DOCKETED

Docket Number:	16-AAER-02
Project Title:	Appliance Efficiency Rulemaking for Computers, Computer Monitors, and Signage Displays
TN #:	214783
Document Title:	ITI -TechNet Comments on 15-Day Language for Computers, Computer Monitors, and Signage Displays
Description:	N/A
Filer:	System
Organization:	ITI-TechNet
Submitter Role:	Public
Submission Date:	12/13/2016 3:51:23 PM
Docketed Date:	12/13/2016

Comment Received From: Alexandria McBride
Submitted On: 12/13/2016
Docket Number: 16-AAER-02

ITI -TechNet Comments on 15-Day Language for Computers, Computer Monitors, and Signage Displays (Docket #16-AAER-02)

Additional submitted attachment is included below.

CEC Computers, Computer Monitors, and Signage Displays (Docket #16-AAER-02)

Appliance Efficiency Rulemaking

ITI/TechNet Comments on the Rulemaking (15-day language)
December 13, 2016

Authors.

The Information Technology Industry Council ("ITI"; http://www.itic.org) and the Technology Network ("TechNet"; http://www.technet.org).
The contacts for our organizations are: Alexandria McBride, (202) 626-5753, AMcBride@itic.org, and Andrea Deveau, (805) 234-5481, adeveau@technet.org

TABLE OF CONTENTS

Page

1 INTRODUCTION 3

2 SUMMARY OF KEY COMPUTERS ISSUES 3

Express Terms:

- Test Methods (1604)
  - ABC enabled system testing
  - Sleep mode test time

3 INDUSTRY RECOMMENDATIONS ON REGULATORY LANGUAGE 9

1. INTRODUCTION

ITI and TechNet (also referred to hereafter as "industry") have been honored to participate in a constructive dialogue with CEC staff since the beginning of the Computers and Displays Standards Rulemaking in Spring 2012. Our collaborative and data-driven discussions have resulted in a historic rulemaking that achieves the highest energy efficiency standards possible without undermining the innovation powering California's economic engine. The standards proposed in this rulemaking are ambitious, but given the industry's history of creating increasingly energy-efficient technologies, we are certain that they are achievable. As stated during the October 10th Public Meeting and subsequent engagement on the proposed 15-day language, ITI and TechNet support the proposed standards.

The remaining industry comments and recommendations below pertain to the CEC's Proposed Regulatory 15-Day Language: Express Terms Computers Computer Monitors and Signage Displays. We urge the CEC staff to review and address these industry recommendations in the final standard.

ITI and TechNet are committed to continued engagement with CEC and other stakeholders to support implementation of the rule, after the rulemaking process is complete. Due to the complexity of the standard, as CEC plans for implementation of this rule, we strongly suggest that CEC provide clear, accurate and timely guidance to industry (and other stakeholders) as the standards come into effect. For example, a CEC announcement letter with corresponding webinars, guidance documents and FAQs should be released at least six months before the effective date to allow stakeholders to make critical adjustments to their business and/or manufacturing processes and ask technical questions to CEC staff. We are certainly open to providing further feedback on implementation as we approach that phase of the process.

We look forward to seeing the results of these discussions in the final CEC standard.

2. SUMMARY OF KEY COMPUTERS ISSUES

Express Terms:

- **Test Methods for Specific Appliance (1604)**

1. **Testing of PC systems with Automatic Brightness Control (ABC) supported and enabled by default 1604(V) (5) (F):** Industry is concerned with CEC's proposal to deviate from ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016) and IEC 62623:2012 standard, by 'ignoring the direction' to disable automatic brightness control (ABC) for short idle testing on PC systems with integrated displays. Industry has several concerns with this approach:

    - **It is not harmonized with global test methodology based on ENERGY STAR framework and international standard.** The harmonized approach was developed over years of collaboration between governments and industry to create a level

playing field for testing of computers. Disabling of ABC and testing at fixed luminance value for regulatory compliance provided such level playing field, irrespective of display factory default settings.

- **Test method proposed by CEC for testing with ABC enabled systems is not mature and creates a lot of test variability:**
  - Different OEMs implement ABC differently.
  - One OEM might implement the Automatic brightness control dynamically with the intention of the user adjusting the screen brightness to their preference and the system will adjust the screen brightness automatically to different ambient light based on that preference. Another OEM might implement it with a fixed setting of screen brightness based on a fixed ambient light and it's not dynamic. And there are likely to be other OEMs implementing a different protocol.
  - The angle of incidence of the light on the Ambient Light Sensor (ALS) will affect the stability of the test and it can be very difficult to get the appropriate light intensity to the ALS of the unit as the light sensor of the test equipment is not directly inline to the ALS of the unit. This will yield inconsistent results.
  - Using a different type of light bulb (e.g. incandescent, LED, halogen etc.) will yield different results as it affects the calibration of the sensor of the product. This depends on how OEMs implement ABC and ALS.
  - As such testing with a 300lux light projected on to the unit will not yield consistent results. 3rd party testers will not be able to decipher the product setting as the unit under test is dynamically configured.
  - Test labs would not know how to test products to get consistent results.

  - **<u>Example 1: 2-in-1 Notebooks - ABC has two brightness settings</u>**
    - Really low light = screen 102 NITs
    - Above 70 lux = screen 300+ NITs

ABC disabled – fixed luminance

ABC enabled

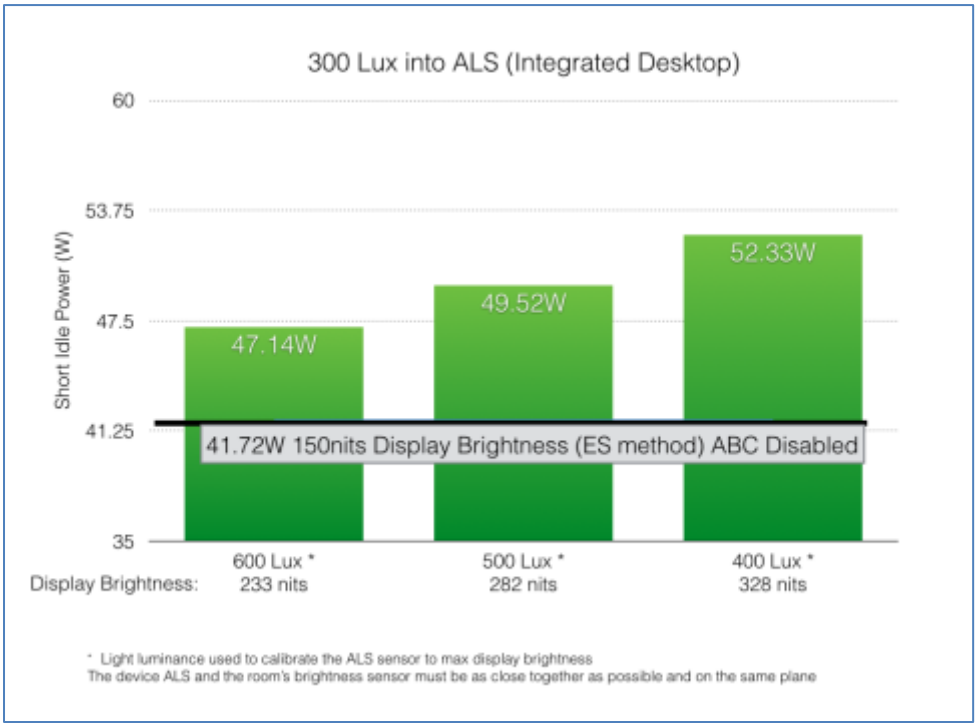
2-in-1 10.5"			2-in-1 12"		
LUX	NIT	AC Pwr	LUX	NIT	AC Pwr
ES V6.1	91	5.6	ES V6.1	90	4.5
0.1	99	5.6	0.1	99	4.5
78	388	8.2	73	289	6.7
97	387	8.2	102	289	6.7
210	388	8.2	216	289	6.7
310	388	8.2	310	289	6.7
505	387	8.2	500	290	6.7

- **Integrated Desktop Example:** As observed below measuring 300 lux projected at the Ambient Light Sensor (ALS) with ABC turned on, varies depending on how you calibrate the ALS initially (variability of 5W)

- Labs or manufacturers and verifiers will need to create a room with the right conditions to test this consistently.

Light projected at ABC for calibration	600lux	500lux	400lux	300lux
Short Idle - 500 lux at sensor with ABC on	56.25W	-	-	-
	display brightness =357 nits	-	-	-
Short Idle - 400 lux at sensor with ABC on	49.25W	53.76W	-	-
	display brightness =259 nits	Display brightness =345 nits	-	-
Short Idle - 300 lux at sensor with ABC on	47.14W	49.52W	52.33W	-
	display brightness =233 nits	Display brightness =282 nits	Display brightness =328 nits	-
Short Idle - 200 lux at sensor with ABC on	40.88W	41.66W	45.46W	49.76W
	display brightness =141 nits	Display brightness =164 nits	Display brightness =223 nits	Display brightness =288 nits
Short Idle - 100 lux at sensor with ABC on	36.69W	36.67W	38.24W	39.62W
	display brightness =80.3 nits	Display brightness =86.5 nits	Display brightness =110 nits	Display brightness =133 nits

The measurement issue highlighted above is shown in the chart below



- **TEC Limits:** The other key test is to establish equivalence for the same system under test. It is clear that same short idle power measurements are not achievable when the same system is measured with ABC disabled (using ENERGY STAR method) and when measured with ABC enabled (using CEC proposed method). Hence the two methods will lead to two different TEC results.

It is inappropriate to set a different test condition (with ABC enabled) which will lead to higher measured power vs. what was used (150nits/90nits) to set CEC targets.

- **Recommendation**: Industry recommends that CEC abandons the proposal for testing systems with ABC supported and enabled by default. This will allow CEC standard to be globally harmonized with other PC standards.

  Should CEC decide to keep its proposal intact, Industry requests that CEC collaborate with stakeholders to develop a new test procedure for ABC enabled integrated desktop and notebook PC systems, within 6 months of the adoption of the final rule The objective of the new test procedure would be to correct variability issues, establish TEC equivalence, and to ensure ABC enabled PC systems are not penalized.

2. **Sleep Mode Measurement:** Industry recommends that 1604 (5) (H) allow an alternate test method for long-idle and sleep-mode for computers that use alternate to ACPI S3 sleep mode.

   Test Burden Issue:
   - ENERGY STAR test method specifically references IEC 62623 Section 5.3.3 which states "place the EUT in sleep mode", which means the ENERGY STAR and CEC tests have to be different.
   - The increase in test time to follow both ENERGY STAR and CEC test methods on the same computer will cause test labs to charge 30% more per computer just for the test method changes
     - Average Energy Star testing costs $1000 per computer
     - Quote to test both ES & CEC would cost $1500
     - $1000 (Energy Star)
     - $200 (extra test report)
     - $300 (extra test time due to test method changes)

ENERGY STAR only test Time (ABC disabled)	**ENERGY STAR + CEC Sleep Test Time (ABC disabled)**	**ENERGY STAR + CEC Sleep + ABC Test Time**	**ITI Proposed Test time for Alternative Sleep Mode (ABC disabled)**
• Short Idle = 15 min • Long Idle = 25 min • Sleep = 5 min • Off = 5 min **Total time = 50 min**	• Short Idle = 15 min • Long Idle + CEC Sleep = 36 min • ES Sleep = 5 min • Off = 5 min **Total time = 61 min** **(22% increase in Test Time)**	• ES Short Idle = 15 min • Short Idle w/ABC enabled = 15 min • Long Idle + CEC Sleep = 36 min • ES Sleep = 5 min • Off = 5 min **Total time = 76 min** (**52% increase in Test Time)**	• Short Idle = 15 min • Long Idle + Sleep= 30 min • Off = 5 min **Total time = 50 min** **Same Test Time as ENERGY STAR testing**

Test Labs charge money based on the length of time for each test. The longer the test the more cost for the test. The above test time does not show setup time between tests, just the total measurement time.

Technical Rationale: The change in test procedure does not change the final result of the Sleep Mode Power. This just makes an increase in test time and test cost.

Computers that use alternate to ACPI S3 sleep typically remain in ACPI S0. However, the operating system reduces power to system components with control of each component separately. This reduces the overall power consumption of the system to levels similar to ACPI S3 sleep while allowing the system to have brief periods of activity to update applications and to respond to incoming Skype calls or IM requests. Systems with these alternate low-power modes are able to return to normal operation virtually instantaneously. This allows the computer to have a behavior similar to long-idle while having power consumption similar to S3 sleep.

The use of an alternative to ACPI S3 sleep mode poses another complication. As noted, the system can have brief periods of activity to update applications. These periods of activity only last a few seconds and may occur over varying periods depending on the configuration of the installed applications. Measuring the average power over 5 minutes can give varying results depending on whether one of these periods of activity occurs during that 5-minute period. This can lead to inconsistent measurements. Measuring the average power over 30 minutes will give more repeatable and accurate measurements of the power consumed in the alternate to ACPI S3 sleep mode. A shorter time period may be used if specified by the manufacturer.

Recommendation: Industry recommend amending 1604 (5) (H) with the following.

The sleep mode power measurement shall be tested in a modified manner from the test procedure described in IEC 62623:2012:

- if the Unit Under Test (UUT) uses ACPI S3 sleep mode accumulate power values for 5 min and record the average (arithmetic mean) value observed during that 5 min period as P_{sleep};
- if the UUT uses an alternative to ACPI S3 sleep mode, (e.g., low power long Idle, Modern Standby, etc.), then accumulate power values for 30 min and record the average (arithmetic mean) value observed during that 30 min period as P_{sleep}. A time period shorter than 30 min may be used if specified by the manufacturer. Such systems shall enter the alternative to ACPI S3 sleep mode directly from short idle without a period of long idle. The measured value shall be used for both sleep and long idle in the TEC calculations.

This alternate test method will give a more accurate reading for the power consumed without changing the total time required for the test.

3 INDUSTRY RECOMMENDATION ON REGULATORY LANGUAGE

COMPUTERS

Description	Page	Current Language	Proposed Language
1604 Test Methods for specific appliances (computers)	14	1604(V)(5) (F) During testing, a notebook computer, mobile gaming system, portable all-in-one, or integrated desktop shall proceed using Section 5.2(A)(1) and ignore the direction not to disable automatic brightness control as described in Section 5.2(A) of the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016). If automatic brightness control is supported and is enabled by default, position a light such that 300 lux directly enters the automatic brightness control sensor. If automatic brightness control is not enabled by default or the luminous emittance of the display is less than described in the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016) Section 5.2(E), then configure luminous emittance of the display per Section 5.2(E) of the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016).	1604(V)(5) (F) During testing, a notebook computer, mobile gaming system, portable all-in-one, or integrated desktop shall proceed using Section 5.2(A)(1) ~~and ignore the direction not to disable automatic brightness control as described in Section 5.2(A) of~~ the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016). ~~If automatic brightness control is supported and is enabled by default, position a light such that 300 lux directly enters the automatic brightness control sensor. If automatic brightness control is not enabled by default or the luminous emittance of the display is less than described in the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016) Section 5.2(E), then configure luminous emittance of the display per Section 5.2(E) of the ENERGY STAR Program Requirements for Computers, Final Test Method (Rev. March-2016~~).

Description	Page	Current Language	Proposed Language
1604 Test Methods for specific appliances (computers)	15	1604(H) The sleep mode power measurement shall be tested in a modified manner from the test procedure described in IEC 62623: 2012. Instead of measuring power after manually entering sleep mode, the power measurement shall begin no sooner than 30 minutes and no later than 31 minutes of user inactivity on the unit under test. This measurement shall follow the long-idle test without altering the unit under test.	1604(H) The sleep mode power measurement shall be tested in a modified manner from the test procedure described in IEC 62623:2012: - if the Unit Under Test (UUT) uses ACPI S3 sleep mode accumulate power values for 5 min and record the average (arithmetic mean) value observed during that 5 min period as P_{sleep}; - if the UUT uses an alternative to ACPI S3 sleep mode, (e.g., low power long Idle, Modern Standby, etc.), then accumulate power values for 30 min and record the average (arithmetic mean) value observed during that 30 min period as P_{sleep}. A time period shorter than 30 min may be used if specified by the manufacturer. Such systems shall enter the alternative to ACPI S3 sleep mode directly from short idle without a period of long idle. o The measured value shall be used for both sleep and long idle in the TEC calculations.