

New Energy Efficiency Policy Tool

STANDBY WARNING LABEL

2 April 2008



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Overview

- 1. Standby Warning Label Design**
- 2. Korea's Energy Situation**
- 3. Energy Standards & Labeling**
- 4. Korea's 1-Watt Plan**

1. Standby Warning Label Design

◆ Korea's “standby warning label” overview



1. Mandatory reporting on standby power
2. **Mandatory indication** of standby warning label on **failing products** to meet standby standard

Target Products of Warning Label

◆ 20 products will be applied warning label

- On the nameplate of failing products standby standard
- Target products : e-Standby Program
: TVs, set-top boxes, computers, monitors, printers, multi-function devices, VCRs, audios, DVD players, microwave ovens, radios, cordless phones, door phones, modems, bidets, fax machines, scanners, home gate ways, etc



Mandatory
Products failing standby standard

or



Voluntary
Products satisfying standby standard

Penalty System for Warning Label

◆ Mandatory reporting on standby power

- In case of violation, a fine up to US\$ 5 thousand will be charged per model

◆ Mandatory indication of warning label on failing product to meet standby standard

- In case of violation, a fine up to US\$ 5 thousand will be charged per model

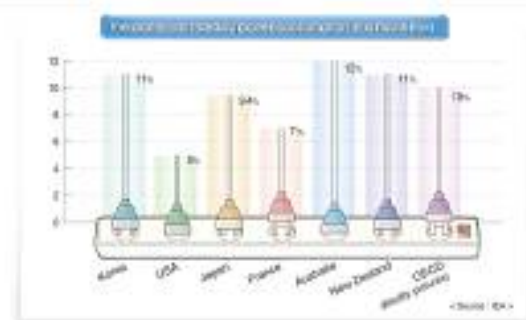


What is Standby Power?

◆ Standby power is wasted energy

- All kind of standby should be included, if appliances are **not performing its primary function**

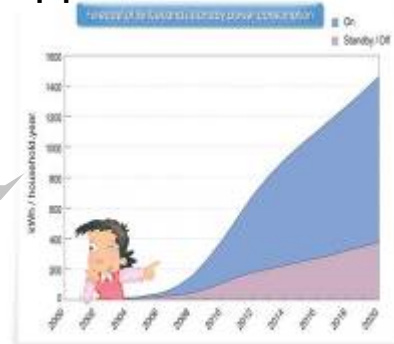
: TVs, computers and other electronic appliances consume a significant amount of energy while awaiting instructions to provide full services. Standby power includes power consumption in no load, off mode, passive mode where the remote control is turned off, active standby mode during network communication and sleep mode during operation



Why Standby is Important?

◆ Most cost-effective way to save energy

- Standby : **\$US 1-3**
 - : 3-4W → <1W (from 0.03W to 1W)
 - : Reducing standby power 75%-90%
 - : only if manufacturer need to change semiconductor
- **Active standby** will be serious issue
 - : Set-top boxes, home networked appliances




Type of Waste Standby

Mode	Description	Power	Products	Remark
No load	State of the power supply when no power is being provided to the rest of the appliances	-	External power supplies(<0.5W), rice cookers	Main target of <1W plan
Off	The appliances is switched off and has no capacity	Switched off	TVs, VCRs, audios, DVD Players, computers, monitors, printers, scanners, copiers, washing machines	
Passive standby	The appliance is off, but can be powered up remotely	Switched off	TVs, VCRs, audios, DVD players	
Active standby	The appliances in on, but is not providing a primary function	Switched of	Set top boxes, home network systems	Networked standby
Sleep	Mode entered after a period inactivity	On and standby	computers, monitors, printers, fax machines, copiers, scanners, multi-function devices	

How Can Limit Standby?

◆ Current policy tools for market transformation

Policy Tool	Label	Characteristic	Related Programs
Energy label	Yes	Mandatory	
MEPS	Yes	Voluntary	
Target	-	Mandatory	Korea, USA, EU, Australia, China
Voluntary agreement	-	Mandatory	Top Runner Program (Japan)
Benchmarking	-	Voluntary	Code of Conduct (EU)
Procurement	-	Voluntary	Market Transformation Program (UK)
	-	Mandatory	FEMP(USA), Green Law (Japan), China

Necessity of Mandatory Policy

◆ Voluntary policy have limit to reduce standby

- Market share of “Energy Boy” labeled products is 14%
- **86% of products fails** to meet standby standard
- : Many manufacturers ignore voluntary policy



에너지절약

Voluntary

Products satisfying
standby standard
(14% of market share)




I don't care!


Products failing
standby standard
(86% of market share)

How Much Fails Standby Standard?



◆ Korea's e-Standby Program (2007, Voluntary)

Product	Satisfied 	Failed (I don't care)
TVs	71%	29%
Set-top boxes	35%	65%
Computers	62%	38%
Monitors	84%	16%
Printers	45%	55%
Multi-function device	60%	40%
Fax machines	21%	79%
Scanners	37%	63%
Copiers	1%	99%
Radios	0%	100%

Product	Satisfied 	Failed (I don't care)
VCRs	28%	72%
Audios	16%	84%
DVD players	1%	99%
Microwave ovens	56%	44%
Adaptors	3%	97%
Chargers	5%	95%
Cordless phones	4%	96%
Door phones	7%	93%
Bidets	11%	89%
Average	14% (13 million)	86% (77 million)

Considering of New Mandatory Tool

◆ Minimum energy performance standard?

- MEPS is energy efficiency standard to prohibit productions and sales, if products fail to meet standard
 - : In case of MEPS violation, a fine up to US\$ 20 thousand will be charged in Korea
- **MEPS is good policy tool, but...**
 - : MEPS is strong, but excessive policy only for standby
 - : IT technology change so fast
 - : Sometime government worry about wrong minimum energy performance standard

MEPS



Thank You! Australia

◆ Australia is grandfather of warning label idea



Benefits of Warning Label

◆ Similar MEPS effect, but free for government


- All manufacturers do not like warning label
- It is **free for government** even if mandatory
 - : IT technology change fast
- “Warning” concept is good for standby
 - : Standby wasted energy = Tobacco



- **All kinds of standby** can be controlled
 - : No load, off, passive standby, active standby, sleep mode

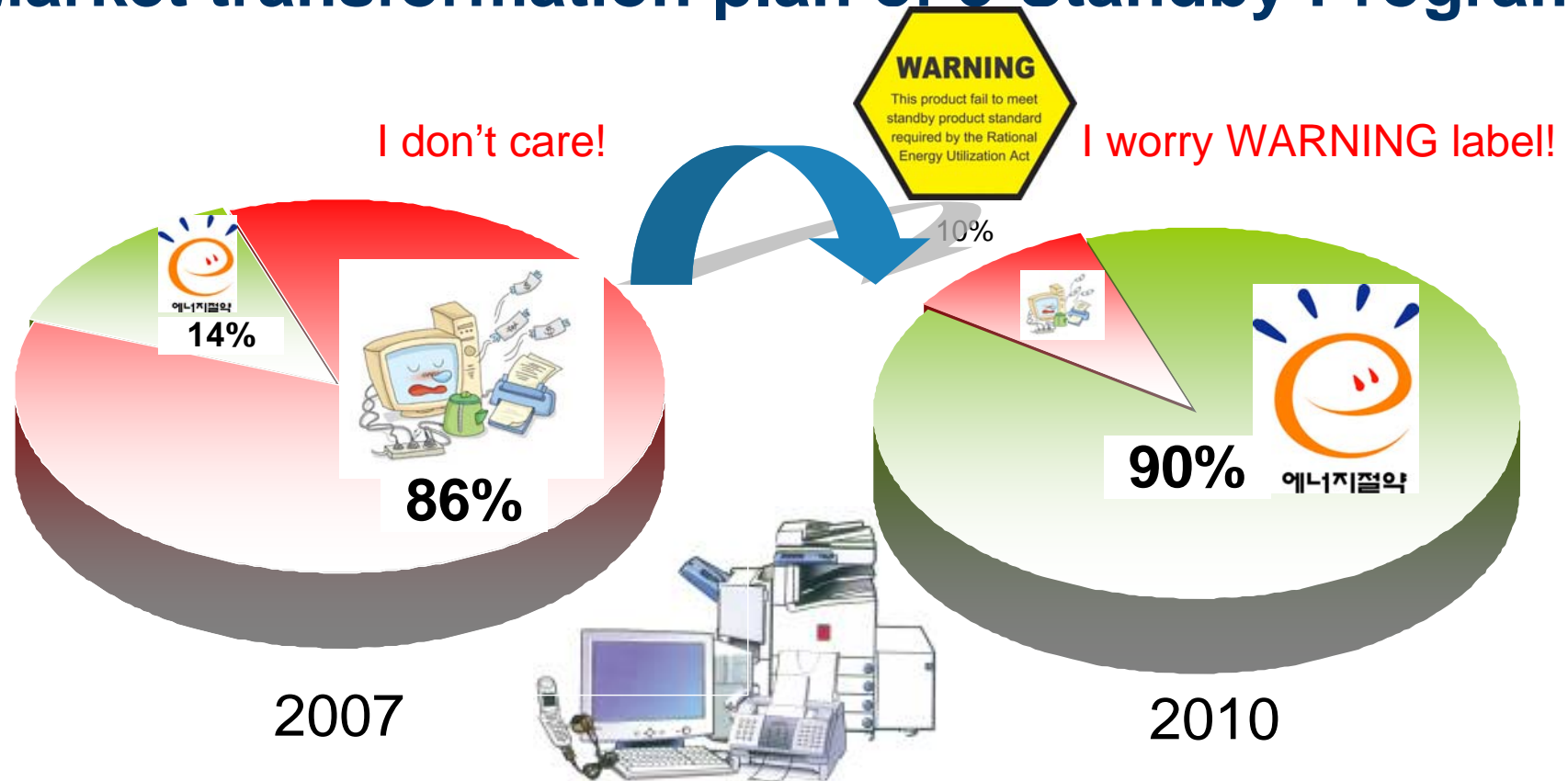
Implementation of Warning Label

◆ Date of enforcement

Warning label	Date of enforcement	Target products (e-Standby Program)
	2009.1.1	TVs, set-top boxes, computers, monitors, printers, multi-function devices (6 products)
	2010.1.1	VCRs, audios, DVD players, microwave ovens, radios, cord/cordless phones, door phones, modems, bidets, fax machines, scanners, home gate ways (12 products)
	2011.1.1	Others (2 products)

Expecting Warning Label Effect

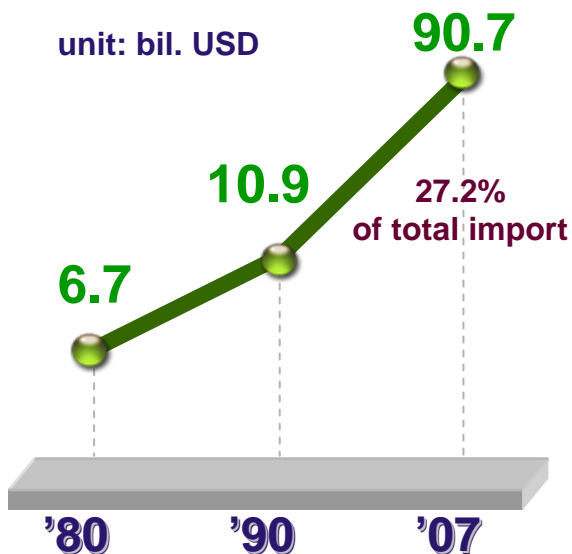
◆ Market transformation plan of e-Standby Program



2. Korea's Energy Situation

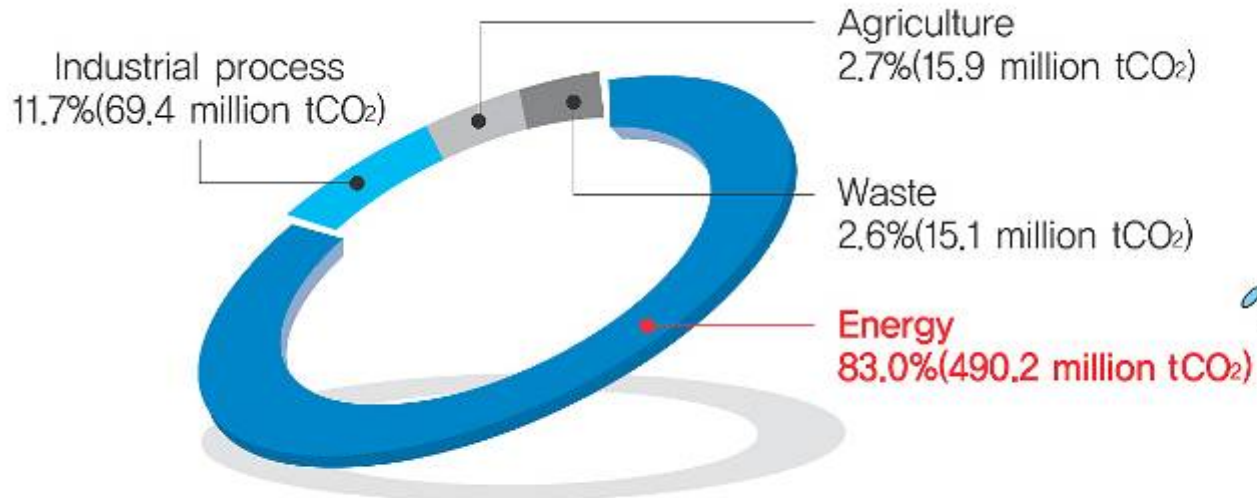
◆ World's 10th largest energy consumer

- 7th oil consumer
- : Korea import 97% of energy
- Korea \$US 90.7 billion on energy import in 2007



Energy & GHG Emissions

◆ Greenhouse gas emissions by sector in Korea

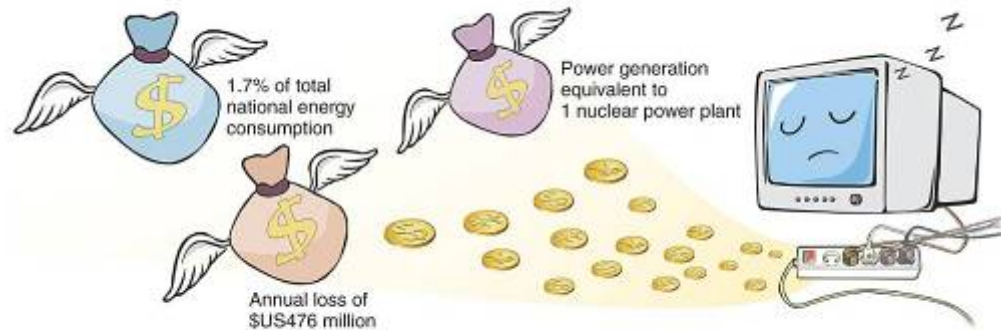


Source : Energy/natural resource statistics (2007.5, MOCIE)

Status on Standby Power

◆ Standby power consumption in Korea

- Standby is “power vampire”
- 300 million electronic devices
 - : Average standby power is **3.66W**
- Annual loss of **\$US 476 million**
 - : **1.7%** of national power consumption
 - : 850 thousand kW power plant



Standby Power per Korean Home

No	Product	Average standby
1	TVs	4.33W
2	VCRs	5.45W
3	Audios	9.12W
4	DVD Players	12.20W
5	Microwave Ovens	2.77W
6	Cassette radios	1.11W
7	Cord/cordless phones	2.15W
8	Washing machines	1.90W

No	Product	Average standby
9	Set top boxes	7.85W
10	Mobile phone chargers	1.72W (0.86W*2)
11	Computers	3.26W
12	Monitors	2.53W
13	Printers	3.07W
14	Modems	6.43W
15	Video phones	1.23W
16	Bidets	3.39W

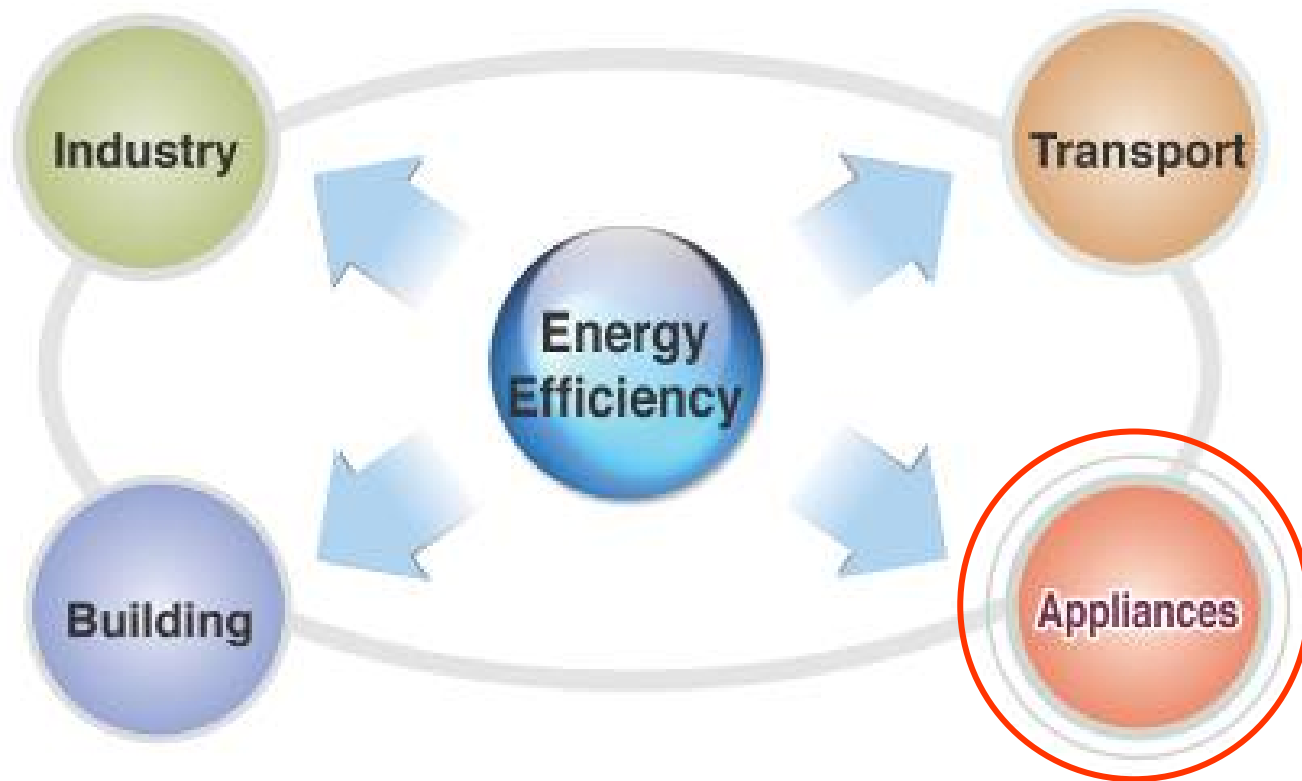


Source : KERI (2003)

Total	57W (average 3.66W) 306kWh/year
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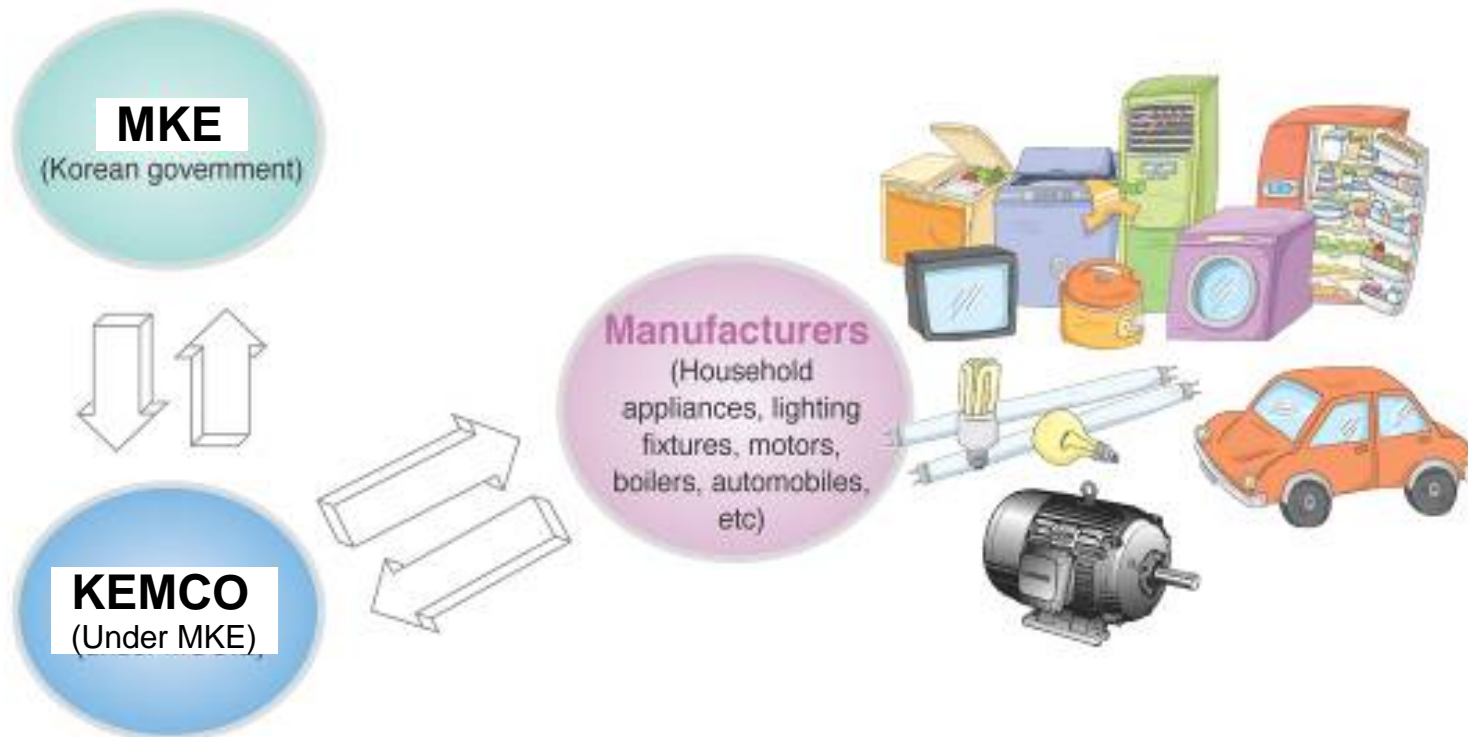
Energy Efficiency Policy

◆ Four major energy efficiency area



Policy Implementation Organization

◆ Korea's energy standards & labeling



3. Energy Standards & Labeling

Energy Efficiency Label and Standard Program (including MEPS)



- Mandatory (since 1992)
- MEPS & 5-grade labeling
- Refrigerators, Automobiles, etc (20 items)

Programs related standby

Energy Standards & Labeling

High-efficiency Appliance Certification Program



- Voluntary (since 1996)
- LED traffic lights, Pumps, etc (37 items)

e-Standby Program



- Voluntary (since 1999)
- Mandatory (from 2009)
- TVs, STBs (21 items)

Energy Efficiency Label and Standard Program(1)

◆ Mandatory Energy Label and Minimum Energy Performance Standard

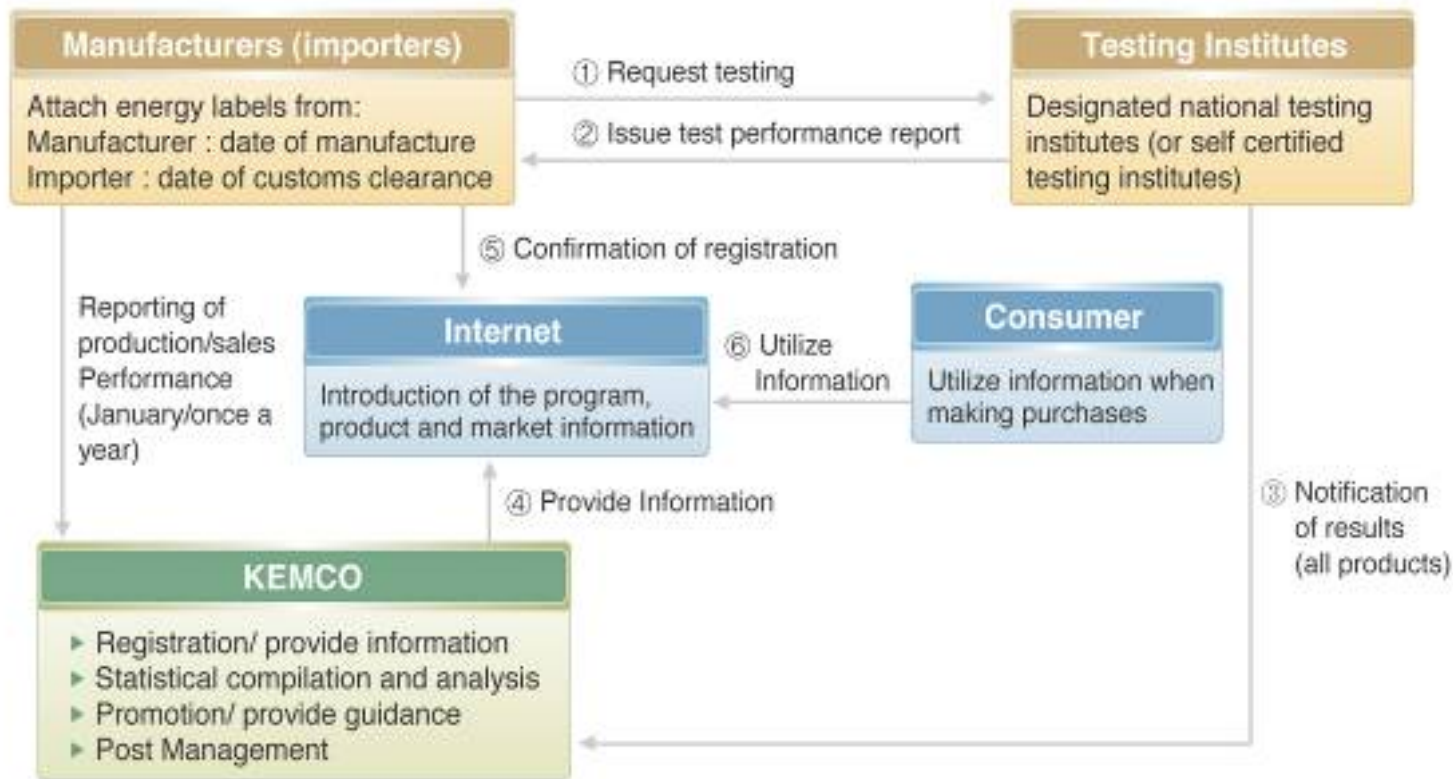
- **Mandatory** indication of energy efficiency grade from 1 to 5
 - Number one is the best in Korea
 - **MEPS** will apply below 5 grade
 - 20 products with over 17,000 models
 - 140 million/year of products are related
- : Refrigerators, freezers, kimchi refrigerators, air conditioners, washing machines, drum washing machines, dish washers, dish driers, coolers, rice cookers, vacuum cleaner, electric fans, air cleaners, incandescent lamps, fluorescent lamps, CFLs, ballasts, 3 phase electric motors, gas boilers, automobiles



Mandatory
Including MEPS

Energy Efficiency Label and Standard Program(2)

◆ Reporting procedure



e-Standby Program(1)

◆ Core program to reduce standby

- Voluntary “Energy Boy” label or **mandatory standby warning label** from 2009
- Government purchase
- 21 products with over 4,000 models
- 90 million/year of products are related
 - : TVs, VCRs, audios, DVD players, set top boxes, microwave ovens, home gateways, computers, monitors, printers, fax machines, copiers, scanners, multifunction devices, bidets, door phones, cordless phones, energy saving & controlling devices, radios, modems external power supplies



에너지절약

Voluntary (Now)

Products satisfying standby standard

or

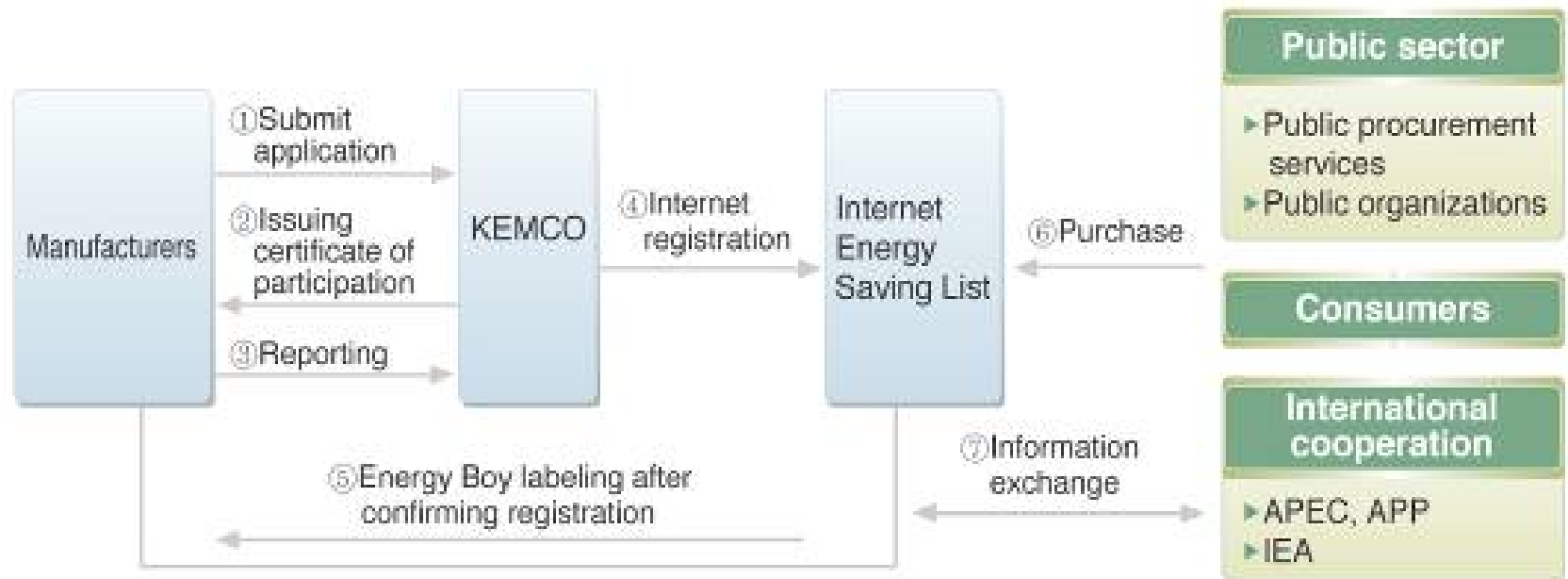


Mandatory (from 2009)

Products failing standby standard

e-Standby Program(2)

◆ Reporting procedure



4. Korea's 1-Watt Plan

All products <1W by 2010

◆ Declare of Standby Power to 1W

- Prime Minister, the 26th Energy Saving Promotion Rally (2004.11.12)

: "the government will offer full assistances----by 2010, the standby power of all electronic product shall be reduced to below 1W"

◆ Korea is the 3th country with 1W policy

- after USA(2001), Australia(2002)

- Korea comply **IEA's "1W Initiative"**



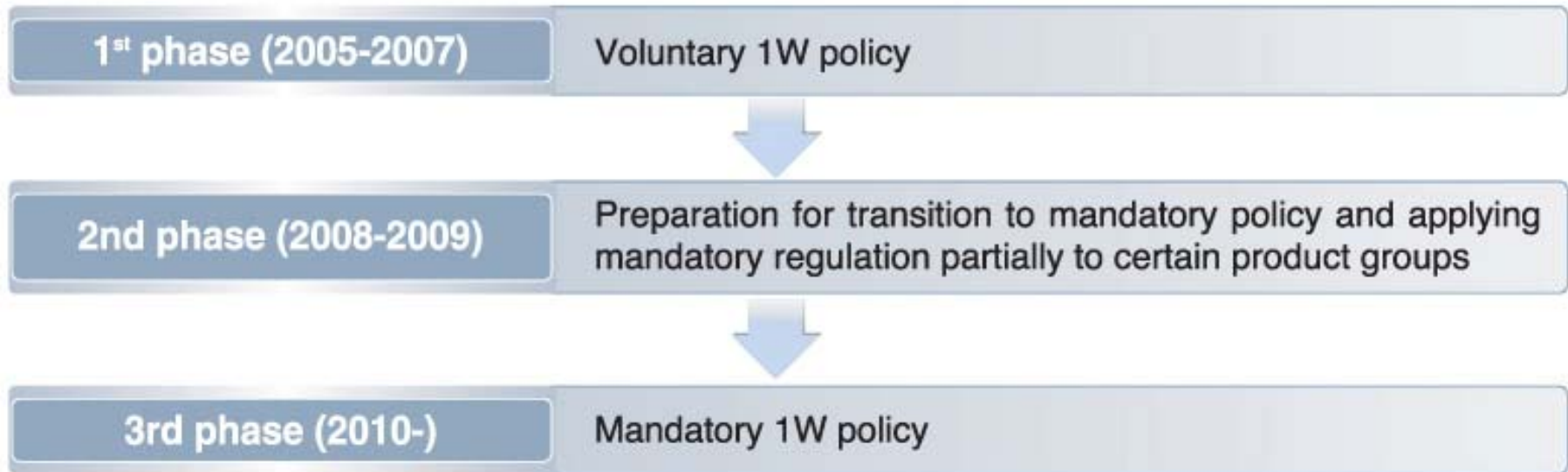
Objectives by 2010

◆ Standby Korea 2010 objectives at each stage

Category	2005	Objective		
		2007	2010	2020
Number of target appliances (e-Standby Program)	18 (18)	22 (20)	30 (24)	30+1Y (30+1Y)
(Energy Efficiency Label and Standard Program)	(0)	(2)	(6)	(6)
Average standby power of equipment sold in the market	-	3.0W	2.0W	1.5W
Average standby power of equipment owned by household	3.66W	3.3W	2.5W	2.0W
Standby power 1W diffusion rate	22%	30%	40%	80%
Annual standby power reduction effect	-	-	1,100GWh	6,800GWh
Annual CO ₂ emission reduction effect	-	-	53million ton	329million ton

Standby Korea 2010

◆ Policy approach for each stage



※ Mandatory 1W policy tools : MEPS, Warning label & Energy efficiency 1st grade label

Stage 1 (2005-2007)

1st phase (2005-2007)

Voluntary 1W policy

◆ <1W Standard for Energy Boy

- <1W standard on passive standby & off mode
: <0.5W-0.75W for external supplies
- Office equipment : Sleep mode + <1W off mode

◆ <1W Standard for 1st grade

- 1st grade : Best efficiency + <1W off mode

◆ KS C IEC 62301

- Test procedure of standby power



◆ Supporting technology of standby



Implementation <1W Standard

1st phase (2005-2007)



Voluntary 1W policy

Category		Date of enforcement	Target products (Passive standby & off mode)
Energy Boy Label	 <p>에너지절약</p>	2006	TVs, external power adaptors, chargers for mobile phone, copiers, cord/cordless phones, energy saving devices
		2007.1.1	Monitors, printers, scanners, radios
		2007.7.1	VCRs, audios, DVD players, microwave ovens, set-top boxes
		2008.1.1	Modems, bidets, door phones
		2009.1.1	Computers, multifunction devices
Energy efficiency 1 st grade label		2007.1.1	Washing machines, dish washers
		2008.1.1	Rice coolers, air cleaners
		2009.1.1	Drum washing machines, electric fans

Adopting IEC 62301

1st phase (2005-2007)

Voluntary 1W policy

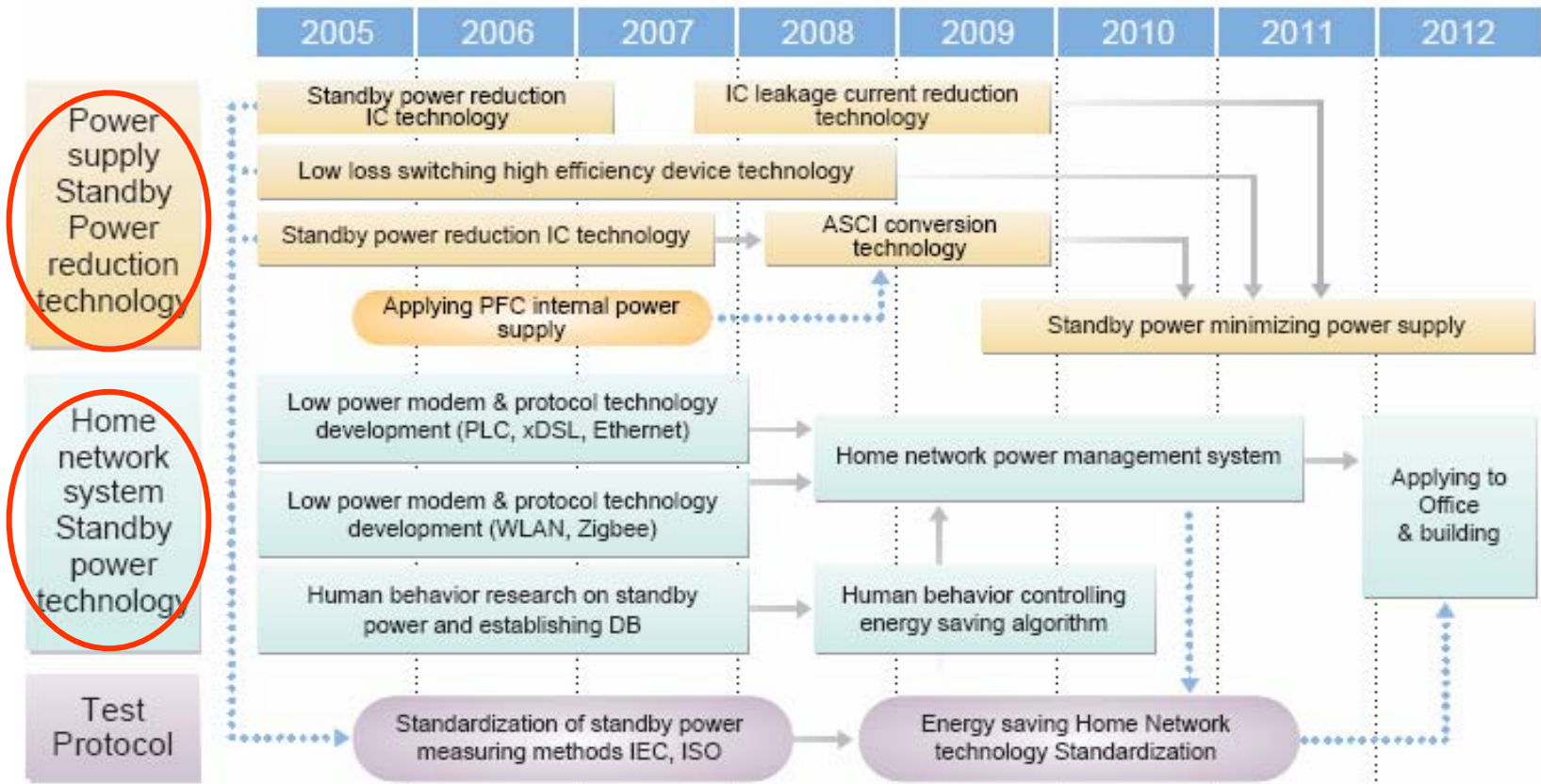
Standard	Description	Programs	Target products
IEC 62301	Household electrical appliances – Measurement of standby power	e-Standby Program 	TVs, VCRs, audios, DVD players, radios, set-top boxes, bidets, modems, external power adaptors, chargers, computers, monitors, printers, fax machines, scanners, multifunction devices
		Energy Efficiency Label and Standard Program 	Washing machines, drum washing machines, dish washers, rice cookers, air cleaners, electric fans

Supporting Technology of Standby

1st phase (2005-2007)

Voluntary 1W policy

◆ Technology development of standby power



Stage 2 (2008-2009)

2nd phase (2008-2009)

Preparation for transition to mandatory policy and applying mandatory regulation partially to certain product groups

◆ Amending “Rational Energy Utilization Act”

- Mandatory warning label from 2009
- e-Standby Program : Voluntary → Mandatory



◆ Applying MEPS for external power supplies

- Standby(No Load) : $< 0.5W$ (for Adaptors & Chargers)
- On-mode : $> 0.09 * \ln(P_{no}) + 0.5$ (only for Adaptors)
- from 2009

Warning Label Products from 2009

2nd phase (2008-2009)

Preparation for transition to mandatory policy and applying mandatory regulation partially to certain product groups

TEC : kWh/week
Off : <1W-2W



Multi-function devices



Passive standby : <1W

TVs



Active standby : <8W-15W
Passive standby : <1W

Set top boxes

TEC : kWh/week
Sleep : <5W-10W
Off : <1W



Printers



Computers

Monitors



Sleep : <2W
Off : <1W



Sleep : <1.7W-4W
Off : <1W-2W

MEPS for Power Supplies from 2009

2nd phase (2008-2009)

Preparation for transition to mandatory policy and applying mandatory regulation partially to certain product groups

◆ Applying MEPS for external power supplies

- Adaptors (No charging function)

Nameplate output power (P _{no})	Active mode energy efficiency
$0 < P_{no} \leq 1W$	$\geq 0.49 \times P_{no}$
$1W < P_{no} \leq 49W$	$\geq [0.09 \times \ln(P_{no})] + 0.49$
$49W < P_{no} \leq 150W$	≥ 0.84



Nameplate output power (P _{no})	Standby power (No load)
$0 < P_{no} < 10W$	$\leq 0.5W$
$10W \leq P_{no} \leq 150W$	$\leq 0.75W$

- Chargers (For lithium-ion battery)




Input power (P _i)	Standby power (No load)
$0W < P_i < 10W$	$\leq 0.5W$
$10W \leq P_i \leq 20W$	$\leq 0.75W$



Stage 3 (from 2010)

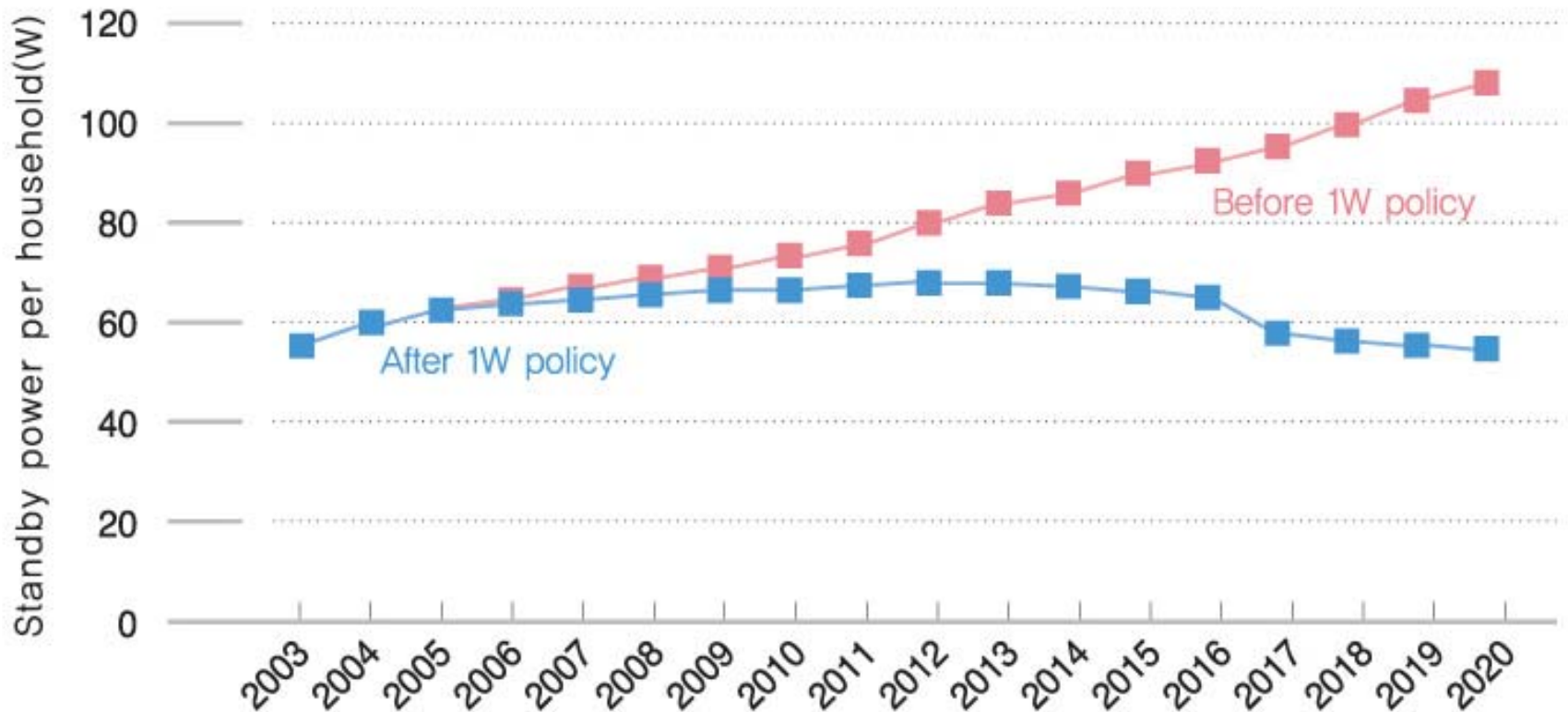
3rd phase (2010-)

Mandatory 1W policy

Policy tools for <1W	Standby	Standby	Target products
<p>Standby warning Label</p>  <p>or</p> 	<p>e-Standby Program</p>	<p><1W (Off or Passive standby)</p>	<p>TVs, VCRs, audios, DVD players, bidets, sep top boxes, microwave ovens, cordless phones, door phones, modems, computers, monitors, printers, fax machines, copiers, scanners, multifunction devices, home gateways, energy saving & controlling devices</p>
<p>Minimum energy performance standard</p>	<p>Energy Efficiency Label and Standard Program</p>	<p><0.5W (No load)</p>	<p>External power supplies</p>
<p>1st Energy Efficiency Label</p> 	<p>Energy Efficiency Label and Standard Program</p>	<p><1W (Off or Passive standby)</p>	<p>Washing machines, dish washers, drum washing machines, air cleaners, rice cookers, air conditioners, electric fans, home networked appliances (<3W)</p>

The Effect of 1W Policy

◆ Standby power reduction effect per household



Energy Saving Effect

◆ 2010

- 1,100GWh (\$US 11.5 million)/year
: Accumulation of 2,550GWh(\$US 26.7 million) by 2010
- 530 thousand ton of CO₂/year

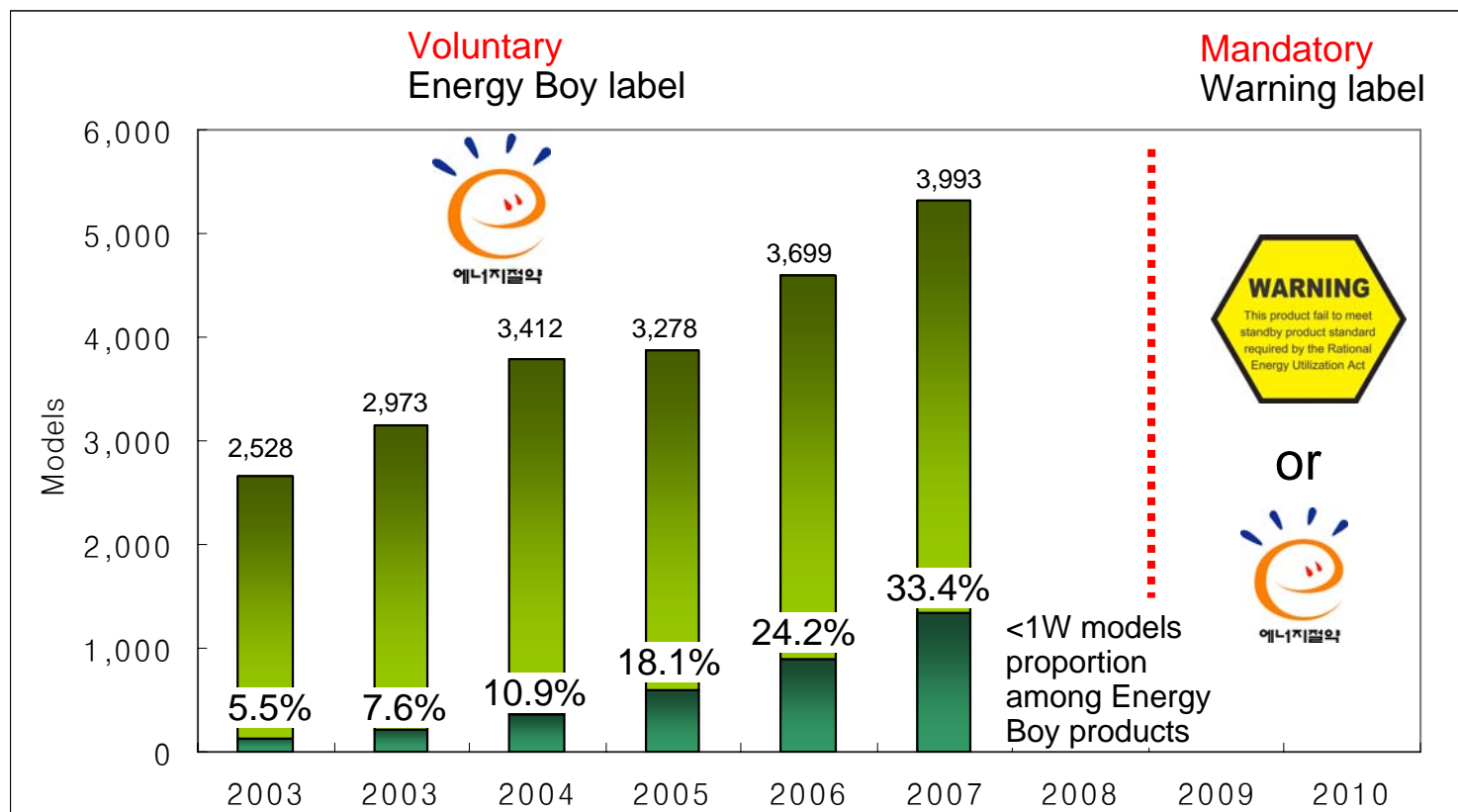
◆ 2020

- 6,800GWh (\$US 71.2 million)/year
: Accumulation of 42,000GWh(\$US 4.4 billion) by 2020
- 3.29 million ton of CO₂/year



Trend to <1W at e-Standby Program

◆ <1W models proportion at Energy Boy products



Thank you

If you have any question,

please e-mail to yrkim@kemco.or.kr