



## ENERGY STAR<sup>®</sup> Notes on Draft Final Dataset

The levels in Draft Final were again developed based on manufacturer-supplied component and power data. For Desktops and Notebooks, the dataset was refined as suggested by stakeholders in comments. The Draft Final includes new categories for both Desktops and Notebooks.

Further details on steps taken to refine and analyze the data are below, along with details supporting the calculation of functional adjustments included for Desktops and Notebooks in the Draft Final. EPA looks forward to stakeholder comments on the Draft Final specification. As is standard procedure, manufacturer names have been masked and model numbers have been removed to protect the anonymity of data submitted by industry members.

### ***Desktops and Notebooks:***

Please find attached the dataset for desktops (see worksheets "Summary," "DT – Analysis," and "NB – Analysis").

### **Updates to Dataset**

Stakeholders commented on a few areas for data quality review prior to creation of Draft Final structure and levels.

Desktops: No revisions or clarifications were made to the Desktop dataset.

Notebooks: Stakeholders shared revised Frame Buffer Width data for seven notebooks. With the exception of one suggestion that was inconsistent with EPA's review of product data, the suggestions were included in Column AU before levels and categories were set. Additional notebook data was provided by stakeholders to assist evaluation of the new Category C; some of the data was found to be duplicated by previous data in the set and was removed prior to evaluation.

Stakeholders again provided comments on the impact of testing at 230V for notebooks, where it was found that an average 6-7% increase of TEC for notebooks tested at 230V (based on review of notebooks submitted in duplicate at 115 and 230V). Stakeholders proposed either setting levels and testing only at 115V regardless of market, or increasing all 115V tested notebooks in the dataset by 6-7% to adjust for the average TEC difference.

Although EPA appreciates stakeholders' concerns and proposed solutions, the Agency is committed to setting levels based on products that are on the market in the US. This principle applies to the more than 50 product categories addressed by ENERGY STAR at this time. At the same time, EPA concurs that a reassessment of proposed Notebook TEC levels did suggest that a slight increase in the proposed levels for notebooks was appropriate.

EPA remains committed to a single level of compliance. Products submitted for qualification under 5.0 must calculate TEC using the weightings provided in the specification, make measurements as appropriate for the voltage/frequency market for which the product is intended, and meet the TEC levels in the specification using the voltage data appropriate.

## Functional Adjustments (“Adders”)

### Desktops

- *Memory*: The adjustment for memory remains 1 kWh per GB over base. For Categories A, B, and C, the adjustment is identical to the proposal in Draft 3, with the adjustment effective for amounts over 2GB. For Category D, the adjustment for memory comes into effect for memory amounts greater than 4GB instead of 2 to account for the categorization option of 4GB.
- *Premium Graphics (for Discrete GPUs with specified Frame Buffer Widths)*: As included in the data notes document for Draft 3, the adjustment for “premium graphics” was determined based on analysis of at-wall power consumption of various graphics platforms, along with analysis of the frame buffer width information on products in each Desktop Category. Under the new category system, only Category D contained systems with 256-bit and above graphics. In the comment period, stakeholders requested an increased allowance to produce a mix of Desktops in the dataset that included 256-bit graphics. Given that the ENERGY STAR specification is a complete-system set of requirements, it is not feasible for the program to include the top 25% component-by-component. However, given that Category D has premium graphics as an optional characteristic rather than assumed base optional nature and that there was no available data for the impact among Category B and C desktops, the adjustment for premium graphics was revised to 60kWh adjustment corresponding to an instantaneous idle level of 17W and results in 2/10 passing Category D systems containing FBW greater than 128-bit.
- *Additional Storage*: The adjustment remains unchanged from Draft 3.
- *TV Tuners*: An adjustment for TV Tuners was not accepted into the Draft Final Specification. EPA is aware that stakeholders are working to improve the efficiency of TV Tuner technology, and that integration into Discrete GPUs (which do receive a kWh allowance) are coming onto the market. Both of these efforts are of great interest to EPA for energy savings potential and will be supported by the program structure in place.

### Notebooks

- *Memory*: The adjustment remains unchanged from Draft 3.
- *Premium Graphics (for Discrete GPUs with specified Frame Buffer Widths)*: The adjustment remains unchanged from Draft 3.
- *Additional Storage*: Stakeholders provided further information on mobile hard drives commonly used in RAID configurations in Notebooks. Idle power of such devices was higher than mainstream mobile hard drives, resulting in a 2kWh increase in TEC impact, based on the data. EPA has raised the adjustment for additional internal storage drives to 3kWh. This adjustment is intended to support further improvements in mobile hard drive efficiency, increasing presence of solid-state drives, and drive power management for secondary devices.
- *Ethernet*: Stakeholders commented that Category A notebooks with 100Base-T Ethernet were disproportionately represented in the systems that passed Category A requirements in Draft 3; this meant that upgraded wired networking speed resulted in difficult qualification under proposed requirements. In response, stakeholders proposed a penalty for systems with 100Base-T Ethernet. Rather than create an additional adjustment, the qualification TEC level for Category A has been raised, allowing 6 additional 1000Base-T systems to meet requirements in the dataset. This approach affords manufacturers the flexibility to adjust Ethernet capability to balance power performance for less Ethernet capability (e.g. for a computer intended primarily for wireless use) while providing some allowance for systems intended for use on wired networks. Additionally, EPA believes that upon availability of Energy Efficient Ethernet, higher speeds at lower energy levels will be possible for products being tested.

**Stakeholders are asked to relay all feedback on the Draft Final Version 5.0 Computer Specification to Katharine Kaplan, EPA, at [kaplan.katharine@epa.gov](mailto:kaplan.katharine@epa.gov) and Evan Haines, ICF International, at [ehaines@icfi.com](mailto:ehaines@icfi.com), by October 30, 2008.**