



May 8, 2009

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ICF International

CC: Andrew Fanara
United States Environmental Protection Agency

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Re: Hewlett-Packard Response to Final Draft of *ENERGY STAR® Program Requirements for Computer Servers*

From: Hewlett-Packard Company, Enterprise Storage and Servers Business Unit

This document may be published on the Energy Star website.

Hewlett-Packard (HP) welcomes this opportunity to give one last set of comments on *ENERGY STAR® Program Requirements for Computer Servers* (hereafter in this feedback document called “Energy Star for Computer Servers”), before it is released as version 1.0. HP is proud to continue its long-standing association with the *ENERGY STAR®* program. The comments and issues in the Final Draft document fall into two major categories and are covered in the two sections of this review:

1. Energy Star Partner Commitments
2. Energy Star Product Eligibility Requirements

Several key issues are detailed on the pages below, but here is a brief summary of five critically important points of feedback:

1. Must remove the written requirement for having at least one hard drive installed “as-shipped” and allow servers that “but-for the absence of a hard drive” would pass Energy Star to be included in certified Energy Star models.
2. 1P/2S servers need a 10W idle power allowance over a 1P/1S server, since most 2S models are sold with 1 processor and extra processors are user-installed option kits.
3. Request a June 1, 2009 release date for version 1.0, for simplicity’s sake and to assure enough time to certify Energy Star servers for the launch of the specification.
4. HP encourages the inclusion of blade servers in version 1.0.
5. If Tier 2 is going to drive significantly different power supply requirements, then those requirements need to be communicated 18 months ahead of the effective date of Tier 2, such that systems manufacturers can develop power supplies that meet the needs of their Tier 2 products. We don’t use standard off-the-shelf power supplies.



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1. Energy Star Partner Commitments

- 1.1. **Lines 79-88:** While we agree with the spirit of the rule requiring VARs to not make substantial changes to the basic Energy Star server platform, HP disagrees with the Final Draft details. If a VAR modifies an HP product, the liability for certifying Energy Star compliance as-sold to the end user must be on the re-seller.
- 1.2. **Lines 62-74:** Some flexibility is required for how manufacturers implement the web pages for storing Power and Performance Data Sheets and how Energy Star products are referenced. Use of the Energy Star logo will be limited to web pages specifically focused on Energy Star products.

2. Energy Star Product Eligibility Requirements

The following is a compiled list of HP comments, referenced to the sections numbers or line numbers listed in the document. Comments are broken into two general lists. The *Substantive Feedback* section lists substantial changes to the approach documented in the Final Draft, while the *Editorial Feedback* section details issues that are important to clarify the intent of the document or to eliminate errors.

2.1. Substantive Feedback

2.1.1. Definition Issues

2.1.1.1.

191 • Includes at least one installed hard drive able to store and boot a local operating system or
192 hypervisor; and

Lines 191-192: Delete this text in its entirety or modify to say that a hard drive must be present “as tested” but not “as shipped.”

While the requirement to have at least one hard drive in certified models might seem obvious, all model numbers for servers start with zero hard drives, so this requirement disqualifies every server SKU. Servers will most likely be configured with hard drives before being deployed by configure-to-order processes, by re-sellers or by end users, so the requirement is met by end-user necessity. Testing will only be done on servers with hard drives, so certification will be contingent upon selection of appropriate hard drive choices. A server Product Family that qualifies for Energy Star with a defined set of hard drive choices, should still be allowed to qualify for Energy Star when it doesn't have a hard drive shipped in it.

- 2.1.1.2. After Section 1.C., to prepare the way for a version 1.1 inclusion of blades, there needs to be additional definitions of other types of blades that could be shipped in a blade enclosure. In some cases, these new definitions define additional categories for exclusions, and in other cases the definitions help to



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define categories that either need power adders or idle power exclusions for required functionality.

- “Blade Storage” devices need to be defined. A certified Energy Star blade system should still be able to ship as energy Star if a storage blade is installed.
- “Blade Network Switch (or Router)” needs to be defined. One or more blade switches or routers are required on most blade systems. Their power consumption impact on the data center is less than it would be if it was excluded from the blade system and put into an equivalent rack-mount switch (or router). So Energy Star should encourage the use of blade network switches and routers. If shipped with one or more blade network switches or routers, a blade system certified as Energy Star without this switch or router should not lose its Energy Star certification, regardless of the power consumed by the switch or router. Examples of switches and routers could be for Ethernet, Fibre Channel, InfiniBand, I/O virtualization, or several other types of network switching or routing functions.
- “Management Blade” should be defined. One “Management Blade” is most often required for the operation of a blade system, but a second Management Blade is required for redundancy in reliable data centers. Additional Management Blades either need an idle power adder or their additional idle power needs to be ignored.

2.1.1.3. The term *Processor* is used in many different contexts and it is not defined. There are many different types of processors in almost every device in the server, including power supplies. Without getting overly detailed (and risking an inaccurate generalized description) there should be a defined term for the processors used to run the application workload of the server, in contrast to the processors that handle I/O, management or system controls.

2.1.2. Tier 1 Requirement Issues

2.1.2.1. Lines 471 and 475: Two-socket (2S) servers are manufactured and sold as model numbers that begin with one processor (1P). Options for upgrades to 2P are installed by the user, so even though they are usually deployed as 2P, the server model is shipped as a 1P/2S. Our energy-efficient 2P servers pass, but giving no idle power allocation to 1P/2S (over 1P/1S servers) servers removes many highly energy-efficient models from qualifying for the Energy Star logo. **HP requests that 1P/2S servers be given a 10 Watt power allowance above 1P/1S servers to raise the Idle Power Limit for 1P/2S servers to 75 watts.**

2.1.2.2. Line 475: HP supports Idle Power Allowances for numbers of processor cores >4.



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- 2.1.2.3. Input power measurement accuracy is not possible for lightly loaded single power supply configurations and any server with two power supplies. We maintain the requirements proposed in our draft 4 feedback. Maintaining the present specification will prevent installed redundant power supply servers from participating in the Energy Star program. There will not be enough competitive options for Energy Star purchases. The goal of the Energy Star program directly conflicts with this current path regarding input power requirements.
- EPA has expressed that the requirement must be independent of the number of power supplies installed. Modifying our proposal to accommodate would be the following:
 - +/- 30W for systems under 200W input power
 - +/- 10% for systems at or above 200W input power
 - EPA has also expressed that the requirement be piece-wise continuous. Modifying our proposal for this as well follows:
 - +/- 30W for systems under 300W input power
 - +/- 10% for systems at or over 300W input power

2.1.2.4. Another change to prepare the way for blade servers:

299 Q. Single-Output Power Supply: A power supply which delivers most of its rated power
300 through one
301 primary DC output for the purpose of powering the Computer Server. Single-Output power
302 supplies may include one or more standby outputs which remain active whenever connected
303 to an
304 input power source. There may be additional outputs besides the primary output and standby
20 output(s), however, the combined power from all additional outputs must be no greater than
304 20 watts.

20 watts is OK for a single server instance, but this limit should be scaled with the number of installed blade servers or the number of nodes in multi-node servers. This is better described as no greater than a percentage of the power supply rated capacity (e.g. 10%), even for typical rack server types.

- 2.1.2.5. Lines 699-708: While the final IEEE 802.3az specification might be released by October 1, 2010, there will be limited device availability and deployment of IEEE 802.3az in that timeframe. The EPA cannot predict the future of standards bodies it does not control. Also, without network switches installed that support Energy Efficient Ethernet, the feature in network adapters provides no benefit. HP requests to NOT make the IEEE 802.3az feature a requirement for Tier 2 servers, but perhaps consider it for an eventual future specification beyond Tier 2.



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2.1.2.6. If idle measurements for blades are planned, then HP proposes the following:

1. The basis for blade server compliance should be by direct comparison to power consumption of a similar non-blade server.
 2. Since blades can be plugged into a variety of enclosures, Energy Star for blade systems must be specific about the blade, the enclosure and the minimum number of blades that must be in a specified enclosure, with a specified number of fans, power supplies, etc. to achieve compliance and parity with non-blade similar servers. A change in quantities or types of fans or power supplies defines a different enclosure configuration and requires a different certification.
 3. Once certified, additional compute blades, storage blades, switch blades and management blades added to the enclosure must not affect the Energy Star compliance of the solution.
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2.1.2.7. For **Tier 2**, net power loss specifications for power supply efficiency only make sense at very low loads. Power supplies are tested for *efficiency* and not net power loss.

2.2. Editorial Feedback

2.2.1. Tier 2 power supply goals, features and requirements need to be defined in the version 1.0 (or version 1.1) release. The design cycles for 2010 power supplies need to begin now.

2.2.2. In addition to power supply efficiency and power factor “curves” versus load and power supply capacity, Tier 2 should define a similar set of curves for inlet power measurement accuracy. Input power measurement accuracy required at different power delivery levels is an important aspect of future power supply designs.

2.2.3. There is inconsistency using the terms “Servers” and “Systems” interchangeably throughout the specification.
