

**Fourth Regional 3R Forum in Asia**

“3Rs in the Context of Rio+20 Outcomes – The Future We Want”

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# **Country Analysis Paper**

**(Draft)**

**< Republic of Korea >**

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This country analysis paper was prepared by Republic of Korea as an input for the Fourth Regional 3R Forum in Asia. The views expressed herein do not necessarily reflect the views of the United Nations.

### **1. Major initiatives and achievements in the areas of 3R policies, programmes, and institutional measures**

#### **A. Reduce**

##### **1) Volume-Based Waste Fee System (1995)**

Volume-Based Waste Fee System (Unit Pricing System) was introduced to impose waste disposal cost on waste generators to reduce the amount of waste discarded and to promote separate discharge of recyclable waste. With the system, per capita waste generation dropped from 1.33kg/capita/day in 1994 to 0.95kg/capita/day in 2011. The amount of waste buried in landfill or incinerated decreased from 84.6% in 1994 to 16.3% in 2011 while amount of recycled waste has double increased from 2000 to 2011. During the period, the net recycling rate rose from 15.4% in 1994 to 83% in 2011 and the landfill rate drastically fell from 81.1% to 9.4%.

##### **2) Waste Charge System (1993)**

'Waste Charge System' imposes the expenses incurred from the treatment of end of life products that are hard to recycle or that contain hazardous chemicals on the manufacturers or importers thereof. Products falling under the category are pesticide, hazardous chemicals, anti-freezing solution, chewing gum, disposable diapers, cigarettes, and plastic products that are not subject to Extended Producer Responsibility system.

##### **3) Packaging Waste Reduction (2003)**

The ratio of empty space to the total packaging volume and the number of packing layers are under control. Product items subject to the regulation are food stuffs, cosmetics, detergent, toys, stationary, quasi-drugs, clothes, and other miscellaneous products.

##### **4) Control over the Use of Disposable Goods (1994)**

This is to regulate the use of disposable goods at department stores, restaurants, public baths and other distribution and consumption sectors and to encourage the use of multiple-use products and shopping baskets. Products under control include disposable cups, plates, containers, razors, tooth brushes, tooth paste, hair shampoo, hair conditioner, plastic bags, and plastic film table covers.

##### **5) Food Waste Reduction (1994)**

A nation-wide campaign for 'Food Table with Less Waste' was introduced in 1992, and a mandatory reduction quota has been imposed on restaurants since 1994. Beginning from January 2005, direct landfill of food waste has been banned and separating food waste at source has been implemented. Starting from 2013, volume or weight based food waste fee system is widely being introduced across the country.

## **6) Industrial Waste Reduction (1997)**

Enterprises generating a large volume of industrial waste are being analyzed and evaluated by the waste reduction achievement or the action plans to reduce waste. Enterprises with good performance are granted with incentives, while those with poor records are provided with training programs. This policy has been applied to companies putting out more than 100kg/day of controlled or hazardous wastes or 300kg/day of municipal waste, and 5 tons of constructional waste.

### **B. Reuse**

'Deposit refund system for glass bottles' was introduced in 1993, and the system levies refundable deposit on consumers to promote empty bottle collection. 95% of empty bottles are being returned to the retailers and the bottles are carried to the manufacturers to be reused. Liquor or soft drink glass bottles are subject to the system

### **C. Recycle**

#### **1) Extended Producer Responsibility (EPR) System (2003)**

The extended producer responsibility system has been in operation since 2003 to enhance the recycling of electronic products, packaging materials, tires, lubricant and other recyclable products. Manufacturers or importers of the items are responsible to recycle annually announced amount of end of use products and packages. Recycling rate is announced by the Ministry of Environment (for ELV, the ratio is prescribed in the Presidential Decree, more than 85% of weight of vehicle until 2014, 95% after 2015). Failure to achieve announced recycling ratio leads to charge of up to 30% more than the cost for recycling un-recycled amount. Manufacturers may establish fraternal association to perform their responsibility, and 11 associations are carrying out 88% of obliged recycling ratio. The system is being reviewed to cover more items and differentiate financial support to the recycling industries according to the quality of recycled materials.

#### **2) Construction Waste Recycling System (2005)**

The 'Act on the Promotion of Construction Waste Recycling' was enacted in December 2003 and went into effect in January 2005. The Act was prepared to promote the environment-friendly treatment, recycling and the use of construction wastes. Construction projects subject to mandatory use of recycled aggregates are road expansion of more than 4km, establishment of industrial park of more than 150 thousand km<sup>2</sup>, construction of sewage treatment facilities and so on.

#### **3) Separate Discharge Label System (2003)**

With the EPR system in effect, the 'Separate Discharge Label system was introduced to help consumers easily recognize recyclables and discard them separately. Producers of mandatory recycling products or packages are obliged to attach a separate discharge label on their products.

#### **4) Recycled Products Quality Certification (1997) was introduced to stimulate the demand for**

recycled goods by informing consumers of the quality of recycled goods.

**5) Public Procurement of Recycled Products (1992)**, as a part of 'Green procurement in Public Organizations', encourages public organizations to purchase recycled goods.

## **2. Major initiatives and achievements in promoting 3R technologies and infrastructure development**

### **1) Encouraging thermal recovery from waste**

Enforcement decree of the Waste Management Act specifies method and procedure of thermal recovery from waste including mixed plastics and packaging film. To facilitate waste to energy policy, Republic of Korea plans to establish 90 facilities to recover energy from waste by 2014. The facilities will be comprised of 48 facilities for energy recovery from burnable and organic waste, 17 facilities for heat collection from incinerators, and 25 facilities to recover landfill gas.

### **2) Recycling Technologies for End-of-life Vehicles**

Once the goal to recycle 85% of the end of life vehicles nationwide is achieved by December 31, 2014, additional efforts to increase the rate by 10% must be made from January 1, 2015.

Thus, in Republic of Korea, extensive efforts need to be made to develop technologies to dismantle all parts of cars along with the technology to adequately manage the materials which are difficult to recycle. Currently, domestic manufacturers are pushing ahead with R&D and development of technologies to increase the recycling of hardly recyclable byproducts (fractured debris, air bag, waste gas, and glass) of end-of-life vehicles; little progress has been made, however. Therefore, plans have been established to set and manage the annual recycling target of the 4 materials known to be difficult to recycle. Current domestic recycling technologies by items are as follows:

- a) Domestic manufacturers have been collecting some of those fabrics used for airbags and developing recycling technology.
- b) As for waste gases (waste refrigerants), technologies have been developed to recycle high-purity refrigerants into reusable refrigerants and incinerate low - purity refrigerants.
- c) Some domestic manufacturers have successfully completed R&D projects to melt and recycle automobile shredder residue (ASR). The thermal recycling technology is to be commercialized.
- d) Technologies have been developed to recycle glass into construction materials, but the technologies has not been commercialized

### **3. Examples of specific policy initiatives or measures in dealing with new emerging waste streams such as e-waste, plastics in coastal-marine environment, chemicals and hazardous wastes.**

#### **A. Allbaro system, online waste manifest system**

Allbaro system is an electronic information system that computerizes the whole process of waste disposal from generation through transportation to final disposal on the web. Since put in place in 2002, Allbaro has addressed the entire waste disposal process online and in real time. The system streamlined waste treatment verification process to be more efficient and less costly.

Allbaro has been used by businesses generating controlled waste and municipal since 2004, and by businesses generating construction waste since 2005.

In 2007, for the users' convenience, the ARS system was introduced so that people could use the telephone and SMS instead of the internet. In addition, the connection system with big business running their own system like ERP (Enterprise Resource Program) was introduced and this resulted in the improvement of system efficiency and compatibility by eliminating the overlapping of separated systems. When the Waste Management Act was amended, the use of electronic handover statements became mandatory for most businesses resulting in a total of 230,000 waste related businesses using the system.

As of 2008, 260,000 businesses utilized the Allbaro, and the processing information of approximately 17,000,000 tons of waste has been digitized and managed by the system

#### **B. Asbestos Waste Management**

Since 2008, waste containing more than 1% asbestos, regardless of its arsenic acid level, has been classified as hazardous waste and is packaged twice and buried in landfill sites. When burying asbestos waste, a specific site must be designated, and necessary embankments or other barriers must be constructed to prevent the waste from being mixed with other waste.

To safely process asbestos waste, it is important to share information about where and how asbestos containing structures are dismantled and demolished. Therefore, the government is building an information sharing system for concerned stakeholders. Furthermore, it plans to improve the asbestos waste management and is conducting research on better processing methods including energy recovery process.

#### **C. Hazardous Waste Management**

Hazardous waste controlled by the "Waste Management Act" includes waste synthetic high molecular compounds, sludge, waste agricultural chemicals, corrosive wastes, waste acid and bases, waste containing slag, dust, waste foundry sand, fireproof materials, cinder, catalyst, and adsorbent, waste solvent, waste paint and lacquer, oil, asbestos, waste containing PCBs, toxic materials, medical waste and other materials designated by Ministry of Environment. Businesses that produce hazardous waste submit a plan to properly dispose of the wastes, and the plan must be approved by the relevant administrative institution prior to the disposal of the waste.

Since August 2008, the government has toughened the "Act on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal" and now the Act requires government approval to import and export not only controlled waste but all waste. Self or commissioned processing (include disposal) of all imported waste has become compulsory, and the transfer information should be registered on the Allbaro system when waste is being imported, transported, or processed. Moreover, any agent

who transports, stores, or processes imported waste must abide by the standards and processing regulations set for industrial waste, and imported waste cannot be exported in a manner retaining the properties or condition in which it was imported.

#### **4. Specific policy initiatives or strategies for promotion of 3Rs in industry and business sectors, including small and medium size enterprises (SMEs)**

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). The foundation of mutual aid associations allowed control of excessive competition between small recycling businesses, while improving the quality of recyclables and increasing transparency in the recycling market.

Furthermore, the recycling industry has been gradually activated and the scale of the recycling market has grown aided by the provision of long-term low interest loans for the development of recycling facilities and technologies, and the pursuit of government-sponsored recycling related R&D projects.

The financial support system (funds for infrastructure installation, management stabilization, technical development) to nurture recycling industry provides long-term funds at low interest rates to help small recycling businesses develop key facilities. The fund budget for 2005 is USD 65 million and interest rate sets at 3.68% (floating interest rate) in 2011. The fund budget is currently supporting USD 60 million each year.

#### **5. Specific policy initiatives or strategies for promotion of 3Rs in agriculture and rural sector in support of rural livelihood generation**

In 2010, 64% of vinyl film used in agriculture sector was collected. 208,377 tons out of 324,101 tons, was collected and treated. And 64% of waste agricultural bottle, 49 million bottles out of 77 million, was collected and treated.

In order to increase the collection of waste in rural areas, the government provides farmers with compensation for collecting wastes. The compensation has been sharply increased from USD 12 million in 2004 to USD 17.8 million in 2010.

Republic of Korea Environment Corporation, in charge of collecting and disposing the waste, is promoting a project to treat the waste more efficiently. The project includes modernization of equipment, collection of waste by private company, and contest of waste vinyl treatment technologies.

The government planned to build 130 waste treatment facilities in rural areas by 2006, among which 119 facilities (1,924,000 m<sup>2</sup>) were completed and 11 facilities (185,000 m<sup>2</sup>) are now under construction or design.