ENERGY STAR Computer Specification Version 5.0, Comment Summary

June 9, 2008

This document summarizes comments submitted by stakeholders in response to the Definitions Summary for the ENERGY STAR Version 5.0 Computer Specification **as well as the EPA response to each comment**. Comments that included confidential information have been excluded from this summary. The European Commission remains committed to, fully engaged in, and supportive of this process and the responses provided in this document.

Topic	Comment	EPA Response
User Information (Lines 30-51)	A stakeholder expressed the opinion that the minimum "5 second display" Electronic Labeling option could potentially impact boot times of some Thin Client devices and expressed support for flexibility if boot time was shorter than 5 seconds.	Stakeholders are reminded that electronic labeling is an alternative to physical labeling of the product under the current Version 4.0 specification. Partners are free to use a physical label instead of electronic labeling, an option that will still be available for Version 5.0. It is not EPA's intent to delay boot time with this requirement and EPA will investigate alternative electronic labeling options. Stakeholders are welcomed to provide other options that result in a balance of adequate communication of ENERGY STAR qualification status to the user and low impact on boot times.
Display Status in Testing (Lines 88-102)	Four stakeholders expressed support for test conditions that took display power consumption into account. One stakeholder pointed out the range of display sizes associated with Integrated Desktop PCs and requested feedback on the degree to which scaling for display size would be present, or how the Energy Star for monitor specification might be integrated. One other stakeholder proposed that during an EEPA test, the monitor be blank during long term idle calculations, and set to a predetermined brightness during the workload operation, consistent with the ENERGY STAR Monitor or Display program.	EPA has received feedback from multiple stakeholders requesting a way to include display power consumption in computers with integrated displays (notebook and integrated product classes). In response, EPA is developing methods to make use of the ENERGY STAR Monitor specification as a basis for this measurement. The current specification for monitors scales requirements by display resolution.
Power Supply Requirements (Lines 104-119 and 372-389)	A stakeholder requested a change to the definition for Internal Power Supply allow an AC line filter in between the wall and the power supply. Computers with line filters external to the power supply were cited as justification for this change.	While EPA does not initially have concerns with this modification, further information on the filter and its impacts on power supply efficiency are required to ensure that such power supply configurations are assessed fairly. Additional information is requested before such a modification is made to the definition.
	Regarding general treatment of power supplies in the program, a stakeholder stated that the more stringent requirements proposed in Draft 1 would require even higher targets on the part of the computer manufacturers to ensure that power supply process variations did not result in non compliance.	EPA remains committed to having distinct pass/fail levels for ENERGY STAR compliance, consistent with other areas of the program. Stakeholders are encouraged to comment on the levels proposed in Draft 1, set to align with the Climate Savers Computing Initiative by stakeholder request, in this context.
	A stakeholder pointed out an inconsistency between the definitions of internal power supplies and option (2) in the Integrated Desktop Computer definition. According to the definition of internal power supply, power cords from internal power supply to the computer components must be placed within the computer housing, while the definition for Integrated Desktop Computers, option 2, allows for an DC connection from the internal power supply to a display.	EPA proposes the following clarification to the definition for Internal Power Supplies to address this concern and welcomes comments as the definition is further refined: In addition, all power connections from the power supply to the computer components, *with the exception of a DC connection to a monitor in an Integrated Desktop Computer*, must be internal to the computer casing (i.e., no external cables running from the power supply to the computer or individual components).

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Small-Scale Servers with Desktop Components (Lines 129-191)	Two stakeholders commented that the limitation to data storage applications in the Small-Scale Server definition should be removed. Countering product uses for this system class were provided that included smart home management and smart terminal management. One of the stakeholders felt that this definition element could result in network switches and attached storage obtaining the designation as a server.	The intent of this product category is to delineate servers intended for data response actions, with the intent that an application server fits the scope of the ENERGY STAR Server specification.
	A stakeholder commented that WOL and autonomous sleep are not necessarily requirements for a machine that is expected to be available 7x24.	In the networking portion of this document, EPA has proposed possible changes to the Wake On LAN requirements. For sleep, EPA agrees that a 30 minute requirement for an "always on" system is not relevant, however a low power mode would be ideal in these systems for longer term idle situations. Since such functionality may not fit all usage cases of a Small-Scale Server, EPA encourages stakeholder feedback on the following: **a)** if an additional power allowance approach for systems making use of pre-set sleep would provide a realistic alternative for systems seeing active use during only portions of their operation; and **b)** what a reasonable auto-activation time would be if 30 minutes is deemed unacceptable.
	A stakeholder requested that the section contained in lines 144-147 be removed to avoid limiting the functionality of the product.	EPA maintains that this portion of the definition is necessary to promote a clear line between the Small-Scale Servers covered in the Computer Specification and those covered in the Server Specification.
	A stakeholder requested that the single processor limitation be removed from the definition to allow more design flexibility.	EPA will remove this bullet from the definition.
Game Consoles (Lines 193-201)	A stakeholder requested that the Game Console definition be removed in absence of limits for the product category.	Performance levels for these products will be set and it is not EPA's intention to drop the product class from the Computer Specification.
	A stakeholder recommended to add a line in the definition of Game Consoles which clearly excludes portable game consoles from the target scope of V5.0 specification.	The Game Console definition will be revised to include this scope clarification. It aligns with EPA's reasoning on handhelds not fitting the Computer specification - both handhelds and portable "consoles" are primarily battery operated devices designed to function apart from electrical connection to the mains.
	A stakeholder provided the following revision to the thin client definition (in italics): Desktop Thin Client: A computer independently powered by an internal or external power supply that relies on a connection to remote computing resources to obtain primary functionality. Main computing (e.g., program execution, data storage, interaction with other Internet resources, etc.) takes place using the remote computing resources. Thin Clients covered by this specification are limited to devices with no rotational storage media integral to the computer. *The main unit is intended to be located in a permanent location (e.g. on a desk). Desktops Thin Clients are not designed for portability and utilize an external monitor, keyboard, and mouse.*	The comment is relevant due to the focus on desktop thin clients and not notebook thin clients. The definition in the Specification will be rephrased, with the omission of the last sentence in order not to exclude possible thin clients with integrated monitors.

Topic	Comment	EPA Response
Thin Clients (Lines 216-231)	A stakeholder requested further clarification regarding why mobile thin clients are to be excluded from the current specification.	In a conference call with Thin Client stakeholders on April 21, participants relayed to EPA and the EC that market penetration for mobile thin clients is currently low. Since one of the goals of ENERGY STAR is to encourage market transformation, it did not seem appropriate to develop specialized requirements for a product category that presented few opportunities for competition.
	A stakeholder requested clarification on the purpose of the "independently powered by..." addition to the definition.	In the first draft the it was phrased: "An independently-powered computer that relies....". The addition concerns only the reference to the power supply - power over Ethernet, a technology that stakeholders characterized as having potential but not yet available on a wide scale, would not meet the definition with this modification.
	A stakeholder suggested that the WOL requirement for thin clients be modified to be only conditional on whether or not the particular TC compute model requires "after hours" remote management and updates. In support, the stakeholder cited the limited nature of software suites stored on the thin client and centralized management capabilities.	EPA proposes modifications to the WOL requirement in the networking section of this document. Specific to thin clients, EPA understands that while WOL may not be valid for certain thin client architectures, it may better suit others designed for this functionality. As such, EPA requests stakeholder feedback if there are any counter-arguments for removing the WOL requirement.
	One stakeholder expressed concern over the applicability of sleep modes, specifically ACPI "S3," to thin clients. The stakeholder commented that the loss of network connection as a result of sleep could result in inconvenience for the user and possible data loss if "data is not saved and/or the remote session does not terminate gracefully." The stakeholder further added concern that ACPI or equivalent standards are not available for embedded operating systems present on some thin clients.	EPA is open to additional information on this topic and wishes to emphasize that power management for Thin Clients is an urgent issue that the EPA and the EC would like to find a solution on. Note that as it appears in the definition for sleep, S3 is included as a point of reference, not as integral to a sleep mode [the phrase "Sleep mode *most commonly* correlates to ACPI System Level S3 (suspend to RAM) or S4 (suspend to disk) states." is used]. While ACPI is an industry standard for power management and it may not be directly applicable to the specialized operating systems in thin clients, EPA understands that by nature that embedded OS control is tailored to the specific thin client implementation. In this specialized environment, it seems reasonable to expect that thin clients qualified for ENERGY STAR and therefore in the top tier of energy efficient thin clients contain power management functionality.
	One stakeholder requested that the evaluation of thin clients in the ENERGY STAR Specification recognize the impacts on datacenter resources inherent with a thin client implementation.	EPA maintains that Thin Clients in the Computer Specification will be evaluated as clients independent of back end resources. EPA believes that this approach will allow the Computer Specification to encourage energy savings at the client level, through operational mode improvements and development of sound low power mode implementation, with the intent of improving server efficiency through the ENERGY STAR Server specification.

Topic	Comment	EPA Response
Notebook and Tablet Computers (Lines 233-242)	A stakeholder requested that the definition for Notebook and Tablet computers be reworded to avoid the implication that a notebook be simultaneously operating on and off AC power.	EPA will modify the definition to make this clear. As a point of clarification, the updates present in the Definitions Summary for the Notebook and Tablet definition are intended to delineate notebooks capable of being evaluated under the ENERGY STAR Specification and those that fall under the "Handheld/PDA" group not eligible for qualification. EPA believes a key factor separating these two product classes is that Notebooks and Tablets are designed with both the portable (i.e. operating on pre-charged battery) and stationary (plugged into an AC power source) use cases in mind, while the Handheld/PDA product class is designed solely with portability in mind, connected to an AC source only to power the battery. This usage model with respect to the mains more closely represents the ENERGY STAR End Use Products category and does not fit the assumptions in place for the Computer program regarding energy savings.
	Item J (line 239) – Notebook and Tablet Computer - Re-word "similar functionality to desktops, including installation and operation of software in common with desktops" to "similar functionality to desktop, including operation of software similar in functionality as that used in desktops." The ability to operate software that has similar functionality with desktops implies that the software can be installed or is preinstalled.	The clause about installation will be removed. See further notes above.
Workstations (Lines 250-266)	A stakeholder requested that the Workstation definition bullet "Have a mean time between failures (MTBF)…" be removed, citing the difficulty in accurately providing MTBF ratings in built-to-order workstations and differences in emphasis placed on MTBF by different Partner manufacturers.	During the development of the Version 4.0 definition upon which this is based, there was some industry support for this characteristic being included in the definition. EPA is not opposed to removing this item, however EPA's ultimate intention is to maintain a well-delineated workstation product category that will fit the goals of SPEC's benchmark. EPA requests feedback from interested stakeholders on the continued applicability of the MTBF as a factor in the workstation definition.
	A stakeholder stated that WOL and autonomous sleep requirements might be detrimental to workloads commonly processed on workstations. The stakeholder cited networked/batched operations that are controlled centrally to manage the individual workstations to execute the larger project as a collective of machines.	The purpose of the inclusion of WOL and Wake Management requirements in the ENERGY STAR Specification is to support system users' ability to contact and wake up sleeping systems in order to run tasks such as those described. No change to requirements is proposed.
	A stakeholder suggested that the Sleep Mode definition text for S4 be updated to include the parenthetical *(suspend to disk)* to align with the format for S3.	EPA will include this revision in the definition for the next draft.
	Two stakeholders requested a clarification on the term "basic application" present in the Idle State definition and specifically what features could be turned off before testing for Idle. One of the stakeholders also requested that the text "and user profile has been created" be added to the end of the Idle definition to ensure that the tested idle state simulates a normal boot-up scenario.	As the Idle definition is largely the same as in Version 4.0, EPA maintains that "basic applications" include those automatically loaded at start-up and as shipped by default. EPA agrees with the suggested addition to the Idle State definition and supports the definition revision.

Topic	Comment	EPA Response
Operational Modes (Lines 269-311)	Two stakeholders provided comments on the Active State definition, one to suggest a graphical representation of the Active State to clearly communicate the definition, the other to suggest that ACPI S0 be added to the definition as a reference to align with the other operation mode definitions.	EPA will evaluate the graphic provided for inclusion as a note in a future draft of the Version 5.0 Specification. EPA requests stakeholder feedback on whether the S0 reference would be helpful as a reference for the Active State definition. Consistent with the other operational mode definitions provided in the Version 5.0 documents, EPA would word the addition to make S0 only a reference for clarification and not a limiting factor for technologies that cannot make use of ACPI standards.
	Two stakeholders commented on the latency requirements added to the definition of sleep mode. One requested a measurement method for a latency time. The other stakeholder asserted that given that a lower system level state, more time might be needed to fully "wake".	The definition will be revised to include explanation that latency refers to the time from initiation of wake event to system becoming fully usable including rendering of display. EPA does not support relaxing this requirement as it is written to approximate current expectations for computers in a "suspend to RAM" sleep mode. EPA believes that users equate a faster wake time with the concept of sleep, and that allowing a latency greater than five seconds could lead to dissatisfaction with the low power mode. This does not preclude devices from having such a long-latency state; it could be presented as an off state, could be a second sleep state (with the first one being a low-latency sleep state), or the device could meet the sleep level limit in an idle state. As stated in the Thin Client section of this document, EPA remains committed to encouraging low power modes in thin clients and understands that resumption of network connections might make this timeframe infeasible for thin clients. Stakeholders are welcomed to comment on appropriate alternatives for thin clients.
	Two stakeholders commented on the application of IEC 62301 in the test procedure, referenced in Draft 1. One stakeholder stated that the proposed Off Mode definition does not correspond with the proposed modification made to recent drafts of 62301. The second stakeholder provided an updated voltage supply detail table for use in the test procedure and requested clarification on the required voltage for test in North America, which is tested at 115V with a standard supply voltage of 120V).	Energy Star remains committed to the existing IEC 62301 standard (2005) as revisions being discussed are not in a final state. Furthermore, the proposed ENERGY STAR specification does not define a mode that corresponds to the standby level in that document, and the current version does not define Off. Thus, there is no conflict. At such time as a new version of 62301 goes into effect, Energy Star will evaluate changes in it and what if anything that suggests for future revisions of specifications. The updated voltage table seems to be relevant to the specification and will be reviewed for inclusion in the next draft of the specification. The 115V voltage for testing was vetted at a program level to simulate performance both in the North American market (120V) and Japan (100V).
	A stakeholder requested that the Network Interface definition be revised to change "IEEE 802.11 Wi-Fi" to" "IEEE 802.11 wireless Ethernet interface."	EPA will revise the definition to replace "IEEE 802.3 wired Ethernet interface or IEEE 802.11 Wi-Fi" with "IEEE 802.3 (Ethernet) or IEEE 802.11 (Wi-Fi)."
	A stakeholder requested that scheduled wake events be added to the definition for Wake Event.	EPA will revise the definition to add scheduled as a type of event in the definition.

Topic	Comment	EPA Response
Power Management and Networking Requirements (Lines 312-331 and 398-399)	Two stakeholders commented on networking testing options. One requested clarification on the scope of Wake On LAN and if it applied to wireless connections in the definition and power management table. The other suggested a possible scenario to bring wireless into consideration for computers with no Ethernet (wired) networking capability.	EPA agrees that WOL should not be required for wireless interfaces and the edits and note included with Table 5 in the Definitions Summary are intended to make this clear. EPA does not oppose using the term WOL in the wireless context as that technology may usefully be incorporated into some future devices, but understands that such technology is not yet widely available. To the second set of comments, EPA proposes that the following scenario be considered for inclusion in the Test Conditions section of future drafts of the Version 5.0 Specification. EPA welcomes stakeholder comments on this proposal and the power differences between various versions of the 802.11 standard: **a)** Systems with Ethernet (802.3) and Wi-Fi (802.11) should be tested with Ethernet active and the 802.11 disabled; and **b)** Systems with only 802.11 should be tested with 802.11 connected/associated to an 802.11 access point that supports the maximum speed of the client device (typically 802.11n today).
	Multiple stakeholders commented on the Full Network Connectivity requirement located in the power management table. Consensus revolved around the draft status of industry work on this topic. One stakeholder suggested a possible definition for Full Network Connectivity.	The Network Connectivity row of Table 5 will be removed. A proposed definition of Full Network Connectivity is provided below, and credit for that functionality will be reflected in the formula for calculating annual energy use. Stakeholders are welcomed to comment on this definition and any revisions that may be necessary. Full Network Connectivity: The ability of the computer to maintain network presence while in sleep and intelligently wake when further processing is required. Maintaining network presence may include obtaining and/or defending an assigned interface or network address, responding to requests from other nodes on the network, or sending periodic network presence messages to the network all while in the sleep state. In this fashion, presence of the computer, its network services and applications is maintained even though the computer is in sleep. (Note: More information on this can be found at: http://efficientnetworks.lbl.gov/enet-proxying.html).
	EPA received multiple stakeholder requirements on the WOL enabled-on-shipment for Enterprise and the WOL capability requirements. Responses were mixed between support of continued enablement requirements and requests to modify the requirements since, in some stakeholders opinions', the EPA allowance of +0.7W for a WOL capability could result in a net increase on annual power consumption if the function was left active but not used by the user.	EPA proposes the following for Version 5.0 (with item b representing a change to the requirement). Stakeholder comment on these provisions is welcomed: **a)** to maintain the requirement that ENERGY STAR computers with Ethernet capability are required to have the ability to enable and disable WOL for Sleep; and **b)** to **change the requirement** that WOL be enabled as shipped to allow it to be disabled on shipment if enabling is sufficiently accessible from the ordinary operating system user interface and over the network. For provision b), the method for evaluation of accessibility is still to be determined, but one initial option would be a case-by-case review similar to the Version 4.0 policy of electronic labeling review.

Topic	Comment	EPA Response
	One stakeholder requested a "Wake from USB" power adder be included that was analogous to the power allowance for Wake On LAN in Sleep/Off modes. Such an allowance was requested to account for a wake capability from keyboard or mouse input.	EPA believes that wake from keyboard/mouse has always been implicit as part of basic sleep functionality so that no adder is called for.
Energy Efficiency Performance Assessment (Lines 334-345)	A stakeholder requested that the EEPA Tool definition be modified to replace the term "capability enumerations" with "system characteristics."	"Capability enumeration" terminology has been used within the BAPCo and Ecma processes to reference system characteristics. EPA proposes the following modification to the definition both to remain consistent and to improve clarity: ...workload. The EEPA tool has the following outputs required for evaluation under this specification: workload energy use, workload duration, modal power levels, and *system characteristics (capability enumerations)*.
	A stakeholder requested that the definition for "Workload" be revised to add the following line to the end: "The workload is composed of specific tasks performed within a series of typical software applications."	EPA proposes that the definition for workload be changed to the following: Workload: a defined set of computational activities, *composed of specific tasks performed within a series of typical software applications*, to be performed over a period of time.
	A stakeholder commented that in the definition for EEPA Tool, the use of the word "computer" produced some confusion about the scope of the EEPA Tool, given that computer is defined broadly in definition A. A strict application of the definitions could be read to include Workstations, Game Consoles, Small-scale Servers, and Thin Clients as covered by the EEPA tool.	EPA agrees that the definition could be revised to clarify that the EEPA Tool would apply <u>only</u> to Desktops, Integrated Desktops, Notebooks/Tablets under Version 5.0. EPA proposes that the following sentence be added to the end of the EEPA Tool definition: *Note: for the purposes of the Version 5.0 Specification for Computers, the EEPA Tool is applied only to evaluate Desktop, Integrated Desktop, and Notebook/Tablet computer categories as defined in this document.*
Other Definitions (Lines 350-358, etc.)	Two stakeholders commented on the Enterprise Channels definition. The first requested the removal of the phrase "with the intent of identifying machines." The second commented that if the definition of Enterprise Channels is limited to managed server/client environments, it excludes the majority of small/medium businesses which may presumably value ENERGY STAR but do not contain hierarchically managed network environments. A refined definition was provided by the stakeholder.	EPA will remove the identification clause, which was a relic from the definition provided on page 11 of the Version 4.0 specification. Since the Enterprise Channel definition is only used in the specification to identify areas where the managed networking requirements (WOL, Wake Management) should apply, the definition is not excluding any user base from the overall specification and therefore no modification is required to this end. EPA maintains the definition of Enterprise with the sole modification provided in the paragraph above.
	One stakeholder commented that the multi-functionalization of products continues to increase and recommended that the language "marketed as XXX" be used in definitions to clarify boundaries among computer types and between ENERGY STAR eligible and non-eligible products.	EPA feels that this suggestion could apply to product categories where there is a close similarity to other product groups, but feels that this language has already been included where appropriate (Workstations, Small Scale Servers) and proposes no further changes to the product type definitions.

Topic	Comment	EPA Response
Testing and Reporting (Family System)	A stakeholder commented on the applicability of EPA's family qualification proposal to built to order (BTO) computers and asked that further discussion on the topic take place. Another stakeholder expressed support for EPA's proposal to require all units/configurations associated with a product model designation, for which a Partner is seeking ENERGY STAR qualification, to meet the ENERGY STAR requirements.	EPA has engaged stakeholders, both partner manufacturers and implementing organizations, on multiple occasions to discuss the family qualification system. The proposal in the Definitions Summary was provided in response to **a)** formally recognize steps some Partners are already taking to clearly identify ENERGY STAR qualification through model numbers, **b)** integrate steps manufacturers of BTO systems already have to make to separate qualifying configurations from those that do not meet the current ENERGY STAR Requirements, and **c)** remain consistent with the intent and language of the Version 4.0 specification. Stakeholders are welcome to provide additional comments on the proposal.