한국환경공단

2024 Jeju Plus International Environment Forum

The Development and Future Directions for Korea's EPR System

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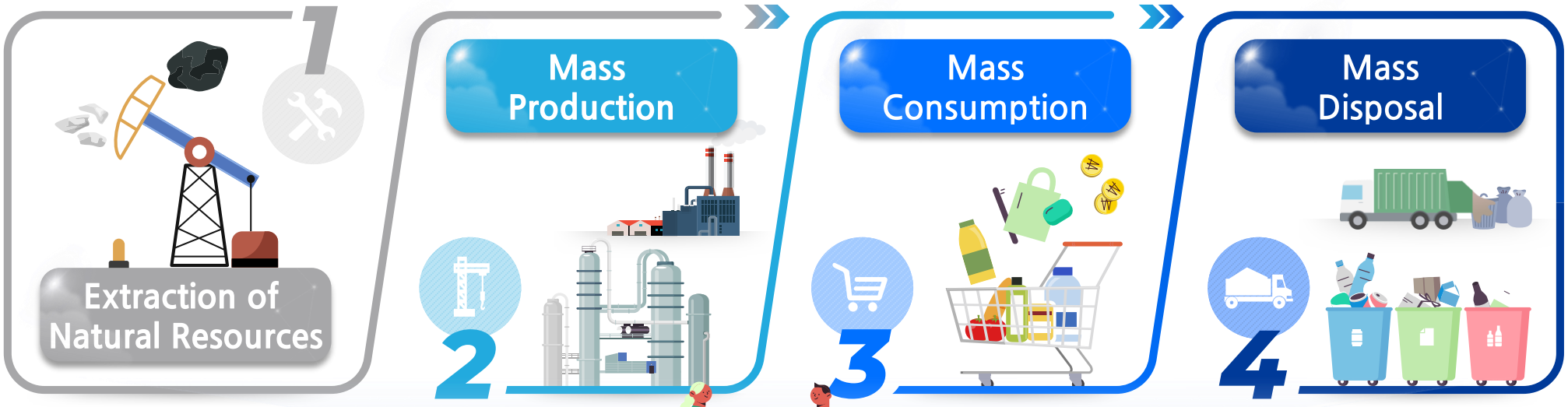
1 Paradigm Shift (From a Linear to a Circular Economy)

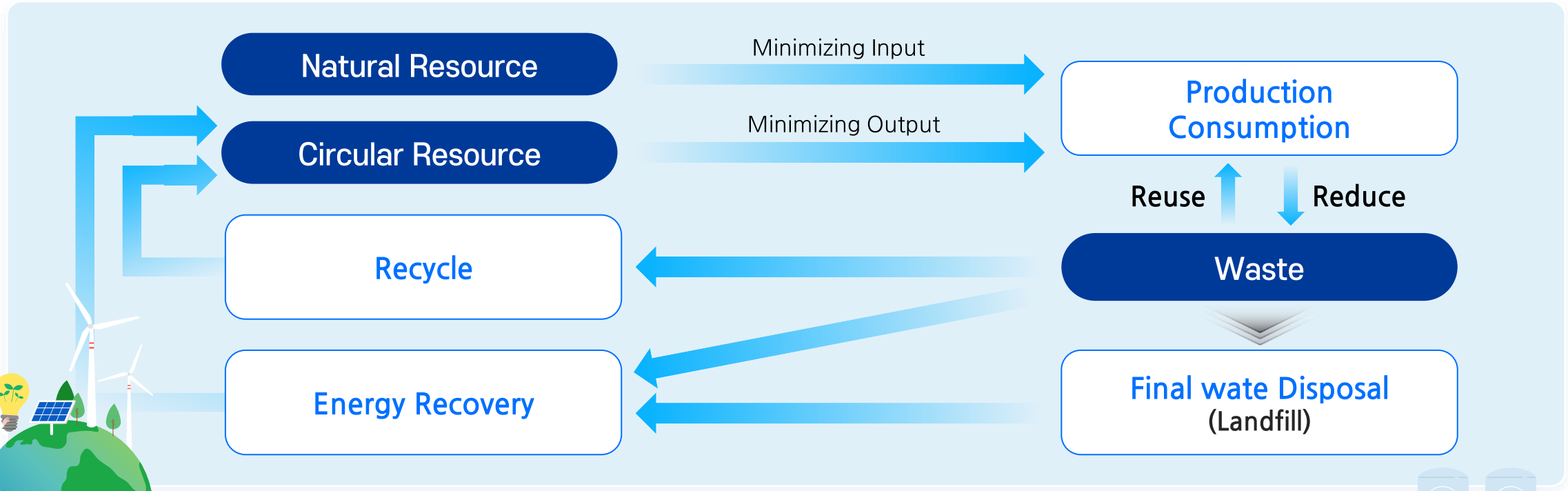
Linear Economy(Decoupling)

Economic Growth → Resource Depletion → Waste Generation



1 Paradigm Shift (From a Linear to a Circular Economy)

Circular Economy(Coupling)



Domestic and International Resource Circulation Policies

1 Global Trends(EU New Circular Economy Action Plan, UN Plastic Treaty)

EU announced a new circular economy implementation plan by supplementing the existing plan('20. 3.)

KEY CONTENTS ① Sustainable products ② Improved circulation of major items ③ Less waste, more value ④ Human·Region·Urban circularity ⑤ Cross-sectoral measures ⑥ Global effort ⑦ Monitoring

The importance of plastic taxes('21) and mandatory use of recycled materials(~'30, 30%) by major countries such as EU are feared to affect the export competitiveness of domestic companies

※ Korea's plastic product exports amount to $1.34 billion, top 10 of all items

Establishing an EU plastic strategy('18.1.), accelerating the deplastic transformation of the international community, including the adoption of a resolution on international plasticsc agreements

* ('22) Formation of a government negotiation committee
→ (~'24) Preparation of international convention on plastic cycle
* EPR **serves as a key tool for implementing plastic cycle international agreements**

Domestic and International Resource Circulation Policies

2 Domestic Trends

2018 → After the 2018 garbage crisis, a series of waste policies were implemented

2020 →
- Resource Circulation Policy Transformation (2020.9):
  Overcoming the limitations of existing waste management systems, such as the continuous increase in waste generation after the waste crisis and the stagnation of the recycling market
- Measures to Deplasticize Domestic Waste (2020.12):
  Transition to a 2050 carbon-neutral society by reducing plastic production and consumption and expanding recycling of collected plastic
- 2050 Carbon Neutrality Promotion Strategy (2020.12):
  Establish a carbon neutrality promotion strategy for each field, including energy, transportation and waste, and include a circular economy as one of the top 10 key initiatives

2021 →
- K-Circular Economy Implementation Plan (2021.11):
  To support 2050 carbon neutrality, reduce greenhouse gas emissions by reducing waste and expanding circulation in the entire process of production · distribution · consumption · reuse centered on existing waste safety treatment

2022 →
Korea is a country that consumes a lot of plastic, and packaging materials and disposable waste continue to increase due to the expansion of non-face-to-face consumption such as delicery and courier due to COVID-19
→ Establishment of ‘Planetary De-Plastic Measures’ in collaboration with relevant ministries(2022.10)

3 Basic Direction of K-Circular Economy

Vision and Goals of the K-Circular Economy

Zero Waste
Full Recycling of Waste Materials

Minimize landfill incineration,
Fully recycle waste resources

Target landfill rates
6.1%('19) → 1%('30) → 0%('50)

2050 Carbon Neutrality
Minimizing net GHG emissions in the resource circulation sector

Minimize Net Emission of Greenhouse gas in Resource circulation

GHG emissions in the waste sector
17.1 million tons('18)
→9.9 million tons('30)→4.4 million tons('50)

Circular Economy Society
Establishing a circular system for the entire production, consumption, and recycling process

production - consumption - recycle
Establishment of circulation system

Circular utilization rates
86%('19) → 95%('30) → 99%('50)

Closing the loop across all socio-economic sectors

CHAPTER

03 Development of Korea's EPR system

<table>
<tr><th></th><th>1992~2002</th><th>2003~2012</th><th>2012~2014</th><th>2014~2016</th><th>2016~2019</th><th>2019~2020</th><th>2020~2022</th><th>2022~2024</th><th>2024~</th></tr>
<tr><td>System</td><td>Waste Deposit System</td><td colspan="8">EPR</td></tr>
<tr><td rowspan="6">Target Materials and Products</td><td rowspan="6">Paper cartons, metal cans, glass bottles, PET bottles, mercury batteries and silver oxide batteries, waste tires, lubricating oil, televisions, washing machines, refrigerators, and air conditioners</td><td colspan="8">(Packaging Materials) ①Paper cartons, ②Glass bottles, ③Metal cans, ④Synthet</td></tr>
<tr><td colspan="8">(Products) ⑤Batteries ('03), ⑥Tires ('03), ⑦Lubricating oil ('03), ⑧Fluorescent lamps ('04), ⑨Fish farming flo</td></tr>
<tr><td colspan="3"></td><td colspan="5">④ All synthetic resin packaging materials('1</td></tr>
<tr><td colspan="4"></td><td colspan="4">⑩ Dry seaweed rack, ⑪ Packing silage film</td></tr>
<tr><td colspan="6"></td><td colspan="2">⑫ 5 types of film('20</td></tr>
<tr><td colspan="7"></td><td>⑬15 types of synthetic resins('23)
⑭ LED lighting('23)</td></tr>
<tr><td colspan="9">①Paper cartons, ②Glass bottles, ③Metal cans, ④Synthetic resins, ⑤Batteries, ⑥Tires, ⑦Lubricating oil, ⑧Fluorescent lamps, ⑨Fish farming floaters, ⑩ Dry seaweed rack, ⑪ Packing silage film, ⑫ 5 types of film, ⑬15 types of synthetic resins, ⑭ LED lighting</td></tr>
<tr><td rowspan="3">Mutual Aid Cooperatives and Associations</td><td rowspan="3"></td><td>(Packaging Materials)
Associations for metal cans, glass bottles, paper cartons, PET, expanded polystyrene, and plastics</td><td colspan="7">(Packaging Materials) ①Korea Packaging Recycling Cooperative and ②Korea Resource Circulation Service Agency</td></tr>
<tr><td colspan="8">(Products) ③Korea Lubricating Oil Industries Association('03), ④Korea Tire Manufacturers Association('03), ⑤Korea Battery Recycling Association('03), ⑥KLRC('15), ⑦KARC('16)</td></tr>
<tr><td colspan="7"></td><td>⑧Korea Construction Materials Recycling Cooperative
⑨Korea Plastic Single Material Recycling Cooperative
⑩Korea Ocean Plastic Recycling Cooperative
⑪Korea Cable Recycling Cooperative
⑫Korea Polyethylene Industry Cooperative
⑬KCPRC</td></tr>
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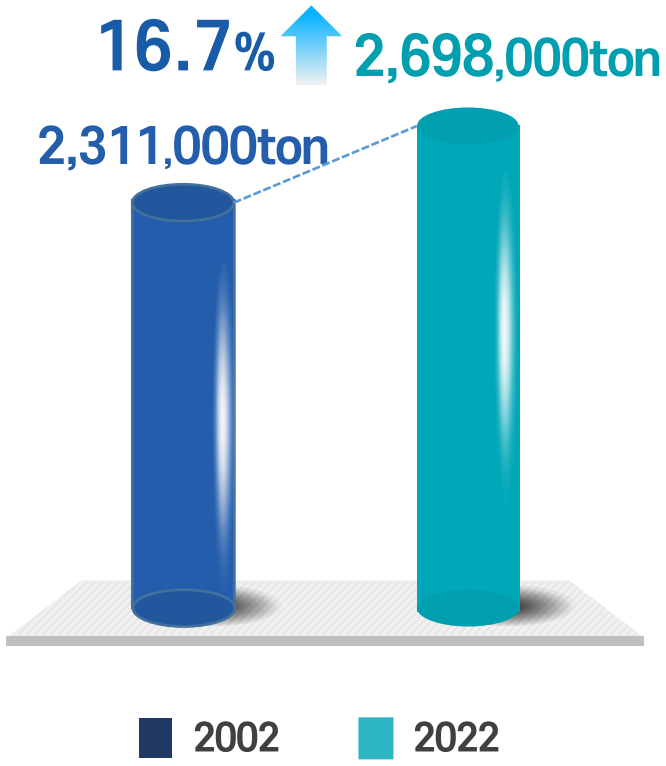
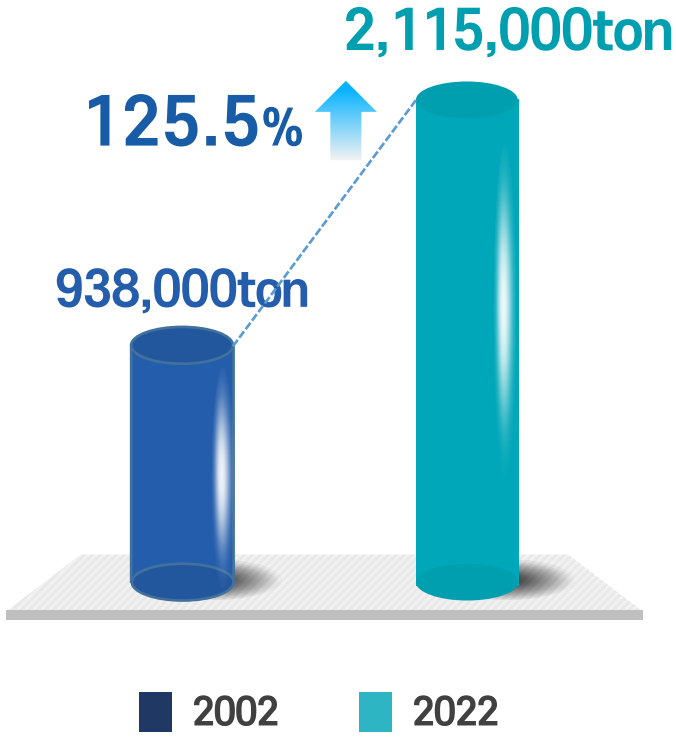
CHAPTER
03 Development of Korea's EPR system

20-year operational performance of EPR (Increasing national recycling volume)

Volume of products and packaging



Volume of recycling



For the two decades since EPR introduction

" Total 31,323,000ton "

Recycling

Volume of products and packaging

16.7% increase

'02. 2,311,000ton ➔'22. 2,698,000ton

Volume of Recycling

125.5% increase

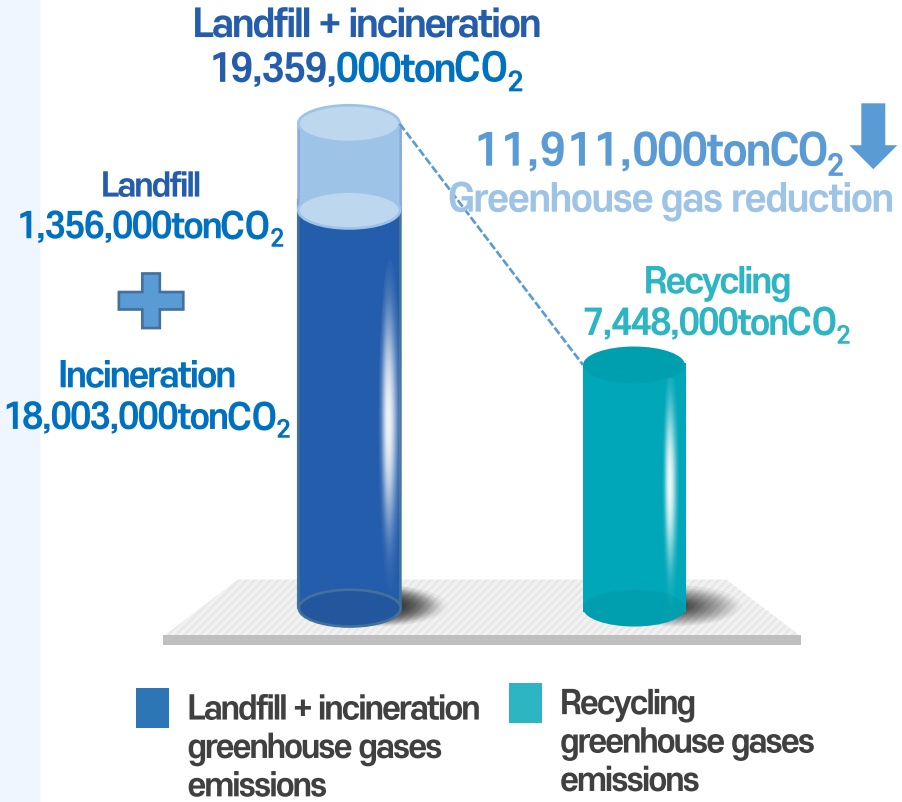
'02. 938,000ton ➔'22. 2,115,000ton

Development of Korea's EPR system

20-year operational performance of EPR (Greenhouse gas reduction)

☑ Reducing GHG by 11,192,000tons of CO2 and inducing the effect of replacing 80,135,000 pine trees by recycling 29,208,000tons

Greenhouse gas reduction



Pine tree replacement effect

85,285,000 trees
Pine tree substitution effect

Annual average
replacement effect of 4,264,000 trees

Greenhouse gas

11,911 thousand tons =
Incineration 18,003,000tons +
Landfill 1,356,000tons -
Recycled 7,448,000 tons

Pine Tree

85,285,000 trees =
Greenhouse gas reduction amount:
11,192,000 tons × per pine tree
Greenhouse gas absorption:
7.16 trees/ton

CHAPTER

04 Global Case Studies on EPR system

EU

Year	1994 (Based on the Directive on Packaging and Packaging Waste)
Country	27 out of 28 EU member states (Denmark excluded)
Role	Manufacturers and distributors of packaging materials are required to meet recovery and recycling targets
Target Material	Paper, cardboard, glass, iron, aluminum, plastic, wood, composite materials, and more

France

Year	1975 (Based on the Act on the Elimination of Waste and Recovery of Resources)
Role	Local governments are responsible for the collection and sorting of household waste while producers contribute to the costs of collection, sorting, and treatment
Target Material	Iron, glass, paper and cardboard, food and beverage cartons, plastic bottles, other plastic packaging, and aluminum (excluding industrial packaging)

Germany

Year	1991 (Based on the Packaging Waste Act)
Target	Producers, importers, distributors of products using packaging materials
Role	Consumers sort packaging waste by material, and the DSD (Dual System Deutschland) handles collection and processing, operating separately from local government systems
Target Material	All items that fall under “packaging materials” (with no restrictions on specific materials)

Japan

Year	1995 (Based on the Packaging Container Recycling Act)
Target	Producers of glass, paper, and plastic containers
Role	Local governments are responsible for collecting and sorting household packaging waste, and producers are required for recycling the sorted materials
Target Material	Glass bottles, PET bottles, cans, paper containers, and plastic containers

CHAPTER
05 Future Directions for Korea's EPR system

1 Key System for Each Stage of the Resource Circulation

Enhancement of the effectiveness of the EPR System for the implementation of a circular economy [Production · Consumption]-[Recycling]-[Monitoring].

Each stage requires strengthed management and oversight.

Production Consumption

- Packaging material structure evaluation system
- Display system for the ratio of recycled raw materials used

Recycling

- Extended Procucer's Responsbility
- High-quality recycling compensation system

Monitoring

- Policy to stabilize the recycling market
- Development of a domestic waste information management system

Future Directions for Korea's EPR system

Production - 1

Packaging Material Structure Evaluation System

Packaging Material Structure Evaluation System

☑ A system to induce design of easy-to-recycle products by evaluating and grading the material·color · weight · recyclability of packaging materials · production (2019.12.25.)

Background

▣ To enhance the recyclability of packaging materials, standards for improving packaging material and structure were recommended in 2013. However, there was a lack of verification procedures and systems to ensure compliance with these standards. This gap led to the development of legislation and practical improvements.

Key Achievements

▣ **76,852** "Packaging Material and Structure Evaluation Reports" have been **issued** (as of December 2023).

- (Incentives) Companies with packaging rated as "best" can receive up to a 50% reduction in their contributions while those with "difficult" ratings face a 10-20% contribution increase
- (Labeling of grades) Packaging labeled as "difficult" must display this on the outside while other grades are optional

▣ A **438% increase in the shipment** of "**best recycled**" packaging materials

Previously (2020)	Improvement Plan (All product)
· 6,614 tons of "best" packaging materials shipment	· Increase to 33,178 tons of best packaging materials shipment (an additional 27,014 tons, representing a 438% increase)

Future Plans

▣ Introducing and **implementing** new **weight standards** for "best" rated drinking water and beverage bottles (July 10, 2024)

▣ **Increasing the number of packaging materials** eligible for the "best recycled" rating from two to four types

* - (Current) PSP, PET bottles ⟶ (Expanded) Glass bottles, and synthetic resin containers and trays

Future Directions for Korea's EPR system

Production - 2

Display System for the Ratio of Recycled Raw Materials Used

Display system for the ratio of recycled raw materials used

☑ A system that displays the percentage of waste plastic recycled raw materials used. Mutual recognition and compatibility can be linked by utilizing the existing domestic and international certification system

Background

▣ **In anticipation of regulations mandating the use of recycled raw materials internationally,** it is essential to expand the adoption of recycled raw materials domestically and develop a verification system to support plastic-free initiatives

Key Achievements

▣ **Signed a business agreement** to create a Korean-style management system for recycled raw material usage (January 2024)
- Established cooperation to develop a mutual recognition plan for recycled raw material certification between the Corporation and ISCC

▣ **Implemented a system for indicating the percentage of recycled raw materials used**, following the revision of the Act on the Promotion of Saving and Recycling of Resources (March 2024)
- Implemented "standards and methods for displaying recycled raw material ratios" (April 11, 2024), and issued pre-announcement of administration guidelines (May 20, 2024)

▣ **Signed a business agreement to establish a high-quality recycling system for recycled raw materials** (May 2024)
- Cooperation established to promote certification of recycled raw materials between the Corporation, Korea Resource Circulation Service Agency, and Control Union Korea

▣ **Launched a business agreement and pilot projects to increase the use of recycled** PET **raw materials** (July 2024)

Future Plans

▣ **(Certification System Development)** Establishing a verification system for **recycled raw material** usage by **2025**
- Implementing improvements such as on-site inspections and document reviews of existing certification system using **data from the EPR system to ensure traceability**

▣ **(Recognition Criteria)** Developing content evaluation and quality standards for recycled raw materials (focusing on ①traceability, ②conformance, ③safety, ④evaluation criteria, ⑤evaluation methods, and ⑥adherence to national standards)

▣ **(Management System)** Creating a recycled raw material use management system **by 2026** to improve operational efficiency, enforce mandatory usage rates, and serve as policy data

▣ **(Compatibility and Mutual Recognition)** Establishing mutual recognition and cooperation between the Corporation and major international certification systems **by 2025**

▣ **(Incentives)** Promoting a priority purchasing system for public institutions to favor products using recycled raw materials and including carbon points as target items **by 2025**

Future Directions for Korea's EPR system

Recycling -1

Extended Producer's Responsibility System - 1

Extended Producer's Responsibility System

☑ A system that imposes recycling obligations on the waste of the product · packaging material to the manufacturer of product · packaging materials, · importers, and imposes recycling charges if not implemented

Background

▣ The EPR was introduced to enhance producer accountability by supplementing the existing waste deposit system*

* Under the deposit system, producers only bore the financial cost based on the amount of waste they generated without actively participating in recycling efforts

Key Achievements

▣ **The national recycling target has been exceeded every year over the past 20 years since the system's implementation in 2003**

* Over the past 20 years, 31.323 million tons have been recycled, generating economic benefits worth KRW 17.4122 trillion

▣ **The scope of producer responsibilities has been progressively expanded from merely recovery and recycling to include processing and reproduction**

Previously

· Linear approach with limited EPR targets at various stages of waste management

Improvement

· The system promotes a circular approach, covering all stages of waste management under the EPR framework

Future Directions for Korea's EPR system

Recycling -1

Extended Producer's Responsibility System - 2

Extended Producer's Responsibility System

☑ A system that imposes recycling obligations on the waste of the product · packaging material to the manufacturer of product · packaging materials, · importers, and imposes recycling charges if not implemented

Key Achievements

▣ **(Producer-Led Bottle-to-Bottle Reverse Recovery System) → Reduced greenhouse gas emissions by 1,308 tons and boosted sales by KWR 1.2 billion annually**

· **MOU signed among the Corporation, bottled water manufacturers, recycling companies, and new material producers (2023.12)**

▣ **Challenges and Resolutions**

· Producer: Faced high additional costs for reverse recovery → Implemented **cost-saving measures** such as reducing contributions

· Flake: Encountered difficulties in securing colorless PET raw materials → **Local governments were incentivized** to supply high-quality raw materials

· Pellet: Experienced high barriers to entry in producing recycled raw materials → Maintained quality standards for flake recycled raw materials and relaxed unnecessary standards

· Blending: Struggled with selling blending ingredients for food and beverages → Support was provided to **increase sales** through stakeholder meetings

Future Plans

▣ **Diversification of 100% Circular Economy Model**

- **(Expansion of the Model) Expanding reverse recovery recycling** to include coffee capsules, cold packs, and glass bottles, in addition to colorless PET bottles
- **(Introduction of K-Certification)** Developing a domestic certification system for recycled raw materials → **Eliminating imports of recycled PET materials** and **promoting the export of** domestic raw materials

▣ **Transferring advanced K-EPR practices to developing countries and enhancing global cooperation**

- Providing customized consulting and demand assessments for the recycling industry (facilities, technology) to build essential infrastructure in countries such as the Philippines and Vietnam which are in the early stages of system implementation
- Establishing a systematic export support system to facilitate the expansion of EPR system exports to developing countries

Future Directions for Korea's EPR system

Recycling -2

High-quality Recycling Compensation System

High-quality Recycling Compensation System

☑ A system that citizens pay compensation for recovery according to their weight when they bring cleanly separated and cleaned recyclables

Background

▣ To **enhance the operation of high-quality recyclables recovery and compensation, a nationwide expansion plan is needed, focusing particularly on single-family homes*** in collaboration with the Environment Headquarters

* **(Multi-family Housing) Separate waste emission systems** (where private companies collect recyclables after payment) **proving to be economical**
(Single-family Homes) Lacking proper separate waste emission systems, making them less economical (as integrated waste is collected by local governments and then sorted and recycled by private companies, increasing costs)

Key Achievements

▣ **Established collaboration between the headquarters and the Environment Headquarters** to **increase collection points nationwide, led by the Corporation**

- Conducted surveys to analyze operational status and identify areas for improvement
- Provided information on collection points through NAVER
- Signed MOUs to promote proper separation and discharge practices
- Raised eco-friendly consumption awareness and provided education in collaboration with the Korea Waste Association
- Hosted **business briefings** to **identify and attract new collection points and** Ran **social media campaigns** to **boost citizen engagement**

Economic Effects		Environmental Effects		
Financial Compensation	Job Creation	Collection and Recycling	Incineration	CO_2 Emissions
Provided KRW 311 million in incentives to citizens	Created 480 direct jobs	Increased national recycling of high-quality resources by 1,544 tons	Reduced incineration treatment costs by KRW 329 million	Decreased greenhouse gas emissions by 525 tons of CO_2

Future Plans

▣ **Promoting the institutionalization of the high-quality recyclables recovery compensation project (2025)**

Existing System	Improved System (Pilot)
· Offering 6 types of information with analysis of 23 indicators and current situation	· Offering 6 types, 27 indicatoes of information with 3-m advance predictions

Monitoring-2

Policy to Stabilize the Recycling Market

Policy to Stabilize the Recycling Market

☑ In order to promote the stability of the recycling market and promote recycling, appropriate stabilization measures, such as the collection of market information such as recyclable resources, · analysis, etc., are implemented

Background

▣ To **stabilize the recycling market**, efforts are focused on **predicting and proactively addressing issues such as inventory accumulation and market instability** caused by imbalances in the supply and demand of recyclable resources

* Public inconvenience due to waste accumulation such as the refusal to collect waste paper (February 2020)

Key Achievements

▣ **The new recycling market risk prediction model is fully operational**

- This model analyzes the importance of "market risk impact factors" and provides information to quickly assess the crisis level for each item.

Existing System	Improved System (Pilot)
· analysis of 23 indicators and current situation	·27 indicatoes of information with 3-month advance predictions

▣ **Enhanced stakeholder communication** to **stabilize the recycling market supply and demand**

- (2023) Reduced inventory backlog by extending the waste paper stockpile at paper-making companies (from 170,000 tons to 100,000 tons)
- (2024) Provided KRW 800 million in export subsidies for plastic (PET), influencing supply and demand by 20,000 tons

Future Plans

▣ **Developing advanced measures based on recommendations from the market risk prediction model expert advisory group**

▣ **Continuing operation of the "Smart Forecast" system for the recycling market and strengthening public-private governance cooperation**

- Ensuring ongoing collaboration with relevant organizations and maintaining an effective emergency response system throughout each stage of business processing

Future Directions for Korea's EPR system

Monitoring-2

Domestic Waste Information Management System

Domestic Waste Information Management System

☑ Digital Integration System for Real-Time Comprehensive Information Management from Domestic Waste Discharge to Final Disposal

Background

▣ Domestic waste management **lacks** a real-time **system** to track waste from generation and discharge through to treatment, making it **challenging to address changes in the recycling market and associated social issues***

Key Achievements

▣ **Launched a full-cycle material flow management foundation** by implementing an automatic collection system for domestic waste disposal information at public treatment facilities (August 2022 to April 2024)

Collected processing data and integrated it with resource circulation systems		
· Monitored real-time processing for each domestic waste item	· Analyzed statistics of domestic waste disposal methods (recycling, reuse)	· Tracked local governments' progress toward domestic waste reduction and recycling goals

▣ **Annual plan for building the domestic waste information management system**

Phase 1 (2021~2022)	Phase 2 (2023)	Phase 3 (2024~2025)	Phase 4 (2026)
· Implemented the system in 48 public treatment facilities (pilot phase)	· Expanded to 715 public treatment facilities, covering incineration, landfill, recycling, and food waste	· **Planned expansion to 5,000 private treatment facilities including incineration, landfill, recycling, and food waste**	· Full operation of the life system information system

Future Plans

▣ Establishing a legal basis to mandate the transmission of domestic waste treatment information to ensure ongoing business operations

▣ Developing a digital information management system utilizing big data analysis of domestic waste data from the public sector

Thank you

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