DOCKETED	
Docket Number:	17-AAER-12
Project Title:	Low-Power Mode & Power Factor
TN #:	224709
Document Title:	ITI Comments on Low-Power Mode & Power Factor - Test Procedure Discussion Document
Description:	N/A
Filer:	System
Organization:	Information Technology Industry Council (ITI)
Submitter Role:	Public
Submission Date:	9/14/2018 12:18:54 PM
Docketed Date:	9/14/2018

Comment Received From: Erica Logan
Submitted On: 9/14/2018
Docket Number: 17-AAER-12

ITI Comments for Docket No. 17-AAER-12; Request for Public Comment on â€œLow-Power Mode & Power Factorâ€ Test Procedure Discussion

Additional submitted attachment is included below.

September 14, 2018

Dr. Soheila Pasha
Senior Electrical Engineer
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Docket No. 17-AAER-12; Request for Public Comment on "Low-Power Mode & Power Factor" Test Procedure Discussion Document

Dear Dr. Pasha,

The Information Technology Industry Council (ITI) appreciates the opportunity to provide comments for the California Energy Commission's (CEC) Low-Power Mode (LPM) Test Procedure (TP) Discussion Document.

General Comments

ITI supports the fundamental tenets of energy efficiency policy, however, we believe a horizontal test measurement approach is fundamentally flawed. First, not all devices can even be placed into a LPM; small network equipment (SNE), for example, scales power use with workload. Further, several energy efficiency standards define 'on' and 'idle' states for each device. These definitions are accepted by manufacturers who build their products accordingly. Adding LPM as a new state before "off" state does not make sense. In the majority of cases LPM will be the same as "idle" state for the device, as defined in ENERGY STAR® documents. In addition, some disconnected modern standby systems may lose internet access while in LPM.

Given the ultimate objective of measurement is energy conservation, the unique considerations of each vertically integrated system must be considered. A comprehensive vertical approach will identify specific product categories with potentially separate capabilities and limits, while also accounting for effects on the network. Horizontal approaches, such as the European Union's (EU) Lot 26, lead to significant inefficiencies.

Definitions

While we do not support horizontal approaches, we recommend that any test procedure (TP) include clear definitions for key terms such as "low power mode" which could include "low data rate mode", "edge device", "small networking equipment", "high network availability", "low network availability", etc.

Recommended characteristics include:
Networking device: (e.g., switch, router, modem, access point or any combination)

- ⇒ Has primary function to pass data, has at least two data ports
- ⇒ Useful functionality defined by point in the network
- ⇒ Point in a Network dictates type of connections and traffic – e.g., access, aggregation
- ⇒ Use same testing and similar feature list (as other networking devises in a same PIN)
- ⇒ Can compare results by subclass of product at point in the network (product with similar functionality)

Networked device (e.g. terminal, end use) uses the network to perform or improve primary function (e.g., IP phone, personal computer (PC), Smart TV etc.,)

- ⇒ Useful functionality dictated by primary purpose (works usefully with 0 or 1 attachment)
- ⇒ Difficult to cover within one scope
- ⇒ Efficiency metric dominated by primary class
- ⇒ Many of these products already have ENERGY STAR specs, e.g., printers, PCs, set-top boxes (STBs)

Product Scope

We note that the EU has differentiated by EMC class, including EMC Class B for home residential use and excluding EMC Class A. Current discussions propose to include EMC Class B products for which (1) the individual user of the services provided by the device has direct control over the equipment and (2) equipment whose main functions are not designed to be used solely for commercial or professional purposes. Computers and displays are already regulated by CEC Title 20 and hence should be outside scope of further regulation. Sensitive applications, such as security systems, video surveillance and voice over internet protocol (VoIP) emergency services should also be excluded.[1]

Existing Test Procedures

We urge the CEC to recognize existing test procedures, standards and voluntary agreements such as EN50643:2018 for measurement of networked standby consumption of edge equipment, ETSI EN 303 423 for measurement of networked standby power consumption of interconnecting equipment, SNE voluntary agreement[2] , ANSI/CTA 2049 SNE test procedure[3],

[1] Federal Communications Commission (FCC) Report and Order (August 2015) on availability of 911 services in event of power outage; August 7, 2015;

[2] Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Small Network Equipment in the United States as Amended Effective January 1, 2018

[3] ANSI CTA 2049; Determination of Small Network Equipment Energy Consumption (February 2015)

EU Broadband Code of Conduct[4], EU's CSTB voluntary agreement[5], etc. When available, ENERGY STAR test procedures should also be leveraged, however, trying to apply ENERGY STAR TPs horizontally is problematic, as they are designed to be product specific. Regarding IEC 62301, it's very high level and not sufficient for a breadth of products. Repeatability deficiencies have been noted and should be addressed by the IEC.

Responses for "Attachment B, List of Questions for the LPM TP Problem Statement and Information Request".

1. Provisioning the Product

1.1. Should the product be allowed to run for a specific amount of time, for example 24 hours, to allow the product to update and provision software before taking the LPM measurements? If so, what is the appropriate amount of time?

Industry seeks clarity on what "run" means. Does it refer to being connected to a live network or "normal use"?

Section 7.1.A.3 of the ENERGY STAR Imaging Equipment v2.0 Test Method allows the EUT to "perform initial system configuration, as applicable". This may be appropriate wording to cover automatic software updates required by some devices at startup. Connection times to the network will vary depending on the type of equipment; 24-hours is not appropriate for all products.

2. Testing State

2.1. Is the approach outlined in section 2 of the test procedure an effective way to define the testing state for a broad range of products? If not, explain why.

According to the testing state, the measurement is conducted after discontinuing the primary function of the product, as defined by the manufacturer in a test report. Discontinuing the primary function for a bluetooth speaker connected to a cellphone to play music can be interpreted in various ways, however: sometimes as disconnecting the cellphone, and sometimes as pausing the music while maintaining

[4] EU Code of Conduct on Energy Consumption of Broadband Equipment; European Commission Joint Research Report, Version 6 (2017);
[5] CSTB Voluntary Industry Agreement to Improve Energy Consumption of Complex Set Top Boxes within the EU; (2017/2018)

the bluetooth connection with the cellphone, etc. This difference in interpretation can cause many issues so the testing state specific to each product has to be considered.

Absence of user interaction for 20 min could be an effective way of testing, however, some devices like cell phones, Apple TV, Roku Box, Wi-Fi-GW, baby monitors, health monitors etc., are always getting a ping/heartbeat from their service provider (or access point). Similarly, even though a cell phone screen goes blank, it is always communicating with a tower to provide the user its primary function immediately. **Hence the same test procedure is not applicable across all products.**

2.2. Explain other approaches that would be preferable/superior to the approach described in section 2 for testing state that is applicable to a broad range of products.

All products cannot be tested in the same way. To do so, all products with similar or like end-use functionality would have to categorized, and a new standard developed, or an existing standard modified for testing. This approach is not workable.

For example, for Imaging Equipment (IE), it is redundant and therefore unnecessary to require both manual and automatic entry into LPM. Also, if standard testing is already performed for other reasons, such as ENERGY STAR, that data should be admissible to meet the CEC requirement.

2.3. How long should X (the time between discontinuation of user interaction and the beginning of the measurement) be?

EU Regulation 801/2013 uses 20 min, whereas ENERGY STAR for Computers v7.1 prescribes 20 to 30 minutes but coming up with a single horizontal approach is not the right path, it should be based on product type.

The time between discontinuation of user interaction and the beginning of measurement will be different for different devices and should be left to the discretion of the test client.

3. Network Connections

A. Traffic content and levels:

3.1. To what extent does network and device data communication traffic need to be prescribed?

Network traffic should be limited to only what is needed to resume the primary function from its non-active mode.

Per ENERGY STAR SNE section 7.1. 0.5 kbps data rate in upstream and downstream direction is an appropriate amount of traffic for devices that support a low data rate state.

We call your attention to testing conducted by CalPlug for an ENERGY STAR network activity proposal.[6] Notably, the EPA subsequently withdrew the proposal as only specific user-initiated requests, such as print jobs, were found to increase power use.

3.2. Is the Energy Commission's proposed approach in section 3A of the test procedure appropriate? What is an appropriate limit on the inbound traffic? Explain what modifications or additions need to be made.

For some compute devices there is no need to prescribe outbound traffic, but this may not be the case for other edge devices. The incoming and outgoing traffic data rates from vertical programs like ENERGY STAR for SNE cannot be extrapolated to all SNE and edge products. Again, the horizontal one-size-fits-all approach is not workable.

3.3. Alternatively, is it better to prescribe specific network conditions, such as which network services are present, similar to the ENERGY STAR's approach? If so, what modifications, if any, need to be made to the ENERGY STAR's network conditions?

Industry seeks clarity on the definition or nature of "network services". Assuming it relates to security or other similar services, it is not possible to make such delineations as they will vary per physical interface/network and the nature of the data service.

B. Configuration requirements

i. Wired Connections

3.4. Are the instructions described in section 3.B.i of the test procedure complete and appropriate?

Industry seeks clarity as to the reason for requiring wired connections to be tested individually. This is a significant addition to the workload, and data collected under 62301 shows there's not a substantial difference between the different connections.

[6] U.S. EPA ENERGY STAR Imaging Equipment Webinar; March 28, 2018 (slides 55-60)

ENERGY STAR TEC is tested with only Ethernet and fax, if applicable. Ideally, this sleep data could be used to satisfy CEC requirements for LPM.

What other configurations or conditions need to be specified?

Ambient room temperature, humidity and barometric pressure ranges with normal air flow should be specified in test procedures.

3.5. Does Ethernet cable's length significantly impact power draw in LPM, and should it be specified for the testing? If so, what is an appropriate length for the Ethernet cable used for the testing?

Yes, Ethernet cable length impacts power draw in LPM. A lengthy cable will draw more power. Measurement focus should be on device characteristics, as opposed to cable characteristics, hence, a maximum cable length of 2-meters is preferable.

ii. Wireless Connections

General Comment: The document seems to be focused on WiFi and 802.11. Should testing also be considered for other radio technologies such as ZigBee, Z-Wave, Cellular (LTE/5G) and Bluetooth?

3.6. Do edge devices require different instructions from network devices? If so, specify which parts of the instructions should be different and how they should be.

Edge devices do not need different instructions.

3.7. What other test conditions besides those described in section 3.B.ii will impact LPM power draw? What additional test instructions are necessary to account for these impacts?

Test conditions should also state the temperature and may specify shielded enclosures from wireless devices.

IEC 62301 does not require testing wireless at the highest band. This requirement by the CEC would likely result in higher power, so any limits imposed should consider this. This could also lead to additional test burden.

3.8. How far should the device under test be from the network router?
The distance from the router should be determined by the manufacturer, but for repeatability purposes, could be specified in a test report.

iii. SNE-Specific Instructions

3.9. Are these setup instructions adequate to ensure reproducible results for testing SNE?

YES

3.10. If not, what instructions should be added or modified?
3.11. Should 3-phase input power requirements be added to the setup instructions?

Today's edge devices use DC power, and network devices use 5 Amps wall plug power, hence 3-phase input power is not required.

NOTE: Questions 4 through 9 apply to edge devices only. The test procedure will require setup instructions for some secondary functions, in addition to network functionality, that are present in the product under test, particularly those that significantly impact power draw.

4. Sensors

4.1. Which sensors besides those listed in section 4 of the test procedure (occupancy/motion, gesture, sound, voice recognition, ambient light, temperature, humidity, touch) need to be addressed in the test procedure?

Hinge/Gyro sensors could be another possibility as part of the list

4.2. Which sensors (for example, gesture recognition) must process environmental conditions to identify particular patterns (for example, a wave gesture)? How sensitive is power draw to ambient inputs (such as, sound for a voice recognition sensor or movement for a gesture sensor)?

When Wake on Voice (WoV) is enabled, the environment condition should be set at 50~55dBA as measured at the center of an array microphone.

4.3. What is the appropriate instruction to ensure that sensors do not cause the

product to exit LPM during the test and also represent real life situations? No environmental input or no specific trigger?

Audio as commented in Q4.2, for hinge sensors would need system integrators' comments so as not to trip the hinge sensor when the notebook PC lid is opened and retracted.

4.4. What other ambient environmental inputs should be specified? For example, what type and level of background ambient noise should be used?

If additional conditions are required to be monitored due to specific sensors, it should be clear that these conditions only have to be monitored if applicable.

5. Charging, wired

5.1. Is the methodology described in section 5 of the test procedure a reasonable approach to evaluate the wired charging function to minimize its power impact when it is not being used?

There are existing test procedures and regulations for battery charging systems. Industry recommends that battery chargers not be part of the CEC LPM test procedure.

6. Charging, wireless

6.1. Is the methodology described in section 6 of the test procedure a reasonable approach to evaluate wireless charging function to minimize its power impact when it is not being used?

There are existing test procedures and regulations for battery charging systems. Industry recommends that battery chargers not be part of the CEC LPM test procedure.

7. DC Powering

7.1. What is the appropriate input voltage to supply during testing, particularly for products that specify a range of acceptable DC input voltages?

Industry seeks clarification on the intended product scope as the range of "acceptable DC input voltages" will vary. Note that ENERGY STAR for Computers v7.1 does not cover DC input voltages.

7.2. How should the measurement be made? Are the instructions in the ENERGY STAR

display test procedure appropriate? Explain how the procedure should be modified, if the ENERGY STAR instructions are not adequate.

Need to specify port if multiple USB-PD-Type C ports are present.

8. Systems

8.1. Would the approach described in section 8 of the test procedure for systems that are powered separately from their system hub adequately represent system's power draw? If not, explain how to capture the actual power of products that need to connect to other products, wired or wirelessly, in order to transfer data.
8.2. Does the test procedure described in section 8 for systems that are powered from their system hub apply to all products? Explain if and how this approach should be modified to be applicable for new technologies.

8.3. Are the test procedures described in section 8 reasonable approaches? Provide reasons and explain what needs to change.

9. Off Mode

9.1. Is the definition in section 9 an appropriate definition for the off mode? If not, what is an appropriate definition?

ENERGY STAR for Imaging Equipment v2.0 definition for Off may be more appropriate: "The power state that the product enters when it has been manually or automatically switched off but is still plugged in and connected to the mains", however, industry seeks clarification on scope as not all devices have an off mode.

IEC 62301 for "no load" or "loaded" is not a sufficient reference for "off mode".

9.2. Are any other instructions beside those in section 9 needed to collect the off mode power measurement?

If standard testing is already performed for other reasons, e.g. ENERGY STAR, that data should be admissible to meet the CEC requirement instead of requiring Off to be measured immediately after LPM. Also, note that IEC 62301 requires a longer test period than ENERGY STAR Imaging Equipment v2.0, which allows as little as 5 minutes for Off. There's no compelling reason to require more than that for Off.

9.3. How might products that do not have hard or soft switches be turned off?

9.4. What proportion of products do not have an off mode?

10. General

10.1. Provide inputs on other gaps or issues not identified in the proposed test procedure

We would be pleased to discuss any aspect in greater detail.

Sincerely,

Erica Logan
Senior Director, Environment & Sustainability
Information Technology Industry Council
1101 K Street NW, Suite 610
Washington DC, 20005
Office: 202-626-5729