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Subject: Computer 6.0 - The Impact on Notebooks of Raising ENERGY STAR® EPS Efficiency Requirements above Level V Requirements

During the March 10, 2011 stakeholder meeting regarding the proposed ENERGY STAR® Computer 6.0 specification, a stakeholder raised the idea of requiring higher efficiency specifications for external power supplies (EPS). After a brief discussion, industry representatives accepted an action to evaluate the potential impacts that such an action may produce. We offer this memo as partial fulfillment of the commitment, and ask that EPA post this document on the ENERGY STAR web site on the appropriate page under Partner Resources. We welcome any questions or comments from the Environmental Protection Agency (EPA) and other stakeholders.

We wish to preface these comments with an observation that such an effective analysis EPS efficiency issues would not be possible unless industry has full access to all EPS-related data in the possession of), other government agencies, and consultants and grantees working with or for such agencies. Accordingly, we request that EPA make available to industry any such studies, reports or other forms of data and analysis that may be used by the agency to determine whether to increase EPS efficiency beyond the current Level V specifications.

As industry attempted to identify the potential impacts associated with a possible increase in EPS efficiency requirements above Level V, we found that it will be difficult to identify and quantify specific impacts without first identifying the prospective specifications EPSs would need to meet. Industry recommends that EPA and industry work together to further explore this issue, including identifying and defining potential active and no-load specifications, and to discuss and identify other factors that must be taken into account, such as appropriate product development

lead times, in order for EPS manufacturers to implement any potential changes in an efficient and cost-effective manner.

Following identification of prospective active and no-load energy efficiency levels for a new Level VI specification, industry will be better able to identify and, where appropriate, quantify the impacts associated with raising EPS efficiency requirements. Generally, the following factors must be taken into account:

1. Manufacturing Costs

Cost impacts associated with requiring greater than current active mode and lower no-load efficiency resulting from redesign (non-recurring) and increased component cost (per unit recurring cost) will be significant, varying based on the efficiency levels required.

2. End User Costs

Experience with previous ENERGY STAR computer power supply specifications indicates that it is unlikely that end users will recoup the cost of more efficient EPS during the life of the product. The experience of a major desktop computer manufacturer is illustrative.

The manufacturer offered both 80 percent and 90 percent efficient internal power supplies. The annual energy cost savings of the 90 percent unit v. the 80 percent unit was approximately two (2) percent. One of the primary reasons for the minimal variation was due to the fact that manufacturers can easily make 80 percent efficiency-rated internal power supplies operate typically in the 85-88 percent range. On the other hand, to achieve 90 percent efficiency rating the internal power supply would need to achieve 90-93 percent efficiency. The cost differential to achieve this higher level is significant.

While comparisons between external and internal power supply units are not perfect, the manufacturer cost impacts and minimal net end user savings are comparable. Nevertheless, for the sake of argument, we will assume that the two (2) percent gain in energy cost savings is comparable, and will provide further details to support this point in a subsequent comment. Current portable systems – notebooks, laptops and tablets – have annual energy costs of about \$5.63. Using the desktop example above, the roughly two (2) percent in energy cost savings would amount to around \$0.12 per year, making it very difficult for end users to justify the extra expense and lack of return on investment.

3. Customer Use Considerations:

Impact on portability (increased size/weight) is likely, due to the competing safety considerations involved in maintaining compliance with maximum surface temperature regulations for the body of the EPS. Increasing EPS efficiency could increase the operating temperature, if the increase is

not mitigated for safety reasons by increasing the size and weight of the EPS. Increasing the size and weight to stay within thermal constraints will also increase the cost of the EPS.

There is also potential impact on cables. Shorter, thicker DC cables may become necessary, reducing the range of use and limiting consumer options. Thicker cables may also impact flexibility.

4. Design and Manufacturing Impacts

Given typical variation in manufacturing processes, and to insure tolerances are maintained within efficiency specifications, computer manufacturers typically request that PSUs be designed with approximately an additional one (1) percent margin. For example, if an efficiency regulation was set at 90 percent average active mode efficiency, EPS manufacturers would be required to design the unit for 91 percent efficiency. Even though this seems like a minor incremental adjustment, it is a significantly harder and more costly target to achieve than 90 percent efficiency.

5. Unintended Consequences

Except when fast charging batteries, typically, EPS units are loaded below the 25 percent range. Driving higher efficiencies at 50, 75, and 100 percent-rated loads may have the side effect of reducing the efficiency below 25 percent due to the component changes necessary to go up to or beyond 90 percent efficiency. This could very well increase the overall energy consumption for a typical notebook system.

6. Logistical / Scheduling Impacts

Requiring manufacturers to increase efficiency beyond the current Level V specifications would require sufficient lead time for redesign and qualification testing, as well as time for manufacturers to “ramp-up” in order to assure a sufficient supply of qualified EPSs in the marketplace, including for sales to Federal agencies. Industry recommends that manufacturers be given up to 18 months lead time between the date potential new EPS requirements are finalized and the date that they become effective.