

Climate Savers Computing Initiative Feedback on Energy Star[®] Storage Framework Draft Specification

Climate Savers Computing Initiative (CSCI) would like to thank the EPA and Energy Star[®] for the opportunity to comment on the proposed Energy Star[®] Enterprise Storage Draft Specification Framework document. This feedback outlines the CSCI recommendations on the storage framework. The recommendations are from the following companies in the CSCI AC/DC workgroup; Acer, Dell, ECOS, Fujitsu, Google, Hipro/Chicony Power, HP, Intel, LiteOn, Microsoft, Power One, Sun, and Supermicro.

CSCI's comments address three of the four sections in the framework document: Building Blocks, Energy Efficient Criteria and Test Procedures, and Information and Management Requirements.

Building Block #1: Definitions Section

CSCI agrees with and supports Energy Star's definitions for single and multi O/P power supplies under the "power supplies" subsection. However, below CSCI will propose a third power supply definition to be defined and included in this and future specifications.

Regarding the question "Do any Storage Products use power supplies directly integrated into the main system (i.e. not separable from the main system), or are power supplies always stand-alone (external) hardware?" CSCI believes that power supplies should be treated as stand alone hardware as they are modular and can easily be removed from the storage products and tested separate from it, similar to server power supplies.

Building Block #3: Energy Efficiency Criteria and Test Procedures Section

In Section #3, the framework document states that "In other words, EPA does not intend to develop unique energy efficiency criteria for different storage products based only on differences in the underlying technology." CSCI strongly advocates aligning the current server specification to the new proposed storage specification as much as possible to prevent industry roadmap disruption.

Under Fan Power, Energy Star indicates that "multi-output power supplies must be tested with internal fan power in the measurement and efficiency calculation. Single-output power supplies must exclude fan power from the measurement and the efficiency calculation." CSCI proposes the above fan testing methodology for single and multi O/P power supplies, but recommends the inclusion of a third power supply category in the power supply definitions and calculations sections. These three power supply categories would apply to storage systems in the Tier 1 storage specification as well as extend to the Tier 2 server and storage and the desktop specifications. Creating this new category would align the power supply requirements across both the storage and server specifications. The proposed categories are:

- **Single O/P PSU category** as outlined in the Energy Star Program Requirements for Computer Servers. These single O/P power supplies would have the same efficiency and power factor (PF) requirements as outlined in

the current Energy Star server specification and these calculations would exclude the fan.

- **Multi O/P PSU category** as outlined in the Energy Star Program Requirements for Computer Servers. These power supplies are used predominantly for low end servers and desktop computers. These multi O/P power supplies would have the same efficiency and PF requirements as outlined in the current Energy Star server specification, and these calculations would include the fan.
- **Multi O/P PSU category for storage.** Unlike multi O/P power supplies used in low-end or pedestal servers, the storage power supply fan is used to cool the entire storage chassis, not just the power supply. In addition, storage fans can be controlled by the storage system. Given that the storage fan within the power supply is integral to a properly functioning storage system and not just the power supply, efficiency and PF calculations for this power supply category should exclude the fan and be measured at 230V.

CSCI proposes including this new category for multi O/P power supplies in which fans are excluded from calculations. This category would be in addition to the current categories for single and multi O/P power supplies. CSCI is still debating our recommendation for efficiency and PF requirements and is unable to make a recommendation for them at this time.

CSCI agrees with Energy Star that for power supplies operating at 230V and 115V input, the power supply must meet the designated Energy Star criteria at both input voltages in order to be labeled Energy Star qualified.

Energy Star has noted in the framework document that they are "considering the adoption of a 'Net Power Loss' approach for power supply efficiency." CSCI strongly opposes using a net power loss approach for measuring and reporting power supply efficiency. Power supplies used in storage and server systems often use the same designs across different platforms for purposes of economies of scale. The industry is currently developing power supplies to meet the recently released server specification. Given that power supply development cycles are typically nine to twelve months, the industry will not have the development time to implement an alternative storage specification into their design cycles by the expected storage specification implementation date of January 2010.

CSCI recommends maintaining strong alignment for power supply requirements between the Tier 1 server and storage specifications. CSCI therefore urges Energy Star to keep power factor and efficiency requirements for power supplies in the storage specification as opposed to developing a net power loss approach. Keeping the same approach for the power supplies in the storage specification will better align the two specifications. In the meantime, CSCI will be developing an alternative proposal to the net power loss proposal which we will forward to Energy Star once we have completed it in Q3'2009. This alternative proposal will cover losses vs. efficiency, loading supply, and system losses.

In section #3, Energy Star asks "what are the typical loading ranges for Enterprise Storage power supplies?" The dynamic range of storage products is much narrower than for server products, with most storage products operating in the dynamic range of 10% to 50% due to redundancies. The storage specification should reflect these loading ranges.

Building Block #4: Information and Management Requirements

With respect to measurement accuracy, Energy Star indicates they wish to increase measurement accuracy to " $\pm 5\%$ or ± 5 watts which ever is greater". These accuracy requirements are more rigorous than the current server specification's accuracy requirements. These requirements are $\pm 10\%$ for measurements greater than 100W and ± 10 Watt for measurements ≤ 100 W. CSCI recommends maintaining alignment between the two enterprise specifications. During the final development for the server specification, the industry was told to expect tighter accuracy requirements in the Tier 2 server specification. CSCI would like the storage specification to be granted the same time line for accuracy improvement as was granted for server accuracy. By delaying the accuracy requirement until the Tier 2 specification, Energy Star will keep the server and storage specifications aligned and also allow the industry the necessary time for power supply accuracy development. CSCI would like the 5% accuracy requirement to be delayed until at least October 2010 which is the expected release of the Tier 2 server specification

Energy Star asks whether "a specification for net power loss or efficiency over the load range be appropriate for Enterprise Storage?" CSCI strongly advocates aligning the storage specification to the server specification which used power supply efficiency over the load range. CSCI discourages a net power loss specification for storage.