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Extended Producer Responsibility (EPR)

CONTENTS

Summary

The Korean government introduced its "Extended Producer Responsibility" (EPR) system in 2000 that strengthened producers' responsibility from the production stage up to collection and recycling.

EPR system is applied to four packaging materials (paper packaging, glass bottles, metal cans, and plastic packaging), lubricants, tires, fluorescent light bulbs, batteries and electronic products.

Performance rates of four major packaging materials for recycling obligations were exceeding 100% annually. With the expansion of EPR items subject to recycling and the establishment of recovery/recycling systems, the quantity of recycled items has increased approximately 46% since the commencement of enforcement. In addition, with the enforcement of EPR (2001-2008) total energy reductions amounted to 3,196,000 TOE, or approximately 2.6 trillion won in electricity costs.

Currently, the government is reviewing the establishment of per capita recycling goals as enforced in the EU in consideration of the characteristics of each recyclable item.

Ministry of Environment · Korea Environment Institute, Republic of Korea

Ⅰ. Background

Since the 1990s, Korean government has increasingly focused on waste reduction and recycling to address the growing amount of waste produced from its mass production and consumption oriented society. Such efforts resulted in the introduction of various policy initiatives, including the "waste separation & collection system" (1991), the "waste deposit and refund system" (1993), and the "volume based waste disposal system" (1995). The waste deposit and refund system introduced in the 1990s imposed deposit fees on producers for waste items, on the assumption that 100% of all products shipped would be collected and recycled, and producers would then be able to recover their deposit. However, in practice the system lacked effectiveness, as recovery of deposits was low. In the 2000s, policy goals and enforcement plans were devised to build a basis for a resource circulating society through increased reduction and recycling of waste. To effectively enforce such plans and reach the associated policy goals, a more active role for producers was required.

As the world faced increasing environmental crises, including climate change and diminishing resources and energy supplies, governments increasingly saw a need to shift from a post facto system that focused on waste treatment, to a resource circulation system that connected the entire life cycle of products, from production and consumption, to recycling. Accordingly, it became necessary to increase responsibility for businesses from the production stage onwards to promote recycling. To this end, the Korean government introduced its "Extended Producer Responsibility" (EPR) system in 2000 that strengthened producers' responsibility from the production stage up to collection and recycling.

Ⅱ. Main contents

1. Items subject to recycling

Packaging materials subject to the EPR system include paper packaging, glass bottles, metal cans, and plastic packaging, while producers subject to recycling obligations include all producers or importers of products that use packaging, i.e. the producers of the items inside the packaging in question (cf. Table 1). As it is difficult to evenly distribute responsibilities among producers in the market, the main entity responsible for the products in question is designated as subject to recycling obligations. However in cases where many small scale unspecified producers exist, e.g. for containers for agricultural, marine, and livestock products, the producer of the packaging is made subject to recycling obligations (2008 Environmental White Paper, Ministry of Environment, p.557). Items subject to the EPR system are based on the items subject to recycling under the previous deposit and refund system, with new items

determined and added as needed. Audio equipment and mobile phones were added to the list in 2005, printers, copiers, and fax machines were added in 2006, and manganese, alkali, and nickel-metal hydride batteries were added in 2008.

Table 1: Items and producers subject to recycling obligations (2010)

Items subject to recycling obligations (Total 24 items)	- Products: Tires, batteries (7 types), fluorescent light bulbs, lubricants, electronics products (10 types) - Packaging: paper packaging, glass bottles, metal cans, plastic (PET, PVC, PE, PP, PS, PSP containers/packing material, styrofoam buffer material) - Styrofoam packing material used as packing filler for electronic products - Styrofoam boxes for packaging agricultural, marine, and livestock products (limited to packaging for food and beverages, agricultural, marine, and livestock products, and medical products)
Producers subject to recycling obligations	- Products: Products from all businesses regardless of scale of manufacturing or import - Packaging materials: Packaging for products from manufacturers whose annual revenue exceeds one billion won, or from importers whose annual imports exceed 300 million won - Other systems exist that support the EPR system, including the separate disposal identification system, the empty container deposit and refund system, and obligations on sellers for collection of discarded products at no charge

Source: Korea Environment Corporation (KECO)

2. Recycling obligations

The producers subject to recycling obligations can perform their recycling obligations through (1) direct recovery and recycling, (2) contracting of recycling to a recycling business, or (3) through the Korea Waste Recycling Mutual Aid Association (KWRMAA). At present most producers pay recycling fees to the Association, which remits recycling expenses to recycling firms to fulfill the obligations of its members. Annual recycling obligations are imposed on packing filler for products with respect to the four major packaging materials, and recycling obligations rates are imposed based on the amount of recyclables received versus shipment quantities. Recycling obligation rates are publicly disclosed every year, and are assessed in consideration of the annual quantity shipped, the quantity separated and collected, and recycling results, etc. Producers that fail to meet their obligations are subject to recycling fees, which are imposed within a scope of 130% of the actual recycling expenses (i.e. standard recycling expenses). Producers that exceed their obligations can "bank" their results for up to two years.

Recycling obligation rates by packing materials for 2010, were in descending order: Polyethylene Terephtalate (PET) bottles, at 76.4%, styrofoam at 76.0%, metal cans 75.6%, and glass bottles at 75.1%.

Table 2: Recycling obligation rates & long term recycling goals by year and product/packaging material

Item			Long term recycling goals (2012)	2005	2006	2007	2008	2009	2010
Metal Cans	Steel cans		78.6	70	71	72	73	74	75.6
	Aluminum cans		78.6	70	71.2	71.7	73	74	75.6
Glass bottles			77.8	67.2	68.4	70.8	72.6	73.7	75.1
Paper packaging			36	27.8	26.6	28	29.1	30.5	32.7
Plastic packaging materials	PET bottles	Sole material	80.6	69.5	70.4	71.7	73.7	74.9	76.4
		Composite material	80.6	69.5	70.4	71.7	73.7	74.9	76.4
	Styrofoam		78.1	61.3	62.9	69	74.8	74.8	76
	Polystyrene paper		42.3	24.9	28	31.7	33.9	33.9	36.7
	Polyvinyl chloride (PVC)		66.4	48	48.4	55.6	58.3	59.8	60
	Sole material		80	50.2	52.8	58.5	62.8	65.3	70.2
	Composite material		60	36.8	38.7	41.4	43.3	47.6	51.7
Lubricants			72.2	68.7	68.7	67.6	67.7	67.7	69.2
Tires			76.2	71.8	72	73.7	74.8	74.8	75.4
Fluorescent light bulbs			30	20.9	20.7	22.5	23.1	24	26.1
Batteries	Mercury batteries		60	25	29.3	38	49	49	60
	Silver oxide cells		56	25	25	30.9	37	39	42.4
	Lithium batteries		65	24.9	29.3	38	49	52	57.7
	Nickel-cadmium battery		40	24.6	24.6	25.7	29.1	31	33.3
	Manganese dry cells/alkali manganese dry cells		30	-	-	-	20	20.5	23.6
	Nickel-metal hydride batteries		30	-	-	-	25	25	28.9
Electronics products	Televisions 21		11.8	12.6	13.3	14.5	16	19	
	Refrigerators		25	14.1	16.9	17.3	18.9	20.6	22.1
	Washing machines		30	21.2	23.4	24.2	25.3	26.1	27.4
	Air conditioners		2.6	3.6	1.7	1.9	2.1	2.3	2.4
	Personal computers		14	8.5	9.4	9.8	10.3	11.1	12.3
	Stereos		20	10.2	12.7	13.1	14.9	15.5	17
	Mobile phones		25	11.9	15.4	16.5	18	19.8	22
	Printers		15	-	8.4	9.2	11.2	11.9	13
	Copiers		15	-	8.4	9.4	12.7	13.3	14.2
	Fax machines		15	-	8.4	9.4	11.4	12.1	13.4

Source: Ministry of Environment Notice No. 2006 - 219, Ministry of Environment Notification No. 2009 - 283, Ministry of Environment Homepage
(http://www.me.go.kr/kor/info/info_view.jsp/gubun=3&code=A60402&inpymd=20100610183055)

Ⅲ. Results of the EPR system

Korea lacks natural resources, and most energy and metals are imported from abroad (more than 95%). Accordingly, if discarded resources are recycled, Korea can simultaneously attain two goals, resource savings and environmental preservation. With the enforcement of EPR, Korea has been able to reduce the use of raw materials and replace the use of natural resources by recycling discarded products that would have otherwise been incinerated or landfilled. For example, one ton of ore contains only 5g of gold, while one ton of discarded mobile phones contains 400g of gold, 3kg of silver, and 100kg of copper.

1. Increased Recycling

Four packaging materials (paper packaging, glass bottles, metal cans, and plastic packaging) have been the major items subject to recycling under the EPR system since 2003. Performance rates for recycling obligations were 100% in 2003, 104% in 2004, 123% in 2006, 115% in 2007, and 113% in 2008, with results exceeding 100% annually. Recycling rates vis-á-vis shipment of packaging materials fluctuated significantly year-on-year, with 64.2% recycled in 2003, and 73.2% in 2008, with an overall tendency towards increased recycling, and generally high rates of recycling. The quantity of packaging materials increased from 642,000 tons per year in 2003 to 853,000 tons per year in 2005 (plastic films were added in 2004), before increasing to 804,000 tons per year in 2006, 867,000 tons per year in 2007, and 865,000 tons per year in 2008; showing strong increases until 2005, and maintaining similar levels thereafter.

Figure 1: Trends in recycling of packaging waste (EPR Results)

(Unit: 1,000 tons, year, percent)

	2003	2004	2005	2006	2007	2008
Shipment quantity	1,000	1,180	1,188	1,172	1,197	1,173
Results	642	701	853	804	867	865
Recycling rate	64.2%	59.4%	71.8%	68.6%	72.4%	73.7%

Source: Korea Environment Corporation, internal data, 2010

2. Reduction of use of raw materials and replacement of natural resources

With the expansion of EPR items subject to recycling and the establishment of recovery/recycling systems, the quantity of recycled items has increased approximately 46% since the commencement of enforcement (from 928,000 tons in 2001 to 1,368,000 tons in 2008). Per capita recycling for electronic products has increased approximately 3 times (from 0.72kg in 2001 to 2.3kg in 2008). For packaging materials such as PET, glass bottles, metal cans, and styrofoam, recycling is now near 80% (2008: PET: 80%, metal cans: 78%, glass bottles: 76%) due to the introduction of a collection and transportation system and the development of recycling technologies. Recycling of batteries (primary cells, nickel-metal hydride batteries etc.) increased 2.5 times since their inclusion in the EPR system, which allowed extraction of valuable metals whose value amounted to more than 20 billion Won per year of import substitution. Previously all plastic film was incinerated or landfilled; however, since the inclusion of plastic film in the EPR system in 2004, 75% of total production has been recycled. Altogether, the recycling of ERP items enabled the creation of approximately 1.7 trillion won of value -added, while saving processing expenses (i.e. opportunity costs) of approximately 1.9 trillion Won for incineration and landfilling.

3. Environmental improvements for products

Since the enforcement of the EPR system, the production of environmentally friendly products by businesses has greatly expanded. The number of products with environmental certifications has increased approximately 18 times (from 326 products in 2001 to 6,005 products in 2008), while products certified as "Good Recycled" (GR) increased by approximately 48% from 166 products in 2001 to 245 products in 2008.

4. Building a foundation for the recycling industry

Recycling infrastructure has expanded with the establishment of five regional Home Appliances Recycling Centers (1998-2008), "refuse plastic fuel" (RPF) Facilities (2003), and mutual aid association recycling facilities like metal can recycling worksites (2001-2008). A system for activating recycling was also devised by operation of recycling project mutual aid associations (total 11 locations). The foundation of mutual aid associations for each item in particular allowed

Figure 2:

Environmentally friendly certification mark, environmental certificate	Good Recycled Product (GR) Certification
	
- Official approval as a product that consumes the minimum amount of resources & energy and discharges the lowest amount of pollutants during production	- GR (Good Recycled Product): Government certification of product quality and environmental friendliness as a recycled product

control of excessive competition between small recycling businesses, while improving the quality of recyclables and increasing transparency in the recycling market. Furthermore, continuous support, including expansion of the scale of recycling support funds (from 29.3 billion in 2001 to 43.9 billion in 2008) to recycling businesses, allowed the number of recycling firms to grow (from 418 in 2001 to 550 in 2008). At the same time the recycling industry has been gradually activated and the scale of the recycling market has grown through the provision of long-term low interest loans for development of recycling facilities and technologies, (1994- 827.3 billion Won already invested), and the pursuit of government-sponsored recycling related R&D projects (2000-2010, 47.2 billion won).

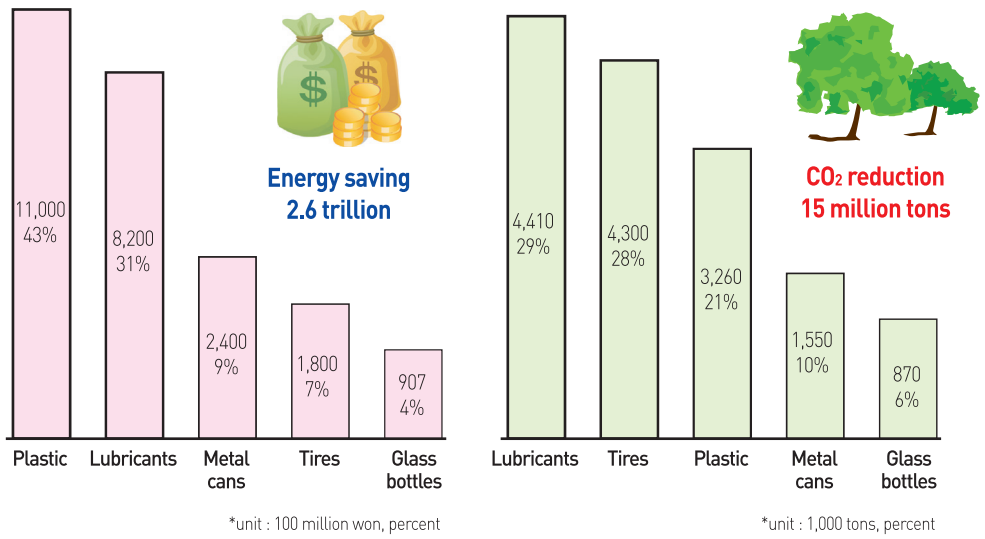
In addition, the distribution of collection boxes at housing complexes nationwide (Paper Pack Association, 2009), and the building of joint transportation systems between local governments and associations (Battery Association, 2008-) has contributed to the activation of the collection/transportation system, as well as the promotion of research projects on recycling (2001-2008, approximately 2 billion won). The creation and operation of associations of producers and recycling firms has greatly contributed to activation of recycling systems.

5. Energy savings and greenhouse gas reduction

With the enforcement of EPR (2001-2008) total energy reductions amounted to 3,196,000 TOE, or approximately 2.6 trillion won in electricity costs. By Item, packaging materials (paper packaging, glass bottles, metal cans, and plastic) accounted for 63% of the total, implying that separation of recyclables is a short cut to energy savings. Among the products recycled, lubricants account for 31%, and these have higher value and strong energy saving effects. Furthermore, the reduction of items with a high thermal recycling weight, such as lubricants and tires, was more than 50%, while high recycling of plastic resulted in a 21%

reduction in production. With the enforcement of the EPR system approximately 15,240,000 tons of greenhouse gas reduction was attained, corresponding to the carbon absorbed by a 30 year old pine forest with an area of 2267ha (1920 times the area of Seoul' s Yeouido) for a year.

Figure 3: Effects of enforcement of the EPR System



Source: Ministry of Environment, Internal Data, EPR Result Appraisal, 2010

Ⅳ. Future Plans

10 years after the introduction of the EPR

1. EPR items subject to recycling