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**SPPI for Sewerage and Waste Management Services
in Korea**

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1. Definition of services being priced

According to the ISIC 4.0, Sewerage Services include the operation of sewer systems or sewage treatment facilities that collect, treat and dispose of sewage. Waste Collection, Treatment and Disposal Services include the collection, treatment and disposal of waste materials. They also include local hauling of waste materials and the operation of materials recovery facilities.

Table 1. ISIC for the services concerned

Division	Group	Class	Description
37			Sewerage
	370	3700	Sewerage
38			Waste collection, treatment and disposal activities; materials recovery
	381		Waste collection
		3811	Collection of non-hazardous waste
		3812	Collection of hazardous waste
	382		Waste treatment and disposal
		3821	Treatment and disposal of non-hazardous waste
		3822	Treatment and disposal of hazardous waste
	383	3830	Materials recovery

2. Standard classification structure in Korea

When we compile the SPPI, we follow the Korean Standard Industrial Classification, which is based on the ISIC. The KSIC is regarded as more suitable for classifying our service industry in more detail, through reflecting our domestic circumstances.

For reference, although we use the KSIC classification for the SPPI, our classification should not be seen as industry-based but rather as closer to being commodity-based, because the output data cover all related outputs from establishments regardless of their industries of origin. We have not been considering the CPC yet.

Table 2. KSIC for the services concerned

Division	Group	Class	Subclass	Description
37				Sewage, Wastewater and Human Waste Treatment Services
	370			Sewage, Wastewater and Human Waste Treatment Services
		3701		Sewage and Wastewater Treatment Services
			37011	Sewage Treatment Services
			37012	Wastewater Treatment Services
		3702		Human and Animal Waste Treatment Services
			37021	Human Waste Treatment Services
			37022	Animal Waste Treatment Services
38				Waste Collection, Disposal and Materials Recovery
	381			Waste Collection
		3811		Non-hazardous Waste Collection
		3812		Hazardous Waste Collection
		3813		Construction and Demolition Waste Collection
	382			Waste Treatment Services
		3821		Disposal of Non-Hazardous Waste
		3822		Disposal of Hazardous Waste
		3823		Disposal of Construction and Demolition Waste
		3824		Disposal of Radioactive Waste
	383	3830		Recovery of Metal and Non-Metal Waste and Scrap
			38301	Recovery of Metal Waste and Scrap
			38302	Recovery of Non-Metal Waste and Scrap

In contrast to the ISIC, the KSIC divides the sewerage industry into Sewage & Wastewater Treatment Services and Human & Animal Waste Treatment Services. It also distinguishes construction waste and radioactive waste from non-hazardous and hazardous waste.

Our SPPI items for these services are limited to human waste and non-hazardous, hazardous and construction waste. The names of those items are “Human Waste Collection & Disposal Services” and “Business Waste Collection & Disposal Services”, respectively. More details on the pricing methods are illustrated in the following sections.

3. Market conditions and constraints

3.1 Human Waste Collection & Disposal Services

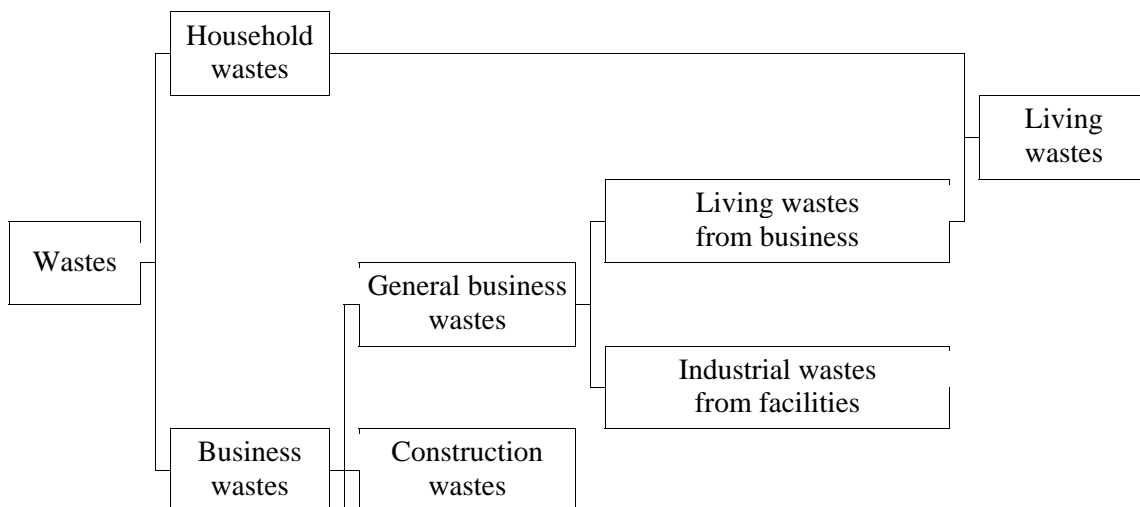
In Korea, under the 「Sewage Act」, local governments are responsible for collecting human waste. In most cases the waste treatment facilities are operated by the higher level local governments, and subordinate level local governments must pay for using them. The rates for use of these facilities are determined and published by the governments in charge of their operation, based on volume and the real costs of treatment the previous year.

Meanwhile, the local governments either directly perform or hire licensed companies to collect and transport human waste from its place of generation. In all case, the rates for collection of waste are regulated by local government ordinance. Nowadays, collecting human waste usually also means cleaning of the septic tanks and collection of the sludge generated.

3.2 Business Waste Collection & Disposal Services

In Korea, under the 「Waste Control Act」 “wastes” are subclassified into living wastes and business wastes, in accordance with their sources and volumes of generation. The types and form of hazardous wastes, which also belong to business wastes, are designated by law. In 2009, construction wastes accounted for 51.2% of non-hazardous wastes, followed by industrial wastes from facilities at 34.5%, and living wastes from households and business at 14.2%.

Chart 1. Classification of Wastes under Waste Control Act



Hazardous
wastes

For non-hazardous wastes, the rate of recycling has been rising, and reached 81.7% in 2009. Landfilling (11.1%), incineration (5.2%) and dumping at sea (2.0%) are the major methods of waste disposal. Local governments own 78% of the landfill sites nationwide and 60% of the incineration facilities.

Table 3. Non-hazardous waste disposal methods

	(Units: ton/per day, %)		
	2007	2008	2009
Landfilling	37,554 (11.2)	37,784 (10.5)	39,794 (11.1)
Incineration	17,957 (5.3)	18,709 (5.2)	18,518 (5.2)
Dumping at sea	8,086 (2.4)	6,940 (2.0)	6,992 (2.0)
Recycling	273,561 (81.1)	295,863 (82.3)	292,557 (81.7)
Total	337,158 (100.0)	359,296 (100.0)	357,861 (100.0)

About 3.3 million tons of hazardous wastes such as waste oil, waste acid, sludge and medical waste were generated in 2009. This was only 2.5% of the volume of non-hazardous wastes. 56.8% of hazardous wastes were recycled, 20.7% went to landfills, and 17.1% were incinerated.

As of 2009, the numbers of waste treatment companies under license of the government were 3,170 for business wastes including hazardous waste and 1,773 for construction wastes. These companies can carry out either some parts of or the whole process of collection and transportation, treatment and final disposal services, depending upon their licenses.

Table 4. Number of waste treatment companies

	Collection & Transportation	Treatment	Final Disposal	Total ¹⁾
Living Waste	1,121	-	-	1,121
Business Waste	2,260	880	30	3,170
Construction Waste	1,343	430	- ²⁾	1,773

Notes : 1) Some companies are double-counted under type of wastes or service stage

2) Since there is no separate regulation for final disposal licensing for construction waste, some companies engaging in these activities are counted under business waste in this table.

Depending upon the license, collection and transportation activities can include collecting wastes and transporting them to treatment facilities or to certain areas for export. Treatment activities include compression, smashing, incineration and chemical and biological treatment of wastes. Final disposal activities are disposal of wastes by means of landfilling or dumping at sea.

Prices related to waste collection, treatment and disposal are market-determined, except in the case of use of landfills owned by local governments, the rates of which are determined by regulation.

4. National accounts concepts and measurement issues related to GDP

GDP calculation also uses the KSIC for estimating industry activities, so when deflating the sewerage and waste management output in current prices it can easily apply our SPPIs.

While GDP covers all output for those services, however, our related SPPIs only cover some parts of them. In this regard, we think our current SPPIs for these services may not be sufficient to meet the demand for accurate GDP deflators.

Output of these sewerage and waste management services is usually produced by the government as well as private units. Sewerage services output in particular is produced mainly by the government in Korea, because it is directly related to public facilities managed by government budgets. Therefore, some government services are unlikely to be provided at prices that are economically significant. From this standpoint, when we consider expanding our price collecting in the future we need to review whether some prices provided by the government are appropriate for the purpose of the SPPI, which is to collect market prices from producers.

5. Pricing Methods

5.1 Human Waste Collection & Disposal services

For Human Waste Collection & Disposal Services collect the list prices of local governments or their licensed agencies for cleaning the septic tanks of houses and buildings and for transporting the sludge generated to the treatment facilities.

The fees for the cleaning of septic tanks are determined by the individual local governments' regulations. Under the current regulations, a base rate is applied for a tank up to 750 liters in size and extra rates are charged for every 100 liters exceeding that.

Currently we only collect the base rates from six major local governments. Since the required

septic tank size is regulated by law, however, depending on the number of people in the building, most buildings need larger tanks than the base size and pay additional charges. The changes in base rates and extra rates can differ, so we think it is more necessary to price the extra rates to grasp more accurate information on price movements.

We conduct a telephone survey every month on whether the regulation prices change or not, and the respondents give us the average base rates in their jurisdictions.

5.2 Business Waste Collection & Disposal Services

We are currently focusing on B2B services when we collect the prices for this index, and exclude the living wastes from households and businesses.

Our pricing method is direct use of the prices of repeated services. We collect the prices for collection, treatment and disposal services for general business wastes, construction wastes and some hazardous wastes, and the prices are based on the actual contracts among companies in the months concerned.

For non-hazardous wastes, we collect the contract prices for collection, treatment and disposal services per ton or cubic meter(m³) of sludge, waste synthetic resins, waste synthetic fiber, dust, slag and construction wastes. Together, they account for a large part of non-hazardous wastes. Similarly, we collect the contract prices for these services for waste oil, waste synthetic fiber and waste synthetic resins for hazardous wastes.

We tried at first to collect the prices for each process stage. We found, however, that in most cases it is impossible to do so since the contracts usually include all of the stages together or connected process stages. We are currently therefore just trying to collect the prices consistent with the same standard. The survey is conducted every month, by email and phone.

We have randomly selected seven large and sustainable companies as our price respondents. (Information on companies running this business can be obtained from the 「Yearbook for National Waste Generation and Disposal」, issued by Ministry of Environment, and from other materials published by associations of companies in this industry.)

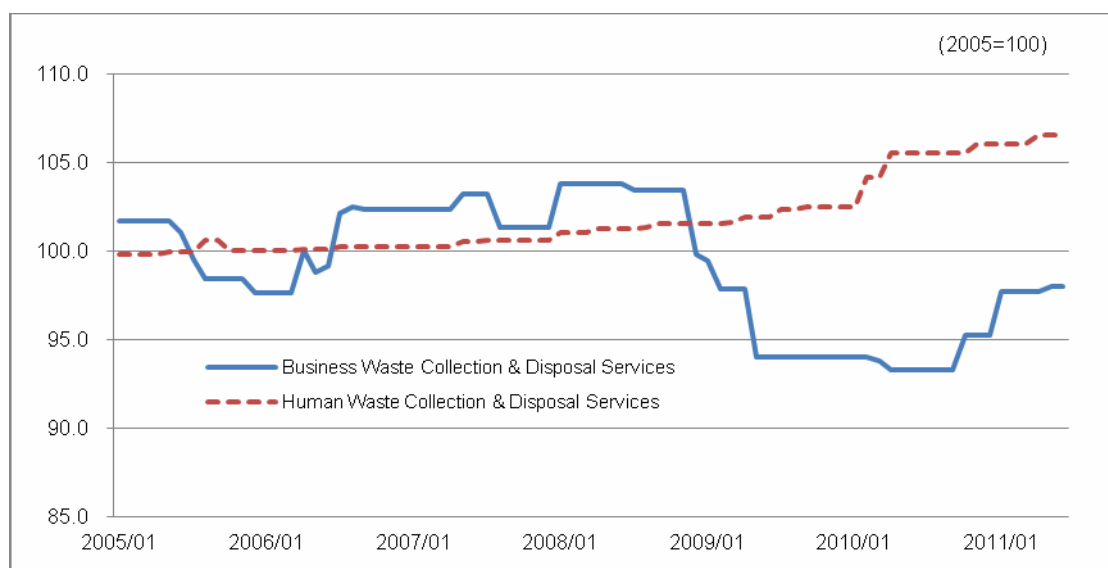
We can also survey the list prices for landfilling from the website of the ‘SUDOKWON Landfill Site Management Corporation’, a government agency whose capacity covers about 68% of the national landfill sites. Its list prices per ton, by waste type, are determined by regulation.

6. Development of SPPIs

“Human Waste Collection & Disposal Services” has shown a pattern of only moderate price increase, as its prices are controlled by regulation.

The index of “Business Waste Collection & Disposal Services” has shown huge fluctuations during recent years. Especially, it plunged from the latter part of 2008 to the first half of 2009, due to the economic downturn and to growing competition as the result of mitigation of the licensing requirement for this service. It then started to increase from the second half of 2010 again, after the government implemented the revised 「Waste Control Act」 that tightened the waste management criteria for companies in all industries.

Chart 2. Trends of SPPIs in sewerage and waste management services



7. Summary

Korea currently compiles two indexes for waste and sewerage management services. “Human Waste Collection & Disposal Services” collects the prices for cleaning of septic tanks and collecting the sludge generated. This index is not concerned with the activities for treatment of that sludge at this moment. “Business Waste Collection & Disposal Services” collects the prices for collection, treatment and disposal of various forms of non-hazardous and some hazardous wastes.

In comparison to GDP, our pricing is limited to some parts of this industry. Therefore, to improve the balance between our coverage and the output in GDP we need to expand our price collection to other activities in this industry and compile our SPPI in more detail.

