2011 Standby Status of Korea

-Did 1W policy work well in Korea?-
Part 1.
Korea’s 1Watt Standby Program
Korea’s step forward to 1W standby

- Implementation of Energy Boy Label (MOCIE, 7 products) 01.1999
- Declaration of Standby Korea 2010 (MOCIE) 05.2005
- First nationwide standby power survey (4600GWh/yr) 06.2003
- Expanded list of Energy Boy (15 products) 09.2002
- Government procurement for energy boy label products 05.2001
- Seoul standby power conference 11.2005
- Standby Warning Label for TVs (World first) 08.2008
- Standby Warning Label for 19 product category 07.2010
- APP & IEA 4E standby annex meeting, Seoul 11.2009
- 1W standby combined with 1st grade EE 01.2007
- 2011 nationwide standby power survey 06.2011
## Energy saving label vs. warning Label

<table>
<thead>
<tr>
<th>A Product</th>
<th>Judgment</th>
<th>Action</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Meets standby standard (e.g. TV ≤1W)</td>
<td>May attach “Energy Saving Label” Voluntary</td>
<td><img src="image" alt="Energy Saving Label" /></td>
</tr>
<tr>
<td></td>
<td>Fails to meet the standard (e.g. TV &gt;1W)</td>
<td>Should attach “Warning Label” Mandatory</td>
<td><img src="image" alt="Warning Label" /></td>
</tr>
</tbody>
</table>

<Courtesy of KEMCO>
Implementation of standby warning label

Since 28 August 2008

Since July 2009

July 2010

TVs

Computers, monitors, printers, MFDs, STBs, microwave ovens

VCRs, audios, DVD players, radios, bidets, cordless phones, door phones, modems, fax machines, copiers, scanners, home gateways

MFD=Multi Function Device, STB=Set Top Box
Standby standard for major products

- **TVs**
  - Passive standby: <1W (from 28 August 2008)
  - Active standby: <10W-20W
  - Passive standby: <1W (from 1 July 2009)
  - Sleep: <1.7W-4W
  - Off: <1W-2W (from 1 July 2009)

- **Set top boxes**
  - Standby: <1W

- **Microwave ovens**
  - Standby: <1W (from 1 July 2009)

- **Multi-function devices**
  - TEC: kWh/week
  - Off: <1W-2W (from 1 July 2009)

- **Printers**
  - TEC: kWh/week
  - Sleep: <5W-10W
  - Off: <1W
  - (from 1 July 2009)

- **Computers**
  - Sleep: <1.7W-4W
  - Off: <1W-2W (from 1 July 2009)

- **Monitors**
  - Sleep: <2W
  - Off: <1W
  - (from 1 July 2009)
Rules for warning label

◆ Mandatory reporting on standby power
  ▪ In case of reporting violation, 5M Won (~US$4,000) fine will be charged per product model

◆ Mandatory indication of warning label
  ▪ Warning label should be attached on the front, or top, or name plate of a product
  ▪ Minimum size of the label is 2.5cm in diameter
  ▪ In case of indication violation, 5M Won (~US$4,000) fine will be charged per product model
## Combining EE label & standby <1W

<table>
<thead>
<tr>
<th>Policy tools for &lt;1W</th>
<th>Standby Standard</th>
<th>Start</th>
<th>Target products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Efficiency Label &amp; Standard Program</td>
<td>MEPS</td>
<td>&lt;0.5W (No load)</td>
<td>Jan 2009</td>
</tr>
<tr>
<td>Requirement for 1st Grade EE</td>
<td>MEPS</td>
<td>&lt;1W, 3W (Off mode or Passive standby)</td>
<td>2007 ~ 2011</td>
</tr>
</tbody>
</table>

<Courtesy of KEMCO>
Part 2.
2011 Standby Power Status of Korea
Old standby data of Korea

- Survey done in 2003 for the first time (by KERI/KEMCO)
- 53 households, 808 appliances

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of households</td>
<td>15,030,000 HH</td>
</tr>
<tr>
<td>Standby power loss per household</td>
<td>306 KWh/year</td>
</tr>
<tr>
<td>Total nationwide standby loss</td>
<td>4,600 GWh</td>
</tr>
<tr>
<td>Total nationwide electricity consumption</td>
<td>274 TWh</td>
</tr>
<tr>
<td>Residential standby percent of nationwide electricity</td>
<td>1.67%</td>
</tr>
<tr>
<td>Nationwide average standby power by home appliances</td>
<td>520 MW</td>
</tr>
</tbody>
</table>
2011 standby survey

◆ Project period: April 2011 ~ August 2011
◆ Surveyor: KERI
◆ Funding: KEMCO/MKE

◆ Project goals
  ▪ 2011 standby power status in residential sector
  ▪ 2011 standby power survey in retail store
  ▪ Projection of “Standby Korea 2015” (preliminary)

◆ Implications
  ▪ First nationwide standby survey in Korea since 2003
  ▪ Measurement and estimation of energy savings by 1 Watt policy in Korea
2011 standby survey in detail(1)

- **Number of household**
  - Totally 109 HH surveyed
  - 105 effective HH

- **NGO volunteers**
  - Energy Network
  - Green Consumers Network
  - Consumers Korea
  - YMCA
2011 standby survey in detail (2)

- Products surveyed: any appliance with a plug
- Mode measured: Off mode/passive standby mode
- Metering: Wattman (Model 100A, 300A)
- After the data collection, standby power status report was mailed to each household
2011 standby survey in detail (3)

◆ 1,943 appliance measured in 105 households
  (May 2011~ Aug. 2011)
◆ 197 appliance measured in a retail store
  (Aug. 2011, 15 product category)
### Summary of 2011 standby survey

<table>
<thead>
<tr>
<th>Standby index</th>
<th>2003</th>
<th>2011</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. standby power per home</td>
<td>3.66W</td>
<td>2.01W</td>
<td>45% decrease</td>
</tr>
<tr>
<td>Avg. number of standby appliances per home</td>
<td>15.6</td>
<td>18.5</td>
<td>19% increase</td>
</tr>
<tr>
<td>Avg. annual standby energy (percent of total electricity)</td>
<td>306kWh</td>
<td>209kWh</td>
<td>32% decrease (43% decrease)</td>
</tr>
<tr>
<td>Percent of appliances &lt; 1 Watt per home</td>
<td>30%</td>
<td>53%</td>
<td></td>
</tr>
<tr>
<td>Nationwide annual standby energy</td>
<td>4,600GWh</td>
<td>3,470GWh</td>
<td>25% decrease</td>
</tr>
<tr>
<td>Nationwide standby electricity bill per year</td>
<td>552B Won</td>
<td>416B Won</td>
<td>Saving 136B Won/yr</td>
</tr>
<tr>
<td>Residential standby percent of nationwide electricity use</td>
<td>1.67%</td>
<td>0.80%</td>
<td>Half-cut</td>
</tr>
</tbody>
</table>

*16,588,516 household in 2009, 120won/kWh*
Summary of 2011 home survey

Average standby power (W):
- 2003년: 3.66 W
- 2011년: 2.01 W

Number of appliances:
- 2003: 15.6
- 2011: 18.5

Annual residential electricity (GWh):
- (+37%, 2003~2010)
- (-25%, 2003~2011)
Boiler, set-top box, cooker are big consumers

- Television shows excellent performance (~1.5 TV sets per home)
- Set-top box ranked in 2\textsuperscript{nd} place thanks to the relatively low penetration (0.28) with very high avg. standby power (12.3 W)
Standby power worst 10

- Set-top box shows 12.3W avg. standby power.
- Policy priority will be focused on STB, internet modem, air conditioner, boiler etc.
Standby power 2003 vs. 2011

- Standby power of DVD, cooker, audio(int.) drastically reduced since 2003
- Standby reduction efforts are needed in boiler, air conditioner, portable audio
Standby power 2003 vs. 2011

**Television [W]**
- 2003 home: 4.3
- 2011 home: 1.3
- 2011 store: 0.3

**DVD [W]**
- 2003 home: 12.2
- 2011 home: 3.7
- 2011 store: 1.2

**Set-top box [W]**
- 2003 home: 7.9
- 2011 home: 12.3
- 2011 store: 8.4

**Cell phone charger [W]**
- 2003 home: 0.86
- 2011 home: 0.26
- 2011 store: 0.25
Standby power 2003 vs. 2011

PC desktop [W]
- 2003 home: 3.3 W
- 2011 home: 2.6 W
- 2011 store: 0.8 W

PC notebook [W]
- 2003 home: 0.7 W
- 2011 home: 0.9 W
- 2011 store: 0.5 W

Printer [W]
- 2003 home: 3.1 W
- 2011 home: 2.6 W
- 2011 store: 0.42 W

Monitor [W]
- 2003 home: 2.5 W
- 2011 home: 1.2 W
- 2011 store: 0.5 W
Standby power 2003 vs. 2011

- **MW oven [W]**
  - 2003 home: 2.8 W
  - 2011 home: 2.2 W
  - 2011 store: 1.1 W

- **Rice cooker [W]**
  - 2003 home: 6.8 W
  - 2011 home: 3.5 W
  - 2011 store: 2.5 W

- **Boiler [W]**
  - 2003 home: 4.9 W
  - 2011 home: 5.8 W
  - 2011 store: 5.2 W

- **Electric fan [W]**
  - 2003 home: 0.7 W
  - 2011 home: 0.2 W
  - 2011 store: 0.5 W
Standby power 2003 vs. 2011

**Audio integrated [W]**
- 2003 home: 9.1 W
- 2011 home: 4.4 W
- 2011 store: 1.7 W

**Audio portable [W]**
- 2003 home: 2.1 W
- 2011 home: 1.1 W
- 2011 store: 2.6 W

**Inverter lamp [W]**
- 2003 home: 0.9 W
- 2011 home: 0.6 W
- 2011 store: 0.8 W
Standby store survey overview

◆ Product below 1 Watt: 137/197 (70%)

◆ Product below 0.5 Watt: 90/197

◆ All samples of television (PDP, LED, DCD), inverter lamp, PC desktop, PC notebook, printer, washer (drum and top loader), electric fan were below 1 Watt standby power

◆ All LCD TV and all drum-type washer showed below 0.5 Watt standby power
Standby Power Trail 2007~2011: TVs
Standby Power Trail 2007~2011: Others
## Comments on 14 core products

<table>
<thead>
<tr>
<th>Core Product</th>
<th>2011 Survey</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothes Washer</td>
<td>○</td>
<td>Most washers are under 0.5Watt</td>
</tr>
<tr>
<td>Microwave Oven</td>
<td>○</td>
<td>Approaches to 1W in average</td>
</tr>
<tr>
<td>TV-CRT</td>
<td>X</td>
<td>Disappeared in the Korean market</td>
</tr>
<tr>
<td>TV-LCD</td>
<td>○</td>
<td>All are under 0.5 Watt</td>
</tr>
<tr>
<td>TV-Plasma</td>
<td>○</td>
<td>All are under 0.5 Watt</td>
</tr>
<tr>
<td>Portable stereo</td>
<td>○</td>
<td>Remains bad in standby</td>
</tr>
<tr>
<td>Integrated Stereo</td>
<td>○</td>
<td>Remains worst in standby</td>
</tr>
<tr>
<td>DV Disc Player</td>
<td>○</td>
<td>Simple types are &lt;1W, Combo-types bad</td>
</tr>
<tr>
<td>Monitor-CRT</td>
<td>X</td>
<td>None found in Korean market</td>
</tr>
<tr>
<td>Monitor-LCD</td>
<td>○</td>
<td>All are under 1 Watt</td>
</tr>
<tr>
<td>Printer-Laser B/W</td>
<td>○</td>
<td>Most are &lt;1 Watt</td>
</tr>
<tr>
<td>Printer-inkjet</td>
<td>X</td>
<td>Market downward / No samples</td>
</tr>
<tr>
<td>Printer MFD</td>
<td>○</td>
<td>All inkjet MFDs are under 1 Watt</td>
</tr>
<tr>
<td>External Power Supply</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
1 Watt standby policy is a big success in Korea

- Avg. standby power per appliance in home decreased (45%) during last 8 years
- Nationwide annual standby energy also reduced (25%) during 2003-2011 despite increased number of appliances
- Over 80% of the appliances on sale in Korea are under 1W
- All of the TVs, PCs, printers (MFDs), washers, cell phone chargers in the market are under 1W

Challenges for future

- Built-in appliances (purchased by housing companies)
- Networked & ‘smart’ home electronics
- Policy and R & D priority towards low standby for boiler & STB