US Programs Related to Network Standby

- Mandatory (MEPS)
  - Federal
    - External power supplies
    - Set-top boxes
  - State
    - California
- Voluntary
  - Energy Star
  - Industry-specific
    - Cable set-top boxes
  - Government procurement specifications for low-standby products
- Test procedures for smart appliances
  - Smart appliances

Federal MEPS

- External power supplies
- Set-top Boxes
  - Process initiated for creation of MEPS
  - Discussions underway for consensus standard
    - Unclear if cable, satellite, terrestrial will be treated differently
    - Power specifications (active/sleep)
    - Auto powerdown
    - Service provider commitment?

California Energy Commission (CEC)

- MEPS for external power supplies
- CEC considering MEPS for network standby
  - Unclear what authority remains with states
  - CEC MEPS framework more flexible than federal laws, so there is more flexibility in
    - Test procedures
    - Benefits for time of use
    - Possible testbed for future network MEPS?

Why is ENERGY STAR interested in networks?

- Network connections increase power levels
  - On
  - Sleep (depends on connectivity)
- Need to provide appropriate allowances for connectivity
- Network connectivity can increase on-times
  - Auto-power-down can be compromised
- Network connectivity a source of innovation, efficiency
  - User functionality
  - Energy saving
  - Powering
  - Reporting

ENERGY STAR and Networks (1)

- Many current* specifications address network connectivity
  - Audio/Video, Game Console, TV, Set-top Box
  - Server, Storage*, PC, Imaging Equipment, (Displays)
- Small and Large Network Equipment
  - Small: spec process underway (finished?)
  - Large: spec process underway

ENERGY STAR and Networks (2)

- Network connectivity in Test Procedures
  - Audio/Video, Game Consoles, Display*, PC, Server, Imaging Equipment, Small Network Eqt.
  - Usually specify test-while-connected; sometimes speed
    - TVs test with network “deactivated”
- Power allowances for network connectivity
  - Sleep: A/V, Game, PC, STB*, Imaging
  - On: A/V, SNE, Servers, STB*
  - Usually x W/port – when on during test
    - Imaging provides power for inactive ports
  - Power varies with speed: Imaging and Servers

ENERGY STAR and Networks (3)

- Auto-power down
  - On -> Sleep after time of no activity
  - A/V, Game, PC, Digital TV Adaptor, STB, PC, Imaging, Display (Monitor)
  - Some specs specify maintaining network connectivity
- Low-voltage DC powered products allowed
  - Imaging, Displays
  - USB and PoE - but not limited
- PCs
  - Reduce link rate in sleep
  - Sleep latency (user experience)
  - Ship with WOL (Wake-on-LAN) enabled
  - Proxying

ENERGY STAR – Smart Appliances

Goal is to recognize appliances that are “grid friendly”, that is, can receive signals from utility.

- Manufacturers want extra energy allowance for network connection
  - Internal conflict within Energy Star; a contradiction with ES goals of cost-effectiveness
- Test procedure not resolved
  - What is network mode?
  - Communications protocols:
    - Proprietary?
    - Open-source?
    - Hybrid?

Industry-Initiated Specifications

- Cable TV industry committed to reducing energy use of set-top boxes through introduction of a sleep mode
  - An attempt to head-off a MEPS?
- No publicized parallel activity for satellite TV
- CEA-sponsored activities?

“Functional Adders” example

Energy Star Imaging Equipment Sleep ‘adders’ (W)

- “Primary” = active; “Secondary” = unconnected

	Primary	Secondary
Wired: < 20 MHz USB 1.x, IEEE488, IEEE 1284/Parallel/ Centronics, RS232, and/or fax modem	0.3	0.2
Wired: > 20 MHz and < 500 MHz USB 2.x, IEEE 1394/FireWire/i.LINK, and 100Mb Ethernet	0.5	0.2
Wired: > 500 MHz 1 G Ethernet	1.5	0.5
Wireless Bluetooth and 802.11	3.0	0.7
Wired card/camera/storage	0.5	0.1
Infrared	0.2	0.2