

Fig. 1: The Flow of the Legislative System Relating to Recycling in Korea

Waste Treatment Charge System [3]

This charge system was established to curb consumption of products and containers which are difficult to collect, treat, or recycle, or likely to render waste management generally difficult. It imposes charges on firms that produce these types of products.

Charges are imposed on firms of nine business types producing 15 items. These items, include containers for insecticides or toxic substances. Firms manufacturing or importing products, materials, or containers for export purposes will be exempt from the charges, however.

Korea Environment & Resources Corporation (Envico) [4]

ENVICO was established by Korean Government in September 11, 1980. The philosophy of ENVICO is contributing the environmental conservation through volume reduction and recycling of the wastes. At the very beginning, the major mission was collection of rural plastic films and the empty pesticide bottles. As of April, 1996, ENVICO has 82 regional points. Also 10 intermediate sorting plants for commingled plastics wastes as well as 4 recycling plants for HDPE from rural area. ENVICO has many activities that support the domestic recycling industry by both developing technologies and financing. Although ENVICO was initiated by waste management law at the beginning, independent ENVICO law was established in December 27, 1993. From January 2003, ENVICO operates the EPR system such as i) Decision on the total mandatory recycling amounts by item, ii) Decision on the mandatory recycling amounts by produce, iii) Performance of the recycling responsibilities.

Volume-Based Charge System for Household Wasted

This system came into force across the country on January 1, 1995. It does not apply to burnt coal briquettes, recyclable wastes or home appliances such as discarded refrigerators. The system was launched in order to reduce the volume of household and small business wastes and encourage

recycling. As of the April 1995, 99% of all household wastes were being discarded in the officially designated plastic trash bags. The system has led to a 37% reduction in the volume of household wastes and a 40% rise in the volume of recycled wastes.

Extended Producer Responsibility System (Eprs) [5]

Under the Producer Deposit System of 1992, producers of home appliances, tires, lubricants, batteries, paper goods, and metal cans paid a certain deposit to the government, and received refunds proportional to the deposit when they recycled their products and product waste. This system, however, was limited in promoting recycling because it did not place enough recycling responsibility directly on the producers.

To further encourage recycling, the government will implement the Extended Producer Responsibility System(EPRS) starting January 1, 2003, which will impose waste recycling obligations on producers or importers of high waste-generating products and packaging materials.

The government sets the amount of waste that must be recycled by each producer of goods and packaging materials, taking into account the collection of recyclable resources and other recycling conditions, and the producers must reach their recycling target.

According to the system, producers must recycle home appliances like televisions, refrigerators, and washing machines, tires, lubricants, fluorescent lights(F.L.), and packaging materials such as cans, glass bottles, and plastic bottles.

WASTE GENERATION [6]

Waste Generation

Solid waste can be classified into either industrial or household wastes as shown in figure 2. However, the law defines waste as general or specified, depending on the characteristics and the hazards it poses.

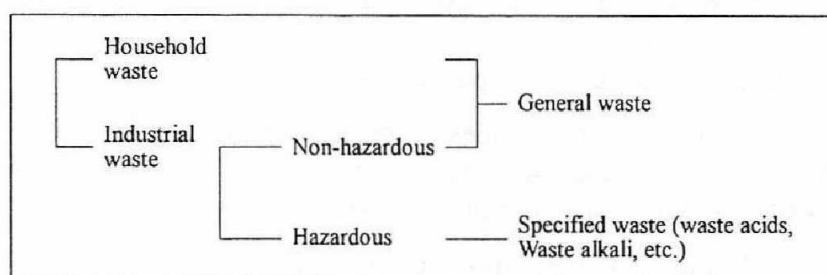


Fig. 2: Classification of Waste

Needless to say, specified waste, or hazardous waste, is subject to more rigorous control in regards to collection, transport, storage, and treatment.

During the last 20 years, there has been a rapid increase by 8% annually in the amount of wastes generated in Korea. Approximately 303,000tons/day wastes were generated in 2003 : 50,700tons/day of household waste and 252,300tons/day of industrial waste as shown in table 1. General wastes from industrial wastes are largely composed of slags, construction debris and sludge and the percentage of non-combustible waste is very high, which is shown in table 2.

Waste Recycling

In general, the waste generated is treated with methods of reclamation, incineration and recycling. Korea still depends mostly on the reclamation although incineration and recycling portions increase gradually. In Korea, the recycling of industrial waste reaches 75.8% because industrial waste can be used as raw materials for other products. However, only 43.1% of the household waste in 2001 was

recovered and re-utilized due to the problems of collection, sorting and recycling systems. Waste disposal by processing method in 2003 is shown in figure 3.

Table 1: Waste Generation by Type and Source in Korea

(Unit : Thousand Ton / Day)

Year		'96	'97	'98	'99	2000	2001	2002	2003	Remarks (1,000tons/ year(2003))
Classification										
Grand Total		180.8	194.7	188.6	219.4	234.1	260.4	277.5	303.	110,595
Household		49.9	47.9	44.6	45.6	46.4	48.4	49.9	50.7	18,505
Industrial Waste	Sub Total	130.9	146.8	144.0	173.8	187.9	212.0	227.6	252.3	92,090
	General	125.4	141.3	138.7	166.1	180.2	204.4	219.6	244.3	89,170
	Specified	5.5	6.1	5.3	7.7	7.6	8.1	8.0	8.0	2,956

Table 2: Composition of Industrial General Waste

(Unit : 1,000tons)

General waste	2002	
	Generation	Rate
Slags	9,571	11.9%
Incineration residue and dust	6,703	8.4%
Metal and glass	1,143	1.4%
Construction debris	43,851	54.7%
Waste paper, Waste wood	550	0.7%
Sludges	10,261	12.8%
Waste lime, Waste gypsum	1,756	2.2%
Waste synthetic high Polymer Compound	1,705	2.1%
Waste sand	1,337	1.7%
Waste body of animal and plant	783	1.0%
Others	2,512	3.1%
Total	80,172	100%

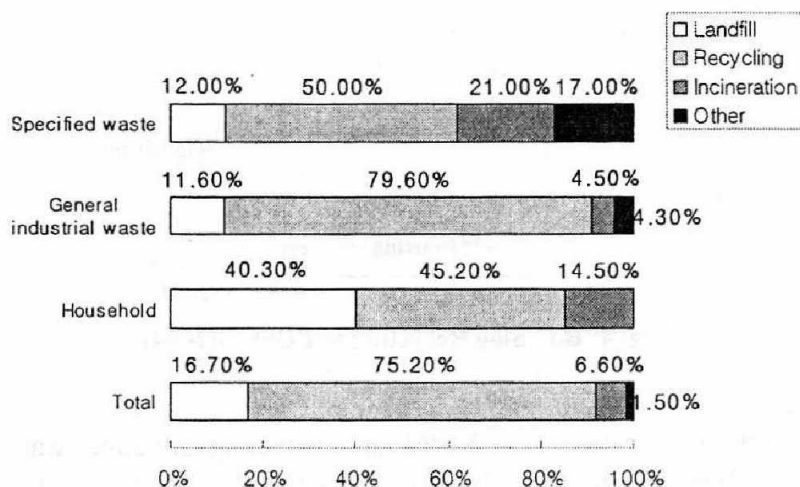


Fig. 3: Methods of Waste Treatment (2003)

RECYCLING OF INDUSTRIAL WASTE

Waste Recycling in POSCO [7]

With the completion of the 5th Blast furnace of Kwangyang Works in 1999, it is anticipated that approximately 16 million tons of wastes will be generated both in Pohang and in Kwangyang Works of POSCO annually. By vigorous activities, POSCO's waste recycling rate reached to about 98% in 2004 from the 40% in early 1980's. Table 3 shows the wastes recycling in POSCO in 2004. A large portion of them is processed for re-utilization as resource for out house use. Utilization of Blast furnace slag in POSCO in 2004 is shown in figure 4.

Table 3: Waste Recycling in POSCO(2004)

(Unit : Ton)

	Generation	Recycling			Recycling Rate 2002	Land fill	Incineration
		In-house Use	Others(Out-house use)	Total			
B.F. Slag	Granulated	7,109	-	7,109	100.0%	0	0
	Air cooled	1,490	21	1,469	100.0%	0	0
Steel slag		5,184	1,625	3,559	5,184	100.0%	0
Dust		1,422	1,189	183	1,372	96.5%	50
Sludge		1,493	720	643	1,363	91.3%	111
Waste oil		11	1	6	7	64.1%	0
Iron oxides		61	1	61	61	100.0%	0
Scale		543	543	0	543	100.0%	0
Waste brick		257	85	172	257	100.0%	0
Other		845	59	746	805	95.3%	29
Total		18,416	4,245	13,947	18,192	98.8%	190

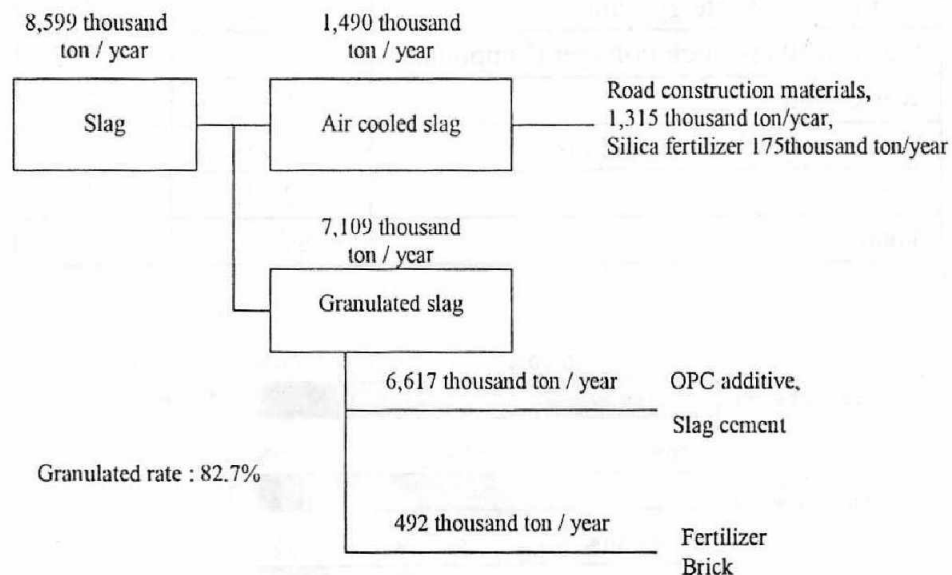


Fig. 4: B.F. Slag Recycling in POSCO(2004)

Fly Ash [8]

Fly ash generation from power plants in Korea and recycling situation was shown in table 4. Recycling rate was 65.3percent in 2004. Mostly, the finer size fly ash which is low content of unburned carbon from bituminous coal were recycled as concrete additive.

Table 5: The Number of Scrapped Vehicles in Korea

(Unit : Number)

Year	No. of vehicles registered	No. of E.L.V. scrapped	No. of E.L.V. abandoned	No. of dismantler
1993	6,274,008	308,252	31,623	86
1994	7,404,347	352,582	26,997	104
1995	8,468,901	406,055	27,514	141
1996	9,553,092	489,178	32,453	160
1997	10,413,427	585,641	19,411	185
1998	10,469,599	562,168	45,934	227
1999	11,164,319	456,191	52,524	259
2000	12,059,861	455,592	59,180	277
2001	12,914,115	461,621	45,969	291
2002	13,949,440	462,996	37,952	300
2003	14,586,795	549,250	59,263	310
2004	14,934,092	509,308	56,659	324

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