January 18, 2013

To: RJ Meyers, EPA, John Clinger, ICF International, Bryan Berringer, DOE

Re: ITI Comments on Draft 3 of the ENERGY STAR Specification for Computers v6.0

Thank you for the opportunity to continue our dialogue on the development of the latest ENERGY STAR Specification for computers. Our priority concerns include (1) category system and switchable graphics treatment (2) discrete graphics adder allowances; and (3) workstations. In conjunction with comment #12 on the specification development process, ITI would like to request a meeting, prior to the issuance of the next draft, to review these comments in greater detail.

1. Category System and Switchable Graphics:

In reference to section 3.5 Draft 3, Notebook categories Table 4 (Page 11), and subsequent communication from EPA dated January 3, 2013 regarding Desktop categories amendment, ITI welcomes EPA's proposal to align Notebooks, Desktop and Integrated Desktop categories with ITI proposed categorization system. However ITI has concerns on introduction of a third integrated graphics system category as proposed by EPA. We strongly recommend staying with two, instead of three categories for integrated graphics (iGfx) systems for the following reasons.

I.   The second iGfx category in the original ITI proposed performance based category system, was designed for high-end iGfx systems, and the performance score was similar to what was proposed by EPA for the third iGfx category in Draft 3 and Jan. 3, 2013 communication- (Desktop: ITI performance score proposal for DTP2 - P >7 is same as EPA proposed DT I3 – P>7; Notebooks: ITI performance score proposal for NBP2 - P >5.2 is different from EPA proposed NBI3- P >8). EPA and ITI could work out and agree on the right performance score band for each category. However adding another iGfx category to Notebook and Desktop and Integrated Desktop categories adds complexity without solving the switchable graphics issue.

II.   EPA's justification for 3rd iGfx category per notes in the Draft 3(Page 11), "..is intended to contain most switchable graphics notebooks..". In addition EPA stated in Draft 3 notes, "…notebooks with switchable graphics are often designed with more powerful hardware to support the discrete portion of their graphics capabilities…". The industry's concern is under current circumstances it would be very difficult to set up a new iGfx category with the expectation that most of the switchable graphics systems will be in that category. Based on joint EPA/ITI experience and months of discussion on the dataset, it became obvious that systems with switchable graphics could not be easily identified in the database due to reporting errors. Hence to set appropriate TEC limits with an assumption that most switchable graphics systems would be part of the new category is far-fetched. The unintended consequence will be TEC limits for third iGfx category will be set based on non-switchable graphics (lightly configured) systems, and most switchable graphics systems will likely fail in absence of any incentive (Note: EPA proposal does not grant any adder for switchable graphics systems).

III.   ITI understands the database complexity and the fact that database cleanup will require too long and is not practical at this phase of specification development; consequently, we are proposing a simpler approach.

Recommendations

Information Technology Industry Council
1101 K St, NW Suite 610, Washington, D.C. 20005
T +1 (202) 737-8888, www.itic.org

Innovation. Insight. Influence.

I. Keep originally proposed performance based category proposal intact – total of 5 categories each for Notebooks and Desktops/Integrated Desktop systems, each of which comprising of a low-end, 2 integrated graphics categories and 2 discrete graphics categories.
II. Should there be a need, ITI is receptive to working with EPA to adjust the performance band for each category from originally ITI proposed bands, based on appropriate cut-off points and system distribution in each category.
III. Switchable Graphics systems treatment for compliance testing:

   a) *Category*: Determine which of the two iGfx categories a switchable graphics system belongs, based on the switchable graphics performance criteria defined in Draft 3. The switchable graphics system will need to comply with the given iGfx category base TEC limit. However, as noted above switchable graphics systems are mostly richly configured and such base TEC limits based on lightly configured iGfx systems will not be sufficient, and will create a disincentive for such systems to qualify. As such, industry proposes incentives for switchable graphics systems.
   b) *Switchable Graphics System Incentives*: The incentive or adder will be equal to 50% of G1-G7 class adder. (Example: Systems with G1 dGfx class will get 50% of G1 adder, while systems with G5 dGfx will get 50% of G5 adder). The adder will be applied to each switchable graphics systems along with base TEC and other applicable adders, for compliance (pass/fail) testing.

2. Changes Are Required to Definitions

The current definitions of GPU, dGfx, and iGfx diverged from the previously agreed upon definitions found in Version 5. While ITI understands that the intention was to allow for the definition of iGfx, the new definitions leave room for misinterpretation. For example, discrete GPUs in notebooks are generally not in a card format. ITI recommends that the Version 5 definitions be retained, and the definitions revised as follows:

Discrete Graphics Processing Unit (dGPU): A graphics processor with a local memory controller interface and a local graphics-specific memory.
Integrated Graphics (iGfx): A graphics solution that does not contain a dGPU

Graphics class definition: In addition, graphics class categories G6 and G7 do not match the definitions of the ECMA 383, 3rd edition "Categories to be used with Ecma-383". G6 should be defined as "FB_BW > 128 and FB width < 192", and G7 defined as "FB_BW > 128 and FB width ≥ 192".

Moreover, to properly account for additional dGPUs in a system in a straight forward and consistent manner, ITI recommends EPA to allow additional dGPUs to receive 80% the allowance of the primary GPU, similar to what DigitalEurope has recommended with regard to ErP Lot 3.

3. Changes Are Required for the Notebook D1 and D2 Base TEC

Under the category definitions, the only difference between D1 and I1/I2 is the GPU, similarly between D2 and I3. As such, adding discrete GPUs to the systems automatically reduces base TEC by 6-10 kWh. ITI believes this is due to the difficulties in properly identifying systems with switchable graphics, and as a result the data set used to derive the base TEC allowances for D1

and D2 categories mistakenly included systems with switchable graphics enabled during testing, therefore skewing the base TEC calculations.

This notebook data issue is further evidenced when compared to the desktop integrated and discrete categories which shows more similar base TECs.

 ITI therefore proposes D1 and D2 be increased by 30% to account for this data set bias, or simply make them similar to I2 and I3 allowances.

4. Changes Are Required for the Notebook Discrete GPU Adders

ITI is very concerned about the notebook base TEC allowances of the discrete categories D1 and D2, as well as the notebook discrete GPU adders.

The discrete GPU adders set forth in Table 10 of Draft 3.0 for notebooks are significantly lower versus the previously agreed upon adders in Draft 2.5. For Draft 2.5, the industry recommendation was that the notebook discrete GPU adders in Watts should be 50% that of the desktop counterparts. However in Draft 3.0, that notebook to desktop ratio is much lower than 50%. For example, G1 and G2 notebook adder were calculated to be 38% and 44% of desktop, respectively.

Coupled with the lower D1 and D2 base allowances, the overall allowance for the notebook systems with discrete adders are drastically impacted unfairly.   For example, a D2 system with G1 discrete GPU only gets additional 1 kWh TEC relative to an otherwise similar I3 system without discrete GPU.

Table 1 – Calculations Based on Notebook Base TEC Allowances and Current Discrete GPU Adders

Notebook	G1	G2	G3	G4	G5	G6	G7
Discrete GPU adder (TEC)	11	18	24	32	42	48	60
D1 + Discrete GPU adder - I1 (TEC)	5	12	18	26	36	42	54
D1 + Discrete GPU adder - I2 (TEC)	3	10	16	24	34	40	52
D2 + Discrete GPU adder - I3 (TEC)	1	8	14	22	32	38	50

Even when the iGfx categories are reduced from 3 to 2 categories as proposed by ITI earlier in the document, the problem with dGfx base TEC remains.

Proposed Allowances

Base TEC Allowances	Current TECBASE(kWh)	Proposed TECBASE(kWh)
NB D1	16.0	24.0
NB D2	18.0	28.0

		Notebook	
		Current	**Proposed**
TECGRAPHICS (kWh)*vii* **Graphics Category***viii*	**G1** *(FB_BW ≤ 16)*	11	**14**
	G2 *(16< FB_BW ≤ 32)*	18	**20**
	G3 *(32 < FB_BW ≤ 64)*	24	**26**
	G4 *(64 < FB_BW ≤ 96)*	32	32
	G5 *(96 < FB_BW ≤ 128)*	42	42
	G6 *(128 < FB_BW and FB width < 192)*	48	48
	G7 *(128 < FB_BW and FB width ≥192)*	60	60
	Additional dGPU	0% of Primary	80% of Primary

Similarly for **desktop and integrated desktop**, ITI would like to request additional dGPU to get 80% of the allowance of the primary dGPU.

The dGPU recommendations that are provided represent "typical" idle power; dGPUs exhibit a distribution of idle power which varies with the semiconductor lithography process. The typical or median value represents the middle point of the distribution, while there will be dGPUs from a given product SKU that can produce idle power measurements that are lower or higher than the typical due to process variations. The ENERGY STAR specification needs to allow for the high end of this distribution.   It should also be noted that graphics processor suppliers are now faced with the slowing down of semiconductor manufacturing technology improvements which are the enablers of future power reductions.

5. **Workstations (section 3.6)**

ITI's understanding of the EPA's goal is as follows:
Test the feasibility of using efficiency metric as criteria for future ENERGY STAR qualification by reporting benchmark performance data to EPA in conjunction with power.

To accomplish this goal ITI's position is that:
- i.   Existing tools, Linpack and SPECViewPerf are sufficient
    - a.   Both benchmarks used and understood by ENERGY STAR partners
    - b.   Data obtained is sufficient to determine feasibility of benchmark approach
- ii.   Additional benchmarks, like CINEBENCH and SPECCPU_2006, are workloads for specific applications and market segments that are not needed to test the feasibility of the benchmark concept

Recommendations:
- iii.   EPA and DOE actively continue to promote the 3 – 5 year development of appropriate workstation benchmarks specifically (e.g. SPEC GWPG)
- iv.   Collect both performance and power information on workstations using Linpack (Watts to complete x Mflops/time) and SPECViewPerf (Watts to complete x frames/time)

v. EPA to document the standard method of collecting data (e.g. benchmark settings and required data fields)
vi. Data to be provided from manufacturer measurements. Data collection should **not** be required to go through the product qualification/certification process due to complexity, configuration settings, and access to all workstation hardware configurations.
vii. Data should be collected, made anonymous, maintained and distributed to manufacturers by EPA but not published in the public domain.
viii. EPA and ITI to collaborate and agree on configurations requiring benchmark data from the range of workstation configurations available on the market.

Consider providing a workstation allowance added to the PTECmax for power supply efficiency similar to the desktops and notebook power supply efficiency allowances.

6. <u>Incentives for systems with full networking capability:</u>

Integrated desktop and Notebook PCs with full networking capability are incentivized with proxy weighting (Tables 6 & 7 – page 14), with lower long and short idle mode weightings and higher sleep and off weightings. However, this becomes a disincentive when a lower short idle weighting is used for calculating the display adder, for Integrated desktop and Notebooks PCs (Table 10). This leads to lower display adder and minimizes the intended incentive for these systems. Industry proposes to use conventional mode weighting for short idle (Tables 6 & 7), in the display adder equations (Table 10) for all integrated desktop and Notebook PCs. This provision will only apply to display adder equations. For measured TEC calculations, systems with full network capability will continue use the applicable proxy mode weighting for Off, Sleep, Long Idle and Short Idle modes per Tables 6 & 7.

7. <u>Applicability of Sleep Mode and Long Idle</u>
We continue to seek clarification regarding page 12, line 394 of Draft 3, v6.0 which refers to desktops lacking a discrete sleep mode, but having a long idle at <10W. Does this provision apply to integrated desktops also or only to desktop computers? ITI prefers the provision apply to both desktop and integrated desktop computers

8. <u>Thin Clients (section 3.8)</u>
We note and support the correction of the base TEC from 55 kWh to 60 kWh with a G1 adder.

9. <u>Slate Computing Devices (section 3.9)</u>
We note and agree with the decision to defer incorporation of slates to v6.1 of the computer specification. The EPA and ITI will work in concert to incorporate the appropriate battery charger specification into the next update.

10. <u>Power Supplies</u>
Lines 306 and 307 should be removed. There is no "Level 5" ranking for internal power supplies; IPS supplies have to be Bronze.

306	•	Multi-output EPS shall meet the level V requirements when tested using the *EPRI*
307		*Generalized Internal Power Supply Efficiency Test Protocol, Rev. 6.4.2.*

Industry is unaware of protocol to identify efficiency on multi-output EPS. In addition, lines 306 and 307 incorrectly require external power supplies to be tested using a procedure intended for internal power supplies.

Line 442, footnotes iv and v, should be corrected as well.
Footnote iv should have the words "EPSs and" removed from the following sentence:

iv   Single-output EPSs shall meet the specified requirements when tested using the *Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies*, Aug. 11, 2004. Multi-output EPSs and IPSs shall meet the specified requirements when tested using the *EPRI 306 Generalized Internal Power Supply Efficiency Test Protocol, Rev. 6.6.*

Footnote v, should have the last sentence remove for the same reasons that apply to lines 306 and 307:

v   Average efficiency is the arithmetic mean of efficiencies tested at 25%, 50%, 75%, and 100% of rated output current. Single-output EPSs shall meet the specified requirements when tested using the *Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies*, Aug. 11, 2004. Multi-output EPSs shall meet the specified requirements when tested using the *EPRI 306 Generalized Internal Power Supply Efficiency Test Protocol, Rev. 6.6.*

## 11. <u>Draft 3 Test Method (Rev. Nov-2012):</u>
ITI recommends that all test methods reference to ECMA 383 be replaced with IEC 62623. IEC 62623 is now the international standard focusing on energy consumption of desktop and notebook computers. It has been finalized and published and has all the latest updates, except for categorization. To update categories a separate registry process has been set up.

EPA may consider updating the ECMA 383 references elsewhere in the draft and replace it with IEC 62623 where applicable.

12. <u>Specification development process:</u>
ITI proposes to work with EPA on the above changes before the final draft specification. If that is not possible ITI proposes EPA to generate draft 4 of specification before moving to final draft specification. ITI further requests that the EPA provide access to the data set used for establishment of the TEC values.

Sincerely,
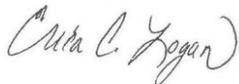
Erica Logan
Director, Environment and Sustainability
Information Technology Industry Council
1101 K Street NW, Suite 610
Washington, DC 20005
(202) 626-5729

<u>About ITI:</u> The Information Technology Industry Council (ITI) represents numerous high-tech and electronics manufacturers in the information and communications technology (ICT) sector. Our members are global leaders in all facets of ICT innovation, from hardware, to services and software, and have long been leaders in sustainability. Many exceed environmental design and energy efficiency requirements, and lead the way in product stewardship efforts. As a result, the Dow Jones Sustainability Index, the Financial Times Sustainability Index, and the Global 100 have consistently recognized several ITI member companies for their significant environmental and sustainability achievements.