DOCKETED

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California Energy Commission

Computers, Computer Monitors, and Signage Displays Appliance Efficiency Rulemaking

ITI/TechNet Oral Comments on the Rulemaking

Docket No. 16-AAER-02

October 10, 2016

Agenda

- Opening Remarks- Hankin (ITI)
- Displays Comments – Fossati (HP)
- Computers Comments – Sheikh (Intel)

Opening Remarks

- Our thanks to the CEC for the collaborative and constructive process at and since the last Workshop.
- ITI and TechNet support the standards proposed*.
- Our oral and detailed written comments on computers and displays will address omissions, clarifications and adjustments that we've discussed with CEC staff. Our two other speakers will highlight key needed edits to the express terms.
- On rechargeable battery subsystems, the correction proposed is vital, and it aligns with our discussions.

Displays Comments

Issues with 45-day Regulatory language

*1605.3 (E) Manufacturers shall apply no more than **one** applicable adder from Table V-5 to determine the maximum on-mode wattage.*

Industry Concerns:

- During all of the Industry's presentations and feedback, for Monitors and Computers alike, we have emphasized that in cases an allowance is needed, such an allowance be additive to any other additional power needs.
- The concept of the adders for allowances was a compromise to the original request by the industry to have the product "out of scope" instead.
- On the Computers Regulation, it is understood and accepted by CEC that Industry will get capability based adders for attributes like system memory, discrete GPU, additional storage, add-in cards, etc.
- The same situation exists for Monitors, where the individual allowances should be additive, if a product incorporates more than one of the capabilities for which an adder has been identified (not accounted for in the base "ON" mode limit)

Issues with 45-day Regulatory language (Cont'd)

*1605.3 (E) Manufacturers shall apply no more than **one** applicable adder from Table V-5 to determine the maximum on-mode wattage.*

- For reference, other Monitor related regulations like ENERGY STAR also incorporate the concept of adding allowances to the "ON Power" as capability is added to the baseline monitor definition:

> 3.3.3 For all Monitors, Calculated TEC (ETEC) in kWh shall be less than or equal the calculation of Maximum TEC (ETEC_MAX) with the applicable allowances and adjustments (applied at most once) per Equation 2.
>
> **Equation 2: Total Energy Consumption Requirement for Monitors**
>
> $E_{TEC} \leq (E_{TEC\_MAX} + E_{EP} + E_{ABC} + E_N + E_{OS} + E_T) \times eff_{AC\_DC}$
>
> *Where:*
>
> – *ETEC is TEC in kWh calculated per Equation 1;*
> – *ETEC_MAX is the Maximum TEC requirement in kWh calculated per Table 1;*
> – *EEP is the enhanced performance display allowance in kWh per Section 3.3.4;*
> – *EABC is the Automatic Brightness Control allowance in kWh per Equation 4;*
> – *EN is the Full Network Connectivity allowance in kWh per Table 3;*
> – *EOS is the Occupancy Sensor allowance in kWh per Table 4;*
> – *ET is the Touch Technology allowance in kWh per Equation 5; and eff AC_DC is the standard adjustment for ac-dc power conversion losses that occur at the device powering the Display, and is 1.0 for Ac-powered Displays and 0.85 for Displays with Standard dc.*

- The following slides show the proposed changes to the Regulatory Language. To resolve the identified issue, an additional "Category" column has been added to explicitly indicate which adders can be applied only once.

Changes to the Requirement and Table V-4

E. Manufacturers shall apply ~~no more than one~~ the applicable adder(s) from Table V-5 to determine the maximum ON-mode wattage. Only one adder can be applied from each category

TableV-5

List of Potential Allowances to the "ON Power" limits specified in Table V-4 ~~ly ApplicableAdders~~

Category	Computer Monitor Type	Models manufactured on or after July 1,2019, and before January 1, 2021	Models manufactured on or after January 1,2021
E.P.Ds.	Enhanced Performance Display with a color gamut support of 32.9% of CIELUV or greater (99%or more of defined sRGB colors)	30% "ON Power" Allowance	20% "ON Power" Allowance
	Enhanced Performance Display with a color gamut support of 38.4% of CIELUV or greater (99%or more of defined AdobeRGB colors)	75% "ON Power" Allowance	60% "ON Power" Allowance
Gaming	Gaming Monitors without incremental hardware-based assistance	30% "ON Power" Allowance	20% "ON Power" Allowance
	Gaming Monitors with incremental hardware-based assistance	35% "ON Power" Allowance	35% "ON Power" Allowance
OLED	OLED monitor	30% "ON Power" Allowance	20% "ON Power" Allowance
Curved	Curved monitor	30% "ON Power" Allowance	20% "ON Power" Allowance
Touch	Touch monitors	1W "ON Power" Allowance	1W "ON Power" Allowance

Example: a Curved gaming monitor with hardware assistance would receive both the 30% and the 35% adders, for a total ON Power allowance of an additional 65%.

Corrections on Table V-5 to match changes to Table V-4

Table V-4
Power Consumption Standards for Computer Monitors

	Diagonal Screen Size (d) in Inches	Maximum Computer Monitor On Mode Power Consumption in Watts
Resolution ≤ 5 MP	17”≤d≤20”	[(6.0*r) + (0.025*A) + 3.7] + applicable adder(s) in Table V-5
	20”<d<23”	[(4.2*r) + (0.02*A) + 2.2] + applicable adder(s) in Table V-5
	23”≤d<25”	[(4.2*r) + (0.04*A) – 2.4] + applicable adder(s) in Table V-5
	25”≤d<30”	[(4.2*r) + (0.07*A) – 10.2] + applicable adder(s) in Table V-5
	30”≤d≤61”	[(6.0*r) + (0.1*A) – 14.5] + applicable adder(s) in Table V-5
Resolution > 5.0 MP	17”≤d≤20”	[25 + (0.025*A) +3.7] + applicable adder(s) in Table V-5
	20”<d<23”	[25 + (0.02*A) +2.2] + applicable adder(s) in Table V-5
	23”≤d<25”	[25 + (0.04*A) – 2.4] + applicable adder(s) in Table V-5
	25”≤d<30”	[25 + (0.07*A) – 10.2] + applicable adder(s) in Table V-5
	30”≤d≤61”	[25 + (0.1*A) – 14.5] + applicable adder(s) in Table V-5

Computer Display Modal Testing

1604. Test Methods for Specific Appliances.

(4)(B) A computer monitor shall be tested as required by the test procedure only for each of the following:

1. On mode power consumption.
2. Sleep mode power consumption.
3. Off mode power consumption.

Industry proposal: Exempted Computer Monitors should not be required to test and report power consumption information (no value add)

Computers Comments

Computers comments - I

- Definitions:
  - High expandability computer and Mobile workstation did not separate the agreed system memory bandwidth and frame buffer bandwidth requirements
  - Workstations: Industry recommends to correct bandwidth unit of measure from ‘Gigabytes/sec’ to ‘Giga transfers/sec’ under workstation definition (3)(B).
- Limited capability (zero)Thin Client Treatment:
  - 1605.3 (v)(5)(C) does not include Thin Clients exemption from 1605.3 (v)(5)(B), for systems with a limited capability operating system or internal storage.

    If the model is shipped at the purchaser’s request with either a limited capability operating system or without an operating system , the model is not required to comply with Section 1605.3(v)(5)(B).

Computers comments - II

- Limited capability thin clients (cont'd) - Industry proposes the following addition to 1605.3 (v)(5)(C) to help clarify the Total Energy Consumption (TEC) procedure and avoid confusion.
  - *If the model is shipped at the purchaser's request with either a limited capability operating system or without an operating system or without internal storage, the model is not required to comply with Section 1605.3(v)(5)(B). Further the model may substitute the power in long idle mode with power in sleep mode in Typical Energy Consumption (TEC) equation, when calculating TEC.*
- Mode weightings:
  - 1604 (v)(5)(B) allows for Conventional and Full Capability Duty Cycles
  - ITI has confirmed that not all OS and hardware suppliers support the Full Capability requirements.
    - Three major non-proprietary operating system manufacturers do not support Full Capability
    - Two of three of the major network interface chip manufacturers do not support Full Capability
  - OS and hardware suppliers do support the "remote wake" capability
  - Proposed change would insure all computer manufacturers would have the option of choosing between either Conventional or Remote Wake duty cycle weightings

Computers comments - III

- Mode weightings (Cont'd) - Industry proposes modifying 1604 (v)(5)(B) as follows:
  1. Modify last sentence, '…. unless they meet the criteria to use ~~"full capability"~~ "remote wake" mode weightings, below.'
  2. In order to use the ~~"full capability"~~ "remote wake" mode weighting a computer shall have the following features enabled as shipped:

     i. Maintain Ethernet (*IEEE 802.3-2015*) or wireless (*IEEE 802.11-2012*) network addresses and network connection capability while in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode; and

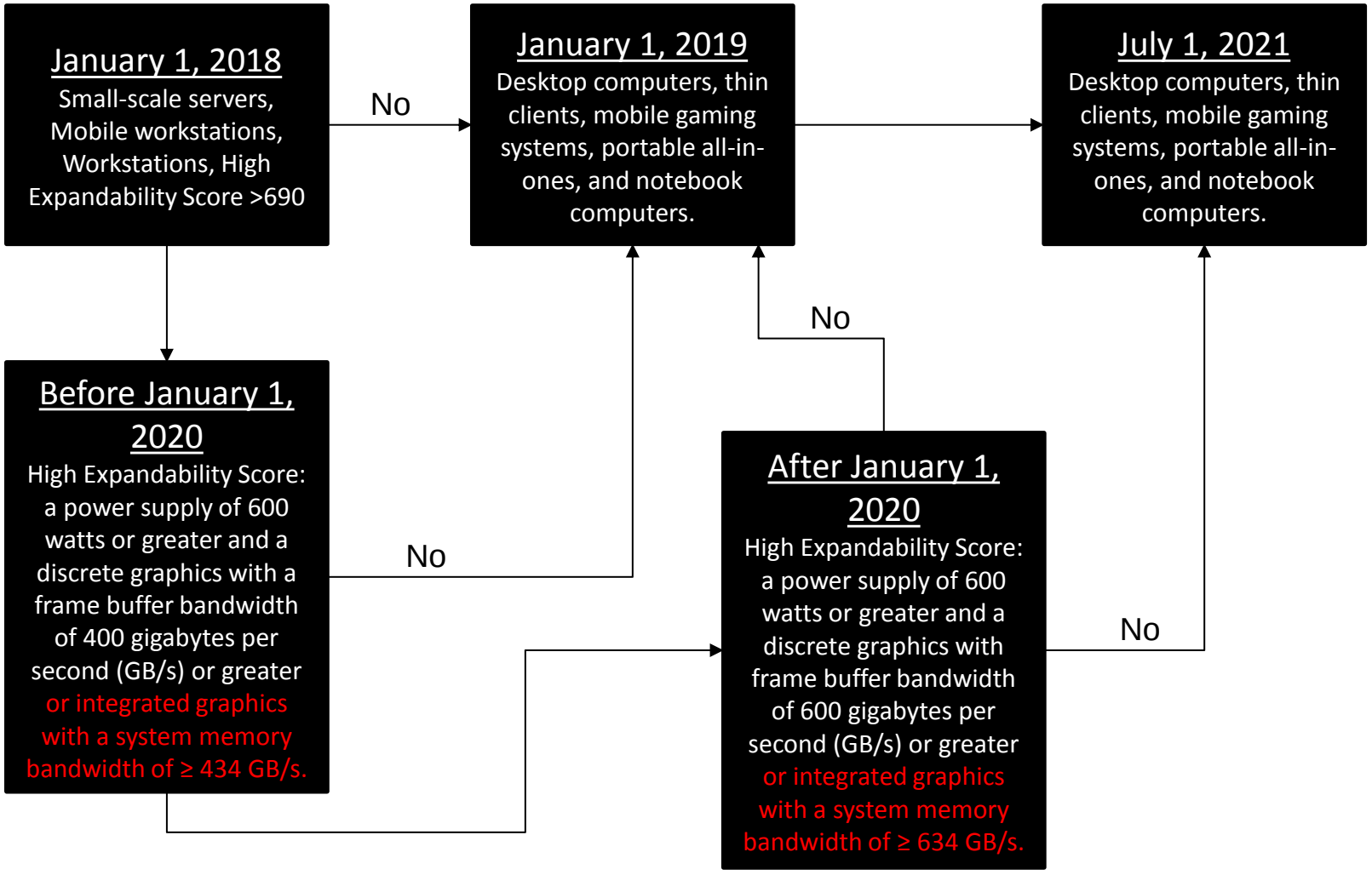
     ii. ~~Resume from ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode upon request from outside the local network~~ While in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep, the system is capable of remotely waking upon request from outside the local network.

     ~~iii. Support advertising host services and network name while in ACPI System Level S3 Sleep Mode or an alternative to ACPI S3 sleep mode.~~

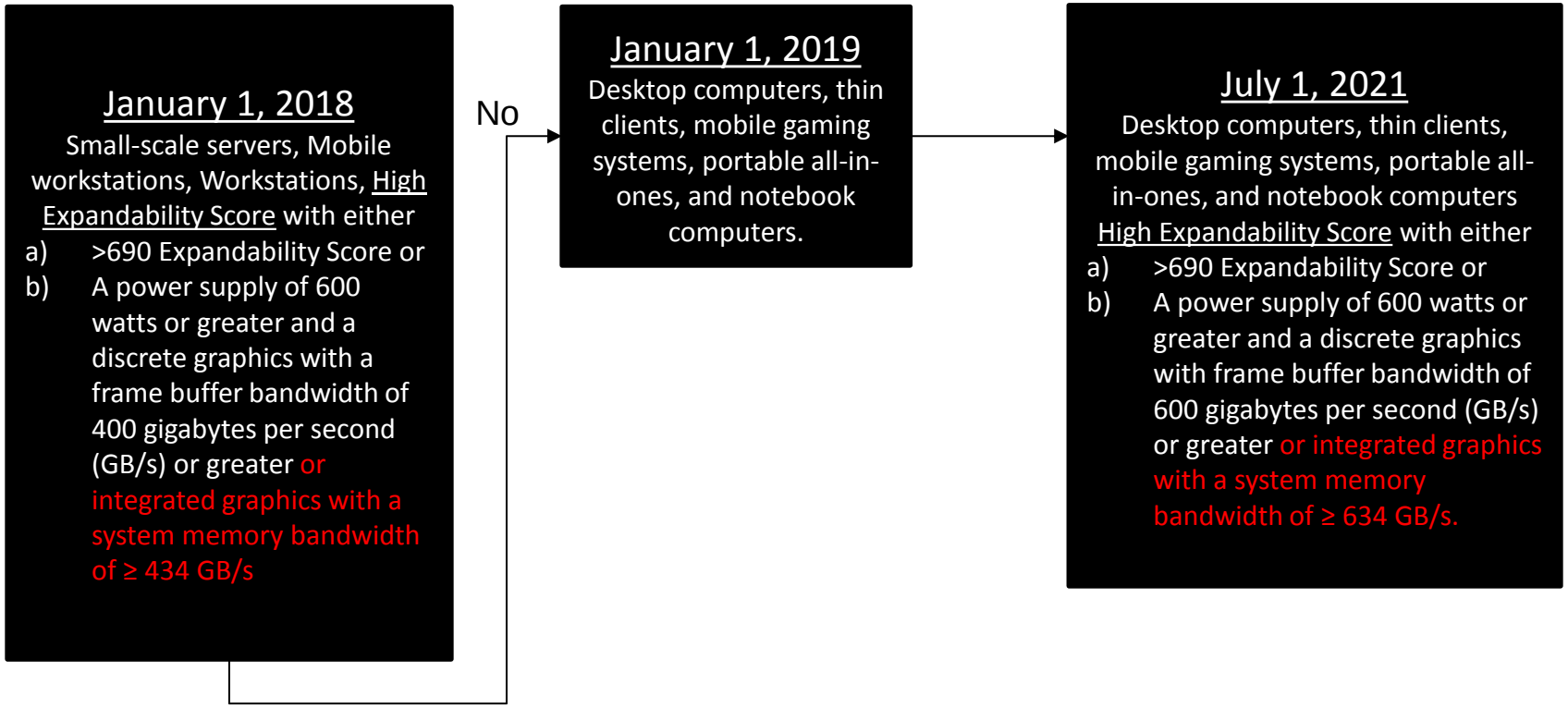
Computers comments - IV

- Schedule:
  - **Enhanced performance (EP) display**
    - **EP Tier 1 and Tier 2** requirements are aligned with computer monitor effective dates (Table V-8). However, the same EP requirements apply to integrated desktop computers that have different effective dates. This date misalignment is confusing and unworkable for computers.
    - **EP Industry Proposal**: Modify Table V-8 to align EP requirements dates with computers effective dates respectively (Tier 1: Jan 1, 2019, and Tier 2: July 1, 2021)
  - **High expandability computer**
    - Compliance for computers meeting the high expandability criteria (per definition) start January 1, 2018. However the dates for discrete graphics and power supply requirements are on a different timeline ("before January 1, 2020" and "on or after January 1, 2020"). It is confusing and unnecessary to track these dates. This could inadvertently lead to potential non-compliance.
    - Industry Proposal: Modify High expandability computer criteria (2) to remove the following language "If the computer is manufactured before January 1, 2020", and modify (3) to change from "on or after Jan 1, 2020" to "on or after July 1, 2021" to align with computer Tier 2 dates. (see visual slides)

Current Effective Dates



Industry Proposed Effective Date Alignment



Computers comments - V

- Add-in cards (Staff report – Final Analysis P47):
  - The add-in card allowance is incorrectly stated in watts instead of kWh, while the separation should also be in kWh. The transmission rate should be gigabits/sec (Gb/s) and not Gigabytes/sec (GB/s). These corrections are necessary for consistency.
- Future Technologies (Staff report – Final Analysis P49):
  - The discussion of future technologies is welcomed, and consistent with our discussions, except in one important aspect.
  - The reference to the petition process under Section 1221 of Title 20 seems to contemplate business as usual, whereas our discussions have emphasized the importance of expeditious consideration for these future technologies.
  - New technologies coming to market should not be held unnecessarily hostage to a prolonged petition process.
  - We request that CEC Executive Director take steps to ensure expedition, committing to a process of no more than 6 months.

TechNet

ITI

THANK YOU