

# Current Practice of Recycling & Treatment of Hazardous Wastes in Korea

- Focus on *E-Wastes Recycling* by *Eco-Assurance System* -

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Korea Environment Corporation

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# I. Wastes-Related Legislation in Korea

# 1. Classification of Waste-related Legislation

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

# 1. Classification of Waste-related Legislation

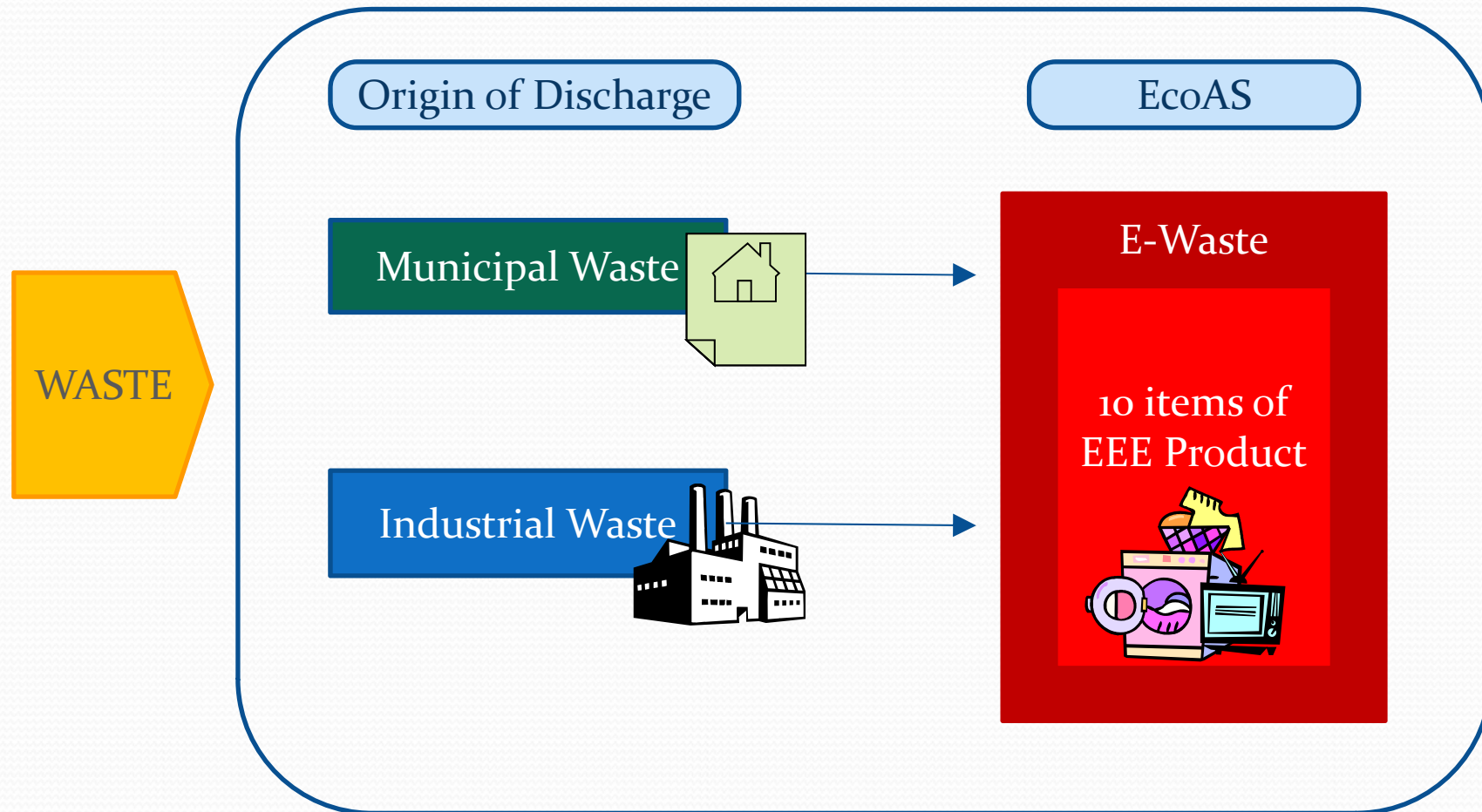
Legislation Name	Contents
<b>Act on the Resource Circulation of Electrical·Electronic Equipment and Vehicles</b>	<ul style="list-style-type: none"><li>-WEEE(Waste Electrical and Electronic Equipment )</li><li>-RoHS(Restriction of Hazardous Substances )</li><li>-ELV(End-of-Life-Vehicle Direction ) , etc.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

# Target of Legislation



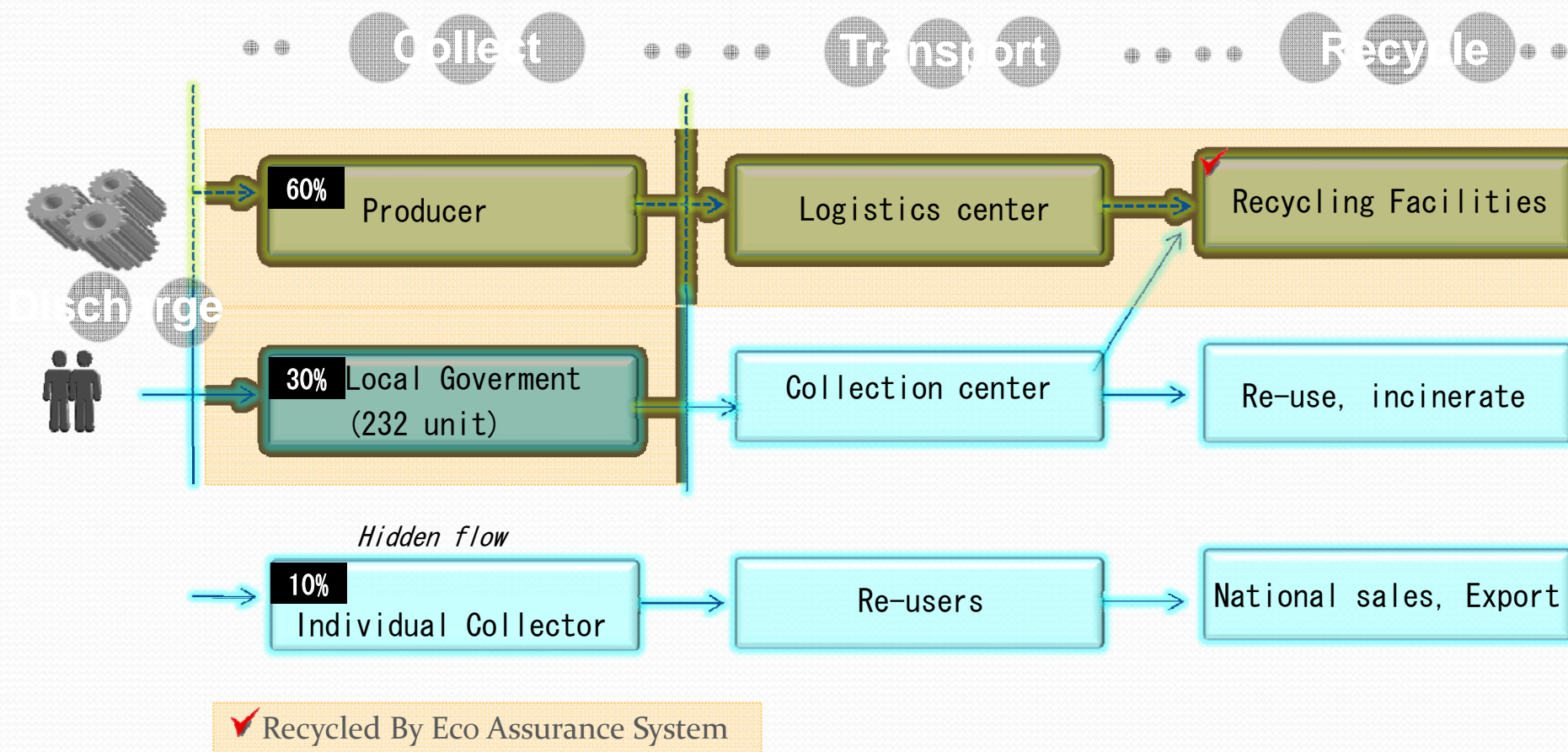
## II. Waste Streams of E-Wastes

# 1. E-Waste classification system





## 2. Take-back and Recycling of E-Wastes



### III. What is the Eco-Assurance System?

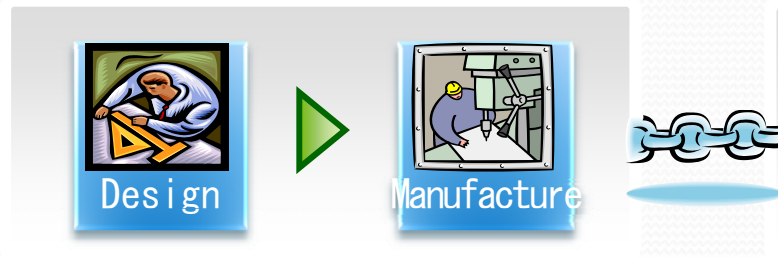
# 1. Eco-Assurance System

- 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

# 1. Eco-Assurance System

## Preventive Management



Environmentally Sound-Design

## Follow-up Management



Environment Sound disposal of waste

**Systematic Management of the whole life cycle  
to promote recycling**

# 1. Eco-Assurance System

## ● *Preventive management regulations*

- **Compliance with standards for hazardous substance contents and self-declaration**
- **Attainment of annual recycling possibility rate and self-declaration**
- **Compliance with material & structure improvement guidelines**
- **Recycling information provision**

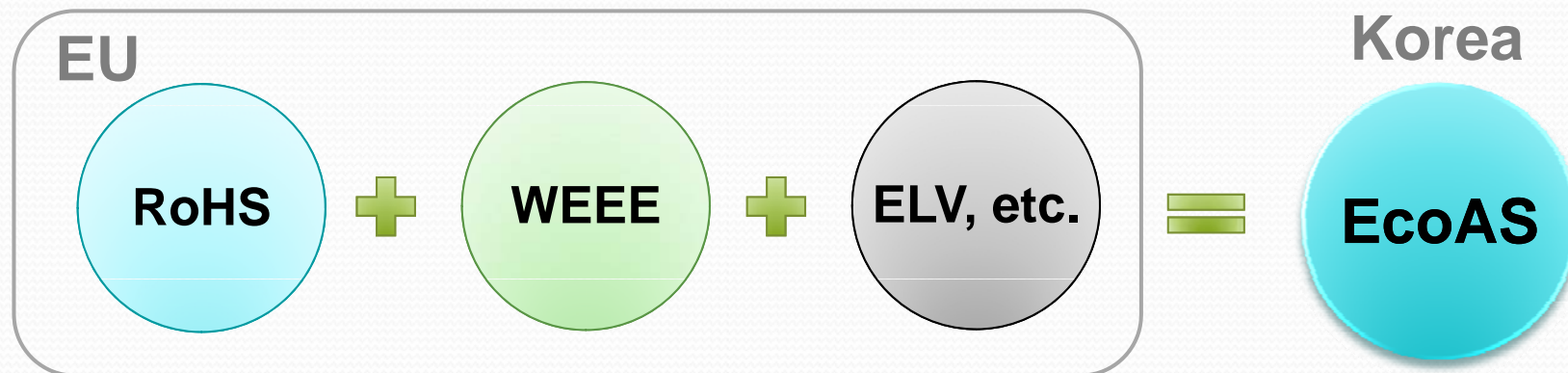
## ● *Follow-up management regulations*

- **Achievement of recycling obligation rate**
- **Compliance with recycling method and guidelines**
- **Distributor's collection obligation**
- **Registration of end-of life vehicles recycling business**
- **Preparation and submission of management sheet**

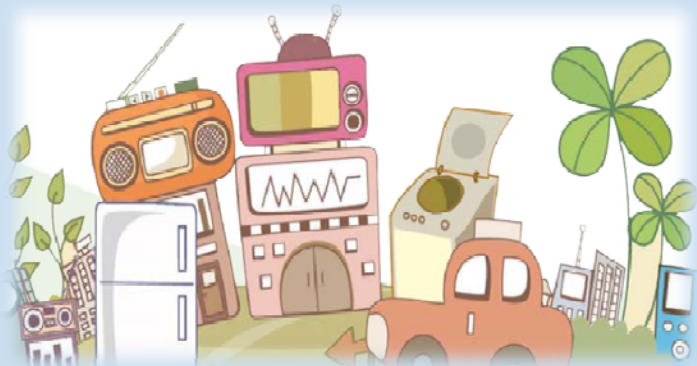


## 2. Legal basis

- **Act on the Resource Circulation of Electrical·Electronic Equipment and Vehicles**
- **Entry into force : Jan. 1. 2008**



# 3. Target Products

Electrical·Electronic Products	Vehicles
<ul style="list-style-type: none"><li>- TV</li><li>- Refrigerator</li><li>- Washing machine (only for home use)</li><li>- Air conditioner</li><li>- PC (including monitor and keyboard)</li><li>- Audio (excluding portable audio)</li><li>- Mobile phone (including battery and charger)</li><li>- Printer</li><li>- Copying machine</li><li>- Facsimile machine</li></ul>	<ul style="list-style-type: none"><li>- Passenger car</li><li>- Van (capacity : 9 persons or less)</li><li>- Truck (light and small trucks )</li></ul> 

✓ Target Products are considered to be extending

## 4. Role and duty for different parts of society

Parts	Roles and Duties
Government Administration (Ministry of Environment)	<ul style="list-style-type: none"> <li>- Manages entire Eco Assurance System</li> <li>- Various kinds of policy establishments also obligation of recycling and operation of administration</li> </ul>
Local authority	<ul style="list-style-type: none"> <li>- Collects E-waste from a consumer</li> <li>- Stable transportation and handover to the producer R/C</li> </ul>
Producer	<ul style="list-style-type: none"> <li>- Fulfill duty of recycle</li> <li>- Duty of collect back electrical and electronic equipment when sales new goods</li> </ul>
Consumer	<ul style="list-style-type: none"> <li>- Proper separation of discharge according to the related rule</li> <li>- Defray direct/indirect discharge</li> </ul>

✓ **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.**



## 5. Mandatory recycling quantity

- **Mandatory recycling quantity =**
  - Mandatory recycling rate
  - x Average weight of WEEE
  - x Number of units by manufacturer or importer of EEE released during the relevant year

### ※ How to Fulfill the Recycling Obligation

- Direct WEEE recycling
- Entrust WEEE recycling to a recycling business (signing an agreement)
- Entrust WEEE recycling to authorized mutual aid association (Korea Association of Electronics Environment)

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



## **IV. Recycling & Collecting Facilities in Korea**

# 1. Infrastructure of collection and recycling

(Mutual aid association - Korea Association of Electronics Environment)

## Collection System

- 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 System

- Through advanced recycling centers in the Seven region nationwide and 57 recycling co-worker, we are Encouraging Environment-friendly recycling

# 1. Infrastructure of collection and recycling

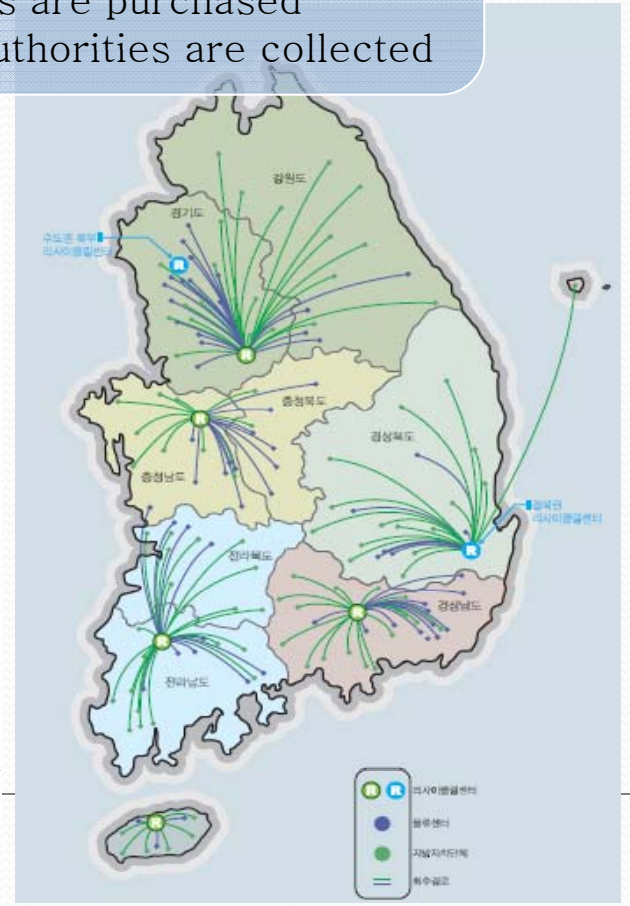
(Mutual aid association - Korea Association of Electronics Environment)

## Collection System

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	18,000	YeongCheon
North of Gyeonggi	14,000	Yangju
<b>Total</b>	<b>117,000</b>	<b>7 places</b>



## 2. Criteria for Recycling Facilities

### Criteria For Recycler for General Wastes

facility	<i>description</i>
Storage Facilities	- the vessel or facility which can store the amount of the waste which is from 10 times to 30 times of the daily treatment capacity
Recycling Facilities	-More than 1 set of facility which can properly recycle wastes in the way of screening, separating, crushing, grinding, shredding, dissolving, melting, compressing, extruding , evaporating, concentrating, refining, reacting, extracting, injecting, drying, carbonization, molding, heating, cooling, fermenting, aggregate processing, making fertilizer, etc.
Vehicles	More than 1 vehicle for collecting and carrying waste

✓ Based on Waste Control Act

## 2. Criteria for Recycling Facilities


### Currently Considered Criteria For Recycling Facilities for E-Wastes(Draft)

Items of facility	Standard of facility	amount
1. Common Facilities	<ul style="list-style-type: none"> <li>- Metering facilities</li> <li>- Dust Facilities(For Air)</li> <li>- Dismantling·Compression·Shredder Facilities(Must have Building with Roof and Walls)</li> <li>- Storage Facilities</li> </ul>	More than 1 set of each
2. Refrigerator, Air Conditioner	<ul style="list-style-type: none"> <li>- Collecting·Storage Facilities - Refrigerant and Oil</li> <li>- Shredder Facilities</li> <li>- Screening Facilities</li> </ul>	More than 1 set of each
3. TV Personal Computer Monitor(CRT)	<ul style="list-style-type: none"> <li>- Facilities for Segregating Front and Rear Glass</li> <li>- Closed facilities for Collecting Fluorescence Material Safely</li> </ul>	More than 1 set of each
4. Mobile phone	<ul style="list-style-type: none"> <li>- Shredder Facilitis</li> </ul>	More than 1 set of each

✓ Due to Revised and Legislative notice on 2012

# 3. Recycling methods and guidelines

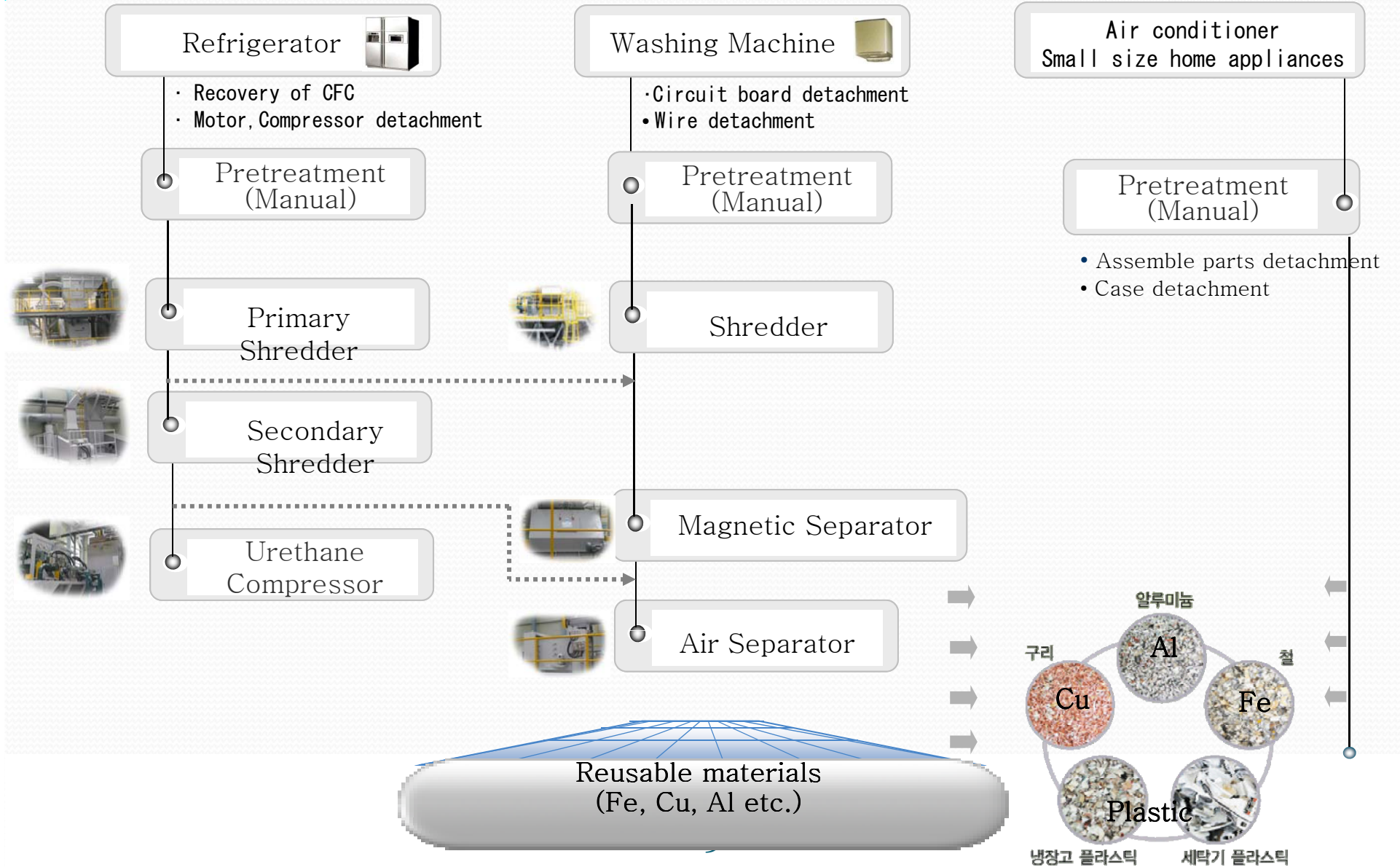
- Methods(obligation)
  - Reusing the recyclable components/parts through an interim treatment process such as dismantling, compressing, crushing, cutting or recycling after assorting them by materials
- Guidelines(obligation)
  - Safe collection of refrigerant(refrigerator), precious metals in PCBs(PC, Mobile phone)
  - Batteries of mobile phone shall be disposed safely

 Recycling rate per item	Items	Guidelines
	TV (PDP, LCD excluded), PC	65%
	Refrigerator, Audio, Mobile Phone	70%
	Washing Machine, Air Conditioner	80%
	Printer, Copy machine, Facsimile	75%



# 4. Flow of Recycling Prozesse

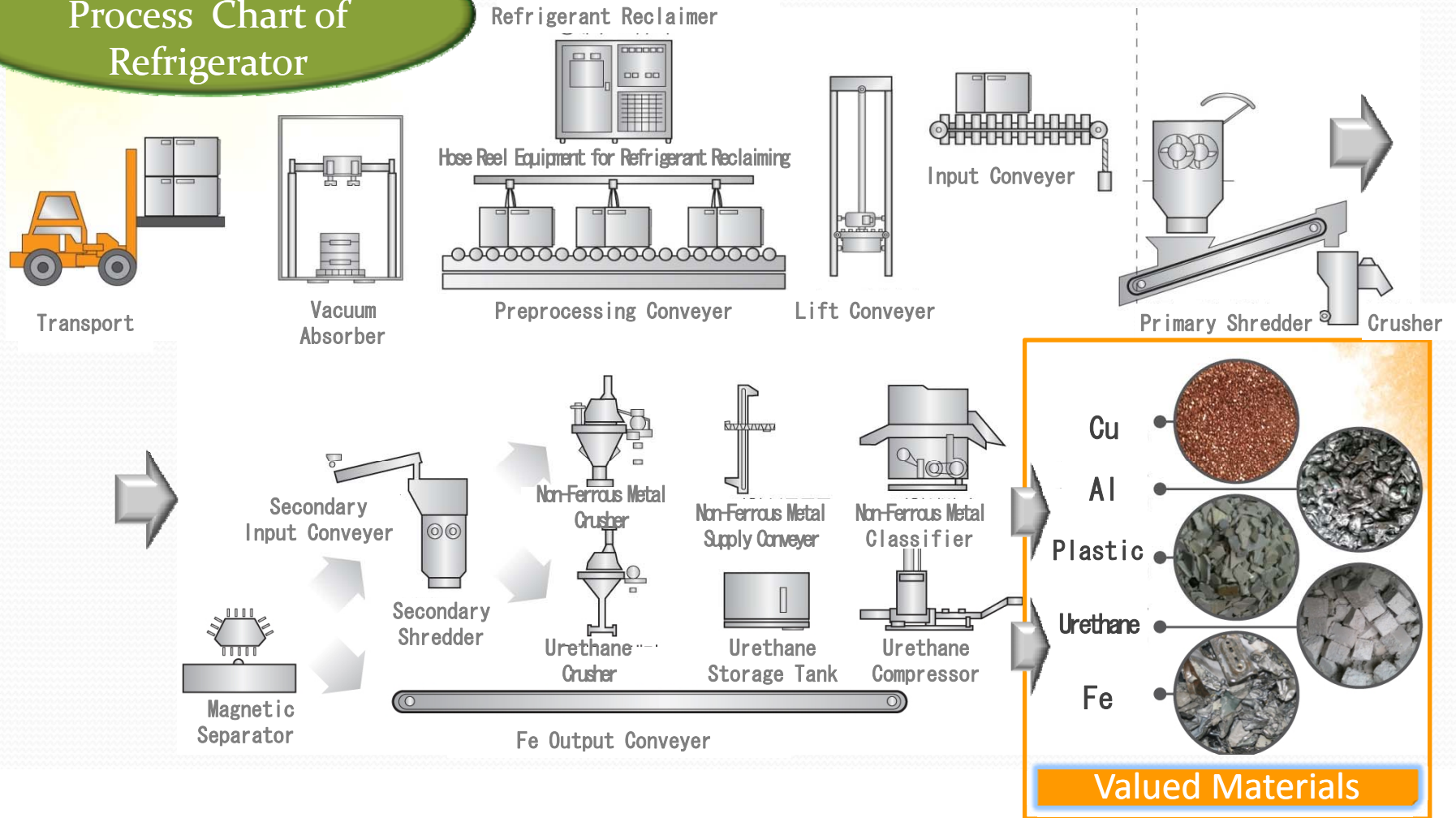
(In Case of Metropolitan Recycling Center)



# 4. Flow of Recycling Prozesse

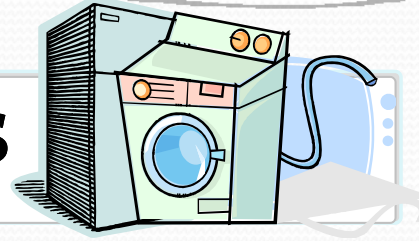
(In Case of Metropolitan Recycling Center)

## The Urban Mining Process Chart of Refrigerator



# 5. Collection of valued reusable materials

E-wastes



Shredded E-wastes



Safe Collection of refrigerant



Fe



Cu



Al



Synthetic resin



CFC (R-12)



## 6. Recycling results through EcoAS(2010)

(unit : ton, %)

Items	Quantity of EEE released (A)	Mandatory recycling rate (B)	Quantity of mandatory recycling (A*B)	Recycling result (C)	Recycling rate (C/A)	Mandatory recycling performance rate (C/B)
Total	640,329	-	111,716	133,204	21%	119%
Refrigerator	234,347	0.221	51,791	64,618	28%	125%
Washing Machine	107,137	0.274	29,355	29,215	27%	100%
Air Conditioner	128,790	0.024	3,091	3,064	2%	99%
TV	86,300	0.190	16,397	21,491	25%	131%
PC	54,304	0.123	6,679	9,790	18%	147%
Audio	4,632	0.170	787	711	15%	90%
Mobile phone	3,533	0.220	777	731	21%	94%
Printer	15,056	0.130	1,957	2,462	16%	126%
Copy machine	5,707	0.142	810	994	17%	123%
Facsimile	525	0.134	70	129	25%	184%

# V. Operating System(EcoAS)

# 1. EcoAS(www.ecoas.or.kr)

The screenshot displays the EcoAS website interface, which is a platform for environmental information and administrative services. The main navigation bar includes links for '제도소개' (System Introduction), '고객마당' (Customer Area), '사용자정보' (User Information), '자동차관리' (Vehicle Management), '전기전자제품관리' (Electronics Management), and '재활용부과금관리' (Recycling Fee Management). The site features a 'LOGIN' section with '공인인증서 LOGIN' and '아이디 LOGIN' buttons, along with '회원가입' (Sign Up) and '아이디찾기' (Find ID) links. A '공지사항' (Notice) section lists recent announcements, such as the 2010 recycling fee adjustment and vehicle recycling fee collection. A 'POPUP ZONE' section provides information about pre-shipment reservations for used electronics. The '분기알림안내' (Quarterly Notice) section details regulatory updates for electronics and vehicle recycling. A '대상품목 확인하기' (Check Major Products) section allows users to search for specific items. The '사업자별 준수사항' (Compliance by Business Type) section lists requirements for manufacturers, importers, and recyclers. The footer contains contact information for the Korea Environmental Corporation (KECO) and the Ministry of Environment, along with a copyright notice for 2010.

- Various administrative issues for efficient law enforcement are handled online, with the relevant information provided

## 2. Major works

- Declaration of compliance with standards for hazardous substances contents
- Declaration of compliance with the vehicle's annual recycling possibility ratio
- Recycling information provision
- Submission of recycling obligation performance plan and result report
- Preparation and submission of electronic management sheet(collection, transport, recycling)
- Preparation and submission of end-of life vehicles recycling result report
- FAQ on laws & regulations and systems
- Recycling statistics and current status data on international environmental regulations

### 3. Preparation and submission of electronic management sheet

- **Objective**
  - Monitoring collection, transportation and recycling of E-waste and ELV in real time
  - Prevention of illegal dumping through appropriate transporting and receiving of wastes
  - Attainment of statistics about e-waste and end-of-life vehicle
  - Reduction on the amount of administrative cost through automatic creation of related reports
- ***Duty on Collectors, Transporters and Recyclers of E-waste and end-of-life vehicle***
- **Contents** : Information on collection, transportation and recycling
- Submit to Keco



# ❖ Example : WEEE Transporter's management sheet

**환경정보장제 EcoAS**  
 0 건 관리자 HOME : LOGOUT : SITEMAP

제도소개 고객마당 사용자정보 자동차관리 전기전자제품관리 재활용부과금관리

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 유해물질 함유기준 준수

**관리표관리**

수거운반용인계  
 수거운반용인수  
 운반용인계  
 운반용인수  
 재활용정보  
 재활용정보(판매업)  
 관리표실적분배  
 관리표기한초과현황

**전기전자 관리대장**

회수재활용관리대장  
 현재보관량조회  
 비대상품관리대장  
 제조수입관리대장

**관리표 수정요청현황**

관리표수정요청현황

**수거운반용인계**

최초로 수거운반한 품목에 대하여 인수자에게 인계한 품목을 전자관리표로 작성후 인수자에게 전송하여야 합니다.  
**관리표 작성 제출기한 안내 : 인계정보는 인계후 1일 이내 작성 제출(위반시 과태료)**

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관리표 작성일자	관리표 제출일자
수집지역	페이지당 조회 건수 200
검색유형	:: 선택 ::

[ 0 / 0 ]

NO	선택	관리표번호	관리표상태	인계업체	인수업체	수집지역	인계운송 차량번호
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**Thank you for your attention!**