



E-waste EPR in Korea



Introduction Of K-eco(Korea Environment Corporation)

Legal basis	The K-eco Act by parliament
Type of Institution	A consigned enforcement-typed quasi-government agency
Umbrella Body	Ministry of Environment
Organization	5 Headquarters, 8 Regional Headquarters
Number of Employees	3,400 environmental experts
Annul budget(2023)	1.68 billion USD

Closer to Nature, Closer to People

Keco Business overview



Environmental Infrastructure

- Installation support of aquatic ecology restoration and water treatment facilities
- Installation and operation of water and sewage facilities
- Installation and support of environmental energy recovery Facilities



Resource Recirculation

- Resource circulation program
- Operation and management of the resource circulation system
- Waste management



Environment Technology Research Institute

- Research on Environment Technology
- Environment Data Portal Services



Climate & Air

- Air quality and GHG reduction Policy support
- Reinforcement of capacity for climate change response
- Management of national ambient air quality and smokestack monitoring system
- Management of ambient air quality



Water & Soil

- Water and sewage policy support
- Soil and underground water management
- Water pollution management and control
- Water quality monitoring



Environmental Health

- Promoting life-based environmental services
- Provision of environmental public health services
- Management of hazardous materials
- Prevention and reduction of pollutant discharges



Korea Water Cluster

- Build infrastructure to provide lifecycle support of water business
- Develop technology and penetrate global market



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Overview

Background to introducing the EPR

EPR

(Extended Producer Responsibility)

The EPR system imposes the Responsibility to recycle a certain amount of product and packing materials on the producers, importers or Seller of products and packing materials, and **Imposes a recycling levy that is larger than the recycling cost incurred** if they do not fulfill this responsibility.

EPR
System

Production

Sale

Consumption

Disposal

Recycling

Previously

Under EPR

Overview

Purpose

Reduce the use of **hazardous materials and the generation of waste**, and enhance **recyclability in manufacturing** electrical and electronic equipment.

- Systematic management throughout the product life cycle from **design to manufacturing**, and to **scrapping**

Duty

Prevention

Reduce the use of **hazardous materials** and enhance recyclability in manufacturing

Follow-up management

Build a resource circulation system to promote the efficient use of resources by encouraging waste recycling and to minimize environmental load

Legal foundation

Law

- **Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles**
- **Enforcement Decree of the Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles**
- **Enforcement Regulation of the Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles**

Regulation

- **Guidelines for checking compliance with the maximum levels of hazardous materials in electrical and electronic equipment and vehicles**
- **Guidelines for fulfilling duties to recycle and recover electrical and electronic equipment**

Notification

- **Guidelines for material and structure improvement of electrical and electronic equipment**
- **Electrical and electronic equipment exempted from restricted use of hazardous materials**
- **Guidelines for the preparation and submission of ledgers by the transporters of waste electric and electronic equipment and end-of-life vehicles**
- **Notification of application for the reduction of charges and procedures**

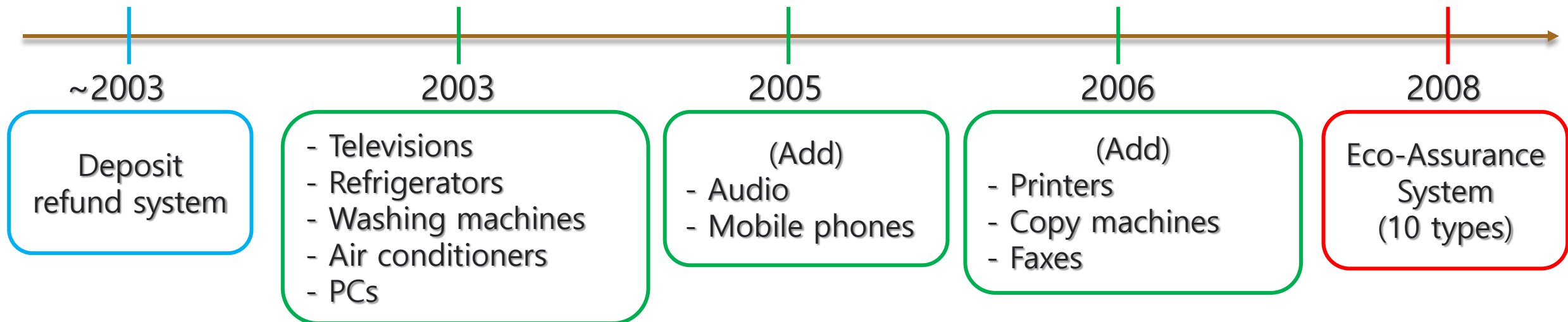
Overview (Recycling System)

Deposit refund system

- A manufacturer or importer of products or containers that are subject to the deposit refund system are mandated to deposit the cost of collecting and treating waste products or containers every year. (~2003)

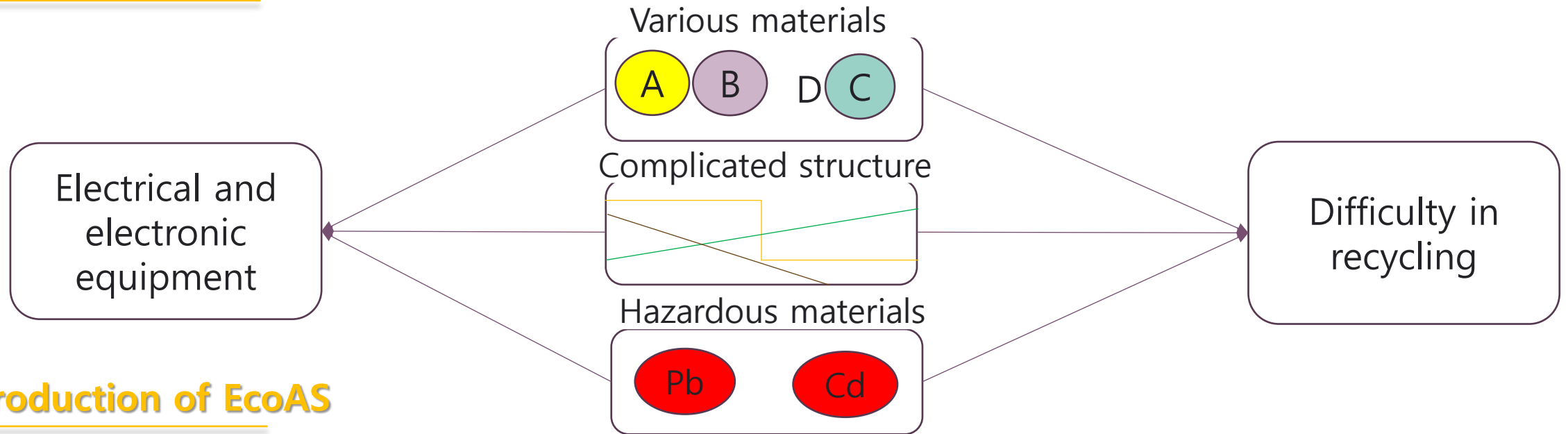
Extended producer responsibility

- Producers are mandated to recycle a certain quantity of waste to encourage the saving and recycling of resources (2003~2007)



Overview (Introduction)

Features of electrical and electronic equipment



Introduction of EcoAS

Follow-up management (EPR)

- Collection and recycling of electrical and electronic equipment



Prevention

- Compliance with the maximum levels of hazardous materials
- Improvement of material and structure
- Provision of recycling information



Eco-Assurance System

(Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles)



Overview (Actors Subject to EcoAS)

Prevention

- Manufacturers and importers of electrical and electronic equipment
 - ※ regardless of sales/import amount

Follow-up management

Producer(duty to collect, transfer, and recycle)

- (Manufacturer) Sales of electrical and electronic equipment in the previous year: KRW 1 billion or more
- (Importer) Import of electrical and electronic equipment in the previous year: KRW 300 million or more

Seller (duty to collect and transfer)

- (Seller) Sales of electrical and electronic equipment in the previous year: KRW 5 billion or more
- Subject to mandatory recycling since 2014
 - ※ Korea's electrical and electronic equipment distribution market has turned into a seller's market, and the role of sellers in collecting waste equipment has increased, which is why the duty to collect waste equipment was imposed on sellers, too.

Overview (Recycling Target Management System)

Purpose

- **Recycling target (kg/person)** was introduced in 2014 to improve the recycling rate of waste electrical and electronic equipment and ensure their systematic management.
 - ※ Previously, a mandatory recycling quantity was set for each manufacturer, considering its production volume.

Long-term recycling target

Long-term recycling target established every 5 years

Classification	Year	Recycling target (kg/capita)
1st phase	2018	6.00
2nd phase	2023	8.60
3rd phase	2028	10.01

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Recycling target (kg/person)	3.90	4.50	4.80	5.40	6.00	6.52	7.04	7.56	8.08	8.17	8.38

Overview (Product Categories)

Expansion of product categories

2008

- TVs, refrigerators, washing machines, air conditioners, PCs, audio, mobile phones, printers, copiers, faxes
- (10 types)

2014

Electric water purifiers, electric ovens, microwave ovens, food processors, dishwashers (driers), electric bidets, air purifiers, electric heaters, electric rice cookers, water softeners, humidifiers, electric irons, fans, mixers, vacuum cleaners, video players, vending machines (27 types)

2020

- Dehumidifiers, navigation devices, scanners, beam projectors, wired/wireless routers, electric massagers, coffee makers, food dryers,
- treadmills, toasters, electric kettles, electric water heaters, electric frying pans, hair dryers, surveillance cameras, foot baths, sewing machines, video game machines, bread makers, fryers, steamers, spin-dryers (49 types)

2023

- Solar PV panels (50 types)

2026

- To be expanded to all product categories



Overview (Hazardous Materials)

Expanded application to hazardous materials

Year	Types of hazardous materials	Maximum level (based on weight in the same material)
2008	Lead (Pb), Mercury (Hg), Hexavalent chromium (Cr6+), PBBs, PBDEs	0.1 (wt)% or less
	Cadmium (Cd)	0.01 (wt)% or less
2021	Diethylhexylphthalate (DEHP)	0.1 (wt)% or less
	Dibutylphthalate (DBP)	
	Butylbenzylphthalate (BBP)	
	Disobutylphthalate (DIBP)	

Overview (Flowchart)

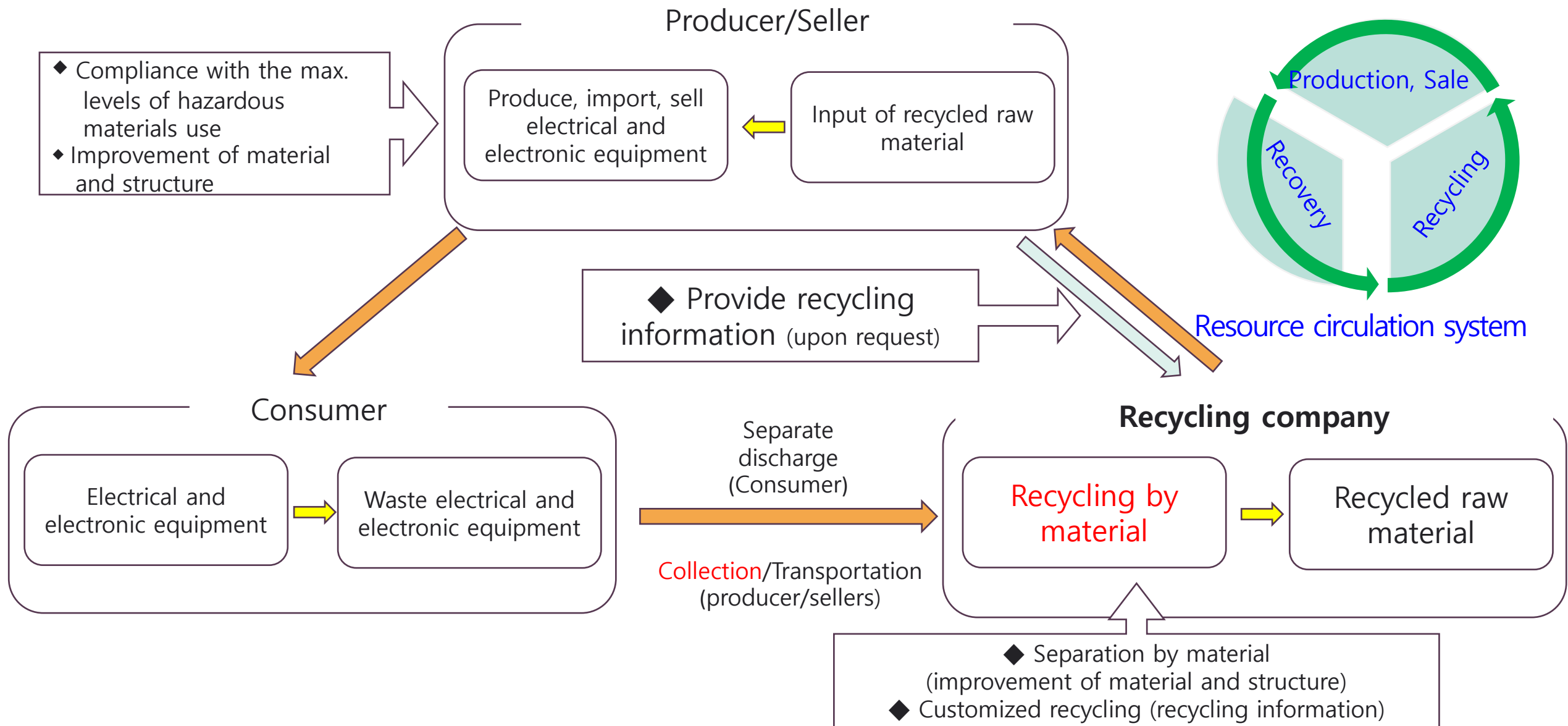




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Operation





Operation (Prevention Procedures)

Within 3 months from the date of release or import declaration

Declare compliance with the maximum levels of hazardous materials (manufacturer, importer)

After 6 months from the date of release or import declaration

Request recycling information (e.g., recycling company, waste treatment reporter, licensed waste recycling business)

Within 1 month from the date of request

Provide recycling information (manufacturer, importer)

July 31

Submit an assessment report on material and structure improvement (→Korea Electronics Association)

Year of mandatory recycling/collection

Following year

Operation (Hazardous Materials Analysis)

Regulation of hazardous materials

Classification	Verification by operating institution	Self-declaration by manufacturer (Adopt as a system)
Method	An operating institution verifies compliance by all new electrical and electronic equipment	A manufacturer makes a self-verification of compliance with precautionary regulations before releasing new electrical and electronic equipment and declares
Pros	Transparency of the system ensured by compliance check of all products Effective implementation of the system	Reduced cost and manpower for compliance check Simplified verification with less impact on time to market, from product development to launching
Cons	Cost and manpower of the operating institution should secure for compliance check Low economics	Low transparency compared to direct verification Thorough follow-up verification needed

Verification of the use of hazardous materials

- Test and analyze compliance with the maximum levels of hazardous materials every year (by a commissioned institution/budget for 2022: KRW 800 million)
- Impose fines on product models that exceed the containment levels of hazardous materials

Operation (Annual Procedures)

Dec.	Announce annual recycle targets and reflection coefficients (Ministry of Environment)	Pervious year
Jan.	Submit plans to fulfill duty to recycle/collect (producer, sellers, PRO → KECO)	Year of mandatory recycling/ collection
Feb.	Approve the plans to fulfill duty to recycle/collect (KECO → producer/sellers, cooperative)	
Apr. 15	Submit performance on mandatory recycling/collection by product, release · import/purchase · sales quantity, and the use of recycled raw materials (producer/seller → KECO)	
Jun. 30	Notify total release quantity/total purchase, population (Ministry of Environment)	
Jan.–Dec.	Fulfill mandatory recycling/collection (producer/seller, cooperative)	
Apr. 30	Submit reports on the result of mandatory recycling/collection, apply for reduction of recycling/collection charges (producer/seller, cooperative → KECO)	Following year
Jul. 31	Notification of recycling/collection penalty fees (KECO → producer, sellers, cooperative that fail to fulfill mandatory recycling/collection)	
Aug. 31	payment of recycling/collection penalty fees (producer, sellers, cooperative that fail to fulfill mandatory recycling/collection)	

Operation (Mandatory Recycling and Collection Quantity)

Manufacturers subject to mandatory recycling

- **(Duty to recycle)** Producer shall collect waste products they have released and transfer them to licensed recycling companies for recycling, or joint a PRO to collect, transfer, and recycle waste products jointly.
* PRO : Producer Responsibility Organization

$$\begin{array}{l} \text{Mandatory} \\ \text{recycle quantity} \\ \text{by product} \\ \text{category} \end{array} = \begin{array}{l} \text{Annual} \\ \text{recycle target} \end{array} \times \begin{array}{l} \text{Population} \end{array} \times \frac{\begin{array}{l} \text{Quantity of a product category released by a producer in the} \\ \text{previous year (including imports)} \end{array}}{\begin{array}{l} \text{Total quantity of all electrical and electronic products released by a} \\ \text{producer in the previous year (including imports)} \end{array}}$$

※ 2024 Annual recycle target: 8.38kg/person, Population: 51,751 thousand, Total quantity of release in the previous year: 1,088,264 ton

Seller

- **(Duty to collect)** The sellers of electric and electronic equipment shall collect waste equipment that belongs to the category of equipment they sold or join a PRO to collect and transfer such equipment. Collected equipment shall be transported to designated locations.

$$\begin{array}{l} \text{Mandatory} \\ \text{collection quantity} \\ \text{by product} \\ \text{category} \end{array} = \begin{array}{l} \text{Annual} \\ \text{recycle target} \end{array} \times \begin{array}{l} \text{Population} \end{array} \times \begin{array}{l} \text{Coefficient reflecting} \\ \text{mandatory collection} \\ \text{quantity by product} \\ \text{group} \end{array} \times \frac{\begin{array}{l} \text{Quantity of a product category purchased by a seller in the} \\ \text{previous year} \end{array}}{\begin{array}{l} \text{Total quantity of all electrical and electronic products} \\ \text{purchased by a seller in the previous year} \end{array}}$$

※ 2024 Reflection Coefficient: 0.3, Total quantity of purchase in the previous year : 404,057 ton

Operation (Classification of Products)

Classification of products

- Products are classified by recycling method and characteristics.

Product category	Products subject to EcoAS (50 types)
Temperature exchange devices	Refrigerators, electric water purifiers, vending machines (with temperature exchange function only), air conditioners, dehumidifiers
Display devices	TVs, desktop PC monitors, laptops, navigation devices
Telecommunication and office equipment	Main body, parts, and accessories of desktop PCs (e.g., keyboards, mice, speakers, and connecting cables), copiers, printers, facsimiles, scanners, beam projectors, wired/wireless routers, mobile phones
General electrical and electronic products	Washing machines, electric ovens, microwave ovens, food processors, dish dryers (dishwashers), electric bidets, air purifiers, electric heaters, audio, electric rice cookers, water softeners (sweet water), humidifiers, electric irons, electric fans, mixers, vacuum cleaners, video players, toasters, electric kettles, electric water heaters, electric frying pans, hair dryers, treadmills, surveillance cameras, food dryers, electric massagers, foot baths, sewing machines, video game machines, bread makers, fryers, coffee makers, herbal medicine boiling pots, spin-dryers, vending machines [except for items falling under subparagraph 1 (c)]
Solar PV panels	Solar PV panels (from 2023)

Operation (Recycling Method and Standard)

Recycling method

Product category	Recycling method	Recycling standard	
		Common standard	Product-specific standard
1. Temperature exchange devices (which includes refrigerant)	Waste products shall be put through treatment, such as dismantling, compression, crushing, and cutting: Reusable parts shall be reused, and materials shall be separated for recycling.	Valuable metals in the printed circuit boards (PCBs) of waste electrical and electronic equipment shall be recycled in a safe manner.	A. Substances causing changes to the climate and ecosystem, such as chlorofluorocarbons (CFC), set forth in Article 15, Clause 3 shall be collected, separated, stored, and treated in accordance with the Standards for Collection, Separation, Storage and Treatment of Substances Causing Changes to Climate and Ecosystem in Appendixes 1 and 2.
2. Display devices (size: 100 cm ² or above)			B. Reuse/recycling rate shall be 75% or more, based on the total weight of a product.
3. Telecommunication and office equipment			Reuse/recycling rate shall be 70% or more, based on the total weight of a product.
4. General electrical and electronic products			A. The batteries of mobile phones shall be subject to the recycling method and standard for batteries stipulated in Appendix 6, No. 7 of the Enforcement Regulations of the Act on Resource Saving and Promotion of Recycling. B. Reuse/recycling rate shall be 80% or more, based on the total weight of a product.
			Reuse/recycling rate shall be 75% or more, based on the total weight of a product.

Operation (Recycling Method and Standard)

Recycling method

Product category	Recycling method	Recycling standard	
		Common standard	Product-specific standard
5. Solar PV Panel	Waste products shall be put through treatment, such as dismantling, compression, crushing; Reusable parts shall be reused, and materials shall be separated for recycling.	Valuable metals in the printed circuit boards (PCBs) of waste electrical and electronic equipment shall be recycled in a safe manner.	<p>A. Heavy metals (limited to chromium, hexavalent chromium, copper, cadmium, lead, arsenic, and mercury) contained in solar panel cells separated and recycled by site are subject to the 「Environmental Testing And Inspection Act. Hazardous substances contained in designated waste must be managed below the reference value set by the waste process testing standards established and announced pursuant to Article 6, Paragraph 1, Item 7.</p> <p>B. The reuse/recycle ratio must be more than 80% based on the total weight of the product.</p>

Operation (Website)

제도소개	전기전자제품관리	자동차관리	부과징수관리	제도현황	사용자정보	고객마당
사전예방관리 (EcoAS) 유해물질함유기준준수 재활용정보제공관리 재질구조개선사항평가	전자관리표록 수집정보관리표 운반정보관리표 재활용관리표 폐가스류인계관리표 관리표수정요청서 바코드연계오류 바코드연계실적 바코드중복조회	관리대장 준수사항 회수·재활용관리대장 제조·수입관리대장 매입·판매관리대장 폐냉매 회수·처리 관리대장 재활용현황	재활용실적 제 BI 재활용의무이행계획 출고·수입실적 재활용실적분배 재활용의무이행결과 초과재활용실적 20년실적산출모니터링	회수실적 거합 회수의무이행계획 매입·판매실적 회수실적분배 회수의무이행결과 초과회수실적	점검관리 의무량/예상부과금 조회 혼입비율관리 의무량감경 부과금감경 출고매입실적서 중량비교 평균중량조사 법정서류모니터링 (신)법정서류모니터링	

- The status and performance (fulfillment of duty: prevention, follow-up management) to be managed through a website

Operation (Recycling Quantity)

Annual recycling by producers subject to mandatory recycling

(Unit: 1,000 tons)

Year	Amount of product	Mandatory recycling quantity	Actual recycle quantity	Achievement rate	Year	Amount of product	Mandatory recycling quantity	Actual Recycle quantity	Achievement rate
2008	713	99	113	114%	2016	833	244	270	111%
2009	592	94	118	126%	2017	898	287	292	102%
2010	641	112	133	119%	2018	990	311	323	104%
2011	634	117	126	108%	2019	1046	341	335	98%
2012	593	125	141	113%	2020	1189	369	398	108%
2013	595	159	159	100%	2021	1263	399	430	108%
2014	839	193	200	104%	2022	1318	425	410	96%
2015	806	227	214	94%					

Operation (Collection Quantity)

Annual collection quantity by sellers subject to mandatory collection

(Unit: 1,000 tons)

Year	Purchased quantity	Mandatory collection quantity	Actual collection quantity	Achievement rate	Year	Purchased quantity	Mandatory collection quantity	Actual collection quantity	Achievement rate
2014	333	38	41	108%	2019	447	67	109	163%
2015	333	44	52	118%	2020	455	71	165	232%
2016	341	50	67	134%	2021	543	101	181	179%
2017	381	59	99	168%	2022	575	107	187	175%
2018	430	62	104	168%					



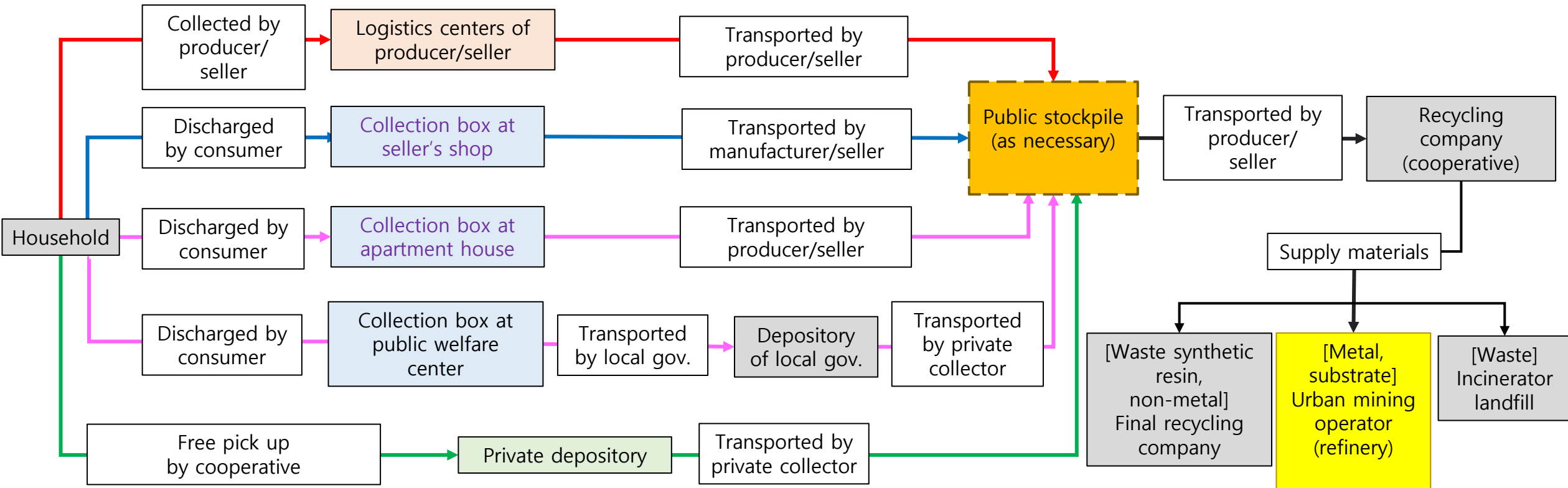
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Progress



Progress (Expansion of the Routes of Collection)

- Focus on the increase in the collected quantity of waste electrical and electronic equipment as the current collection quantity far exceeds the capacity of recycling companies.
- Build a collection system involving consumers, considering that small and medium-sized waste electrical and electronic equipment are often discharged along with general waste at home.)



Collection system

Recycling system

- Collection at base
- Collection at home
- Reverse collection
- Pick-up service
- Stockpiling support
- Urban mine



Progress (Overview)

Build a collection system for small and medium-sized products

(Issue) The quantity of collected small and medium-sized products is less than that of large products collected through reverse take-back.

(Action) Increase collection boxes for small and medium-sized waste electrical and electronic equipment: agreements with producers, sellers, local governments, public institutions, and expand free pick-up service

(Plan) Enter into agreements with various organizations.

Expand to all product categories

(Issue) Increase in multifunctional products, more frequent launching of new electrical and electronic equipment, administrative resources consumed with compliance checks, insufficient measures to manage electrical and electronic equipment not subject to the Eco-Assurance System.

(Action) Recognize collection/recycling performance on waste electrical and electronic equipment not subject to the Eco-Assurance System (active involvement by the Ministry of Environment)

(Plan) Expand the Eco-Assurance System to all product categories: Revision for Enforcement Decree in progress

Progress(Small and Medium-Sized Products)

Free pick-up service



- **Free pick-up service is offered to collect** waste electrical and electronic equipment (PRO)
- Requirement for free pick-up service: **5 or more small and medium-sized products** or 1 or more large products
- In the future expand free pick-up service and improve it so dispose of e-waste without a sticker

		<div data-bbox="1625 611 1905 843"> <p>알림톡 도착</p> <p>안녕하세요. 폐가전수거팀입니다. 접수해주신 배출 예약건의 수거가 완료 되었습니다. 무상방문수거 서비스를 이용해 주셔서 감사드립니다.</p> <p>보다는은 서비스 제공을 위해 만족도 조사를 진행하고 있사오니, 많은 참여 바랍니다. [수거일로부터 5일간 참여 가능]</p> </div> <div data-bbox="1964 611 2244 843"> <p>알림톡 도착</p> <p>안녕하세요. 폐가전 수거팀입니다. 고객님의께서 예약하신 폐가전제품 수거를 위해 07월 22일(금) 폐가전수거팀 기사(중)가 배치되어 방문 예정입니다.</p> </div>
<p>Reservation by phone or online</p>	<p>Free pick-up truck</p>	<p>Text messages to notify confirmation and pick-up time</p>

Public-private joint collection system

- Collection boxes for small and medium-sized waste electrical and electronic equipment are installed at the stores of sellers.

		
<p>Samsung Digital Plaza</p>	<p>LG Best Shop</p>	<p>Lotte Hi-Mart</p>

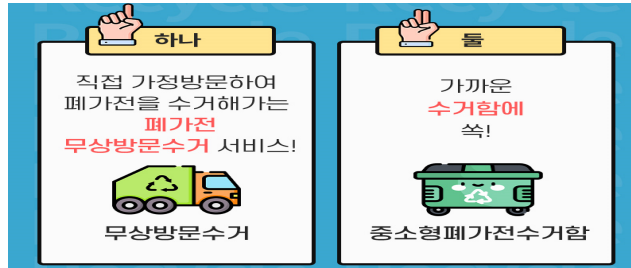
Progress(Small and Medium-Sized Products)

Collection boxes at nationwide

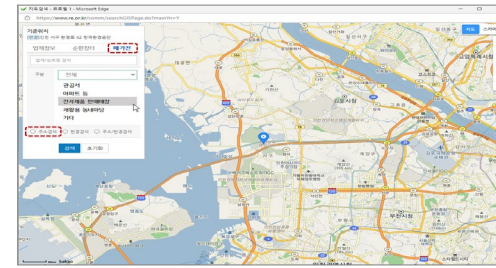
9,100 collection boxes installed by nationwide(Seller's shop, Apartment, public welfare center)



Collection box



Guidelines for waste electronic equipment discharge



Collection box map



QR code

Platform to practice resource circulation





Agreement with public institutions

Public institution	Details of agreement
Korail (Korea Railroad Corporation)	Collect waste electric and electronic equipment generated in the operation of facility (Platform, Ticketing booth, etc)
LH (Korea Land and Housing Corporation)	Collect waste electric and electronic equipment generated in the course of residents' moving out/in.

Progress(Expansion to All Product Categories)

Recognition of performance for products not subject to the E-waste EPR

- Active administration by the Ministry of Environment: to recognize collection and recycling of products not subject to the Eco-Assurance System

			
Clothes dryers	Clothes management equipment	Electric stoves	Digital cameras

: Revision for Enforcement Decree in progress to expand the system to all product categories

- Reclassify product categories and set standards for electrical and electronic equipment previously not subject to the E-waste EPR.
- The details of implementation are being worked out and the Enforcement Decree is expected to be implemented in a few years.



Thank You.

