Progress and improvement plans of Extended Producer Responsibility

2023.09.07. Jeju International Forum

한국환경공단

한국환경공단

CONTENTS

Progress and improvement plans of Extended Producer Responsibility

CHAPTER Progress and improvement plans of Extended Producer Responsibility

Overview of EPR

한국환경공단

CHAPTER_01

01 Overview of EPR

01 Definition of EPR

- Extended Producer Responsibility imposes obligations on manufacturers, importers, and distributors of products and packing materials to recycle a certain amount of their products and packing materials and requires producers to pay more than the cost of recycling when they fail to recycle.

02 Rationale for implementation of EPR

- Article 16(Obligations of Manufacturers to Recycle) of Act on the Promotion of Saving and Recycling of Resources

01 Overview of EPR

03 Items subject to recycling obligations(34)

Items subject to recycling obligations | Article 18 of Enforcement Decree of Resource Recycling Act
(products and packing materials subject to recycling obligations)

Packing materials(4)

- Paper packaging
- Metal cans
- Glass bottles (excluding products subject to deposit return scheme)
- Synthetic resin
  - Expanded Polystyrene
  - Polyvinyl Chloride
  - PET bottle(colorless, colored, composite material)
  - Single material Polystyrene Paper (PSP)
  - Other synthetic resins
    (single material containers, trays, films, sheets, composite materials)
  - Containers of lubricants including antifreeze and
    brake fluid according to Paragraph 6
    (Limited to packing materials of synthetic resin)


Paper packaging


Glass bottle

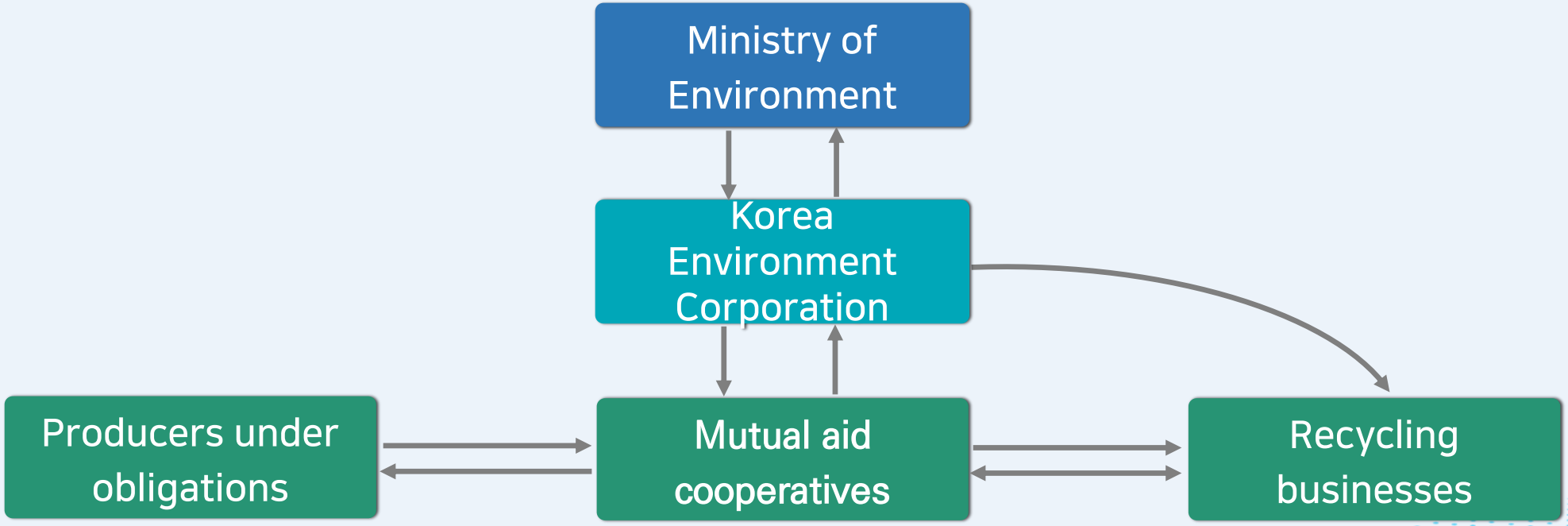

Metal can


Synthetic resins

Products(30)

- Batteries
- Tire
- Lubricants
- Lighting
  - Fluorescent light
  - Light emitting diode(LED) light
- Aquaculture buoy
- Bale silage
- Laver net
- Products made of synthetic resin(15types)
  - Industrial film
  - Safety net
  - Rope
  - Polyvinyl Chloride (PVC) products
  - Pallet
  - Window frame, door frame
  - Insulation materials for construction
  - Parts for automobile maintenance
- Single-use bags made of synthetic resin
- Films made of synthetic resin(excluding PVC)
  - Air cap
  - Plastic laundry bags
  - Plastic bags
  - Single-use plastic gloves
  - Food packaging wrap
- Replaceable water purifier filter
- Fishing nets
- Polyethylene pipes
- Household items made of polypropylene
- Plastic box for transport
- Flooring material
- Lines for electric power and communication

04 Each entity's role



CHAPTER

II

Progress and improvement plans of Extended Producer Responsibility

Analysis of performance

한국환경공단

02 Analysis of performance

01 Contribute to the increase in national recycling volume

Increase recycling volume through continuous expansion of contributors and discovery of new companies

- The number of producers under recycling obligations and recycling businesses has increased with continuous addition of new items for recycling.
  15 items in 2003 (4 packing materials, 11 products) → 34 items in 2023 (4 packing materials, 30 products)
  - (Producers under obligations) 2,747 in 2003 → 11,319 in 2021 (312% increase)
  - (Recycling businesses) 418 in 2003 → 803 in 2021 (92.1% increase)

- Promote national resource circulation by fulfilling obligations to recycle 15 items(industrial films, etc.) from waste waste charge scheme of 2022-2023 (based on voluntary agreement) that are added to item list under EPR obligations
  - Waste charge * imposed on 1,703 companies Recycling volume is expected to increase to approximately 486,000 tons thanks to the integration with EPR scheme

    ※ 2,111,855 tons in 2022 → 2,597,659 tons in 2023 (485,794tons ↑)

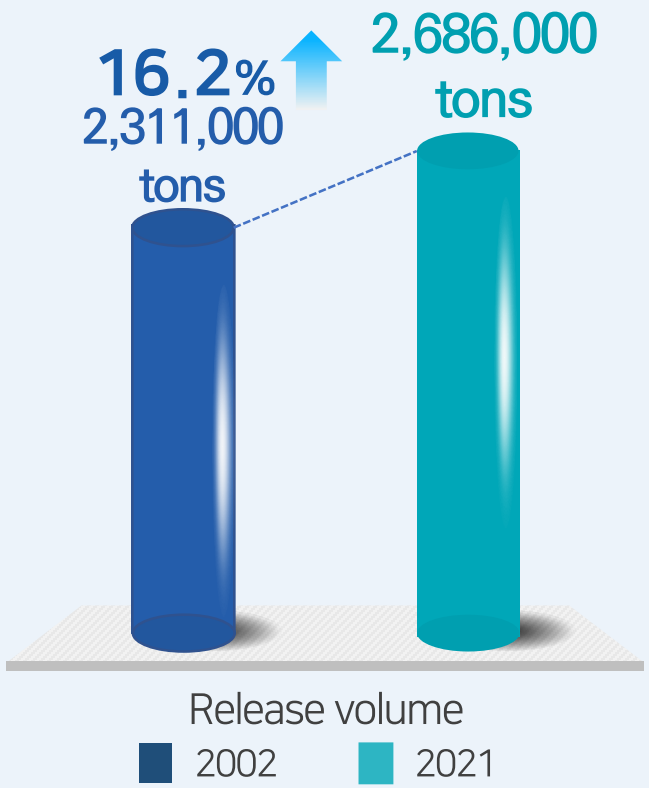
*Waste charge scheme requires manufacturers or importers of products, materials, and containers with hazardous substances that are difficult to recycle and that may cause problems in waste management to pay the cost of waste disposal

* * Items subject to waste charge scheme: Insecticides and toxic containers, antifreeze, chewing gum, disposable diapers, cigarettes, ice pack (superabsorbent polymer), plastic

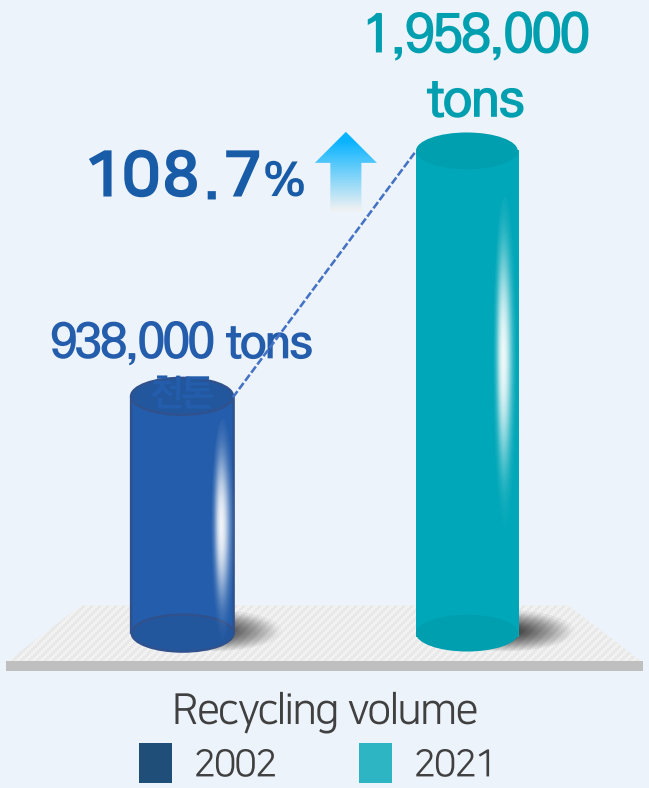
02 Analysis of performance

01 Contribute to the increase in national recycling volume

Release volume



Recycling volume



2002~2021 since the implementation of EPR scheme

"Reached total 29,208,000 tons of recycling volume"

Release volume

16.2% increase

2,311,000 tons in 2002
➔2,686,000 tons in 2021

Recycling volume

108.7% increase

938,000 tons in 2002
➔1,958,000 tons in 2021

※ Cumulative recycling volume from 2002 to 2021 : 29,208,000 tons

02 Analysis of performance

02 Create economic benefits

Recycling 29,208,000 tons leads to reducing landfill costs and creating economic values
Thereby, creating economic benefits of KRW 12.182 trillion

Save costs of landfill(incineration)
Economic value of recyclables
Total economic benefits

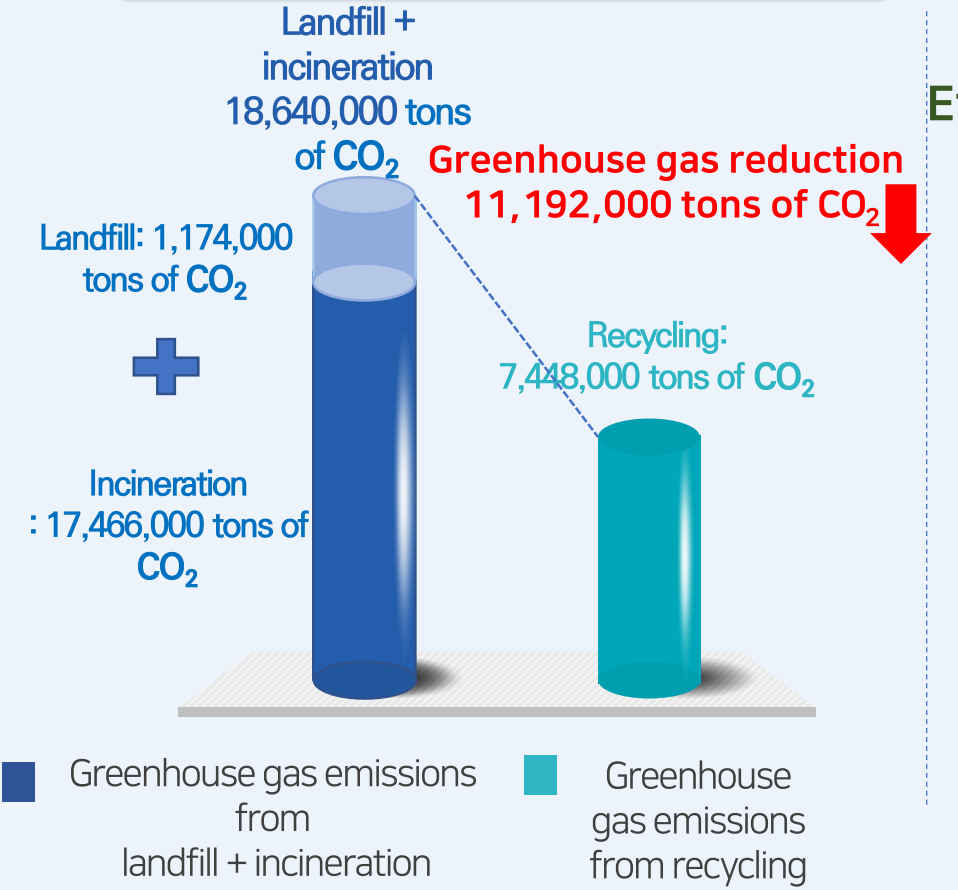
- Total economic benefits: KRW 16.098 trillion = Landfill replacement cost: KRW 7.1088 trillion + economic value of recyclables: KRW 8.901 trillion
- Economic net profit: KRW 12.182 trillion = total economic benefit: KRW 16.098 trillion – direct recycling cost: KRW 3.9916 trillion

02 Analysis of performance

03 Greenhouse gas reduction and effect equivalent to pine plantation effect

After implementation of EPR scheme

Greenhouse gas reduction



Effect equivalent to pine plantation

Effect equivalent to plantation of 80,135,000 pine trees

Effect equivalent to plantation of an average of 4,218,000 trees per year

"Effect of greenhouse gas reduction (11,192,000 tons of CO_2)"

Greenhouse gas

17,466,000 tons of incineration + 1,174,000 tons of landfill
- 7,448,000 tons of recycling = 11,192,000 tons

Source: Life Cycle Inventory Database (LCI D)(ecoinvent 3.9, 2022))

Pine tree

80,135,000 trees = 11,192,000 tons of greenhouse gas reduction × greenhouse gas absorption of 7.16 trees/ton

Source : standard carbon absorption of major tree species

02 Analysis of performance

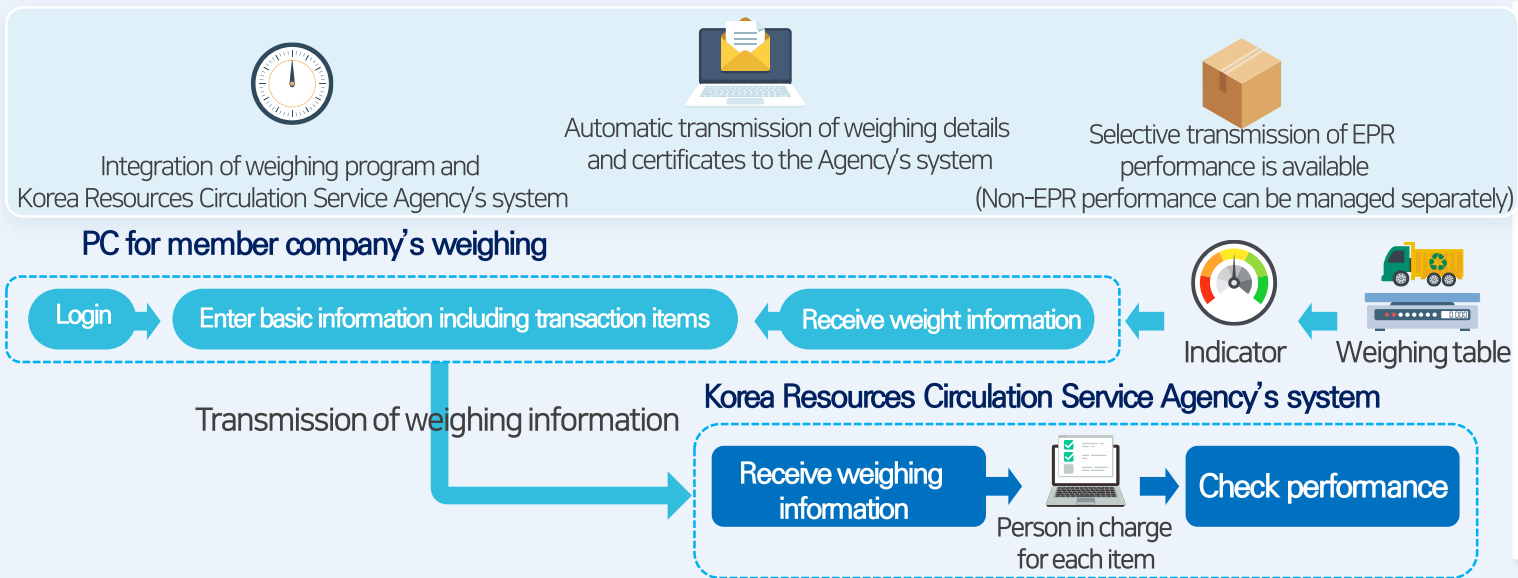
04 Contribute to creation of healthy recycling environment by thoroughly preventing false report of performance

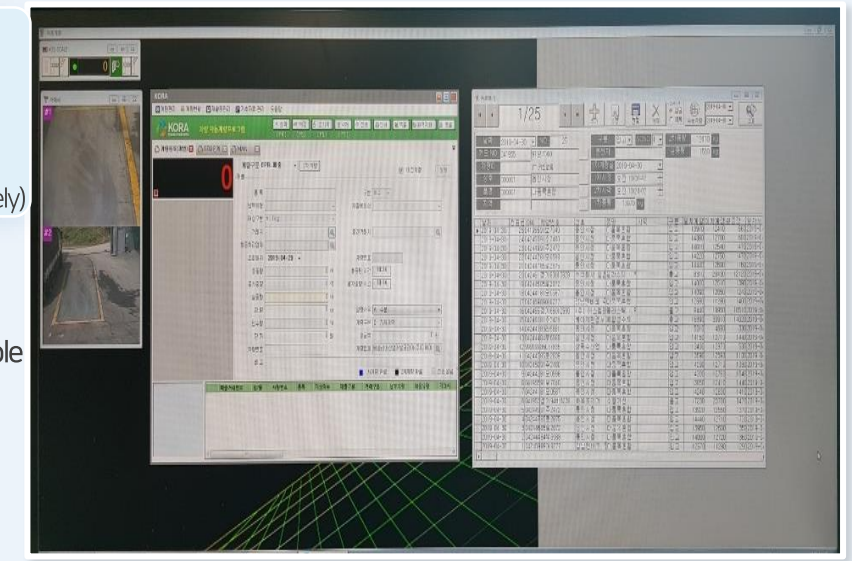
Automatic vehicle weighing system and mandatory use of CCTV

☑ Mandatory use of automatic vehicle weighing system of Korea Resources Circulation Service Agency and real-time monitoring of recycling performance through automatic integration with the Corporation's EPR system to thoroughly prevent false report of recycling performance

- Addition of weighing table and CCTV requirements to recycling business licensing standards and standard commissioning/consignment contracts

[Automatic vehicle weighing system]





02 Analysis of performance

05 Lay the foundation for enabling high-quality recycling

Implementation of evaluation on packing materials and structure

- [x] Impose different level of contributions according to the ease of recycling by requiring grading and labeling of packing materials and structures
  - Consider ease of recycling from the design of packing materials and phase out use of packing materials that are difficult to recycle

Before

- ✓ Use colored PET bottle packaging with focus on aesthetics
- ✓ Difficult for households to separate and dispose of (undetachable labels, etc.)
- ✓ No differentiation in the level of recycling contributions

After

- ✓ Use improved packing materials that are easy to recycle (colorless PET bottles, etc.)
- ✓ Improved ease of recycling by putting perforated line to make labels detachable
- ✓ Differentiation in the level of recycling contributions

(Color) Colored→ Colorless

(Label) Perforated line

(Label) Label-free

02 Analysis of performance

05 Lay the foundation for enabling high-quality recycling

Separate disposal of transparent PET bottles

☑ Establish high-quality recycling system and boost domestic demand for recyclables by producing regenerated fibers through separate disposal, screening, and recycling of PET bottles

Discharge and collection

Expansion of separate disposal of PET bottles from apartment buildings ('20.12~)→single-family houses('21.12~)

Screening

Improve the criteria for payment of subsidies to support screening of transparent PET bottles (2022.1) and subsidies for public selection sites (KRW 28.1 billion in 2022) to expand facilities to screen and store transparent PET bottles

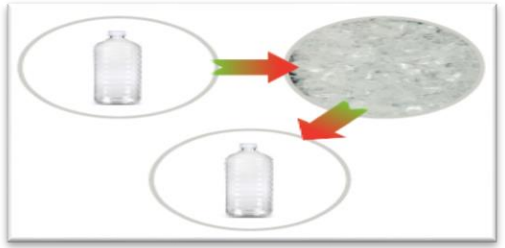
- (Criteria for payment of screening subsidies) No incentives if there is no separate storage in the screening site/ Subsidies are provided according to performance of separate screening of transparent PET bottles

Use

Produce food containers using waste PET bottles that are collected, transported, and produced separately

Separate disposal of transparent PET bottles

Compression of bottles in each screening site



Production of food containers using waste PET bottles

CHAPTER

Progress and improvement plans of Extended Producer Responsibility

III Analysis of conditions and problems of EPR

한국환경공단

03 Analysis of conditions and problems of EPR

01 Changes in conditions for the scheme

Conditions in Korea

☑ Continuous increase in the use of plastics centering on packing materials and containers

- Korea is a large plastic consumer* and its demand** and waste of plastics continue to increase

* (annual per capital plastic consumption) Belgium(170.9kg) Taiwan(141.9kg) Korea(132.7kg)

- Significant use of packing materials and disposable products with short use cycle* due to increase in single-person households and expansion of online consumption (e.g., delivery)

☑ Transition to a circular economy is required to achieve carbon neutrality by 2050

- Need to break away from existing policy that is centered around safe waste disposal and reduce waste and promote circulation in the entire process of production, distribution, consumption, and reuse

CHAPTER_03

03 Analysis of conditions and problems of EPR

01 Changes in conditions for the scheme

External conditions

Promote transition into circular economy to respond to climate crisis centering around developing countries

- [EU] announced new plan to implement circular economy (March 2020)
  → global efforts are included as one of the seven categories*,
  EU calls on its neighboring countries to join the transition into a circular economy

  * (7 categories) ①sustainable products, ②improve circularity of key items, ③Less waste, more value, ④human, regional, urban circularity ⑤sector-specific measures, ⑥global efforts, ⑦monitoring

- [OECD] announced Plastic Outlook (2022) → propose to manage the whole lifecycle of plastics

- [UN] adopted the resolution on the international convention on plastic pollution (by 175 countries, March 2022)
  → draft a binding international convention that covers the entire life cycle of plastics (-2024)
  ▲ Methods on sustainable production and consumption of plastics,
  ▲Cooperation measures to reduce marine plastic pollution, ▲National action plan to prevent plastic pollution, etc.

- [Japan] prepared 「legislation on promotion of plastic resource circulation」(June 2021)
  → based on rationale for management of all products that use plastics

Analysis of conditions and problems of EPR

02 Problems in the operation of EPR

1. Need to review recycling system along with market changes for each item of EPR

- ☑ Need to prepare improvement plans for recycling system as there will be discontinuation of production or material changes with EPR (improve efficiency of lighting for fluorescent lights, production of new buoys for aquaculture by the Ministry of Oceans and Fisheries, material change in mercury batteries)

2. Urgent need to prepare plans to reduce packaging waste generation

- ☑ Need to prepare plans to reduce waste of resources and waste generation from the stage of production and to increase the effectiveness of system to evaluate packing materials and structure

3. Need to prepare plans to promote the use of recycled plastic materials to respond to the international recycled plastic materials market

- ☑ Mandatory use of recycled plastic materials and plastic tax which are to be introduced in major countries including the EU are expected to affect export competitiveness of Korean companies
- ☑ Need to respond to international recycled plastic materials market and prepare plans to promote the use of recycled plastic materials to actualize carbon neutrality and build a circular economy

Analysis of conditions and problems of EPR

02 Problems in the operation of EPR

4. Poor collection and transport system (old facilities that use manual screening)

- Most of the public screening sites(187 sites) rely on manual labor (83.7%), exceed life years (48%), and the average screening rate is only 54%. Such poor and small recycling industry structure limits the advancement of recycling

5. Existing private collection system has limitations in preventing refusal of collecting recyclable wastes

- Need to strengthen public collection and disposal responsibilities as there are concerns about refusal of collection with difficulties in the recycling market caused by falling oil prices and declining demand for recyclables in the private-centered waste resource collection system

03 Analysis of conditions and problems of EPR

02 Problems in the operation of EPR

6. Limitations in responding to domestic and overseas issues due to lack of organization governing statistics on resource circulation

- ☑ Urgent need to establish a system that can promptly respond to the increase in demand for statistics on waste and resource circulation required in promoting environmental policies and other major issues in the field
- ☑ Lack of specialized statistics management system on the material flow analysis of entire lifecycle of plastics and recycling statistics by recycling method

7. Need to actively engage in international cooperation for management of the entire lifecycle of plastics

- ☑ Expedite transition to plastic-free society by the international community by adopting the resolution for UN international convention on plastics (2022 March, 175 countries)
- ☑ Lack of government-wide support measures for discussion on the convention and how to apply it to companies

Promote selection of 7 tasks to advance EPR scheme
by reflecting economic and social conditions in Korea and overseas, and problems in the operation of the scheme

CHAPTER

Progress and improvement plans of Extended Producer Responsibility

Ⅳ Improvement plans

한국환경공단

CHAPTER_04

04

Improvement plans

Vision

Lead circular economy by establishing resource circulation system

Direction

- ☑ Transition into complete recycling through advancement of EPR
- ☑ Strengthen monitoring of waste resource by establishing national waste statistics management system
- ☑ Expand to global green industry and market

7 tasks

1. Improve items under EPR and establish upgrade plans
2. Improve system for evaluating ease of recycling packing materials
3. Expand use of recycling materials
4. Advance recovery and screening of recyclables
5. Stabilize recycling market
6. Strengthen the management of statistics on the entire lifecycle of plastics
7. Expand support for exports in green industry

04 Improvement plans

01 Revise items under EPR and establish upgrading plan

Revise items under obligations according to market changes for each item of integrated EPR scheme

Fluorescent light
- ☑ Phase out by 2027, establish exit strategy for recycling of waste fluorescent light along with discontinuation of fluorescent light production

Buoy for aquaculture
- ☑ As there is surge in production of buoys for aquaculture made of materials that are difficult to recycle with the introduction of new buoys for aquaculture by the Ministry of Oceans and Fisheries, efforts are made to seek transition into waste charge scheme.

Mercury battery
- ☑ Modify measures to manage waste mercury batteries in line with efforts to eradicate the use of mercury batteries such as the Minamata Convention on Mercury

Waste fiber
- ☑ Basic research on the increasing recycling of waste clothes and fibers along with global trend to build circular economy as shown in EU's regulations on fast fashion

* Ongoing research 「Research on improvement of recycling system by item」(December 2022–September 2023)

Improvement plans

02 Improve system to evaluate ease of recycling packing materials

Establish new criteria for weight of packing materials

☑ **Amend resource recycling act by establishing criteria for weight of packing materials to reduce the generation of waste packing materials (2023.3.28, will go into effect after one year)**

- (Incentives) Designate the title of “best recycling material” for packing materials with lightweight index of 1 or less (refund up to 50% of recycling contribution)
- (Reduction of use) Designate the title of “difficult to recycle” (surcharge of 15% recycling contribution) for materials with lightweight index of 2 or higher and give improvement order for materials with index of 3 or higher (prohibition of use)
- (Exclusion) Exclude from the materials for reduction of use if it is using recyclable materials of certain proportion

* (Lightweight index) Relation between the displayed capacity of each type of packing material and the weight of the empty container. The maximum weight for the displayed capacity of each type of packing material can be set using the lightweight index.

Establish criteria (proposal) for designation of “best recycling packing material”

☑ **Only the PET bottles and PSP packing materials under the current scheme have the highest grade. Therefore, other materials such as other PET bottles and glass bottles cannot be given the highest grade and incentives.**

Review the adequacy of highest-grade criteria for PET bottles and PSP and establishment of new criteria for items that do not have the highest grade such as glass bottles, and synthetic resin containers and trays.

- (PET bottles) Designate the highest grade to light-weighted PET bottles(e.g., lightweight index 1 or below)
- (Glass bottles) Designate the highest grade to colorless glass bottles (the next highest grade given to brown and green bottles, no grade to other colors)
- (Synthetic resin containers, trays) Designate the highest grade if no label is used
- (Synthetic resin films, sheets) Designate the highest grade if no label is used

04 Improvement plans

03 Expand the use of recyclable materials

Establish a target rate* of recyclable material use by plastic material producers(those who produce 10,000tonsor more PET), and set the use rate of recyclable materials for final products such as PET bottles

- ☑ Establish a certification system for tracking the use of recyclable materials based on international standards that can be applied to major countries and companies in need such as the EU
- ☑ Promote safety verification and validation of the manufacturing process of recyclable material producers to expand recycling of transparent PET bottles to be used as food containers

* Target rate of recyclable material use by producers of final PET products PET : 10% in 2025 → 15% in 2030

Encourage consumers to choose products that use more than a certain percentage of recyclable materials by marking the information on the products and build a system to prioritize purchase of such products by local governments

- ☑ Establish guidelines to promote purchase of products using recyclable materials by setting targets for purchasing products and containers that use recyclable materials and checking the performance

Improvement plans

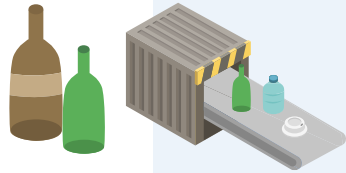
04 Advance recovery and screening system for recycling

Modernization of aged public screening facilities and Support transition into AI smart factory based on machine learning

Modernization of aged public screening facilities*

Replace old conveyor belts and screening machines and equipment*
(Expand existing facilities)

*65 aged public screening sites will be replaced with new facilities across the nation from 2018 to 2025



Support transition into AI smart factory based on machine learning

Government fund support for optical screener, separate line for screening transparent PET bottles, and delta robots (modernization) (KRW 199.3 billion from 2022-26)

** Support transition into smart factory (manual screening → AI and optical screening) : 22% in 2022 → 27% in 2023

AI-based automatic screening robot

Optical screener

Magnetic screener

Trommel (size screener)

04 Improvement plans

05 Stabilize recycling market

Reinforce market management capabilities to respond to changes in domestic and overseas conditions (oil price fluctuations, economic recession, etc.)

- ☑ Establish an information management system* to check the volume of domestic waste inflow and Outflow (2022-25) and develop manual** to respond to each scenario of the recycling market (2023)

  * Monitoring of waste inflow and outflow: 50 screening sites in 2022 → 1900 screening sites, incineration and landfill facilities) in2023

  ** Research on market stabilization measures through analysis of recycling market and economic indicators (from January 2023, Korea Environment Corporation)

- ☑ Expand the capacity of public recycling waste storage (13,000 tons in 2021 → 35,000 tons in 2023)* and increase support for storage and transport fees for public storage when there are piled up wastes to be collected

  * 1st phase in 2020 (Jeongeup, 2,870 tons)→3rd phase in 2021 (Anseong, Daegu, Cheongju, 10,000 tons) → 4th phase in 2022-23 (Eumseong, Yangju 22,000 tons)

- ☑ Add waste batteries, electronic products and other major waste resources to market monitoring items

Improvement plans

06 Strengthen the management of plastic lifecycle statistics

Establish and operate specialized statistics institution for plastics circular economy

- [x] Operate a dedicated organization that manages statistical information on plastic material flow by each institution for production sector, consumption, recycling, and processing and support the transition into plastic free society
  - Establish procedures and standards that enable prompt calculation of statistical data in conjunction with the Corporation's current statistic operation system to respond to internal and external environmental changes
  - Supplement and revise laws and guidelines to improve use of statistics and address problems

Advance statistics on waste plastic processing

- [x] Production, provision, and management of information (plastic material flow, detailed recycling statistics by recycling method) required to support transition into a circular economy
  - Generate statistics on the entire lifecycle of waste synthetic resin (manufacturing, waste generation, recovery, recycling and disposal)
  - Generate detailed statistics on each method of waste recycling (material recycling, energy recovery, etc.)

- [x] Reinforce capabilities to aggregate, analyze, process, and calculate relevant information by establishing an integrated system to manage information on the Corporation's wastes and resource circulation

04 Improvement plans

07 Expand support for exports in green industry

Establish a global resource circulation cooperation system by exporting EPR scheme

- ☑ Seek channels for exporting recycled resources and infrastructure in line with the global trend of carbon neutrality and government-wide goal for export expansion

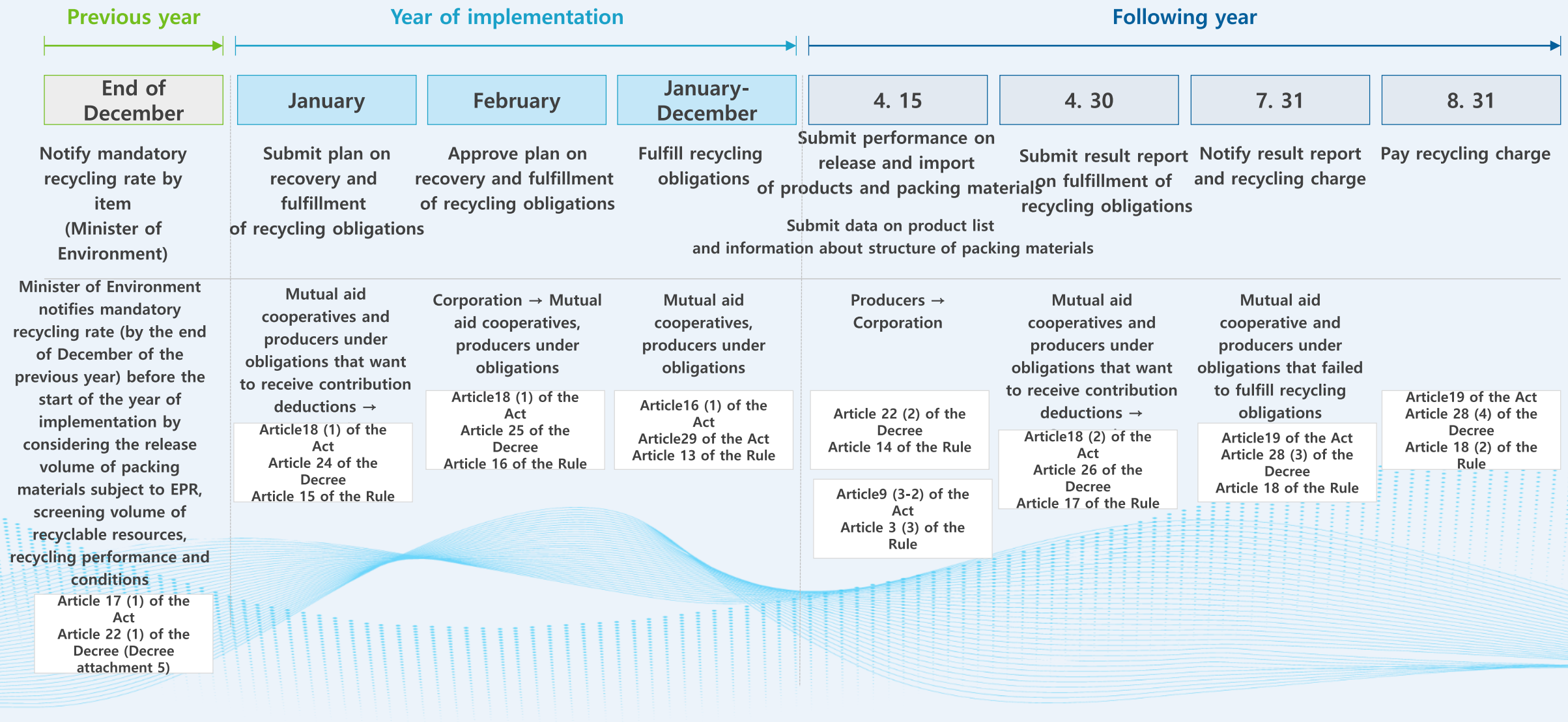
- ☑ Identify export strategies for customized EPR scheme of each country and establish the export system
  - (Establish domestic cooperation channels) Establish a system to support overseas expansion of domestic recycling companies by operating public-private cooperation channels between the Corporation, mutual aid cooperatives and recycling companies
  - (Expand international MOUs) Create a favorable environment for overseas expansion by strengthening the cooperation network among governments through the signing of MOUs with other countries including Vietnam and Malaysia for K-EPR scheme export

• (Vietnam) (2024) EPR for packing materials → (2025) EPR for electrical and electronic products → (2027) EPR for automobiles and motorcycles and waste charge system to be implemented (date TBD)

• (Malaysia) (2024) EPR scheme will be introduced

Reference materials

Procedures of EPR scheme



Reference materials

Status of mutual aid cooperatives of EPR

Items subject to EPR	Name of mutual aid cooperatives
Packing materials (paper pack, metal can, glass bottle, synthetic resin packing material, 5 types of film products)	Korea Packaging Recycling Cooperative
Lubricant, lubricant container	Korea Lubricating Oil Industries Association
Battery	(Korea Battery Recycling Association
Fluorescent and light-emitting diode(LED) light	Korea Lamp Recycling Corporation
Tire	Korea Tire Manufacturers Association
Aquaculture buoy, laver net, bale silage, packing material for fertilizer and feed, PP sack, industrial film, replaceable water purifier filter	Korea Agriculture and fisheries and industry Recycling Cooperative
Window frame, door frame, flooring material, polyvinyl chloride (PVC) products	Korea Construction Materials Recycling Cooperative
PP-based(polypropylene) daily necessities	KPMC
Parts for automobile maintenance	Korea Automotive Recycling Cooperative
Safety net, fishing net, rope	Korea Ocean Plastic Recycling Cooperative
Pallet, plastic transport box	Korea Circulation Logistics Articles Recycling Cooperative
Polyethylene (PE) pipe	Korea polyethylene industry cooperative
Insulation material for construction	Korea foamed plastic recycling cooperative
Lines for electric power and communication	Korea electric wire recycling cooperative

한국환경공단

Thank you

Progress and improvement plans of Extended Producer Responsibility