Terminology and Definitions Needs for Low Power Mode Energy Use with Network Connectivity

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Overview

- Why definitions?
- Types of terms
- Contexts
- Terminology Systems (Approaches)
- Recommendations

Why?

- Low power mode policy and technology has long history of problems with terms, definitions
- This impedes communication within policy community and for others

- This problem is solvable
  – But will take time

Title terms revisited

Terminology and Definitions Needs for Low Power Mode Energy Use with Network Connectivity

- Low Power Modes
  - General term (clearly non-specific); ANY low power mode
- Network
  - Standard technologies for arbitrary communication among a set of entities
  - Does it include simple digital data links?
- Energy
  - Electricity
  - Also covers power management (time dimension)

Types of terms

- Topic areas   (collections of ideas)
- Named modes   (with specific meanings)
- Mode categories   (with only general meaning)
- Mode characteristics   (i.e. functions)
- Power levels
- Test procedure results

Many terms routinely used for several of these

Contexts

- **Energy Policy**
  - mandatory standards, voluntary programs, and analyses of energy consumption patterns
- **Test Procedures**
  - instructions for manufacturers or test laboratories on how to measure energy use of products
- **Technology Standards**
  - technical documents that specify how devices, components, or communication protocols operate
- **User Interfaces**
  - terms printed on product hardware, rendered on displays, or described in user documentation

Contexts (2)

- Terms can move among contexts
- Some people occupy more than one context

- Terms can vary among product types
- Terms can vary among manufacturers
  - And within a single manufacturer
- Terms can vary among countries
- Terms need to be translated to many languages

Terminology Systems

- ## Minimum Power Mode*
  - The IEC 62301/Ed.1 definition
- ## Standby as a Mode
  - Standby defined by the functions present
- ## Standby as a Condition
  - From the EU "Lot 26" draft regulation
- ## Sleep Paradigm
  - Three basic modes: on, sleep, off

*"mode" and "state" taken as synonymous

Minimum Power Mode

- First edition of IEC 62301 (2005) – "Standby" is:
  - "lowest power consumption mode which cannot be switched off (influenced) by the user and that may persist for an indefinite time when an appliance is connected to the main electricity supply and used in accordance with the manufacturer's instructions"

- Simple, unambiguous

- Can occur in any mode

- Widely used in U.S.

Standby as a Mode

- Second edition of IEC 62301 (2010) - "standby mode(s)" are:
  - "any product modes where the energy using product is connected to a mains power source and offers one or more of the following user oriented or protective functions which usually persist:
    - to facilitate the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, timer;
    - continuous function: information or status displays including clocks;
    - continuous function: sensor-based functions"

Standby as a Mode (2)

- Also defines function, mode, product mode, low power mode, off mode(s), network mode(s), active mode(s), and disconnected mode
- Named modes for specific products to be defined by standards for those products
- Standby distinguished from Off
- Standby does NOT include network connectivity
- Functions present define a mode
- Places modes along a linear scale

Standby as a Condition

- "Networked Standby"
- EU regulatory framework, proposed amendment to the standby regulation (EC 1275/2008) defines "networked standby" as:
  - "a condition in which the equipment is able to resume a function by way of a remotely initiated trigger from a network connection"
- Facilitates horizontal treatment of network connectivity

Sleep Paradigm

- Third basic state between On and Off
  - Power command required to exit Off
  - Wake may occur for many reasons
- No additional horizontal definition
- Mode category
  - Devices may have multiple sleep states
- Most (not all) products (can) retain network connectivity in sleep

Contentious Issues

- Creating a 'spectrum' of named modes
  - Functionality and power increase in tandem
- Degree of horizontality (policy, UI, …)
  - Totally horizontal
  - Totally vertical
  - Sectoral horizontality; clustered horizontality
- IEC 62542 — "Partial On"

What to do?

- Move incrementally
- Acknowledge all points of view
- Consider all contexts
- Only create terms when needed
- Be specific when specific meaning intended
- Continue to use "Low power mode"

- Revisit in 2-3 years to make more progress

What to do? (2)

- Minimum power mode
  - Concept has value and should be retained; use this term

- Network standby
  - Use for the general topic area of technologies, policies, etc., around energy use of low power modes with network connectivity; no more specific meaning

- Network**ed** standby
  - Use as defined in the EU widely-horizontal policy approach for a "condition" of a device that is in a low power mode with network connectivity
  - May at times get confused with 'network standby'

- Standby
  - Use "IEC 62301 standby" when that specific meaning is intended (v2)
  - Otherwise "Standby" to refer to the topic area of "low power modes" generally, including those with network connectivity

- Sleep
  - Use in user interfaces and product-specific test procedures and specifications
  - Refer to "network-connected sleep" when needed
  - Some devices (kitchen and laundry) could have "ready" modes and not sleep

Summary

- Continued confusion over terminology and definitions is a pointless waste of time
- Many interests and contexts are relevant
- Need progress that is incremental and inclusive
- A near-term path forward seems workable
- We should consider drawing some conclusions today

Thank you