



**Information Technology Industry Council (ITI) Comments on ENERGY STAR
Eligibility Criteria and Test Methods for Computers Draft Ver. 5.2**

October 15, 2010

EPA Sunset of ENERGY STAR Program Requirements for External Power Supplies (Ver 2.0):

ITI understands why EPA feels that the stand-alone version of the 2.0 EPS program requirements is no longer needed. We are concerned that uniform test methods still exist after the ver. 2.0 EPS specification is cancelled out. Does EPA plan on referencing the "Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies (August 11, 2004)," in the ENERGY STAR program requirements (for all main products using EPSs)? This is the test method currently referenced in section 4 of the ver. 2.0 EPS program requirements. Or does EPA plan to reference other test methods (such as alignment with U.S. DOE EPS test methods for class A EPS)? Industry prefers one test method for EPSs and recommends retaining the "Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies (August 11, 2004)," in the ENERGY STAR program requirements for all products using EPSs and also working with DOE to harmonize the test methods (between the two programs).

ENERGY STAR Version 5.2 Technical Draft Feedback

ITI members understand that changes associated with the enhanced testing and verification requirements must be updated in the ENERGY STAR product program requirements. ITI members would like to keep the technical parts of the Ver. 5.0 PC specification in place (Example: Keep same system category definitions and table formats as Version 5.0), with the exception of updating the requirements to reflect progress made with the Ecma-383 standard and correcting proposed changes inadvertently impacting how products are classified (family definitions) and use of the label managed. With respect to specification limits, nothing has been changed mathematically in the ITI input provided below. Changes to the specification limits should be considered in the Ver. 6.0 update. In addition to the comments below, ITI has provided EPA a marked up copy of the draft Ver. 5.2 PC specification that integrates the changes being recommended by ITI members. Note that the line numbers have changed from EPA's Ver. 5.2 draft, as ITI comments were added to the document.

We ask that EPA consider the following recommendations:

- Sect. 1, 1) – Computer definition, beginning with line 13:
 - Add new definition c) to the characteristics for PCs: *An integrated display screen and/or the ability to support an external display screen to output information*

- Sect. 1, 2) – Integrated Desktop Computer definition, beginning with line 27:

- Add a clarifying note to the Integrated Desktop Computer definition: *Should be tested like Notebooks using modified Notebooks TEC equation, but complying with Desktop TEC weights and limits)*
- Sect. 1, 6) – Workstation definition, beginning with line 84:
 - Add note “e” as follows: “Provide support for 2 or more processors (shall support physically separate processor packages/sockets, i.e., requirement cannot be met with support for a single multi-core processor); and/or”
- Network connectivity, beginning with line 144
 - “Low power mode” is relative and ill defined. Idle is also low power compared to active. EPA needs to drop or define “low power mode”
- Product Family definition, beginning with line 174

We recommend that EPA allow manufacturers to define what constitutes a product “family” definition. It is not possible to develop a standardized definition for product families that will fit every manufacturer’s products and that will remain current for any appreciable period of time. Product families describe a variable feature set of a core device or system, which has little or no impact to the energy consumption, test set up criterion or test parameters. Computer devices or systems are distinguished from appliances due to significant variability in feature sets and power consumption directly attributable to anticipated workload and anticipated performance.

This can be demonstrated by the wide variability in TEC values by server, desktop or laptop categories. Computer technology continues to rapidly evolve to support new technology feature sets, operating systems, networking environments, and peripheral ecosystems. If the ENERGY STAR program persists in defining peripheral or feature categories, the list quickly becomes stale, and deviation requests and approvals are more frequent due to technology advancement.

Product families defined by the manufacturer, specifically peripherals and features sets to be included in an envelop of energy consumption performance (TEC) and category (desktop, laptop, workstation, server) deliver superior availability of system configurations over ENERGY STAR category, with minimal standards updates. Any other approach will require accreditation bodies and certification bodies to instigate more attention than required to manage the category and product definition without returning value, increasing complexity and excluding potential systems from ENERGY STAR qualification, that would nominally meet the criteria.

Draft Ver. 5.2 specifically calls out Workstations with respect to product family. Workstation configurability is just as great as any other PC product, if not more so. We request that EPA indicate that Workstation families are as defined by the manufacturers just as any other PC product, or leave the Ver. 5.0 definition for product family unchanged.

Should EPA feel that additional definition for Workstation families is required, we need to better understand the logic involving the number of GPUs being used as the only variable in the Ver. 5.2 draft.

- Added Sect. 2.3 Future Specification Considerations to allow the user and global Energy Regulatory bodies get a preview of what to expect in the upcoming ENERGY STAR ver 6.0 (supports EPA/Industry global harmonization goals) Sect. 3.2 Power Supply Requirements, line 261 add new par. 3.2.1 suggesting that power supply test reports from manufacturer's or independent test entities accredited to perform power supply testing shall be recognized for the purpose of qualifying the ENERGY STAR product (as shown on industry's marked up Ver. 5.2 draft).
- Sect. 3.2.3 External Power Supplies, line 273 – see note above for need to retain valid EPS test methods now that EPA is sun-setting the Ver. 2.0 EPS Program Requirements (also discussed at beginning of this input).
- Section 4.2 Number of Units for Testing, beginning on line 437:
 - Refer to additional comments requesting that EPA allow manufacturers to determine the definition for Workstations (as shown on industry's marked up Ver. 5.2 draft and discussed in other related sections of ITI's input on the 5.2 specification draft).
- Sect. 1 D) Operation Modes beginning with line 127 through 135:
 - Industry proposes revising Idle State definitions to break down "Idle State" into "Long Idle State" and "Short Idle State" that recognize the difference between the way desktop and notebooks are tested in idle, which, with the help of EPA, was incorporated into the Ecma-383 standard on measuring personal computer energy: Short Idle (P_{side}) where it's an idle condition where the screen is on (as the desktop is measured) and Long idle (P_{idle}) where it's an idle condition where the screen is blanked or off (as the notebook and integrated computers are measured). Propose that definitions be taken from the Ecma-383 3rd edition standard.
 - Long Idle (P_{idle}). The mode where the EUT has reached an idle condition (e.g. 15 minutes after OS boot or after completing an active workload or after resuming from sleep), the screen has just blanked but remains in the working mode (ACPI G0/S0). Power management features if configured as shipped should have engaged (e.g. display is on, HDD may have spun-down) but the EUT is prevented from entering sleep mode. P_{idle} represents the average power measured when in the long idle mode.
 - Short Idle (P_{side}). The mode where the EUT has reached an idle condition (e.g. 5 minutes after OS boot or after completing an active workload or after resuming from sleep), the screen is on and set to as shipped brightness and long idle power management features should not have engaged (e.g. HDD is spinning and

the EUT is prevented from entering sleep mode). P_{idle} represents the average power measured when in the short idle mode.

This would also change equation 1 for calculating TEC for desktop and notebook:

Equation 1: TEC Calculation (E_{TEC}) for Desktop, Integrated Desktop, and Notebook Computers

$$E_{\text{TEC}} = (8760 / 1000) * \{(P_{\text{OFF}} * T_{\text{OFF}}) + (P_{\text{SLEEP}} * T_{\text{SLEEP}}) + (P_{\text{IDLE}} * T_{\text{IDLE}}) + (P_{\text{SIDLE}} * T_{\text{SIDLE}})\}$$

Where:

- P_{OFF} = Measured power consumption in Off Mode (W)
- P_{SLEEP} = Measured power consumption in Sleep Mode (W)
- P_{IDLE} = Measured power consumption in Long Idle Mode (W)
- P_{SIDLE} = Measured power consumption in Short Idle Mode (W)
- T_{OFF} , T_{SLEEP} , and T_{IDLE} are mode weightings as specified in Table 5 (for Desktops and Integrated Desktops) or
- Table 1: Mode Weightings for Integrated Desktop Computers

Mode Weighting	Conventional	Full Network Connectivity			
		Base Capability	Remote Wake	Service Discovery/ Name Services	Full Proxying
T_{off}	55%	50%	47%	43%	40%
T_{sleep}	5%	14%	20%	25%	30%
T_{idle}	40%	36%	33%	32%	30%
T_{side}	0%	0%	0%	0%	0%

- Table 2 (for Notebooks).

And changing the way the weighting tables are presented:

Table 4: Mode Weightings for Desktop Computers

Mode Weighting	Conventional	Full Network Connectivity			
		Base Capability	Remote Wake	Service Discovery/Name Services	Full Proxying
T _{off}	55%	50%	47%	43%	40%
T _{sleep}	5%	14%	20%	25%	30%
T _{idle}	0%	0%	0%	0%	0%
T_{side}	40%	36%	33%	32%	30%

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T _{sleep}	5%	14%	20%	25%	30%
T _{idle}	40%	36%	33%	32%	30%
T _{sidle}	0%	0%	0%	0%	0%

Table 2: Mode Weightings for Notebook Computers

Mode Weighting	Conventional	Full Network Connectivity			
		Base Capability	Remote Wake	Service Discovery / Name Services	Full Proxying
T _{off}	60%	54%	49%	48%	45%
T _{sleep}	10%	18%	24%	26%	30%
T _{idle}	30%	28%	27%	26%	25%
T _{sidle}	0%	0%	0%	0%	0%

This would also require how the equations are represented in the Notebook TEC calculation example in Annex A:

Following is a sample E_{TEC} evaluation for a Category A Notebook Computer with integrated GPU, 8 GB Memory, and 1 HDD.

A) Measure values using the ENERGY STAR Computers Test Method:

- 1) Off Mode = 1.0 W
- 2) Sleep Mode = 1.7 W
- 3) **Long** Idle State = 10.0 W

B) Calculate E_{TEC} from power measurements and weightings:

Notebook State Weightings	
T _{off}	0.60
T _{sleep}	0.10
T _{idle}	0.30
T _{sidle}	0

$$1) E_{TEC} = (8760/1000) * (P_{off} * T_{off} + P_{sleep} * T_{sleep} + P_{idle} * T_{idle} + P_{sidle} * T_{sidle})$$

$$2) E_{TEC} = (8760/1000) * (1.0 * 0.60 + 1.7 * 0.10 + 10.0 * 0.30)$$

Currently the only difference between the Ecma-383 definitions and the ENERGY STAR V5 definitions is in how the HDD is treated. In the Ecma-383 standard, the HDD is assumed to be spinning in the short idle case, but could be spinning in the long idle mode, where-as the ENERGY STAR V5 requires the HDD to be spinning in both modes (which the industry still disagrees with based on the fact that HDD spin-down is a mode used to lower idle power and power management features should be encouraged by ENERGY STAR testing and definition practices.

The industry would be willing to compromise with the draft 5.2 definition to have HDD spinning in both short idle and long idle definitions (to keep testing the same as version 5.0), but will insist on this change in the next major 6.0 revision to align with the Ecma-383 standard.

- Desktop categorization, line 280: Leave the definitions and the format as is according to version 5.0. Category D in 5.2 implies you need both a discrete GPU > 128 bit FBW and >= 4 GB of memory. It should be one or the other, not both if this change is made.
- Storage allowance, lines 286-287
Allowance is given for only one instance of additional storage. Clients rarely ship more than 2 hard drives, so this is not a big deal, but it's a change. We need to understand the reason for the change. We also would like EPA to clarify the allowance policy for optical drives.
- Network proxy
 - We would like to see the data justification to back up the proxy weightings, and the inconsistent weighting between desktops and laptops.
 - Industry is not certain that "service discovery/name services" makes sense on a client. Clients are typically consumers of services, not producers. Industry requests clarification. If this proxy is not appropriate for a client, some path must be made for a client to obtain full proxy weightings.
 - Proxy weightings for notebooks provide no incentive for implementing the feature, which is illustrated by the analysis below:

Desktop	Proxy					Desktop Pwr	TEC				
	Conv	base	RW	SD/NS	Full		Conv	base	RW	SD/NS	Full
Toff	55%	50%	47%	43%	40%	1.0	181.8	167.0	155.7	152.7	145.4
Tsleep	5%	14%	20%	25%	30%	4.0	TEC HR	14.8	26.1	29.1	36.4
Tidle	40%	36%	33%	32%	30%	50.0		8.9%	16.8%	19.0%	25.0%

Notebook	Proxy					Notebook Pwr	TEC				
	Conv	base	RW	SD/NS	Full		Conv	base	RW	SD/NS	Full
Toff	60%	54%	49%	48%	45%	0.5	30.5	29.7	29.6	29.0	28.6
Tsleep	10%	18%	24%	26%	30%	1.8	TEC HR	0.8	0.9	1.5	1.9

Title	30%	28%	27%	26%	25%	10.0	2.5%	3.1%	5.2%	6.6%
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For desktop systems, proxying provides a 9%-25% TEC benefit for the system. The notebook values only provide 2.5% to 6.6% TEC benefit, which translates to a very small power margin to actually implement the feature, which may be infeasible. The notebook numbers need to be adjusted to provide similar incentive as the desktop numbers.

- Number of units required for testing, beginning at line 383
 - Why are Workstations called out separately in line 388?
 - Need an explanation for lines 391-393.

- Effective date, line 425. We are shipping systems that meet basic proxy qualifications. When can we apply the new weightings?