



# Energy Efficiency Management in the Appliance & Equipment Sector



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“Improve Energy Efficiency, Respond to Climate Change, Disseminate New and Renewable Energy”



KOREA ENERGY AGENCY



Name

Korea Energy Agency (KEA)

Founded

July 4, 1980 (Article 45, Energy Use Rationalization Act)

Budget

1.96 trillion KRW (Year. 2025)

Staff

760 (Year. 2025)

Organization

21 Divisions, 1 Affiliated, 12 Regional HQ

#### Major Activities

01

Delivering Sectoral  
Energy Efficiency  
Services

02

Accelerating New and  
Renewable Energy  
Deployment

03

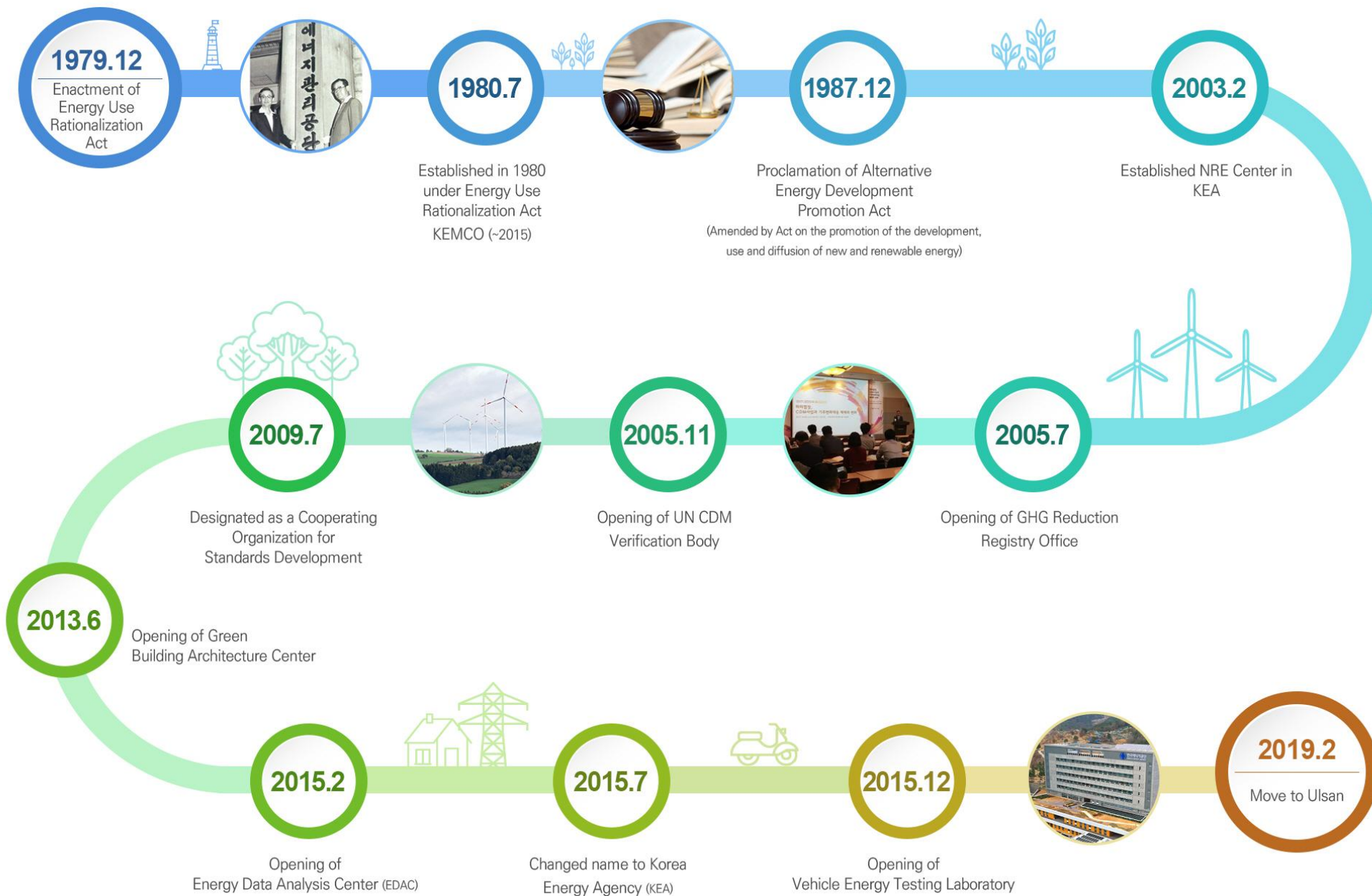
Establishing  
Greenhouse Gas  
Reduction Scheme

04

Communication  
and  
Cooperation

# 1-2

## Overview of Korea Energy Agency



# 2-1

## Role of Energy Efficiency

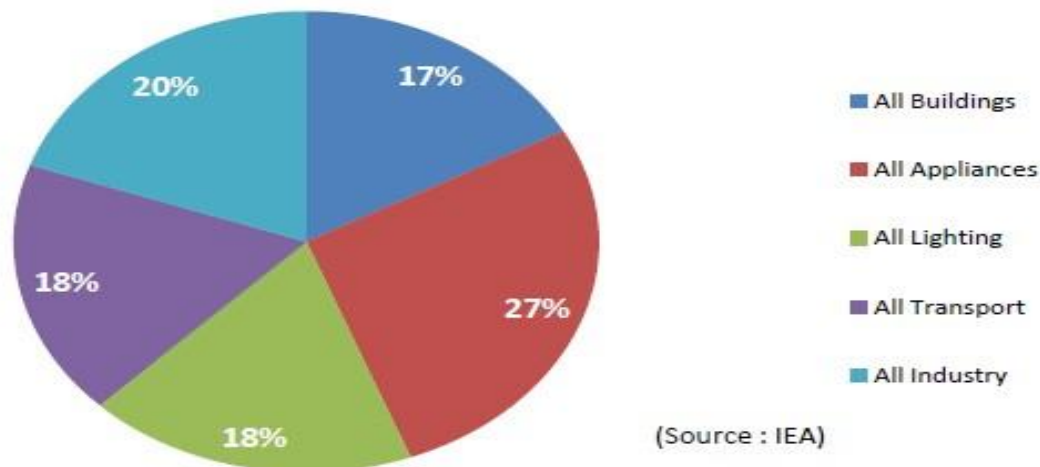
- » The biggest energy source from '74~'15 among IEA member countries was 'energy efficiency'
- » Major countries are focusing on enhancing national energy efficiency by establishing mid - to – long term goals
  - (EU) Reduce 40% of GHG by '30, use 27% of total energy in renewables, increase energy efficiency by 27%

### Share of appliances & equipment sector in energy saving

#### Share in potential CO<sub>2</sub> reduction: 45%

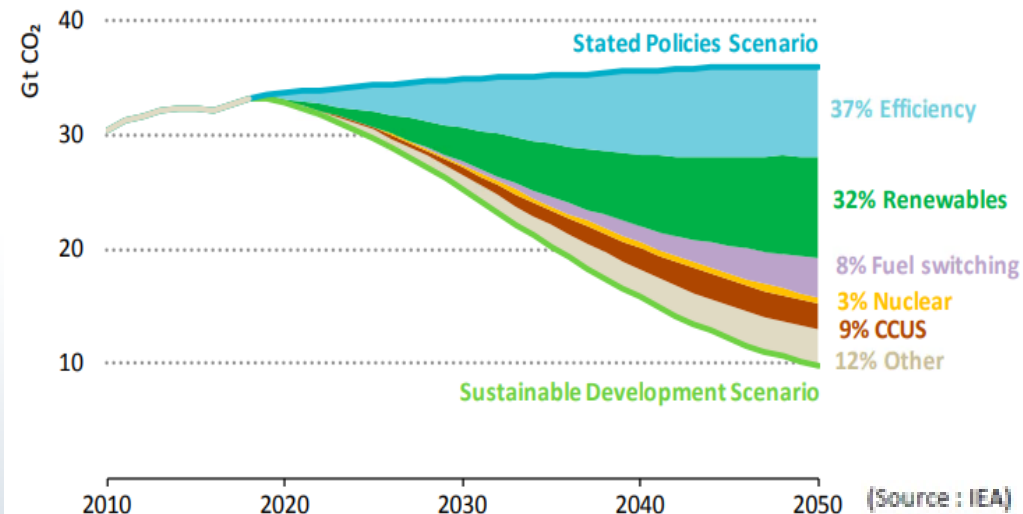
- The International Energy Agency (IEA) analyzes that 45% of total potential CO<sub>2</sub> emissions reduction by 2030 will be the appliances & equipment sector (including lighting, based on OECD+EU)

#### Reductions in CO<sub>2</sub> emissions by 2030



### 2050 CO<sub>2</sub> emissions reductions contribution

- Energy efficiency is the primary “fuel” of choice in most regions, because of its cost-effectiveness
- No decarbonization pathway is achievable without rapid and significant deployment of energy efficiency measures



# What are the Energy Efficiency Programs (EEP) in the Appliance & Equipment Sector?

## 2. High-Efficiency Appliance Certification Program

- ☑ **Voluntary** Certification
- ☑ 25 Items: Lighting, Pump, etc.
- ☑ Certificate and Incentives for high-efficient products

## Energy Efficiency management Programs



## 1. Energy Efficiency Labeling & Standard Program

- ☑ **Mandatory** 5 rating Label with MEPS
- ☑ Failing to meet MEPS restricts on Production and Sales
- ☑ 40 Items: Refrigerator, Washing Machine, 3 Phase Induction Motor, etc.

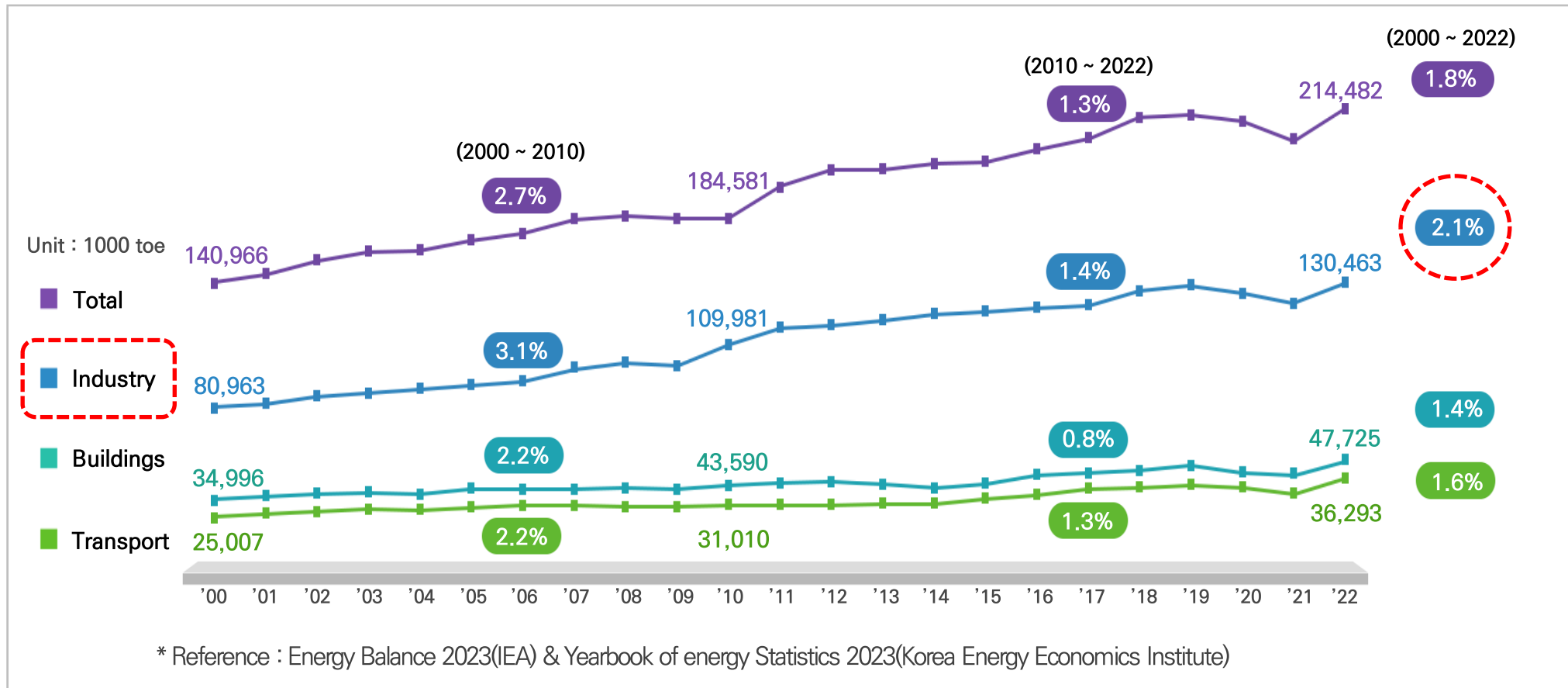
## 3. e-Standby Power Reduction Program

- ☑ **Mandatory + Voluntary** system
- ☑ 18 Items: Printer, Audio, etc.
- ☑ Automatic shift to low standby power mode
- ☑ Meet Standard: Energy-saving Mark  
Below Standard: Warning label required

# 2-3

## Energy Consumption Status in South Korea

» Energy Consumption in Industry, Buildings and Transport Sectors has steadily increased. Particularly, Industry sector is higher than other sectors due to diversity of technologies & devices



# 2-4

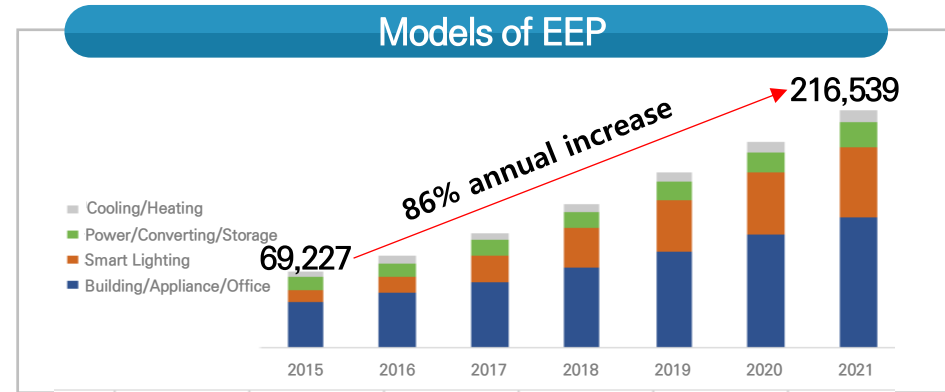
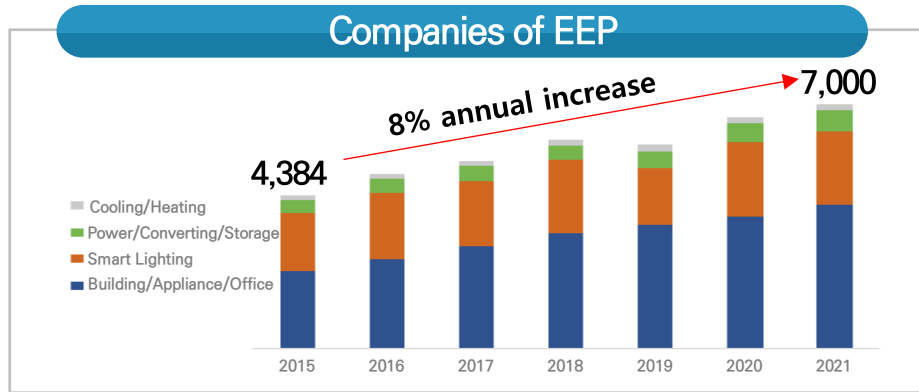
# Appliance & Equipment Sector's Energy Consumption Status



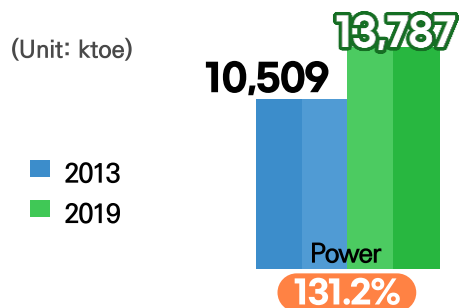
## Appliance

Energy consumption has steadily increased due to diversity of appliance & equipment

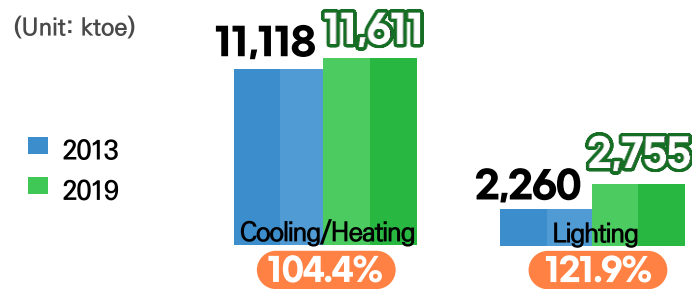
- » Energy consumption in the appliance & equipment sector has increased
- ➔ Energy consumption management is required by expanding items and models of EEP



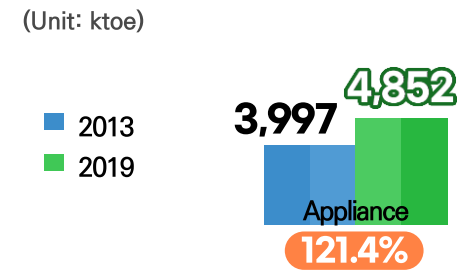
### Energy consumption in Manufacturing



### Energy consumption in Commercial&Public

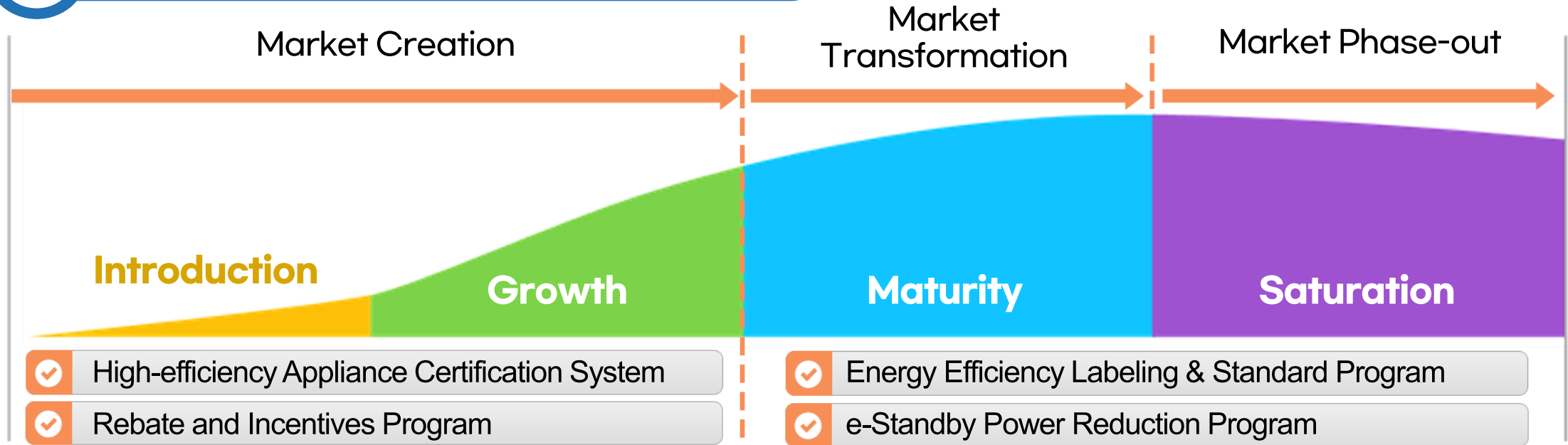


### Energy consumption in Residential



\* Reference: EEP Total Status(Korea Energy Agency), Energy Consumption Survey in 2020(Korea Energy Economics Institute)

## Energy Efficiency Improvement Step



<p>01 Market Creation</p>	<p>High-efficiency Appliance Certification</p>	<ul style="list-style-type: none"> <li>o The Korean government certifies high-efficiency appliance &amp; equipment that meet standard</li> <li>- 4 Sectors with 25 items: Lightings, Power, Cooling/Heating, Insulation</li> </ul>
<p>02 Market Transformation &amp; Phase-out</p>	<p>Energy Efficiency Labeling &amp; Standard</p>	<ul style="list-style-type: none"> <li>o Mandatory energy efficiency rating for 40 items that need energy consumption management</li> <li>- Energy efficiency rating: 23 items, Only MEPS: 17 items</li> </ul>
	<p>e-Standby Power Reduction</p>	<ul style="list-style-type: none"> <li>o Power reduction and warning mark for promoting excellent standby power reduction home &amp; office appliance</li> </ul>

# 2-6

# Energy Efficiency Labeling & Standard Program



## Labeling

Consumers can easily purchase high efficient products

- » Manufacturers and importers are required to label products from production and import stage (Mandatory)
  - Mandatory 1 – 5 rate labeling program

### 1 – 5 Rate Labeling

- ✓ Label based on product energy efficiency (Rate 1 = most efficient)
  - Prohibition of production and sale of products that do not meet Minimum Energy Performance Standards (MEPS)



### Program Overview

- ✓ Legal Basis: Energy Use Rationalization Act
  - 1-5 rating energy grading system (mandatory)
- ✓ Started in 1996, Currently 40 Items

Rating-labeled (23 Items)	MEPS only (17 Items)
Refrigerators, Kimchi-fridges, washers, water dispensers, LED lamps, dryers, etc.	Fans, incandescent bulbs, fluorescent lamps, motors, transformers, set-top boxes, etc.

### Reporting & Performance

- ✓ Registered items by year

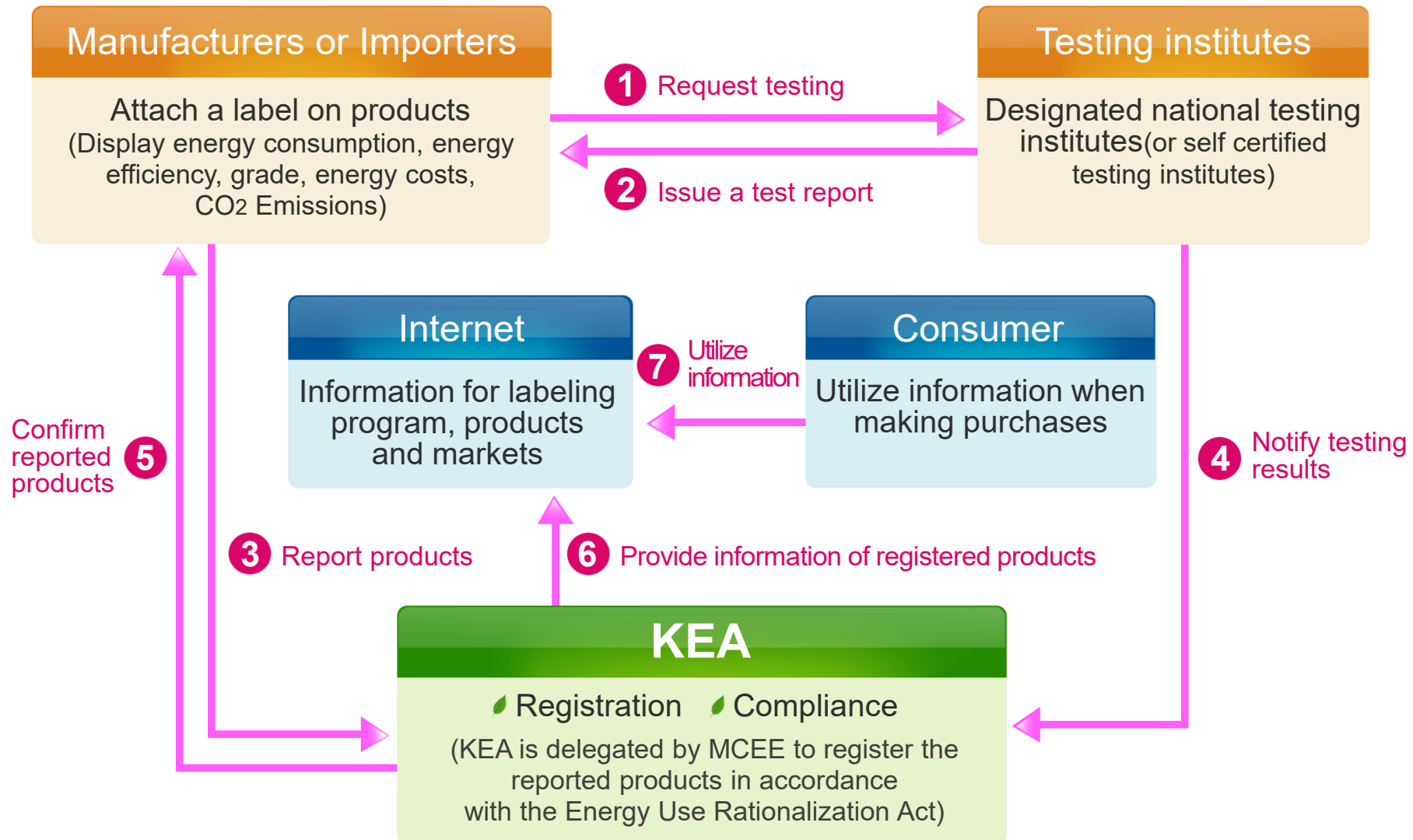
Year	2023	2024	2025
Items	34	34	40
Companies	4,888	5,145	5,489
Models	130,567	141,301	188,048

- ✓ Energy saved: 1,758 kTOE (as of 2024)



## Labeling

### Energy Efficiency Rating Registration Process



## Introduction Year of Products

Year	Items
1990s	Refrigerator(92) / Incandescent lamp(92) / Fluorescent Lamp(92) / Air-conditioner(93) / Ballast for fluorescent lamps(94) / Compact fluorescent lamps(99)
2000s	Washing machine(01) / Household gas boiler(01) / Dishwasher(02), Electrical Cooler and Heater for Drinking-Water Storage(03) / Rice Cooker(04), Kimchi Refrigerator(04) / Freezers(04) / Vacuum cleaner(04) / Horizontal drum washing machine(06) Electric fan(06) / Dish drier(07) / Air cleaner(08) / 3-phase induction motor(08) / Adapter-charger(09)/ Electric Cooling & Heating equipment(09)
2010s	Commercial Refrigerators(10) / Gas Water Heaters(11) / Electric fan heater(11) / Electric stove(11) / Electric pad(11) / Electrically heated water mat(11) / Electrical Heating Board(11) Electric bed(11) / Electric radiators(11) / Electric Heat Pump(12)/ Window set(12)/ Transformer(12) / TV(12) / Dehumidifier(12) / External • Internal converter type LED(18)
2015-2016	Exclusion : Ballast for fluorescent lamps / Dishwasher / Freezers / Dish drier / Electric pad / Electrically heated water mat / Electrical Heating Board / Electric bed/ Electric radiators
⋮ 2025	Currently 40 Items

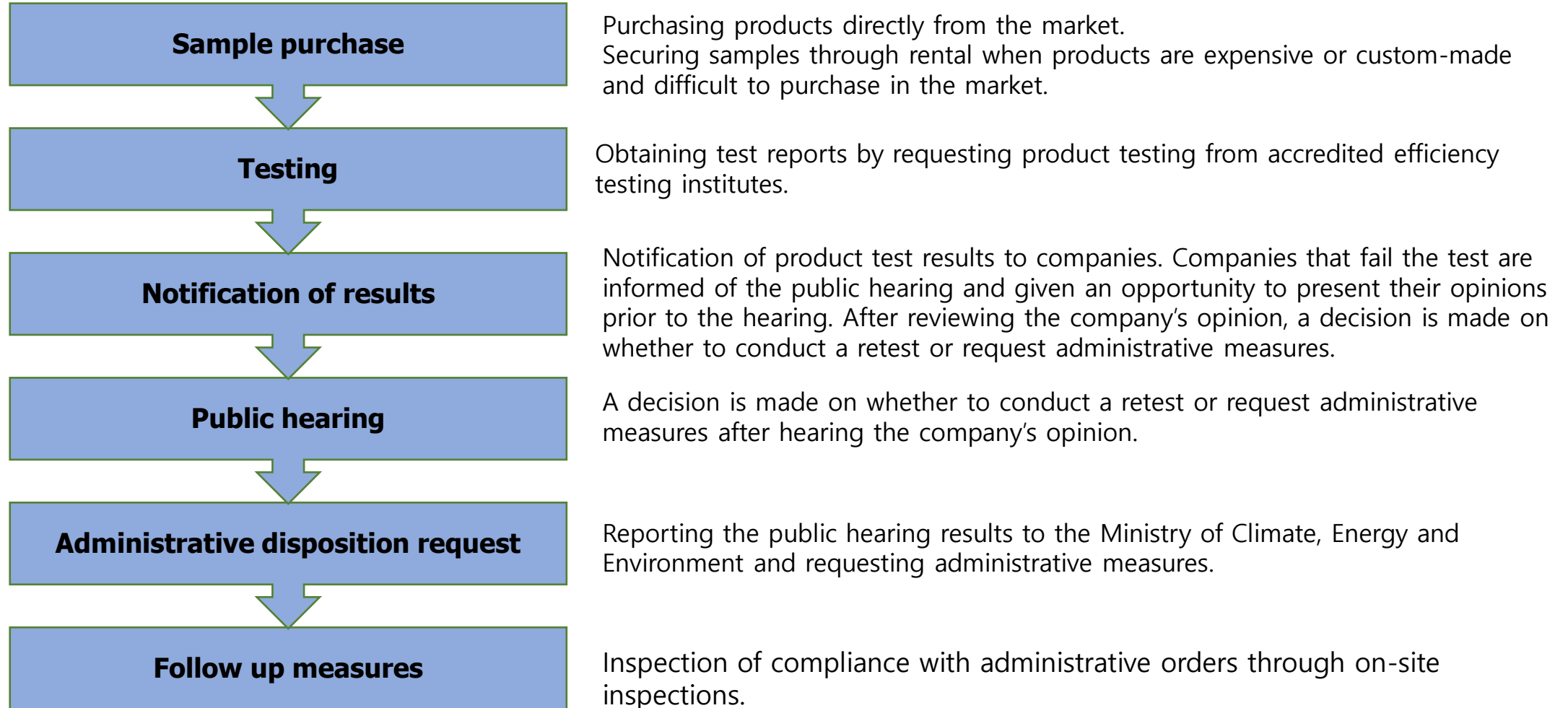
# 2-9

## Product-specific labeling requirement

Items	Rating	MEPS	Energy Cost		Items	Rating	MEPS	Energy Cost
Kimchi storage refrigerator	O	O	O		Stove	△	O	O
Air conditioner	O	O	O		Electric heat pump	O	O	X
Washing machine	O	O	O		Dehumidifier	O	O	O
Water dispenser(Hot&Water)	O	O	O		Electric range	△	O	O
Vacuum cleaner	O	O	O		Set-top box	△	O	X
Fan	△	O	X		LED lamp(Converter-integrated)	O	O	X
Air purifier	O	O	O		LED lamp(Converter-external)	O	O	X
Incandescent lamp	△	O	X		Industrial chiller	△	O	X
Fluorescent lamp	△	O	X		Air compressor	△	O	O
Self-ballasted lamp	△	O	X		Signage display	△	O	X
3-phase induction motor	△	O	O		Clothes dryer	O	O	O
Residential gas boiler	O	O	X		Computer monitor	△	O	X
Power adapter and charger	△	O	X		Dishwasher	O	O	O
Commercial refrigerator	O	O	O		Portable air conditioner	O	O	O
Gas water heater	O	O	X		LED lamp(Linear)	O	O	X
Transformer	△	O	X		Pump	△	O	O
Window set	O	O	X		Computer	△	O	X
Television	O	O	O		Multifunction printer(Exc.Inkjet)	O	O	O
Fan heater	△	O	O		Multifunction printer(Inkjet)	△	O	X

• △ : Energy label applied; no efficiency grade indicated.

# Post-market Management Procedure



## 2

## Certification

### Excellent SME Product Guarantee, Quality Improvement Incentives

- » Certify products meeting high-efficiency standards (**Voluntary**)
  - Products meeting a certain EE standard are certified, issued a certificate, and marked

#### Target Items (25)

- ✓ **Lightings (5)** LED lamps, fixtures, smart lighting, etc.
- ✓ **Power (9)** UPS, inverters, ESS, EV chargers, etc.
- ✓ **Cooling/Heating (8)** Boilers, chillers, GHP, heat/humidity control, etc.
- ✓ **Insulation(3)** High-seal doors, etc.



#### Program Overview

- ✓ **Legal Basis: Energy Use Rationalization Act**
  - High efficiency certification system (Voluntary)
- ✓ **Started in 1996 with motors & lamps**
- ✓ **Currently 25 items**

#### Reporting & Performance

##### ✓ Registered items by year

Year	2023	2024	2025
Items	23	23	25
Companies	1,537	1,624	1,644
Models	64,714	73,732	82,818

##### ✓ Energy saved: 596 kTOE (as of 2024)

## 3

## e-Standby Promotes Excellent e-Standby Power Reduction Products

- » Promotes sleep mode and standby power reduction when not in use (**Mandatory + Voluntary**)
  - Mark attached to low standby power products, Mandatory warning for non-compliant items

## e-Standby Power Reduction Program

- ✓ **Mandatory (13)** PC, printer, copier, microwave, modem, bidet, etc.
- ✓ **Voluntary (5)** Router, digital converter, hand dryer, etc.



## Program Overview

- ✓ Legal Basis: Energy Use Rationalization Act
- ✓ Started as voluntary in 1999, Warnings mandatory since 2008
- ✓ Total 18 items
- ✓ To be integrated with EE Labeling & Standard by 2027

## Reporting &amp; Performance

## ✓ Registered items by year

Year	2023	2024	2025
Items	20	20	18
Companies	899	925	788
Excellent Models	59,007	56,915	15,935
Warning Models	495	535	200

## ✓ Energy saved: 104 kTOE

## ☑ Energy Efficiency Labeling & Standard Program

Category	2017	2019	2020	2021	2022	2023	2024	2025
No. of Items	27	32	33	33	33	34	34	40
No. of Declared Businesses	2,738	3,448	3,707	4,166	4,390	4,888	5,145	5,489
No. of Models	52,148	69,349	82,383	93,680	106,975	130,567	141,301	188,048

## ☑ High - Efficiency Appliance Certification Program

Category	2017	2019	2020	2021	2022	2023	2024	2025
No. of Items	37	22	22	23	23	23	23	25
No. of Declared Businesses	1,616	1,376	1,463	1,440	1,483	1,537	1,624	1,644
No. of Models	24,318	39,373	47,100	51,732	58,082	64,714	73,732	82,818

## ☑ e-Standby Power Reduction Program

Category	2017	2019	2020	2021	2022	2023	2024	2025
No. of Items	21	21	21	21	21	20	20	18
No. of Declared Businesses	728	826	854	960	1,027	899	925	788
No. of Models	29,495	43,690	52,777	57,115	66,685	59,502	57,450	16,135

To maximize efficiency in implementing energy efficiency policies, it is essential to systematically manage the full policy cycle based on market trends



## Early Proposing the Master Plan of Energy Efficiency management System

- ✔ The pre-proposing of energy efficiency management systems master plan promotes the technology development and investment in related industries



## Modernization and Optimization of the Energy Efficiency Standards

- ✔ Promote high-efficiency device adoption by establishing transparent and consistent standards through rigorous validation of new markets and technologies, while minimizing gaps between real-world use and standards



## Leading a Good Efficiency Market with Harmonizing Regulation and Promotion

- ✔ Strengthening the reliability of the Korea efficiency market by improving systems that regularly check and confirm the performance of high-efficiency appliances and equipments



## Supporting Energy Efficiency Competitive of Small and Medium Companies through Public-Private Cooperation

- ✔ Booming energy efficiency innovation by helping small and medium companies bring new high-efficiency technologies to market through teamwork among energy experts and public-sector leadership

# Thank You!

