Korea's Energy Efficiency Program in terms of Networked Standby

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Definition of “networked standby” in this presentation

“Networked standby modes are conditions, in which the equipment provides reduced functionality, but retains the capability to resume applications through a remotely initiated trigger via network connection.

Networked standby modes may distinguish different levels of network availability and by that different resume-times-to-application as well as power consumption.” (Source: EuP Preparatory Studies, Lot 26)

- Include: Sleep mode, Idle mode, Active standby mode, Standby mode
- Exclude: Passive standby mode (only waiting for remote controller)

Sleep mode (wake up by proximity or touch sensor, such as bidet, hand dryer)

Focus on networked devices (e.g., TVs, Set-top boxes, Computer, etc) rather than network devices (e.g., switch, router, etc)
Power Reduction Programs in Korea

**Energy efficiency labeling program**
- Implementation ('92)
- Mandatory labeling, applying MEPS
- 35 items included

**High efficiency certification program**
- Implementation ('96)
- Voluntary
- 41 items included

**e-Standby program**
- Implementation ('96)
- Voluntary
- 22 items included

Certification of high efficiency equipment (support market entry)

Energy efficiency labeling program (support the market consolidation)

Lowest energy efficiency standard (throw out the low-energy efficiency appliances)
7 Target Products have networked standby power limits. 
- Air conditioners, washing machines, drum washing machines, dish washers, household gas boilers, gas water heaters, TVs.

Other 28 products have efficiency level, off mode and passive standby mode power limits.
## Summary of 7 Target Products

<table>
<thead>
<tr>
<th>Target Product</th>
<th>Networked Standby Mode Power Limits</th>
<th>Network Function</th>
<th>Networked Standby Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Conditioners</td>
<td>≤ 1W (Passive Standby) ≤ 3W (Active Standby)</td>
<td>Available (some)</td>
<td>Available (Ethernet Communication)</td>
</tr>
<tr>
<td>Gas Boilers</td>
<td>≤ 3W (Sleep Mode)</td>
<td>Available (majority)</td>
<td>Available (Serial Communication)</td>
</tr>
<tr>
<td>Gas Water Heaters</td>
<td>≤ 3W (Sleep Mode)</td>
<td>Available (majority)</td>
<td>Available (Serial Communication)</td>
</tr>
<tr>
<td>Washing Machines</td>
<td>≤ 2W (Active Standby)</td>
<td>Not available</td>
<td>-</td>
</tr>
<tr>
<td>Drum Washing Machines</td>
<td>≤ 2W (Active Standby)</td>
<td>Available (some)</td>
<td>Available (Ethernet Communication)</td>
</tr>
<tr>
<td>Dish Washers</td>
<td>≤ 3W (Active Standby)</td>
<td>Not available</td>
<td>-</td>
</tr>
<tr>
<td>TVs</td>
<td>≤ 0.5W (Passive Standby) ≤ 2W (Active Standby)</td>
<td>Available</td>
<td>None</td>
</tr>
</tbody>
</table>
11 target products have networked standby power limits.

Computers, Printers, Fax machines, Copiers, Scanners, Multi-function devices, Set-Top Boxes, Door Phones, Cord/Cordless Phones, Modem, Home gateways,

Other 11 products have passive standby and idle mode power limits.
### Summary of 11 Target Products

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<th>Target Product</th>
<th>Networked Standby Mode Power Limits</th>
<th>Network Function</th>
<th>Networked Standby Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computers</td>
<td>TEC including <strong>Sleep Mode</strong>, <strong>Transition Time</strong> and Off Mode</td>
<td>Available</td>
<td>Available (Wake On LAN mode)</td>
</tr>
<tr>
<td>Printers, Fax Machines, Copiers, Multifunction devices</td>
<td>TEC including <strong>Sleep Mode</strong>, <strong>Transition Time</strong> and Off Mode</td>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td>Scanners</td>
<td>≤ 15 min (Transition Time) ≤ 5~10W (Standby Mode) ≤ 0.5W (Off Mode)</td>
<td>Available</td>
<td>Available</td>
</tr>
<tr>
<td>Door Phones, Cord/Cordless Phones</td>
<td>≤ Various (Standby Mode)</td>
<td>Available</td>
<td>Available (Backlight off control)</td>
</tr>
<tr>
<td>Set-Top Boxes</td>
<td>≤ 1W (Optional, Passive Standby) ≤ 10~20W (Active Standby)</td>
<td>Available</td>
<td>None</td>
</tr>
<tr>
<td>Modem</td>
<td>≤ 0.75W (Off Mode) ≤ Various (Standby Mode)</td>
<td>Available</td>
<td>None</td>
</tr>
<tr>
<td>Home Gateways</td>
<td>≤ 10 min (Transition Time) ≤ 10~20W (Sleep Mode)</td>
<td>Available</td>
<td>None</td>
</tr>
</tbody>
</table>
Extending single product level program into system level program

- Korea government is considering new programs about ICT convergence product.
- For example, BEMS (Building Energy Management System), HEMS (Home Energy Management System), FEMS (Factory Energy Management System), Data Center...

Management Server

- Energy Monitoring
- Data Integrity
- Decision Support
- Cost Optimization
- Control

BEMS

LED Dimming System

- LED Lamps
- Sensors
- Controllers

HAVC System

- Heater
- Ventilation
- Air Conditioning

Other Systems...

BAS (Building Automation System)

Efficiency? Test Method?
### Calculation of Maximum TEC Requirement

\[ TEC_{MAX} = TEC_{BASE\_MAX} + \sum TEC_{ADDL\_i} \]

**Ex. ENERGY STAR Set-top boxes Program**

- **Base Functionality**
  - Cable: 60 kWh/year
  - Satellite: 70 kWh/year
  - Cable DTA: 35 kWh/year
  - Internet Protocol (IP): 50 kWh/year
  - Terrestrial: 22 kWh/year
  - Thin-client / Remote: 35 kWh/year

- **Additional Functionality**
  - Advanced Video Processing: 12 kWh/year
  - CableCARD: 15 kWh/year
  - Digital Video Recorder (DVR): 45 kWh/year
  - DOCSIS®: 20 kWh/year
  - High Definition (HD): 25 kWh/year
  - Home Network Interface: 10 kWh/year
  - Multi-room: 40 kWh/year
  - Multi-stream – Cable/Satellite: 16 kWh/year
  - Multi-stream – Terrestrial/IP: 8 kWh/year

Adding more functions, power allowance will be bigger. In other words, products need more functions to get enough power allowance.

Products consume more power to pass the program.
Thank you.

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