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## INFORMATION NOTE

### South Korea's waste management policies

#### 1. Introduction

1.1 South Korea has been pursuing a sustainable waste management strategy since 1990s focusing on demand-side management for reducing waste generation at the source. A number of new policy measures have been introduced to reduce waste generation in the prior phase of disposal. This strategy contrasts with the waste management policies adopted before 1990s, which had been confined to expanding facilities for the post-treatment of wastes to provide a safe and clean environment. Local governments were charged with the responsibility of expanding the disposal facilities for waste treatment.

1.2 Rapid economic developments in 1990s have precipitated the change from supply-side to demand-side waste management strategy. The South Korean Government has realized that expanding waste treatment facilities could not meet the ever increasing demand for waste treatment. In particular, the shortage of sites for waste treatment facilities and soaring waste collection and disposal cost have warranted the need for controlling the demand for waste services.

1.3 With the shift of the government's policy goal from maximizing treatment facilities to minimizing wastes, responsibility for waste management is no longer merely borne by local governments. It is also shared by consumers and producers. Extended responsibility has contributed to the enhancement of people's awareness of waste management and environmental issues in the country. In 2003, the waste management policies experienced another paradigm change. The South Korean Government has expanded the policy scope to reusing wastes as an energy resource, as wastes are viewed as resources to be explored rather than as something for disposal.

1.4 Waste production in South Korea has been on the gradual decline over the past years amid the implementation of demand-side waste management. Total domestic wastes decreased from 58 118 tons/day in 1994 to 50 906 tons/day in 2009. The purpose of this information note is to provide information on South Korea's waste management policies, in terms of its basic legal framework, responsible authorities, and major policy initiatives implemented by the South Korean Government to reduce household wastes and promote recycling. It also covers waste disposal and treatment, and the development of the recycling industry in South Korea.

## 2. Legal framework

2.1 Waste management in South Korea is primarily governed by the *Wastes Control Act* enacted in 1986 and amended in 2007, and the *Act on Promotion of Saving and Recycling of Resources* enacted in 1992 and amended in 2008. There are also specific waste management laws governing the disposal of electric/electronic equipment and vehicles, construction waste recycling, installation of waste disposal facilities, and management of hazardous wastes.

### Wastes Control Act

2.2 The *Wastes Control Act* sets out the basic framework for waste management in South Korea, including classification of wastes, responsibilities of national/local governments and citizens, standards and rules for waste discharge and treatment procedures, etc. The *Act* also requires the Minister of Environment to prepare a master plan every ten years for proper management of wastes generated throughout the country.

### Act on Promotion of Saving and Recycling of Resources

2.3 The *Act on Promotion of Saving and Recycling of Resources* stipulates the framework for waste recycling such as the basic recycling plans, roles and responsibilities of enterprises and citizens for promoting waste recycling, and provisions concerning waste reduction. The *Act* also requires the Minister of Environment to formulate a basic plan for the recycling of resources every five years in consultation with relevant authorities such as the chief executives of local governments.

### Other specific legislation

2.4 The *Act on Resource Circulation of Electric and Electronic Products and Vehicles* was passed in 2007 to promote recycling of wastes from electric and electronic equipment and vehicles by stipulating the recycling obligations of manufacturers and importers of vehicles and electric goods. Construction waste recycling is regulated under the *Construction Waste Recycling Promotion Act*. Other waste management laws include (a) the *Promotion of Installation of Waste Disposal Facilities and Assistance, etc. to Adjacent Area Act* for the installation of waste disposal facilities and (b) the *Act on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal* for the management of hazardous wastes.

## **3. Responsible authorities**

3.1 The Ministry of Environment is the government agency in charge of the overall environmental policies in South Korea. It is responsible for:

- (a) enacting and amending environmental laws and regulations;
- (b) drafting and implementing mid to long-term comprehensive measures for environmental conservation;
- (c) providing administrative and financial support to local governments on policy implementation; and
- (d) setting out plans and frameworks for waste reduction, recycling, and recovery of energy through its policy branch, the Resource Recirculation Bureau.

3.2 To facilitate policy implementation, the Ministry of Environment has established various subsidiary public organizations. For example, the Korea Environment and Resources Corporation was established in 1980 to operate waste treatment facilities and provide necessary support to the green industry. In addition, the Environmental Management Corporation came into place in 1987 to conduct projects relating to the prevention of environmental pollution. Recently, the Ministry of Environment established the Korea Environment Corporation in 2010 to provide financial assistance to companies running recycling business.

#### **4. Waste reduction strategies**

4.1 The South Korean Government has introduced a number of policy initiatives to minimize waste generation, including:

- (a) Volume-based Waste Fee System applicable to households and small commercial sector;
- (b) restrictions on the use of disposable products by businesses; and
- (c) restrictions on the use of packaging materials which are difficult to recycle.

##### Volume-based Waste Fee System

4.2 Before 1995, waste collection in South Korea was charged on a fixed rate through property tax or monthly fee regardless of the volume of wastes disposed of. In 1995, the Volume-based Waste Fee System was introduced under the "producer-pays" principle requiring users or polluters to pay the disposal cost according to the quantity of wastes they produce. The "producer-pays" principle is intended to change the consumption and disposal behaviour of producers and consumers, thereby reducing wastes at the waste generation stage. The Volume-based Waste Fee System has proven to be successful in South Korea's efforts to reduce wastes. According to the Ministry of Environment, the amount of domestic wastes produced per person was reduced 23% from 1.33 kilogram per day before its introduction in 1994 to 1.03 kilogram per day in 2009.

4.3 Under the Volume-based Waste Fee System, wastes generated by households and small commercial sector<sup>1</sup> are disposed of according to the following three methods:

- (a) household wastes are discharged using standard plastic garbage bags ("VBWF bags") of various sizes purchased from local governments for collection. The cost of collection, transportation and disposal of wastes is included in the price of VBWF bags. Prices of VBWF bags are determined by local government based on the disposal cost<sup>2</sup>;
- (b) recyclables are to be separated from household wastes (referred to (a)) and placed in separate receptacles. Recyclable wastes are collected free of charge by local government or private haulers at a designated time and place; and
- (c) bulky items such as home electronics and furniture are separately discharged. Residents are required to purchase appropriate stickers from local government or private haulers and attach them to the wastes when discharging. **Table 1** shows the waste collection under the Volume-based Waste Fee System.

**Table 1 – Waste collection under Volume-based Waste Fee System**

Source	Type of wastes	Use of VBWF bag	Cost borne by source
Households & small commercial sector in urban area	Household wastes	✓	✓
	Recyclable wastes	×	×
	Bulky wastes	×	✓
	Construction/demolition debris	×	✓
	Food wastes	×	✓

Source: Ministry of Environment (2010a) and Korea Development Institute (2012)

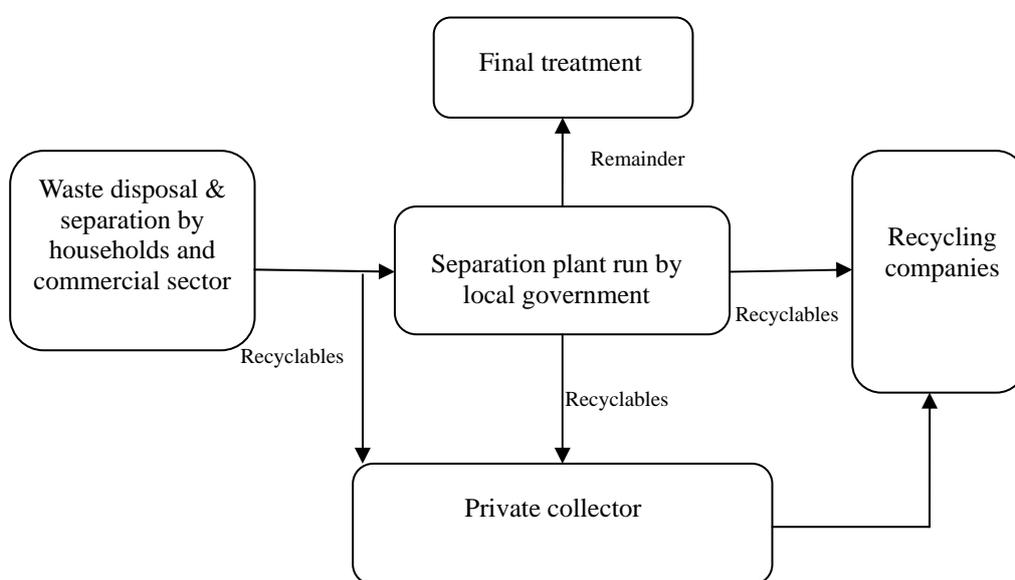
<sup>1</sup> Small commercial sector includes small businesses and office buildings. Large-scale businesses that produce more than 300 kg of wastes per day are required to arrange waste collection on their own and are not subject to obligatory use of standard garbage bags. However, they are recommended to participate in the Volume-based Waste Fee System if the wastes they generate are similar to household wastes.

<sup>2</sup> According to the *Wastes Control Act*, anyone who is found throwing away household wastes without using VBWF bags will be imposed a maximum fine of 1 million Korean won (or HK\$7,100 based on the average rate of HK\$0.0071 per Korean Won in February 2013).

## Recyclable wastes

4.4 In South Korea, recyclable materials are in principle divided into paper, can, bottle, scrap iron and plastic for collection by local governments or private companies. If it is difficult to do so due to shortage of equipment and resources, the recyclables may be divided into broader categories. In residential areas, recyclable wastes are typically separated into two to three types. **Figure 1** depicts the recyclable waste collection process.

**Figure 1 – Collection system for recyclable wastes**



Source: Korea Development Institute (2012)

## Restriction on the use of disposable products

4.5 Use of disposable products (i.e. products designed to be used only once) by businesses has been subject to the regulation of the *Act on the Promotion of Saving and Recycling of Resources* since 1994. The Act prohibits the use of disposable cups, plates, bowls, wooden chopsticks and toothpicks, and plastic tablecloths in restaurants and cafeterias, as well as restricting free distribution of disposable goods. Over the years, the South Korean Government has been expanding the list of disposal items subject to use and distribution restriction. An up-to-date list is shown in the **Table** below.

**Table 2 – Disposable items subject to use/distribution restriction**

Type of businesses	Items	Type of restriction
Restaurants and those providing group meal services	<ul style="list-style-type: none"> <li>Disposable cups, plates, containers; wooden chopsticks and toothpicks; disposable spoons, forks, knives, and plastic tablecloths.</li> </ul>	<ul style="list-style-type: none"> <li>Use.</li> </ul>
	<ul style="list-style-type: none"> <li>Disposable advertising materials.</li> </ul>	<ul style="list-style-type: none"> <li>Use, production and distribution.</li> </ul>
Public baths, lodgings with seven or more guest rooms	<ul style="list-style-type: none"> <li>Disposable razors, toothbrushes, toothpaste, shampoo and conditioner.</li> </ul>	<ul style="list-style-type: none"> <li>Free distribution.</li> </ul>
Large-scale stores such as department stores and outlets, wholesalers and retailers	<ul style="list-style-type: none"> <li>Disposable bags and shopping bags (excluding bags made of paper).</li> </ul>	<ul style="list-style-type: none"> <li>Free distribution.</li> </ul>
	<ul style="list-style-type: none"> <li>Disposable advertising materials.</li> </ul>	<ul style="list-style-type: none"> <li>Use, production and distribution.</li> </ul>
Food production & processing businesses serving instant meals; and inside of large-scale store	<ul style="list-style-type: none"> <li>Disposable synthetic resin containers.</li> </ul>	<ul style="list-style-type: none"> <li>Use.</li> </ul>
Financial, insurance, pension, security, and derivatives businesses	<ul style="list-style-type: none"> <li>Disposable advertising materials.</li> </ul>	<ul style="list-style-type: none"> <li>Use, production and distribution.</li> </ul>
Playgrounds, gyms and sports complexes	<ul style="list-style-type: none"> <li>Disposable items for cheering.</li> </ul>	<ul style="list-style-type: none"> <li>Free distribution.</li> </ul>

Source: Ministry of Environment

4.6 Inspection is conducted once a year to ensure proper use/distribution of disposal items. In the event of unlawful use of disposable products, a fine of 3 million Korean won (HK\$21,300) shall be imposed. At the initial stage, there was a lack of officers to carry out inspection and monitoring. As such, the Ministry of Environment implemented a reward system for reporting unlawful use of disposable products by citizens. To further promote reduced use of disposable plastic bags, it launched a refund system in department stores and markets in 1999 to allow customers to get a refund should they return their used plastic bags. The reward system has resulted in a remarkable reduction in the number of plastic bags sold. In recent years, the South Korean Government has also been cooperating with wholesalers and retailers to discontinue the supply of disposable plastic bags on a voluntary basis, with the aims of further reducing the use of disposable bags and promoting the use of shopping baskets.

### Restriction on the use of packaging materials

4.7 To reduce the environmental impact caused by over-packaging, the South Korean Government has put in place policy to ban the use of packaging materials that are difficult to recycle. For example, use of packaging materials which include a polyvinyl chloride ("PVC") lamination, shrink packaging or coating is not allowed. Use of packaging materials made from synthetic resins is gradually phased out based on the annual reduction target specified by the South Korean Government.

4.8 The vacant space after packaging and the number of packaging layers in a box or container are also regulated in a move to control excessive packaging. Currently, the vacant space is restricted to 10%-35% of the packaging capacity (subject to the type of products) and the number of packaging layers in a box or container is limited to two. The packaging restrictions are applicable to products such as foods, cosmetics, detergents, medicine concomitants, clothes, etc.

## **5. Waste recycling**

5.1 The South Korean Government has been promoting the 3R (Reduce, Reuse and Recycle) policy in recent years. Major policy initiatives implemented on the part of waste recycling include:

- (a) Waste Charge System (applicable to products not easy to recycle or containing hazardous materials); and
- (b) Extended Producer Responsibility System.

## Waste Charge System

5.2 Introduced in 1993, the Waste Charge System requires product manufacturers and importers to pay part of the cost for the disposal of products that are not easy to recycle or contain hazardous materials and may cause environmental problems in waste management. The Waste Charge System is intended to minimize production of non-recyclable wastes and promote efficient disposal. Items being subject to waste charges comprise containers of insecticides and toxic chemicals, antifreeze, chewing gum, disposable diapers, cigarettes and plastic products. The charge rate is based on each product's environmental impact. The waste charges for the above items are provided in **Table 3**.

**Table 3 – Waste charges on different product items**

Item	Classification	2012 charge rate
Pesticides/ toxic products	<ul style="list-style-type: none"> <li>• Plastic containers</li> <li>(a) 500ml or less</li> <li>(b) above 500ml</li> </ul>	<ul style="list-style-type: none"> <li>(a) 24.9 won (HK\$0.18)/unit</li> <li>(b) 30.7 won (HK\$0.22)/unit</li> </ul>
	<ul style="list-style-type: none"> <li>• Glass containers</li> <li>(a) 500ml or less</li> <li>(b) above 500ml</li> </ul>	<ul style="list-style-type: none"> <li>(a) 56.2 won (HK\$0.40)/unit</li> <li>(b) 84.3 won (HK\$0.60)/unit</li> </ul>
	<ul style="list-style-type: none"> <li>• Steel containers</li> <li>(a) 500ml or less</li> <li>(b) above 500ml</li> </ul>	<ul style="list-style-type: none"> <li>(a) 53.9 won (HK\$0.38)/unit</li> <li>(b) 78.2 won (HK\$0.56)/unit</li> </ul>
Antifreeze		<ul style="list-style-type: none"> <li>• 189.8 won (HK\$1.35)/litre</li> </ul>
Gum		<ul style="list-style-type: none"> <li>• 1.8% of sale/imported price</li> </ul>
Disposable diapers		<ul style="list-style-type: none"> <li>• 5.5 won (HK\$0.04)/unit</li> </ul>
Tobacco		<ul style="list-style-type: none"> <li>• 7 won (HK\$0.05)/ 20 cigarettes</li> </ul>
Plastic products	<ul style="list-style-type: none"> <li>• General plastic products</li> </ul>	<ul style="list-style-type: none"> <li>• 150 won (HK\$1.07)/kg of synthetic resin input</li> </ul>
	<ul style="list-style-type: none"> <li>• Plastics for construction (including plastic pipes and heat insulating material)</li> </ul>	<ul style="list-style-type: none"> <li>• 75 won (HK\$0.54)/kg of synthetic resin input</li> </ul>

Source: Korea Environment and Resources Corporation

5.3 The collected charges are deposited in the Special Account System for Environmental Improvement maintained by the South Korean Government for:

- (a) research and development;
- (b) support of recycling businesses and establishment of waste disposal facilities; and
- (c) purchase of recyclable materials.

#### Extended Producer Responsibility System

5.4 The Extended Producer Responsibility System ("EPR System") imposes more collection and recycling responsibilities on producers for the products they make or import. Every year, they have to meet the required recycling quota set by the Ministry of Environment. EPR System was introduced in 2003 to replace the former system, namely the Waste Deposit System, which required manufacturers to pay a deposit for the production of recyclable items, including bottles, aluminum and steel cans, glass, and polyethylene bottles<sup>3</sup>.

5.5 At the inception of EPR System, items subject to obligatory recycling were based on the items under the Waste Deposit System. More items have been added to the list in subsequent years, including audio and mobile phones in 2005; printers, copiers, and fax machines in 2006; and manganese, alkali, and nickel-metal hydride batteries in 2008. **Table 4** below shows the list of regulated items and their mandatory recycling rates.

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<sup>3</sup> Under the Waste Deposit System, the deposit was refundable to the manufacturers upon proper collection and treatment of the items. The system was however proved ineffective as most producers simply passed on the cost of the deposit to consumers through product prices rather than making efforts to collect used recyclable items and recoup the deposit. The system was therefore abolished in 2003.

**Table 4 – Mandatory recycling rates of products and packages (Year 2005 to Year 2010)**

Item		2005	2006	2007	2008	2009	2010	
(a) Metal cans	Steel cans	70.0	71.0	72.0	73.0	74.0	75.6	
	Aluminum cans	70.0	71.2	71.7	73.0	74.0	75.6	
(b) Glass bottles		67.2	68.4	70.8	72.6	73.7	75.1	
(c) Paper packaging		27.8	26.6	28.0	29.1	30.5	32.7	
(d) Plastic packaging materials	PET bottles	Sole material	69.5	70.4	71.7	73.7	74.9	76.4
		Composite material	69.5	70.4	71.7	73.7	74.9	76.4
	Styrofoam	61.3	62.9	69.0	74.8	74.8	76.0	
	Polystyrene paper	24.9	28.0	31.7	33.9	33.9	36.7	
	PVC	48.0	48.4	55.6	58.3	59.8	60.0	
	Sole material	50.2	52.8	58.5	62.8	65.3	70.2	
Composite material		36.8	38.7	41.4	43.3	47.6	51.7	
(e) Lubricants		68.7	68.7	67.6	67.7	67.7	69.2	
(f) Tires		71.8	72.0	73.7	74.8	74.8	75.4	
(g) Fluorescent light bulbs		20.9	20.7	22.5	23.1	24.0	26.1	
(h) Batteries	Mercury batteries	25.0	29.3	38.0	49.0	49.0	60.0	
	Silver oxide cells	25.0	25.0	30.9	37.0	39.0	42.4	
	Lithium batteries	24.9	29.3	38.0	49.0	52.0	57.7	
	Nickel-cadmium battery	24.6	24.6	25.7	29.1	31.0	33.3	
	Manganese dry cells/alkali manganese dry cells	-	-	-	20.0	20.5	23.6	
	Nickel-metal hydride batteries	-	-	-	25.0	25.0	28.9	
(i) Electronics products	Televisions	11.8	12.6	13.3	14.5	16.0	19.0	
	Refrigerators	14.1	16.9	17.3	18.9	20.6	22.1	
	Washing machines	21.2	23.4	24.2	25.3	26.1	27.4	
	Air conditioners	3.6	1.7	1.9	2.1	2.3	2.4	
	Personal computers	8.5	9.4	9.8	10.3	11.1	12.3	
	Stereos	10.2	12.7	13.1	14.9	15.5	17.0	
	Mobile phones	11.9	15.4	16.5	18.0	19.8	22.0	
	Printers	-	8.4	9.2	11.2	11.9	13.0	
	Copiers	-	8.4	9.4	12.7	13.3	14.2	
	Fax machines	-	8.4	9.4	11.4	12.1	13.4	

Note: (1) For items (a) to (d), mandatory recycling applies to those used for packaging food and drinks, raw commodities, detergents, cosmetics, shampoos & conditioners for pet, medical supplies, butane gas, insecticides, electric and electronic equipment buffer.

Source: Ministry of Environment (2010b)

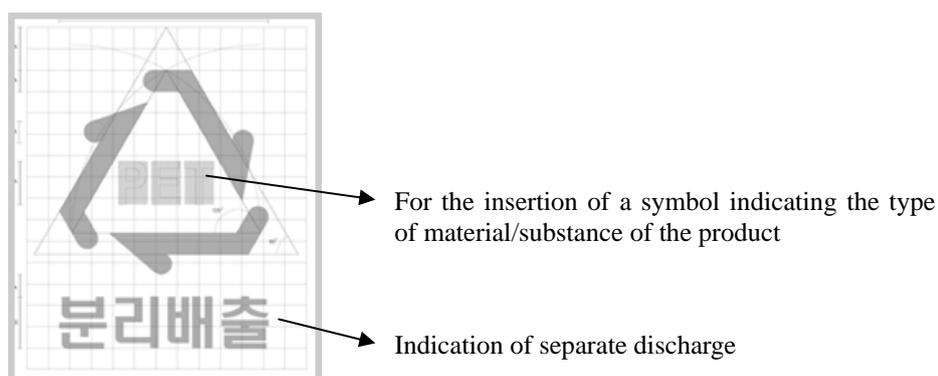
5.6 Producers subject to recycling obligations can perform their recycling obligations through:

- (a) direct recovery and recycling;
- (b) contracting out to a recycling business directly; or
- (c) joining Producers Responsible Organizations by paying joining fees<sup>4</sup>.

Producers who fail to meet their obligations are subject to standard recycling fees and surcharge<sup>5</sup>.

5.7 Along with ERP System, the Separate Discharge Mark System was introduced in 2003 requiring producers of mandatory recycling products or packages (mostly the daily necessities) to attach a separate discharge mark on their products to raise consumers' awareness for separate discharging and recycling. A mark design has to comply with the guidelines for Separate Discharge Mark issued by the Ministry of Environment. **Figure 2** shows a sample of the separate discharge mark.

**Figure 2 – Sample of a separate discharge mark**



Source: Korea Environment and Resources Corporation

<sup>4</sup> Producers Responsible Organizations are organizations authorized by the Ministry of Environment to perform recycling obligations.

<sup>5</sup> The surcharge is in the range of 15% - 30% of the standard recycling fees.

5.8 While the major obligation of recycling rests with producers, the responsibilities are also shared by all players involved in the life-cycle of the products. **Table 5** below summarizes their respective roles and responsibilities under EPR System.

**Table 5 – Role and responsibilities of different players involved in EPR System**

Players	Role and responsibilities
Producers	<ul style="list-style-type: none"> <li>• Performing the required recycling obligations.</li> </ul>
Consumers	<ul style="list-style-type: none"> <li>• Separately discharging recyclable wastes.</li> </ul>
Local government	<ul style="list-style-type: none"> <li>• Carrying out public awareness programmes for local residents; and</li> <li>• Disposing of non-recyclable wastes and collecting recyclable wastes for recycling.</li> </ul>
National government	<ul style="list-style-type: none"> <li>• Enacting and amending waste management laws;</li> <li>• Administering the system;</li> <li>• Setting mandatory recycling rates; and</li> <li>• Authorizing the establishment of Producers' Responsible Organizations.</li> </ul>
Korea Environment and Resources Corporation <sup>(1)</sup>	<ul style="list-style-type: none"> <li>• Setting overall direction regarding the EPR operation.</li> </ul>

Note: (1) The Corporation is a subsidiary organization of the Ministry of Environment entrusted with establishing resource-recycling policies including the EPR System.

Source: Korea Environment and Resources Corporation.

## 6. Food waste reduction and recycling

### Food waste reduction campaigns

6.1 Food wastes have long been a significant problem in South Korea owing to its traditional style of large number of small dishes. Food wastes do not only include throwing away cooked food but also all the food thrown away during the process from production to distribution. Over the years, the South Korean Government has launched various programmes which aim to raise the public awareness on the matter. For example, in 2010, the Ministry of Environment, in collaboration with the Ministry for Food, Agriculture, Forestry and Fisheries, and the Ministry for Health, Welfare and Family Affairs, carried out a food waste reduction project to promote food waste reduction by signing agreements with different sectors for voluntary cooperation. The sectors included restaurants, hotels, schools, rest areas in highways, etc.

6.2 Under the food waste reduction project, customized measures were devised based on the characteristics of different sectors. For example, restaurants were encouraged to use less and smaller side-dish plates and adopt eco-friendly menu; cafeterias in public institutions launched the "no-leftover day" once a week. School canteens were guided with expected food demand while service bars in rest areas on highways offered different menus for standard and small food quantities. The Ministry of Environment also cooperated with the Korea Hotel Association and the Korea Restaurant Association to promote waste reduction at the pre- and post-consumption stages.

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## Food waste collection

6.3 South Korea first started food waste recycling programmes in the 1990s. Large food waste generators (such as restaurants) are held responsible for recycling their food wastes. Households perform food waste separation for collection by local government. Collection of food wastes in residential areas has been either free or charged at a flat rate among local regions until recent years. In 2010, the South Korean Government announced the introduction of the pilot Volume-based Food Waste Fee System to 144 local regions by 2012, in a move to make residents accountable for the food wastes they generate. Under the volume-based charge scheme, households are required to pay based on the amount of food wastes they generate. Basically, local governments can choose one of the following three ways to operate the system:

- (a) standard plastic garbage bags – households should dispose of their food wastes in plastic bags that are specially designed and sold in grocery stores. The bags are distinctively coloured and come in different sizes for different prices;
- (b) chips or stickers – local government distributes food-waste bins to households. When households dispose of food wastes, they should stick a chip or sticker on the bin. When the garbage collectors empty the bins, they will remove the chip or sticker. However, the bin will not be emptied if there is no chip or sticker attached. The chips or stickers can be purchased at grocery stores; or
- (c) Radio Frequency Identification ("RFID") tags – local government prepares specially designed food-waste bins that have a magnetic card reader. Each household is given a magnetic card that contains information about them. When the households dispose of their food wastes, they touch the card reader with their card and the information about the household will be read. The weight of the wastes is then measured and the monthly data will serve as the basis for charging fees to the household<sup>6</sup>.

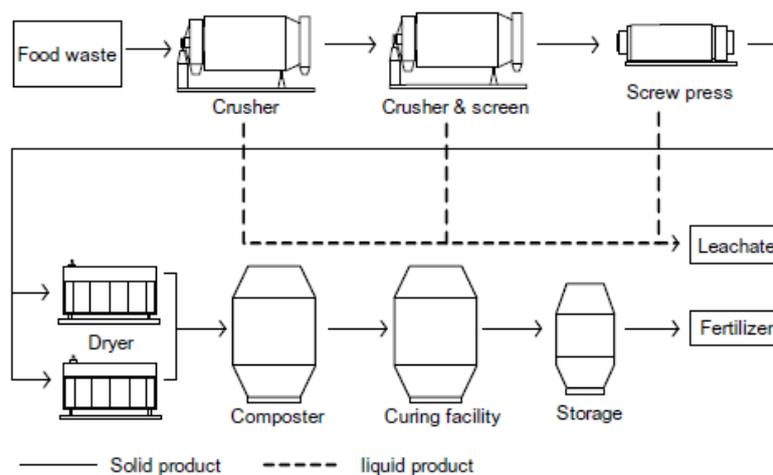
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<sup>6</sup> It was reported that seven districts in Korea had been operating the RFID-based disposal system on a trial basis as at 2010. Its use would be extended to more cities as it allows local governments to monitor and keep track of garbage disposal data. See National IT Industry Promotion Agency (2011).

## Food waste recycling

6.4 Direct landfilling of food wastes was banned in 2005. Since then, separate collection of food wastes has been launched and food waste recycling activities have been intensified. The rate of recycling food wastes increased to 95% in 2009 from 45% in 2000. To promote recycling, the government has been providing financial support for the expansion of public recycling facilities that transform food wastes into feed for poultry, compost and bio-mass. By 2013, the South Korean Government will invest a total of 782.3 billion Korean won (about HK5.6 billion) to build 17 biogas facilities and four sewage sludge drying fuel facilities that could turn 188 000 tons of organic wastes into fuels every year. **Figure 3** below depicts the recycling process of a typical recycling facility that recycles food wastes into fertilizers:

**Figure 3 – Food waste recycling process**

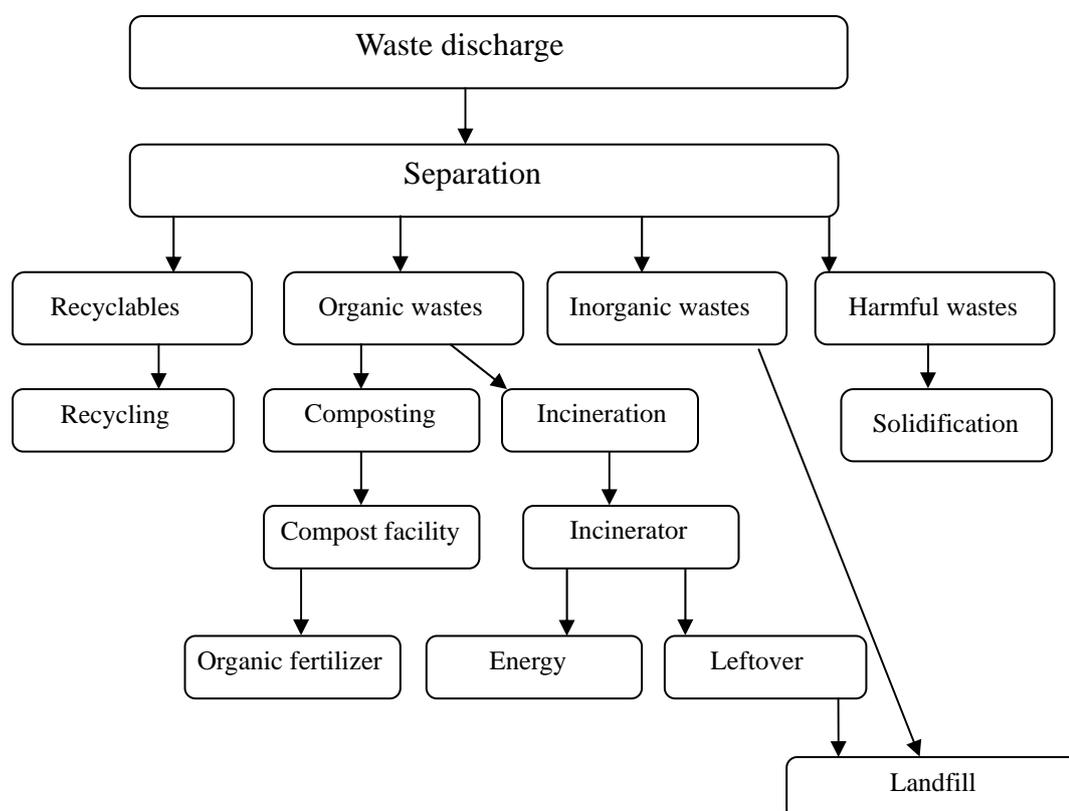


Source: D.H. Lee, S.K. Behera, J.W. Kim, and H.S. Park (2008)

## 7. Disposal and treatment of wastes

7.1 Disposal of municipal wastes (i.e. wastes other than industrial wastes) in South Korea is by way of landfilling, recycling, composting and incineration. The waste treatment process is illustrated in **Figure 4** below:

**Figure 4 – Waste treatment process**



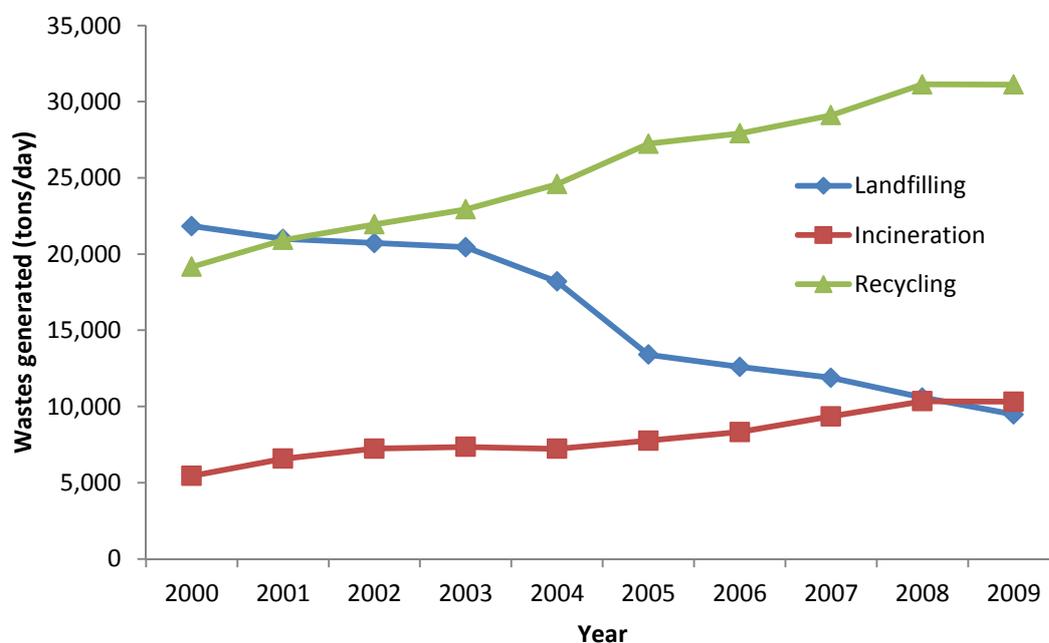
Source: Korea Development Institute (2012)

7.2 Before the introduction of the Volume-based Waste Fee System in 1995, 72.3% of the municipal wastes in South Korea were buried and only 23.7% recycled. After the implementation of the system, the recycling rates have demonstrated a distinct rising trend and landfill rates have been reducing with a general reduction in the number of landfill sites over the years (see **Table 6**). In 2009, over 60% of daily domestic wastes were treated by means of recycling (see **Figure 5**). The change reflects a desirable shift in the waste management pattern.

**Table 6 – Number of landfill sites and incineration plants in South Korea**

	No. of landfill sites	No. of incineration plants	
		Run by local governments	Run by companies
2000	383	605	9 450
2001	366	513	7 053
2002	345	489	5 120
2003	269	305	4 632
2004	252	269	3 442
2005	252	230	2 855
2006	252	201	1 815
2007	238	180	1 189
2008	300	177	823
2009	296	172	540

Source: Ministry of Environment (2012b).

**Figure 5 – Ways of disposal of domestic wastes**

Source: Ministry of Environment (2012b).

7.3 In the past, landfilling was the most common way of waste disposal. Because of the shortage of new land in the cities and growing concern of its potential environmental hazards, landfilling has no longer been the preferred means of waste disposal. According to the Ministry of Environment, over 1 000 landfill sites had been shut down. As at 2009, there were only 296 landfill sites in operation and many of them were small-scale.

7.4 In Seoul, there are four incineration facilities which are equipped with the resource-recovery system. These incineration facilities are capable of recovering heat in the process of trash burning. The heat recovered is provided to the nearby households in the form of hot water. The four incineration facilities in Seoul are located in the districts of Mapo, Nowon, Gangnam and Yangchon.

7.5 According to the Environmental Review 2011, the South Korean Government plans to further expand the waste-to-energy facilities in the nation for converting combustible waste resources into refuse-derived fuel ("RDF") and waste-to-biogas, and for collection and use of waste heat of incinerators and landfill gas. The expansion of these facilities is to convert 47% combustible wastes and 26% organic wastes for energy utilization by 2013.

7.6 Moreover, the South Korean Government has sought to build an "environmental energy town" in Sudokwon landfill site, which is to be equipped with RDF manufacturing facilities and other waste-to-energy facilities. The site is designed to operate on a self-sufficient basis through the conversion of waste resources and biomass to energy, and is expected to turn into an international environmental tourist spot after full implementation of the related facilities.

## 8. Development of the waste recycling industry

8.1 The recycling industry is the foundation of a sustainable society that uses resource-circulating. Owing to the introduction of the Volume-based Waste Fee System and the Extended Producer Responsibility System, the resource-recycling businesses in South Korea have been growing rapidly. The number of recycling companies in the nation increased rapidly from 1 647 in 1999 to 4 375 in 2009, employing a total of 52 000 people<sup>7</sup>. The government's financial support has lent particular support to the growth of the recycling industry in South Korea. The Ministry of Environment provides long-term low interest loans to small recycling businesses for the development of recycling facilities and technologies<sup>8</sup>. New recycling businesses are provided with consultations from business initiation experts to facilitate their start-up work.

8.2 As part of the green growth initiatives, the South Korean Government had allocated a total of 930 billion Korean won (around HK\$6.6 billion) for investment in projects relating to recycling of waste resources from 2009 to 2012, which was estimated to be able to create about 16 196 new jobs in the industry<sup>9</sup>. To promote the use of green products, policies are also in place to mandate the national and local governments and government-related public institutions to purchase environmentally-friendly products (including recycled products) through the enactment of the *Act on the Encouragement of Purchase of Environment-friendly Products* in 2005. Every year, the Ministry of Environment issues guidelines to public agencies when they establish and implement their purchasing plans.

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<sup>7</sup> See Energy & Climate Policy Institute (2012).

<sup>8</sup> The Ministry of Environment provides the financial support through its subsidiary organization, the Korean Environment and Resources Corporation.

<sup>9</sup> See Energy & Climate Policy Institute (2012).

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