>	<b>Each Department and Agency</b> <ul style="list-style-type: none"> <li>• Review of basic plan and establishment and implementation of subordinate implementation plans</li> <li>• Setting of subordinate objective of resource circulation and policy implementation</li> <li>• policy and budget support</li> </ul>
	Local Self-Governing Entities	<b>Regional Self-Governing Entities</b> <ul style="list-style-type: none"> <li>• Establishment and implementation of subordinate implementation plans</li> <li>• Policy and budget support</li> <li>• Enhancement of resource circulation in the region</li> </ul>
Corporations, Citizens, NGO's		<b>Corporations</b> <ul style="list-style-type: none"> <li>• Enhancement in production activities and resource circulation of products</li> <li>• Setting and implementation of autonomous objectives</li> <li>• Enhancement of voluntary C2C activities, such as reduction in waste generation, etc.</li> </ul>

Source: Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

71. Joint work of related departments and agencies, September 2011, the 1<sup>st</sup> Framework Plan for Resource Circulation (2011~2015).

#### 4) Framework Plan for Construction Waste Recycling

The Framework Plan for Construction Waste Recycling is a statutory plan that is established every 5 years in accordance with Article 8 (establishment of a framework plan for recycling) of the 「Construction Waste Recycling Promotion Act」 in order to appropriately treat construction wastes in an eco-friendly manner and to promote recycling of such wastes.

In the 1<sup>st</sup> Framework Plan for Construction Waste Recycling, the 3 major policy pursuits and 10 main implementation tasks were planned and implemented. As the 3 major policy pursuits, ‘Enhancement of Actual Rate of Use of Recycled Frame Materials at Construction Sites’, ‘Reduction of Generation of Construction Wastes’, and ‘Appropriate Treatment of Construction Wastes’, etc., were designated.

The 10 major implementation tasks are classified into ‘Expansion of Constructions and Uses Subject to Mandatory Use of Recycled Frame Materials’, ‘Resetting of the Target Rate for Recycling in Each Compositional Property’, ‘Incentives for the Promotion of Use of Recycled Frame Materials’, ‘Consolidation of a Information Management System for Construction Wastes’, ‘Pursuit of Inclusion of Recycled Frame Materials in Frame Provision Plans’, ‘Phase-by-Phase Compulsion of Use of Recycled Frame Materials for Classification Dismantling’, ‘Enhancement of Dischargers’ Implementation of Sorting, Selection, Discharge’, ‘Provision of Planning and Construction Techniques for Reduction of Generation of Construction Wastes’, ‘Prevention of Secondary Environmental Pollution through Enhancement of Criteria Related to Treatment of Construction Wastes’, and ‘Enhancement of Management of Hazardous/Polluting Construction Wastes’ etc.<sup>72</sup>

72. Sang Jin Song, 2009, *Research into Methods of Changing Wastes Management Laws for the Establishment of a Resource Circulating Society*.

In the 2<sup>nd</sup> Framework Plan for Construction Waste Recycling, 3 major policy pursuits and 7 major implementation tasks were planned and implemented. The 3 policy pursuits consist of ‘Reduction of Discharge’, ‘Environmental Conservation and Enhancement of Resource Circulation’, ‘Establishment of a Construction Waste Management Policy and Industrial Infrastructure’. The 7 major implementation tasks consist of ‘Enhanced Management of Classification Dismantling of Buildings and Mandatory Requirements’, ‘Reuse of Recycled Frame Materials with Consideration for Ecological Environment’, ‘Increased Reuse of Construction Wastes’, ‘Improvement of the Distribution System and Construction of Facilities’, ‘Establishment of a Unit System for Sources of Generation’, ‘Improvements to the Construction Waste Management System’, and ‘Advancements in Technology and Establishment of a Foundation for Harnessing for Growth’ etc.

#### Major Details of the Framework Plan for Construction Waste Recycling

Category	1 <sup>st</sup> Framework Plan	2 <sup>nd</sup> Framework Plan
Recycling Objectives	Conservation of national land environment and enhancement of public welfare through eco-friendly treatment of construction wastes and promotion of recycling	Establishment of an infrastructure for conservation of ecological environment and enhancement of resource circulation
Implementation Strategies	Enhancement of rate of actual recycling Reduction of generation Appropriate treatment	Reduction in discharge Environmental conservation and enhancement in resource circulation Establishment of policy infrastructure
Major Implementation Tasks	10 tasks, such as expansion of scope of constructions subject to mandatory use of recycled frame materials, etc.	15 tasks, including reinforced management of classification dismantling and mandatory requirement thereof





www.ksp.go.kr

**Ministry of Strategy and Finance, Republic of Korea**

30109, Sejong Government Complex, 477, Galmae-ro, Sejong Special Self-Governing City, Korea Tel. 82-44-215-2114 [www.mosf.go.kr](http://www.mosf.go.kr)

**KDI School of Public Policy and Management**

30149, 263 (Bangok-dong, Korea Development Institute), Namsejong-ro, Sejong-si, Korea Tel. 82-44-550-1114 [www.kdischool.ac.kr](http://www.kdischool.ac.kr)



**Knowledge Sharing Program  
Development Research and Learning Network**

- 30149, 263 (Bangok-dong, Korea Development Institute), Namsejong-ro, Sejong-si, Korea
- Tel. 82-44-550-1172
- [www.kdischool.ac.kr](http://www.kdischool.ac.kr)