




Current practice of recycling & treatment of E-wastes and Lead acid batteries in Korea



2012.11



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I

Wastes-related Legislation

1. Classification of Waste-related Legislation

Legislation Name	Contents
Waste Control Act	<ul style="list-style-type: none">-Treatment of general waste-Define the concept and classification of wastes, standard of treatment method & facility-Report of Import and export of wastes-Report of Waste Recycling, etc.
Act on the Promotion of Saving and Recycling of Resources	<ul style="list-style-type: none">-Waste charge system-Extended Producer Responsibility, etc.
Act on the Promotion of Recycling of <i>Construction</i> Wastes	<ul style="list-style-type: none">-Standard of Construction Wastes-Recycled <i>Concrete Aggregate</i> , etc.

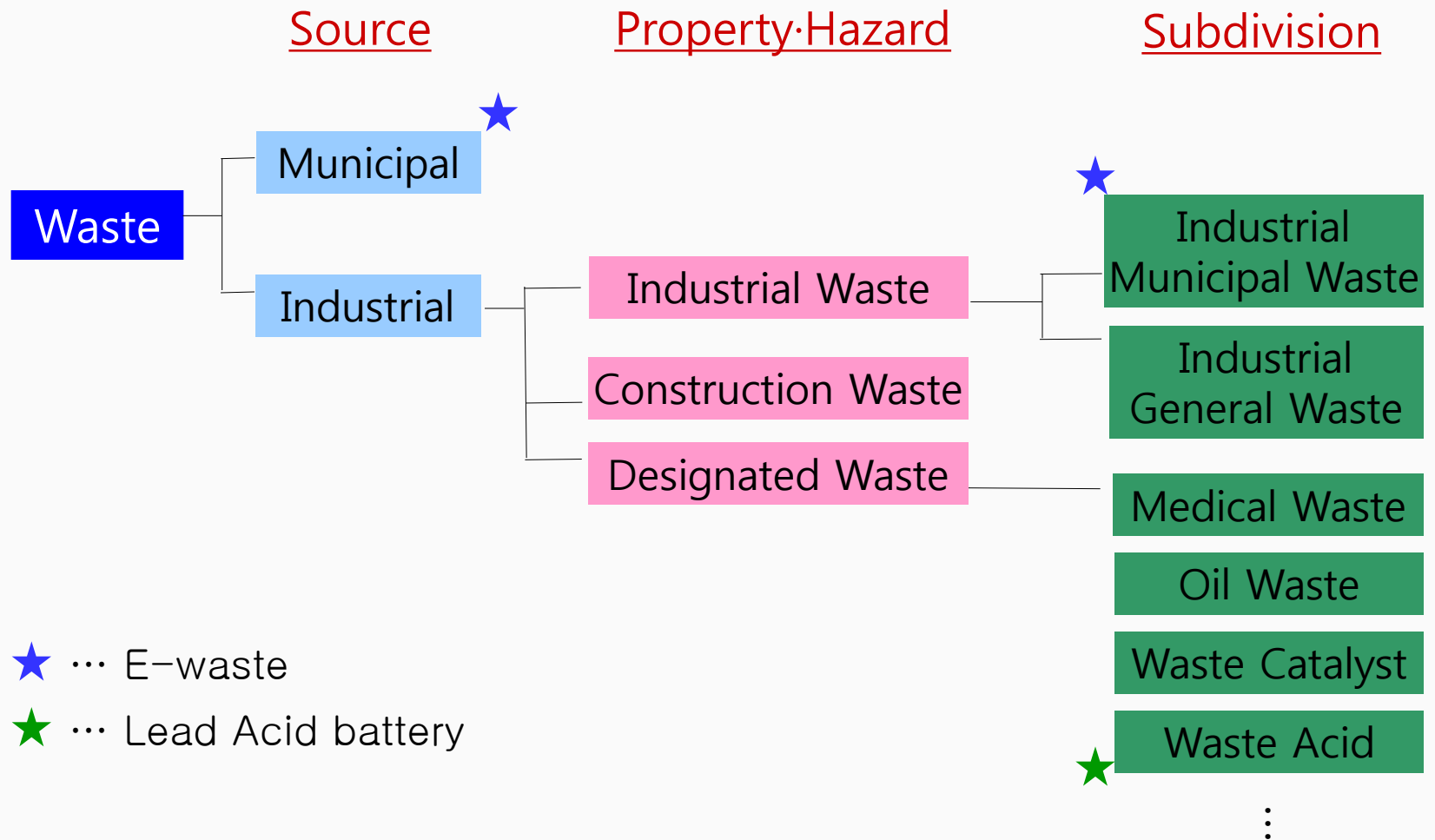
1. Classification of Waste-related Legislation

Legislation Name	Contents
Act on the Resource Circulation of Electrical-Electronic Equipment and Vehicles	<ul style="list-style-type: none">-WEEE(Waste Electrical and Electronic Equipment)-RoHS(Restriction of Hazardous Substances)-ELV(End-of-Life-Vehicle Direction) , etc.
Act on the Control of Transboundary Movements of Hazardous Wastes and Their disposal	<ul style="list-style-type: none">-Permission of Import/Export of Hazardous Wastes-Order of Carryout Wastes, etc.
Promotion of Installation of Waste Disposal Facilities and Assistance, etc. to Adjacent areas Act	<ul style="list-style-type: none">-Support of wastes treatment facility surroundings resident, etc.

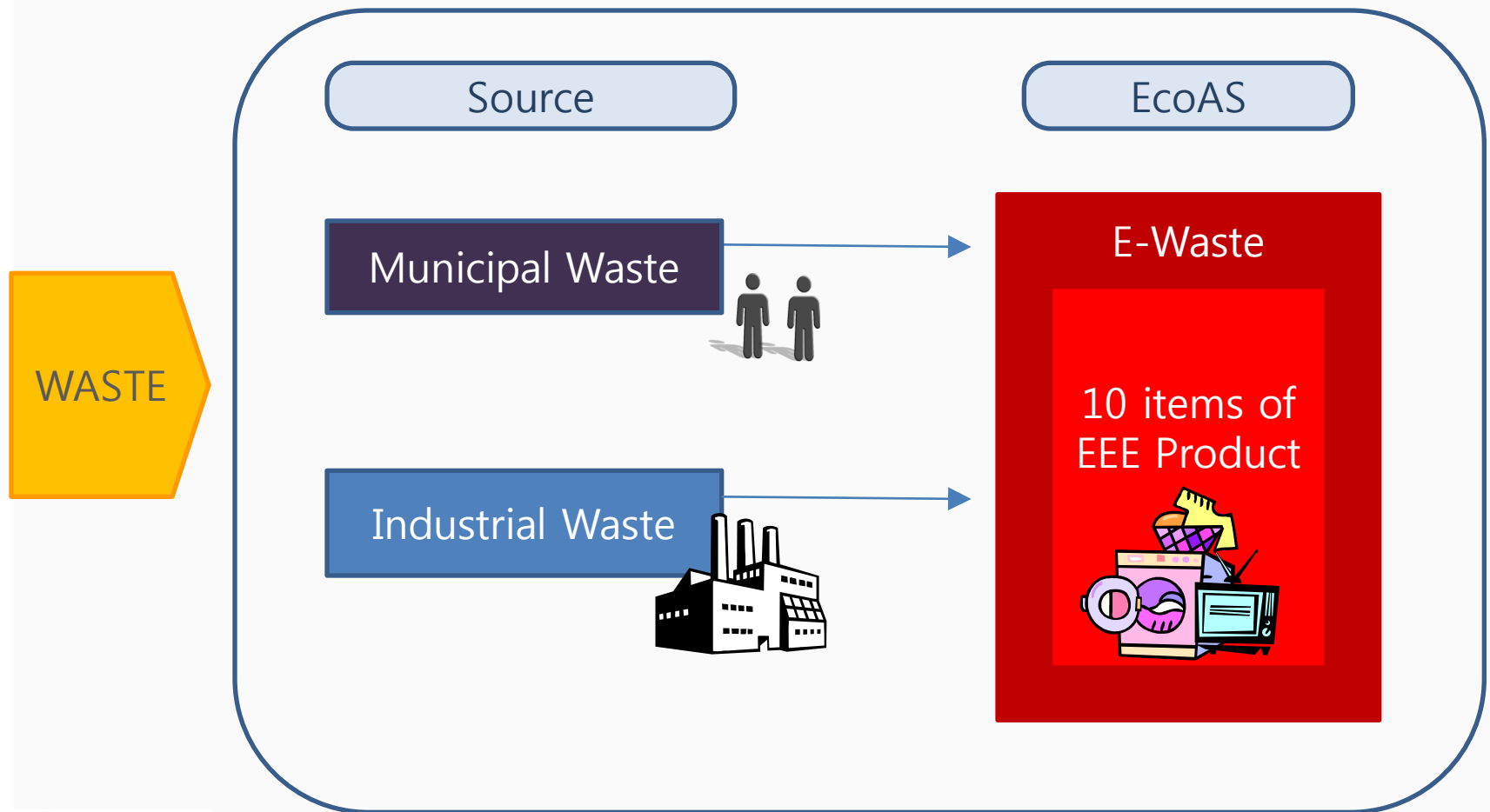
The image features a large, vibrant green circle with a glossy, 3D effect. Inside this circle, the words "Waste stream" are written in a bold, white, sans-serif font. To the upper left of the main green circle, there is a smaller, light grey circle containing the Roman numeral "II" in a black, serif font. The background is white and decorated with various green elements: smaller circles of different sizes, some with outlines, and stylized floral or leaf-like patterns. The overall aesthetic is clean and modern, with a focus on green tones.

Waste stream

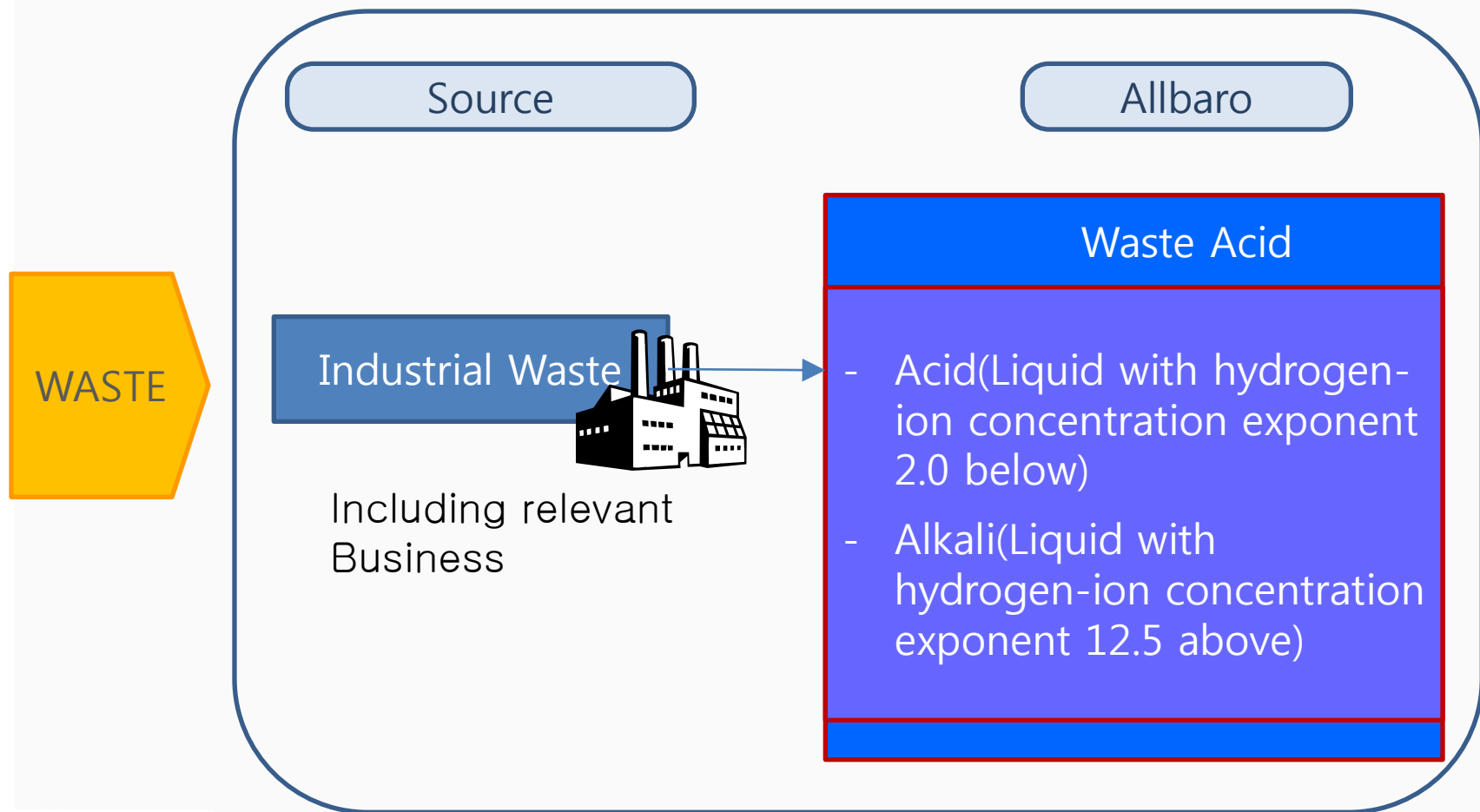
1. Waste Classification



2. Waste stream (E-waste)

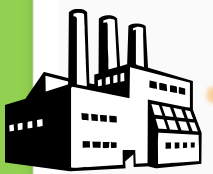


2. Waste stream (Lead Acid battery)

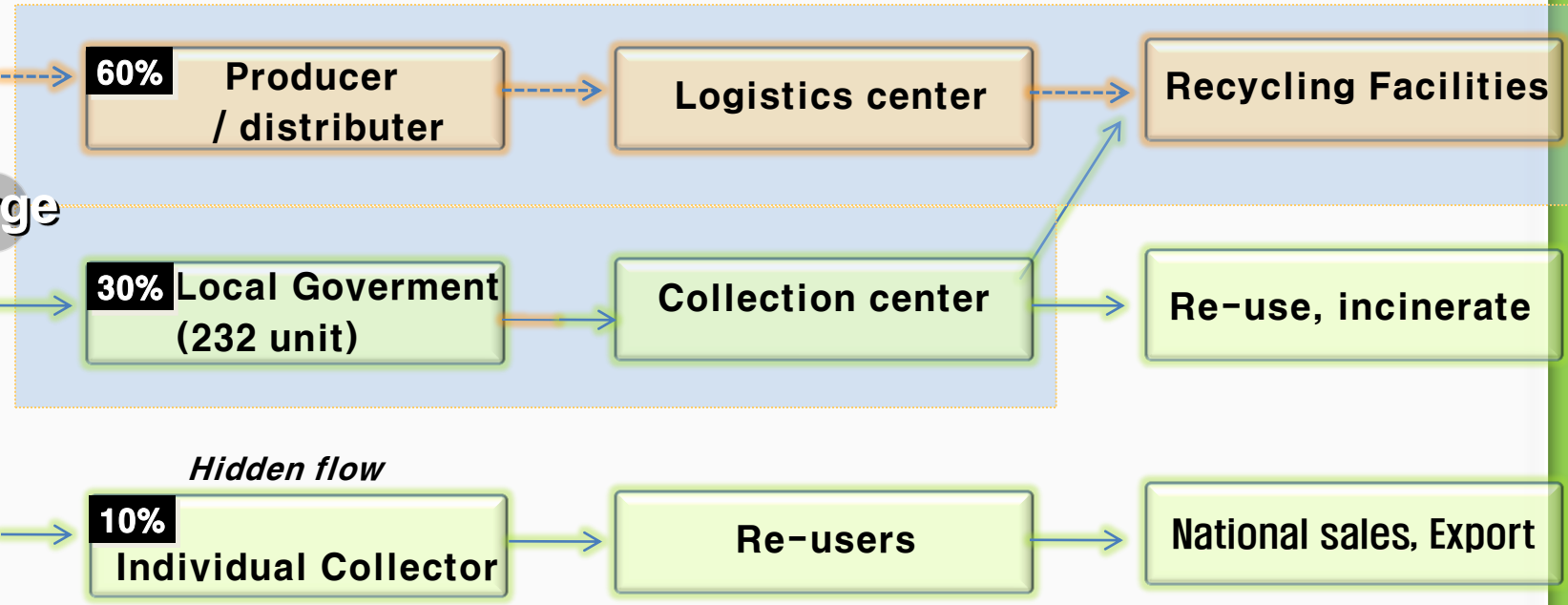


3. Take-back and Recycling (E-waste)

... Collect ... Transport ... Treat ...



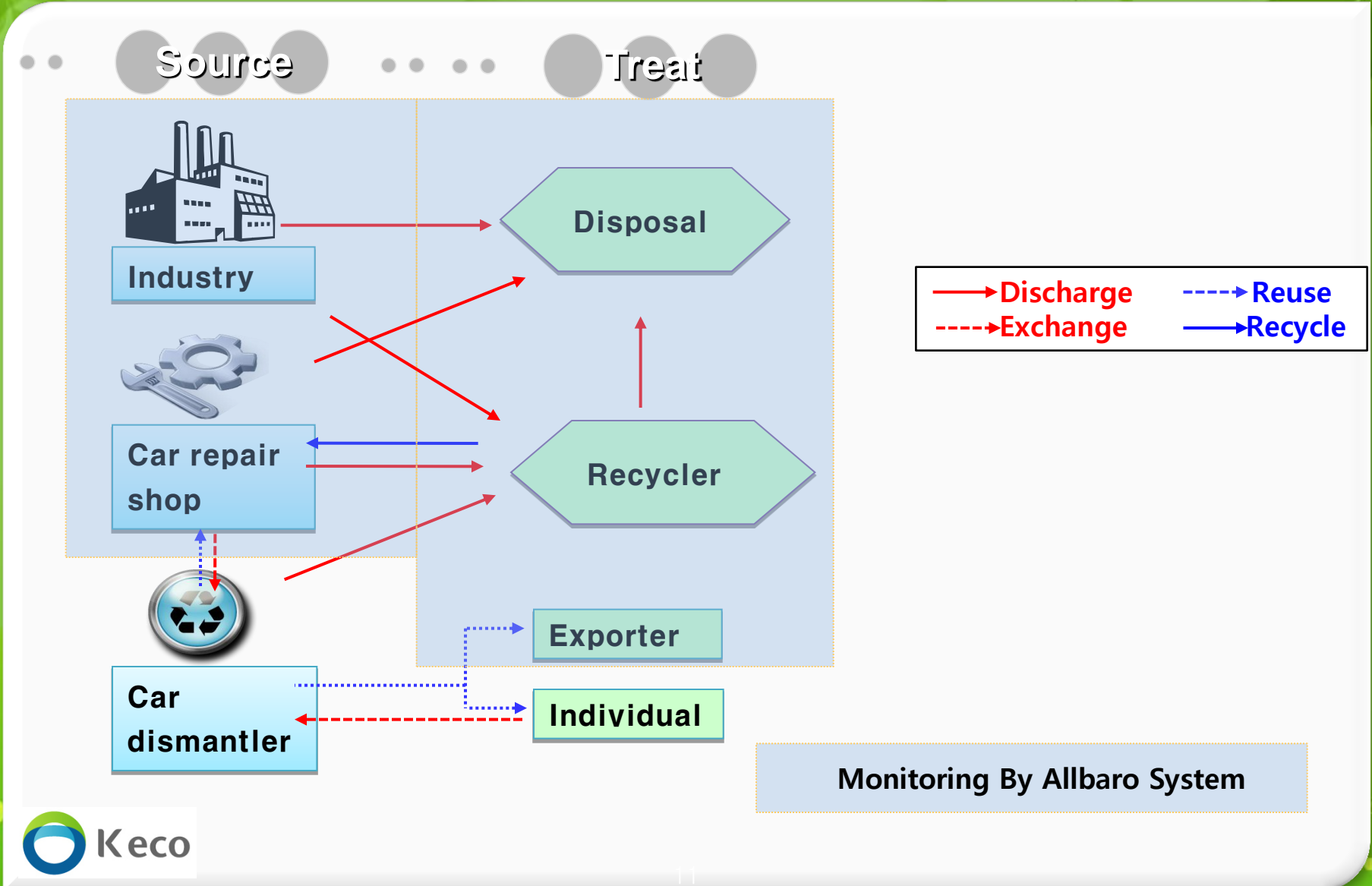
Discharge



Monitoring By Eco Assurance System



3. Transport and Recycling (Lead Acid battery)





III

Eco-Assurance system

1. Eco-Assurance system

- A system for inducing the **minimization of environmental load** through systematic management of the product life cycle from the product design and production stages to product disposal to control waste generation associated with **electrical-electronic equipment and vehicles** and to promote recycling

Korea Environment Corporation(KECO) operates EcoAS by delegation and entrustment of the authority of the Minister of Environment

2. Target product

Electrical·Electronic Products

- TV
- Refrigerator
- Washing machine (only for home use)
- Air conditioner
- PC (including monitor and keyboard)
- Audio (excluding portable audio)
- Mobile phone
(including battery and charger)
- Printer
- Copying machine
- Facsimile machine

Vehicles

- Passenger car
- Van (capacity : 9 persons or less)
- Truck (light and small trucks)

3. Role and duty

Parts	Roles and Duties
Government Administration (Ministry of Environment)	<ul style="list-style-type: none">- Manages entire Eco Assurance System- Various kinds of policy establishments also obligation of recycling and operation of administration
Local authority	<ul style="list-style-type: none">- Collects E-waste from a consumer- Stable transportation and handover to the producer R/C
Producer	<ul style="list-style-type: none">- Fulfill mandatory duty of recycle rate
Distributor (seller)	<ul style="list-style-type: none">- Duty of take-back electrical and electronic equipment when sales new goods(exempted when a customer doesn't want)- Fulfill mandatory duty of collect back rate
Consumer	<ul style="list-style-type: none">- Proper separation of discharge according to the related rule- Defray direct/indirect discharge

This policy is not for the producer to take entire responsibility but for the government administration, local authorities, producer, and consumer to play a role. This can make related person to take social duty.

4. Mandatory recycling and collect-back rate

- Noticed annually by the Minister of Environment in consideration of life span of products, amount of separately collected recyclables, recycling facility capacity, recycling technology, etc.

Items	Mandatory recycling Rate(%)								Mandatory collect-back Rate(%)
	2005	2006	2007	2008	2009	2010	2011	2012	2012
1. TV	11.8	12.6	13.3	14.5	16.0	19.0	21.0	27.2	20.0
2. Refrigerator	14.1	16.9	17.3	18.9	20.6	22.1	25.0	26.7	11.8
3. Washing machine	21.2	23.4	24.2	25.3	26.1	27.4	28.5	31.7	13.1
4. Air conditioner	3.6	1.7	1.9	2.1	2.3	2.4	2.4	2.7	1.0
5. PC	8.5	9.4	9.8	10.3	11.1	12.3	14.0	15.3	1.0
6. Audio	10.2	12.7	13.1	14.9	15.5	17.0	18.5	20.0	1.1
7. Mobile phone	11.9	15.4	16.5	18.0	19.8	22.0	23.0	35.6	16.0
8. Printer	-	8.4	9.2	11.2	11.9	13.0	15.0	15.0	3.6
9. Copier	-	8.4	9.4	12.7	13.3	14.2	15.0	16.0	4.5
10. Facsimile	-	8.4	9.4	11.4	12.1	13.4	15.0	15.6	5.3

5. Performance

The recycling amount of E-waste

(unit : ton)

Items	2003	2004	2005	2006	2007	2008	2009	2010
sum	58,376	65,730	80,257	92,575	107,283	112,799	118,453	133,205
TV	10,360	10,287	11,101	14,568	18,977	18,665	18,544	21,491
Regrigerator	24,801	30,593	35,270	44,660	50,833	53,678	58,636	64,618
Washing machine (for home use)	19,215	19,728	26,289	22,200	23,908	22,035	26,046	29,215
Air conditioner	846	1,250	2,181	2,211	2,907	2,646	2,887	3,064
PC	3,154	3,872	4,554	4,934	6,103	10,823	8,383	9,790
Audio			347	377	404	1,170	685	711
Mobile Phone			515	451	468	711	629	731
Photocopier				1,293	1,150	958	588	994
Facsimile				110	171	111	117	129
Printer				1,771	2,362	2,002	1,938	2,462



IV

Allbaro system

1. Allbaro system

- **IT-based e-information system managing all processes from discharge, transport, and ultimate treatment of industrial waste using internet or RFID technology instead of paper transfer document since 2001**
- ✓ **A waste treatment proof system for waste management has been conducted since 1999, considering the increasing importance of waste management and suitable treatment owing to industrialization**

Korea Environment Corporation(KECO) operates Allbaro by delegation and entrustment of the authority of the Minister of Environment

2. Target waste

Designated Waste

Type	Standard
Based on 14 items including waste agricultural chemicals, slag and dust	50kg or more every month or a sum more than 130kg
Six items including waste synthetic high molecular compound, waste	100kg or more every month or a sum more than 130kg
Sludge	500kg or more every month
PCBs, waste poisonous materials, waste medical materials	—
Common treatment waste	—

Industrial General Waste

Type	Standard
Industrial waste generated from disposal facilities according to 「Air Conservation Act」, 「Conservation laws on water quality and aquatic ecosystems」 or 「Noise and Vibration Control Act」	100kg or more every day
Industrial waste generated from waste water disposal facilities	100kg or more every day
Industrial waste generated from night-soil treatment facilities	100kg or more every day
Industrial waste generated from livestock excretions facilities	100kg or more every day
Industrial waste generated from waste treatment facilities	100kg or more every day
Other Industrial waste	300kg or more every day
construction waste	5ton or more
Industrial waste generated from Temporary work	5ton or more

3. Role and duty

Parts	Roles and Duties
Government Administration (Ministry of Environment)	<ul style="list-style-type: none">- Manages entire Allbaro System- Various kinds of policy establishments operation of administration
Local administration agencies	<ul style="list-style-type: none">- Authorization and permission relating waste- Inspection the users
User	<ul style="list-style-type: none">- Duty of input the transfer document and comply with the various laws and regulations upon treating waste

4. Performance

The discharged amount of Waste Acid (including Lead acid battery)

(unit : ton)

Items	2005	2006	2007	2008	2009	2010
sum	819,243	849,482	733,638	678,920	557,991	614,355
Waste Acid	750,172	792,969	677,246	623,751	511,636	562,112
Waste Alkali	69,071	56,513	56,392	55,169	46,355	52,243



V

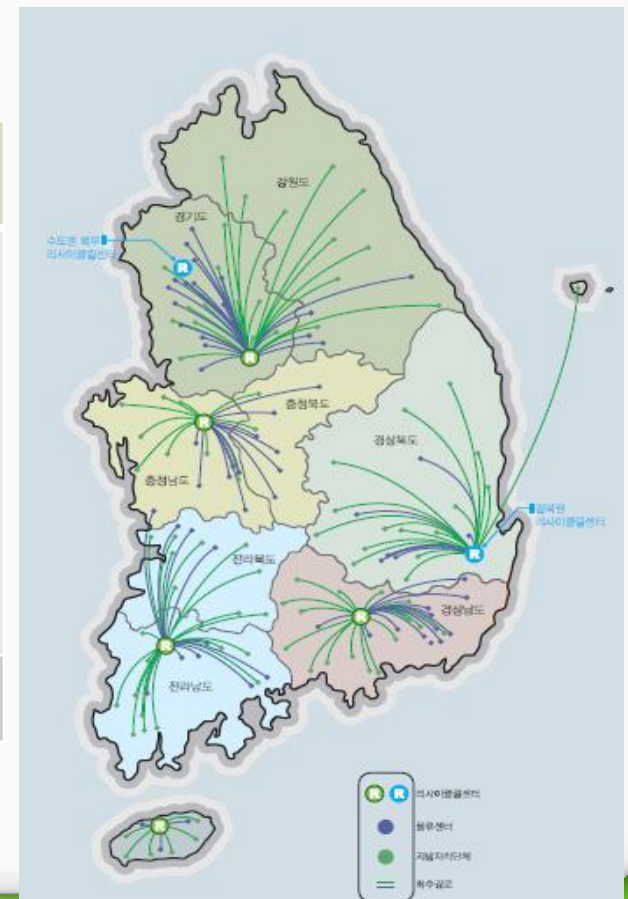
Criteria of ESM facility

1. ESM facility for E-waste

- Through nearly 70 logistics centers nationwide (about 3,250 distributing agencies), electronic wastes are stably collected when new products are purchased. Additionally, electronic wastes discharged to 232 local authorities are collected

Recycling Center

Region	Capacity (ton/year)	Location
Metropolitan	21,000	Yongin
Chungcheong	22,000	Asan
Gyeongnam	20,000	Chilseo
Honam	20,000	Jangseong
Jeju	2,000	Jocheon
Gyeongbuk	13,000	YeongCheon
North of Gyeonggi	19,200	Yangju
Total	117,200	7 Regions

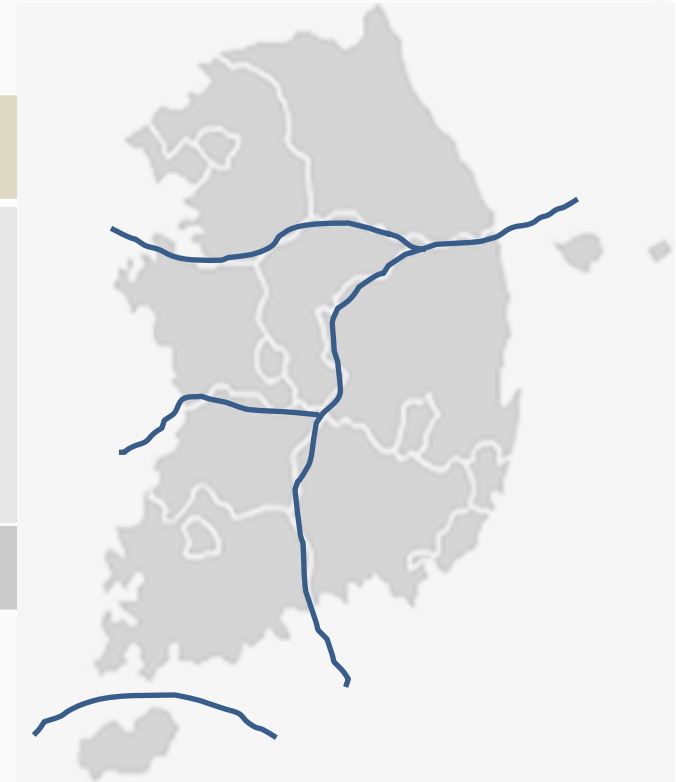


2. ESM facility for Waste Acid

- Through nearly 290 Licensed for the designated waste(waste acid) transportation businesses nationwide, Waste Acid(Including waste acid batteries) is safely collected and treated at 120 recycling facilities

Recycling Center

Region	Transportation businesses	Recycling Facilities
Metropolitan	135	52
Chungcheong	35	16
Honam	21	7
Youngnam	93	38
Jeju	4	2
Total	288	115



3. Criteria for Recycling Facility(E-waste)

Items of facility		Standard of facility	EA
Essential Facilities		<ul style="list-style-type: none"> -Metering facilities -Recycling Facility (Must have Building with Roof, Walls and dust collector) -Storage Facilities(the capacity for 30times of daily treatment) -Air pollution prevention facility as relevant Law -Water pollution prevention facility as relevant Law 	More than 1 set of each
Optional Facility	Refrigerator, Air Conditioner	<ul style="list-style-type: none"> -Collecting · Storage Facilities(for Refrigerant and Oil) -Shredder Facilities -Screening Facilities 	More than 1 set of each
	TV, Personal Computer Monitor(CRT)	-Facilities for Segregating Front and Rear Glass (Closed facilities for Collecting Fluorescence Material Safely)	
	Washing machine	-Shredder Facility	
	Printer, Fax, copier	-Dust Facility(For toner cartridge)	
	Mobile phone	-Shredder Facility	

3. Criteria for Recycling Facility(Waste Acid)

Items of facility		Standard of facility	EA
Essential Facilities		<ul style="list-style-type: none"> -Metering facilities -Recycling Facility (Must have Building with Roof, Walls and dust collector) -Storage Facilities(the capacity for 30times of daily treatment) -Air pollution prevention facility as relevant Law -Water pollution prevention facility as relevant Law 	More than 1 set of each
Optional Facility	Chemical Treatment	<ul style="list-style-type: none"> -Solidification Facility(with mixing equipment) -Chemical Reaction Facility(with decay resistance, emission gas equipment) -Coagulant – Precipitation facility 	More than 1 set of each



VI

Current E-waste Recycling Scheme

1. Current Issues

- **Only 10 types of mandatory recycling products**
(EU WEEE has **109 categories**)
- The producer's **mandatory recycling rate is only 2.1 ~ 25.3%** of the amount of released equipment to market, which is very low.
 - Korea: 2.7 kg per capita, EU WEEE : **4 kg or higher per capita**
- **Used AC/refrigerators' refrigerants (CFCs, HFCs) are illegally processed, causing pollution.**
 - Greenhouse effect from coolants is up to 11,700 times the effect of CO₂. ↑

**Illegal cutting of compressor
(CFC gas discharged to the atmosphere)**



2. Enhancement of Recycling

- **Trying to Expand the recycling mandatory Items (10 → 26)**
 - Adding small home appliances ; Hair dryeres, Electric irons, Electric fans, Vacuums, Electric rice cookers, Electric blenders, Microwaves, Electric ovens, Electronic image reproducing device(DVD,VTR), Humidifers, Air purifiers, Water purifiers, Electric heaters, Bidets, Dish washers, water softeners
- **Control the refrigerant from E-waste**
 - Inspection illegal cutting at collection point
 - To settle down the amended law for control of refrigerant at recycling facility

Thank you
for your attention!

