

Document	Line number	Commenter	Date Submitted	Topic	Comment	Response
Draft #1 Version 5.0	667	Mark Hollenbeck (HP)	8/22/2008	Effective Date	HP objects to the proposed effective date since the draft is almost 7 months late. The implementation dates needs to be delayed 7 months as well. We can not implement design changes needed to comply with the new Display specifications by October 2008. That is simply not enough lead-time to make the necessary design changes. If the lead time is not extended, we anticipate that very few if any displays will be available on the market that meet the ENERGY STAR specifications. Certainly significantly less that 25% of the products in the market now or on the market in October 2009.	EPA allows manufacturers nine months of lead time (from when the specification is finalized in January 2009 to the October 2009 effective date) to make modifications to product packaging and marketing materials for products which will no longer meet the Version 4.1 requirements. It is EPA's belief this is enough time for manufacturers to prepare for the implementation of the new requirements. EPA will set the specification so that when final, at least 25% of the models currently available on the market will meet the ENERGY STAR criteria.
Draft #1 Version 5.0	244	Mark Hollenbeck (HP)	8/22/2008	Screen Resolution	We protest the power level based on screen pixel format (resolution). This is cumbersome and the majority of the panels have the same format anyway.	Under the current monitor specification V4.1, resolution is the key criteria in determining power consumption levels. In the Draft 1 of the display specification, we determined that display power consumption is a function of both resolution and screen area. It does have design/engineering implications, since the company has to take into account both area and screen resolution when calculating what the max energy consumption of a model may be in order to qualify for ENERGY STAR, and this may render design more challenging. However, the alternative is to neglect resolution, which has a clearly greater effect than area on power consumption the smaller the display. Additionally, there is a wide array of resolution in use, which argues against the point that "the majority of the panels have the same format."
Draft #1 Version 5.0	432	Mark Hollenbeck (HP)	8/22/2008	Section 4.A -Test Conditions	HP does not want to submit power data in low and average room ambience settings. This is too difficult to control in the factory. We want only average lighting conditions.	EPA has incorporated the Automatic Brightness Control testing procedure from the TV specification.

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Draft #1 Version 5.0	244	Brian McLane (HP)	8/26/2008	Screen Resolution	Just because the current 4.1 spec has a criteria does not mean it should not be challenged for the new 5.0 criteria. Actually, we do not see a need for the screen resolution as criteria since the majority of panels for any particular size share the same resolution. So, we would prefer a simpler formula just based on panel size.	Under the current monitor specification V4.1, resolution is the key criteria in determining power consumption levels. In the Draft 1 of the display specification, we determined that display power consumption is a function of both resolution and screen area. This methodology allows EPA to compare power consumption of models with the same resolution but different screen areas as well as models with the same screen areas and different resolutions. EPA's analysis of the data suggests that resolution is the better predictor of On Mode power for units tested at default luminance settings, though incorporating screen area provides a marginal improvement. The finding further suggests incorporating screen area provides more significant importance and flexibility in the context of designing an approach to encompass frames and signage, which have different On Mode power, megapixel, and screen area relationships. This approach also furthers EPA's goal of minimizing the binning of products and designing a parallel ENERGY STAR track for all displays including televisions.
Draft #1 Version 5.0	233	Alvin Carter (Lenovo)	8/27/2008	Section 3.A - On Mode Requirements	Lenovo supports the proposed formula for calculating the on-state power consumption limit in the EPA 5.0 Tier 1 draft: a. Lenovo believes the use of screen size & resolution is more representative of the products available today and in the future. b. Lenovo has demonstrated with products released this year that the new requirement can be achieved by using commercially available technology.	EPA appreciates the comments and we agree display power consumption is a function of both resolution and screen area.
Draft #1 Version 5.0	432	Alvin Carter (Lenovo)	8/27/2008	Section 4.A - Test Conditions	Lenovo has a concern that Draft 1 5.0 test condition does not define a consistent test condition. Lenovo believes a defined test condition, as in version 4.1, provides a more valid method for end users to interpret power consumption. Lenovo has evaluated various monitors and found that by significantly reducing the brightness to levels most users would find too dim for use, nonetheless the design would pass the current requirement in 5.0 Tier 1.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m2 - closer to the average as-shipped luminance level.
Draft #1 Version 5.0	432	Alvin Carter (Lenovo)	8/27/2008	Section 4.A - Test Conditions	Lenovo believes the existing 175 cd/m2 measurement point should be retained in Energy Star 5.0 Specifically, Lenovo suggest changing the corresponding words of "default setting" on page 12 and 13 of the version 5.0 draft to "175cd/m2". Below is the summary of the suggested changes to the draft: a. Page 12, at the Section of Luminance Test Patterns and Procedures, change "the unit's default setting" to "175cd/m2"; b. Page 13, at the Section I, Display Set-up and Characterization, change "the unit's default setting" to "175cd/m2"; c. Page 13, at Section J, Test Method, On Mode 3, change "the unit's default setting" to "175cd/m2"	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m2 - closer to the average as-shipped luminance level.

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Draft #1 Version 5.0	370	Alvin Carter (Lenovo)	8/27/2008	Sleep & Off Modes	<p>Lenovo also suggests that the EPA tighten the sleep/off power requirement to be ≤ 1 watt and ≤ 0.5 watt respectively and to create a different levels for different power achievement (e.g. level 1: sleep ≤ 1 w, off ≤ 0.5 w. Level 2: sleep ≤ 2 w, off ≤ 1 w).</p> <p>a. The above suggested level 1 (sleep ≤ 1 w, off ≤ 0.5 w) power requirement is achievable today. Lenovo has demonstrated that this requirement can be achieved with the multiple products released this year.</p> <p>b. China has released a similar energy standard this year and the above level 1 requirement is included. Lenovo has also achieved this requirement with multiple products released this year.</p>	The Sleep and Off mode requirements in Draft 1 of the Display specification are identical to the current requirements of the V4.1 monitor specification. The proposed change to reduce the Sleep mode to ≤ 1 watt is for Tier 2, and would allow for consistency with other ENERGY STAR specifications, such as TVs.
Draft #1 Version 5.0	546	Birgit Kämpfle (Fujitsu Siemens Computers)	8/27/2008	Section 4.G - Luminance Test Patterns & Procedures	For all Fixed Pixel displays (e.g., LCDs and others), test pattern (VESA FPDM Standard 2.0, A112-2F, SET01K) shall be displayed that provides ten shades of gray from full black (0 volts) to full white (0.7 volts). Input signal levels shall conform to VESA Video Signal Standard (VSIS), Version 1.0, Rev. 2.0, December 2002. With the brightness and contrast is set to factory default setting (as-shipped setting) on monitor , the technician shall check that, at a minimum, the white and near white gray levels can be distinguished. If white and near white levels cannot be distinguished, then contrast or suitable other option shall be adjusted until they can be distinguished. The luminance value shall not be below 170 cd/m² . The technician shall next display a test pattern (VESA FPDM Standard 2.0, A112-2H, L80) that provides a full white (0.7 volts) box that occupies 80% of the image.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m ² - closer to the average as-shipped luminance level.
Draft #1 Version 5.0	Data	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Data Set	In reviewing the charts provided with the draft specification, it is noted that there are a few extraneous data points. Closer review reveals area calculation errors for devices 66, 67, 70, 71, 72, 73, 111, and 112. It is also necessary to reconcile conflicts between some aspect ratios and resolutions in the data set.	EPA is aware of model specific anomalies with regards to screen area and has followed-up with Partners where appropriate. If this issue is not resolved, these models will be removed from the dataset for preparation of the final draft specification.
Draft #1 Version 5.0	244	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Screen Resolution	We support the inclusion of area and resolution as variables in the power calculation. This should give the Version 5.0 requirements flexibility to account for the variety of displays coming into the marketplace. This is an important feature given the range of sizes the standard attempts to address.	EPA appreciates the comments and we agree display power consumption is a function of both resolution and screen area.
Draft #1 Version 5.0	244	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Section 3 Table 1	We recommend setting the category boundaries at 24 inches rather than 30 inches. For example, a category boundary of greater than or equal to 24 inch diagonal is recommended for the third category. This would define the boundary based on LCD backlight construction. 24 inch and larger displays are direct lit, while less than 24 inch displays are edge lit. This would improve the data fit for the mainstream monitor sizes and drive efficiency improvements for the highest power computer monitors. With this consideration, there is a natural commonality between TV technology and the monitor sizes greater than or equal to 24 inches.	EPA appreciates the comment. 30 inches was selected as it best fit the submitted data. EPA will investigate whether this change makes any significant difference to the qualification rate or power consumption level.
Draft #1 Version 5.0	244	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Section 3 Table 1	The Table 1 equations are not meaningful if they were calculated with the default luminance values from the data set. This is because the default luminance is not defined. These equations for "Maximum On-Mode Power Consumption" should be recalculated based on the ENERGY STAR 4.1 powers (measured at 175 cd/m ² minimum axial luminance) reported in the data set. The ENERGY STAR 4.1 power consumption numbers better reflect the efficiency of monitors after they are adjusted to a typical use level.	Table 1 equations are now based on fixed luminance settings dependent on screen area.
Draft #1 Version 5.0	479	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Section 4.F - Power Measurement Protocols	In order to facilitate the convergence of larger displays and televisions, it is requested that the guideline for the approved power meter be adopted from Version 3.0 ENERGY STAR TV specification.	EPA agrees with this comment and will incorporate in Draft 2 the language from the TV specification.

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Draft #1 Version 5.0	479	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Section 4.F - Power Measurement Protocols	A minimum warm-up time is specified, but there is not a burn-in period specified for the device. This leads to uncertainty and difficulty when confirming ENERGY STAR compliance. Displays lose significant luminance in the first 50 - 100 hours of operation. In essence, the factory default luminance changes over the life of the display. This uncertainty is a consequence of not specifying a minimum display luminance test parameter. Therefore, a 175 cd/m ² minimum luminance setting is recommended for on mode power consumption measurements.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m ² - closer to the average as-shipped luminance level.
Draft #1 Version 5.0	546	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Section 4.G - Luminance Test Patterns & Procedures	The default luminance level at which the on mode power consumption is measured must be defined. We recommend keeping the 175 cd/m ² minimum luminance setting from the 4.1 standard as the default luminance level for on mode power measurement. The ENERGY STAR requirement should provide a luminance value as an industry standard default luminance to define the specification fully and to maintain the rigor of the test method. If left unspecified, the default luminance value may result in confusion about the regulation in the market.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m ² - closer to the average as-shipped luminance level.
Draft #1 Version 5.0	564	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Section 4.G - Luminance Test Patterns & Procedures	The luminance setting for on mode power measurement should typical monitor usage. To achieve this, we recommend a default luminance of 175 cd/m ² for monitors with diagonal dimensions less than 24 inches. This brightness value is typical of standard consumer and corporate monitor usage. Above 24 inches, display usage varies more by application and should satisfy the needs of expert users, graphics display, longer viewing distances, and information signage. A higher typical luminance requirement may be needed at 24 inches and above. Therefore we recommend including 24 inch diagonal displays in the large display category. Setting the minimum luminance for on mode power consumption at 175 cd/m ² will set a reasonable, attainable, and meaningful target for the high volume segment of the market. More details, as well as other comments, are offered in the section comments below.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m ² - closer to the average as-shipped luminance level. From the data we have received from stakeholders, 175 cd/m ² is typical of 15" and 16" monitors, but not for larger screen area displays. For a 17" monitor, it is typically 200, while for those larger than 19", it is close to 300.
Draft #1 Version 5.0	564	Shannon Siefken and Kevin Hoffman (3M)	8/27/2008	Section 4.G - Luminance Test Patterns & Procedures	Since no luminance value is fixed for the on mode power measurement, the ENERGY STAR Requirements do not provide goals for display efficiency. Use of "default settings" removes efficiency criteria from the standard and encourages compliance simply by changing default settings. This does not reward the best-in-class devices. There is concern that the language in the boxed note will not be strictly interpreted leading to displays set to lower luminance values. If the default luminance is too low the display is not usable. This would lead the users to setting higher brightness levels thereby negating the intent of the requirements. We recommend that a minimum factory default luminance should be specified, or that the 175 cd/m ² measurement condition from ENERGY STAR 4.1 should be kept in Section G. This would assure fitness for use similar to TCO Development requirements.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m ² - closer to the average as-shipped luminance level.
Draft #1 Version 5.0	546	Shinichi Sano & Masahiro Shimura (JEITA)	8/27/2008	As-shipped Luminance Settings	Concerning as-shipped luminance settings, In principle, JEITA agrees with the EPA's proposal (testing displays at the unit's as-shipped luminance settings). Nevertheless, we would like the EPA to consider the following two concerns: 1. Under the EPA proposal, manufacturers can deliberately make the as-shipped luminance settings of their units lower to meet the ENERGY STAR requirements. Furthermore, even without such "evil deliberate", no unified luminance setting value for manufacturers might happen confusion. 2. If the as-shipped luminance levels are set deliberately lower only for meeting the ENERGY STAR requirements, this could cause the result not suitable for the intent of the standardization.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m ² - closer to the average as-shipped luminance level.

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Draft #1 Version 5.0	667	Shinichi Sano & Masahiro Shimura (JEITA)	8/27/2008	Effective Date	Page 14 — 6) Effective date Can we make the application of the Version 5.0 specification soon after the final version is issued (Jan. 21, 2009)?	EPA appreciates the comment to early qualify products to the revised specification. EPA will need to make some changes to the OPS system for the V5.0 data needs, and once completed, manufacturers are encouraged to qualify their products to the new specification level. We project this occurring in July 2009 at the earliest.
Draft #1 Version 5.0	667	Shinichi Sano & Masahiro Shimura (JEITA)	8/27/2008	Effective Date	Note on Page 15 — Transition time prior to the revised specification taking effect (nine months) We would like the transition time set to one year. Otherwise, we would like the effective date to be Friday Jan. 1, 2010. In general, setting effective dates to the first day of a month is easier for manufacturers to control the production than other dates.	EPA appreciates the comments but it is standard policy to allow manufacturers nine months of lead time from when the specification is finalized to the effective date.
Draft #1 Version 5.0	190	Shinichi Sano & Masahiro Shimura (JEITA)	8/27/2008	Screen Size	Note on Page 5 — Maximum viewable diagonal screen sizes for eligible products The Draft sets the maximum viewable diagonal screen size at 84 inches. We believe, however, that no maximum screen size should be specified because the screen sizes of professional signage are increasing every year.	EPA did not receive any data to suggest that products above the 84 inch diagonal would qualify under the proposed specification power consumption levels. EPA would be interested in receiving data to support the inclusion or exclusion of an upper limit.
Draft #1 Version 5.0	310	Shinichi Sano & Masahiro Shimura (JEITA)	8/27/2008	Tier 2: Added Functionality	Note on Page 8 — Display models with added functionality: Fair comparisons between products are not possible when measuring full-featured products considered in the Tier 2 requirements. Therefore, measurements should continue to follow the Tier 1 requirements.	It is EPA's intention to provide a level playing field for comparing similar products and to reward those models that perform efficiently and have enhanced energy saving functionalities. ENERGY STAR will work with stakeholders in a transparent manner to develop a methodology to measure these products.
Draft #1 Version 5.0	318	Shinichi Sano & Masahiro Shimura (JEITA)	8/27/2008	Tier 2: On Mode Requirements & Effective Date	Note on Page 8 - Tier 2 On Mode requirements: Will the maximum Tier 2 On Mode power consumption levels be defined in Draft 2 (planned for distribution on Oct. 22)? If not, when will they be defined?	EPA has not defined On Mode power consumption levels in Draft 2, but intends to determine them with stakeholder involvement during the Tier 2 development process.

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Draft #1 Version 5.0	192	Shinichi Sano & Masahiro Shimura (JEITA)	8/27/2008	Tuners	Note on Page 5 — Products with a tuner : Products with a tuner In Japan, products cannot apply for Energy Star as TVs. Therefore, from Tier 2 on, products with tuners would not be able to apply in Japan. Consequently, we would like the Draft changed so that products with tuners can continue to apply as display monitors as before even after Tier 2 is introduced.	Currently, ENERGY STAR's agreement with Japan only covers office equipment and not consumer electronics. If interested, EPA would welcome expanding the agreement to cover other product categories. In preparation for the Display specification development, EPA conducted an analysis of power consumption requirements of TVs and monitors and determined that since these product categories are similar/interchangeable in many aspects, they should eventually converge into one display specification. EPA is making changes to the existing computer monitor specification, and will eventually modify the TV specification, to ensure that all possible products are consistently and fairly covered.
Draft #1 Version 5.0	Data	Ken Salaets (ITI)	8/28/2008	Data Set	As with other proposed ENERGY STAR specifications, ITI found it difficult to determine how or why EPA and the EU arrived at the proposed levels, especially given that some of the proposed limits would in effect violate the "25 percent rule" relative to the number of qualifying models. In general, it appears that the larger the display size, the less likely a product will qualify. Of particular note is the impact on so-called "professional signage," where only about 13 percent of current models can meet the proposed limits.	Based on the data supplied to EPA, EPA based the power consumption requirements to cover approximately the top 25% most efficient products for all displays. Within the data set, EPA disaggregated the different screen sizes to ensure the most prevalent size models were adequately represented in the qualified data set.
Draft #1 Version 5.0	667	Ken Salaets (ITI)	8/28/2008	Effective Date	ITI was surprised that EPA and the EU did not postpone the October 2009 effective date, given the inordinate delay in publishing Draft 1. It will be very difficult and costly for manufacturers to make the necessary design changes comply with the new Display specification, once it is finalized. If the lead time is not extended, we anticipate that very few ENERGY STAR-qualified models will be available on the market.	As with all specification revisions, EPA allows manufacturers nine months of lead time from when the specification is finalized to the effective date. Initially, the Display specification was to have been finalized in October 2008 and made effective in July 2009. Due to competing priorities, EPA needed to slow the Display specification development process. EPA anticipates that V5.0 will be final in January 2009 and go into effect nine months later, in October 2009.

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Draft #1 Version 5.0	68	Ken Salaets (ITI)	8/28/2008	Labeling	In line with the comment above, the draft Display Commitment statement relatively to labeling does not include text that is included in other product specifications that provides manufacturers with some flexibility in how they meet this requirement. For example, the Computer 4.0 specification includes the following: 1) EPA will consider alternative proposals regarding approach, duration, or size for electronic labeling on a case-by-case basis. 2) That specification, as well as the Imaging 4.0 specification, includes a variation of the following: 3) On product packaging/boxes for products sold at retail. 4) We believe that such flexibility should also be included for Displays, particularly given the diversity of products covered by the proposed specification.	EPA appreciates the comments and will incorporate the language from the TV specification into the Draft 2 of the Display specification. EPA looks forward to stakeholders' comments on this language inclusion.
Draft #1 Version 5.0	Data	Ken Salaets (ITI)	8/28/2008	Meeting Preparation	In order for ITI to prepare our presentation and possible counterproposals for the September meeting, we request that EPA and the EU provide in advance a detailed explanation of the processes utilized to develop the specifications in Draft 1.	ENERGY STAR is an open specification development process and all documentation on how we set specification criteria is available on the ENERGY STAR product development Web site.
Draft #1 Version 5.0	48	Ken Salaets (ITI)	8/28/2008	Partner Commitments	There are some important, substantive differences between the draft text of the Displays Commitment statement and similar provisions in other office product "Program Requirements." This could present particular challenges for manufacturers that offer multiple product lines and, therefore, sign multiple Commitments. We suggest that EPA develop a consistent "Partner Commitment" statement that applies to all qualified products offered by a manufacturer.	EPA will review other current and draft specifications and ensure there is consistency between Draft 2 and relevant specifications.
Draft #1 Version 5.0	244	Ken Salaets (ITI)	8/28/2008	Screen Resolution	We also wish to express opposition to basing computer display power levels on a screen pixel format. This would be very burdensome to test, and probably is not a very good differentiator, given that the majority of such displays use essentially the same format.	EPA appreciates the comments but the data received to date do not reflect this. The data we received from manufacturers (overwhelmingly LCD manufacturers) show that resolution is a greater factor than screen area On Mode power consumption for small displays. EPA's analysis of the data suggests that resolution is the better predictor of On Mode power for units tested at default luminance settings although incorporating screen area provides a marginal improvement. The finding further suggests that incorporating screen area provides more significant importance and flexibility in the context of designing an approach to encompass frames and signage, which have different On Mode power, mega pixel, and screen area relationships.

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Draft #1 Version 5.0	244	Ken Salaets (ITI)	8/28/2008	Section 3.A - On Mode Requirements	Regarding On Mode Requirements, we have concerns that, if adopted as proposed, the revised Display specification could well prevent certain high performance displays from qualifying for the ENERGY STAR program. These displays utilize Super In-Plane Switching and similar technologies that are favored by professionals for such uses as CAD, design/graphics and media because of their high performance visual ergonomics. Many federal government users also require this type of display technology. However, such displays tend to have significantly higher power consumption profiles due to their use of densely interdigitated electrodes. Accordingly, ITI will be developing and offering an alternative recommendation for including such products under ENERGY STAR.	EPA has not received data from stakeholders to suggest the need to create a specific "high performance display" category. When developing a specification, EPA takes a technology neutral approach. As with other specifications, we do not create separate power requirements for similar products that may employ different display technologies (i.e., TVs with CRTs, LCDs, and plasmas). EPA is interested in receiving data concerning color consistency over viewing angle as a factor in power consumption along with screen area and resolution.
Draft #1 Version 5.0	432	Ken Salaets (ITI)	8/28/2008	Section 4.A - Test Conditions	ITI opposes requiring manufacturers to test and submit power data in low and average room ambience settings. It is very difficult to control in a factory setting, which among other things could result in variations in test data, etc. We recommend that testing be limited solely to average lighting conditions.	EPA has incorporated the Automatic Brightness Control testing procedure from the TV specification.
Draft #1 Version 5.0	432	Ken Salaets (ITI)	8/28/2008	Section 4.A - Test Conditions	ITI recommend removing the requirement to test units under a default as-shipped luminance setting. Testing displays at a single set luminance level will ensure a fair comparison across all manufacturers. Displays are often sold in the retail space at high luminance settings to attract customers to the product. By requiring testing to be conducted at default as-shipped luminance, manufacturers will ship with a lower luminance to comply with Energy Star limits. This will often result in customer dissatisfaction due to differences in out-of-box versus retail experience. This in turn will lead to an increase in complaints and returns, which will result in an increase in cost to the manufacturer. Even worse, it will result in damaged brand reputation and customer loyalty.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m2 - closer to the average as-shipped luminance level.
Draft #1 Version 5.0	433	Ken Salaets (ITI)	8/28/2008	Section 4.A - Test Conditions	ITI recommends modifying the current test conditions for Japan to test at a single frequency of 100V/50Hz. Including the 100V/60Hz test condition unnecessarily increases the test workload. Frequency does not significantly affect power consumption, so testing at 100V/50Hz would be adequate to represent test results at 100V/60Hz.	The specification allows for testing at 100V/50Hz or 100V/60Hz for displays that are to be sold in Japan. It does not require testing at both frequencies.
Draft #1 Version 5.0	582	Ken Salaets (ITI)	8/28/2008	Section 4.A - Test Conditions	Regarding On Mode Step 10 (Item J), ITI recommends changing the test procedure to integrate readings from the power meter over a 5 min period of time after the initial 20 min warm-up. The current proposal would result in an inconsistent testing method. Integrating the readings as we propose will ensure that all displays are tested over the same amount of time in a repeatable manner.	EPA appreciates this comment but feels the current requirement to measure wattage once wattage values are stable (meaning they do not vary more than 1% over a three-minute period) satisfactorily ensures repeatability by allowing comparison of stable wattage values, as opposed to averaged unstable wattage values, across different displays or the same display tested at different times.
Draft #1 Version 5.0	564	Ken Salaets (ITI)	8/28/2008	Section 4.G - Luminance Test Patterns & Procedures	Display brightness is probably the most customer noticeable marketing feature. The decision on what brightness to set for shipping displays should be made by the manufacturer and not indirectly dictated by ENERGY STAR. By testing at a set luminance level, test conditions will be equal across the board without running the risk of shipping with artificially low luminance levels to meet ENERGY STAR levels.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m2 - closer to the average as-shipped luminance level.

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Draft #1 Version 5.0	372	Ken Salaets (ITI)	8/28/2008	Sleep & Off Modes	Regarding "Sleep Mode Enabling" (Section 3.C.2), it is not clear how the requirement for activation of Sleep Mode within 15 minutes of user inactivity would apply to products such as digital picture frames or professional displays where, during normal use conditions, users would not be actively engaged with an input interface. Unlike computer monitors, these products are more similar to a television or stereo in that the user expects the product to remain active during viewing or listening without the need to re-activate the product every 15 minutes (or even every 30 or 60 minutes). While there is logic in applying this requirement to devices where interaction is part of the function, applying it digital picture frames and professional signage would result in a high level of customer dissatisfaction with the product, as well as with the manufacturer and ENERGY STAR brands. Moreover, many manufactures already provide a programmable timer feature or allow programming the display so that it is only active during certain hours of the day. Accordingly, we recommend excluding digital picture frames and professional signage from this requirement.	It is EPA's intention that, as in V4.1, all ENERGY STAR qualified displays must qualify under all three separate energy efficiency modes - On, Sleep, and Off. EPA is interested in receiving data from Digital Picture Frame (DPF) manufacturers concerning qualifying only products with energy saving functions, such as motion sensors or programmable timers, and how DPFs enter low power modes.
Draft #1 Version 5.0	244	Niclas Rydell (TCO Development North America)	8/29/2008	Section 3.A - On Mode Requirements	I'm skeptic to the way of calculating the power in on-mode for LCD displays. The principle of an LCD display is a number CCFL's shining into a light guide (transparent plastic plate). The light comes out of the light guide and passes an LCD crystal and some passive filters. The bigger the screen size is the more CCFL's is necessary to create a uniform and bright light behind the LCD crystal. The LCD crystal itself consumes very little energy to turn each pixel on or off. Thus, the power consumption should mainly be related to the amount of CCFL's which means the screen size. The reason you find a correlation between the pixel density and the power consumption is that manufacturers normally use a standardized pixel density for each screen size: 4:3 format <17" = 800x600; <19" = 1024x768; <20" = 1280x1024; >20" = 1600x1200 For LCD this may give a false vision that the pixels are consuming the power but if you look in detail how and LCD is constructed you realize that it is not true. For other display technologies like plasma I agree that each pixel is consuming energy because the light is produced in the pixel itself.	This specification covers a variety of display technologies (CRT, LCD, plasma), and the data received from stakeholders support the inclusion of resolution and screen area in determining power consumption levels.
Draft #1 Version 5.0	244	Niclas Rydell (TCO Development North America)	8/29/2008	Section 3.A - On Mode Requirements	Conclusion: Your way of calculating with make it difficult for Large LCD displays with low resolution to pass the criteria and it will make it too simple for small LCD screens with high resolution to pass. When you talk about the area "A" it is not clear that it is defined in square inches until you read the example at the bottom of page 6. I think you should use the SI-units mm, cm, m instead of inch as the standard is used on a world wide basis.	EPA appreciates the comment, and has proposed revised equations in Draft 2 that lead to a 30% pass rate in On Mode for products greater than or equal to 30" in diagonal viewable screen size. EPA will investigate converting to SI units in future drafts.
Draft #1 Version 5.0	580	Niclas Rydell (TCO Development North America)	8/29/2008	Section 4.A - Test Conditions	If the test method shall be complete it should include an instruction on how to measure the "default as-shipped" luminance. This instruction should be introduced between number 4 and 5 in the method.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m2 - closer to the average as-shipped luminance level.
Draft #1 Version 5.0	518	Niclas Rydell (TCO Development North America)	8/29/2008	Section 4.G - Luminance Test Patterns & Procedures	In the process of verifying and certifying products it is very important to have repeatability between test labs and technicians. It is very difficult to have repeatability if the technician shall check visually that the white and near gray level can be distinguished. The ability to distinguish different gray levels depends on many things such as visual quality, age, attitude towards the task etc... Conclusion: I suggest the different gray levels are measured by a luminance meter and the acceptable difference in candelas per square meter is defined.	EPA appreciates the comments and will investigate this further in Draft 3.

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Draft #1 Version 5.0	Data	Marc Hoffman & Margie Lynch (CEE)	9/3/2008	Data Set	CEE appreciates the strengthened language in the partner agreement regarding data submission. Committee members have shared that it would also be helpful to have identifying information (manufacturer, model number) for the models in the data set supporting the specification development to the extent that it does not represent confidential information.	It is standard operating procedure for EPA to mask the public data during the specification development process. In order for EPA to obtain relevant and accurate data to set specification levels, we have agreed to honor manufacturers' requests to mask product specific information (model number, etc.) from the public data set.
Draft #1 Version 5.0	Data	Marc Hoffman & Margie Lynch (CEE)	9/3/2008	Market Penetration of ENERGY STAR qualified Displays	CEE is pleased that EPA is revisiting this specification (formerly the PC monitors specification) to ensure that the ENERGY STAR mark continues to identify the top performing products in terms of energy efficiency. Though the current estimated market penetration of 90 percent for these products demonstrates the success of the program, it significantly reduces the differentiation provided by the mark for consumers and for our members. The overall qualification rate of 26 percent under the draft Version 5.0 specification is more in line with a product differentiation that is consistent with ENERGY STAR, though we encourage EPA to closely monitor advances in market adoption of ENERGY STAR-labeled display products. Rapid technological innovation in this category may quickly result in a market penetration rate significantly higher than today's estimates.	The ENERGY STAR program is a voluntary initiative, not a standard, that identifies approximately the top 25% performing models in the market in terms of energy efficiency. EPA modifies the 25% target as necessary to ensure consumers have a choice among products and manufacturers.
Draft #1 Version 5.0	Data	Marc Hoffman & Margie Lynch (CEE)	9/3/2008	Request Supplemental Information (energy savings opportunities, costs to consumers, savings & impact information)	Strong data on market penetration and energy savings of ENERGY STAR-labeled products are essential for our members' consideration of this specification proposal and future program planning activities. We would like to reiterate our comments from the discussion guide requesting detailed information regarding energy savings opportunities--both on a per-unit basis and in the aggregate--for the products that are covered under the specification. In those comments we also sought data on any additional costs consumers might bear for products that comply with the revised specification. We would ask that all of this information at a minimum-- as well as demand savings and impact information--be included in the information presented at the stakeholders meeting on September 25 if not in Draft 2 of the specification.	EPA has provided this data in the analysis it performed pursuant to the Draft 2 specification on the Displays Specification Product Development Web page at www.energystar.gov .
Draft #1 Version 5.0	564	Marc Hoffman & Margie Lynch (CEE)	9/3/2008	Section 4.G - Luminance Test Patterns & Procedures	CEE supports EPA's intent with testing and luminance settings and sees the merit in having products tested and qualified with the same settings consumers receive when they purchase and use the units, and that those setting optimize display viewing for those consumers. We will be interested in hearing from manufacturer stakeholders whether EPA's requirement is likely to achieve the intended result.	Based on comments received on Draft 1 and at the September 25 stakeholder meeting, EPA will propose a set luminance testing level higher than 175 cd/m2 - closer to the average as-shipped luminance level.
Draft #1 Version 5.0	Data	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Data Set	The pass rate for standard monitors was seen as too high. These monitors are very important due to the high sales volume and the pass rate should not be higher than 25 %.	The overall qualifying rate for all displays is 26%. The overall qualifying rate for computer monitors is approximately 28%, but the qualification rate by screen size does vary.
Draft #1 Version 5.0	Data	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Digital Photo Frames	Regarding the inclusion of digital photo frames, the experts thought that they would be included under the US-EC agreement when the specification as a whole is under the agreement.	EPA appreciates the comment and agrees that based on the data received to date, treating digital picture frames as a type of electronic display makes sense.

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Draft #1 Version 5.0	53	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Label and registration	It was asked if products should be registered at either US EPA or the EC before a manufacturer can claim that the product complies with Energy Star or is labeled with Energy Star because this is not stated clearly in the partner commitment section of the specification. The US EPA has confirmed after the meeting that only product registered can be marketed as Energy Star products. Reason for the question was that a MS had seen products declared as Energy Star compliant without being in the database.	The ENERGY STAR mark is trademarked; therefore, legally binding rules apply to its use. For one, it may not be used without permission, and permission is only granted for qualified products. Section 4.0 of "Using the ENERGY STAR Identity to Maintain and Build Value" reads, "Organizations must enter into an agreement with the government to use the marks..."
Draft #1 Version 5.0	244	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Power Consumption vs. Screen Size	The experts did not understand the argument that the best correlation for power consumption was a combination of area and resolution because the R Squared value for power consumption vs. screen area is 0.93, while EPA states that it is 0.70 for the combination of area and resolution. The 0.93 value is for "Screen Area (sq. inches)" vs. "On Power at Default Luminance (W)" when filtering out incorrect or lacking data.	0.93 is only for professional displays (n=23). Area is a weak predictor of power consumption for small digital picture frames. Ultimately, EPA proposed three equations which weigh area and resolution differentially as screen area and resolution change.
Draft #1 Version 5.0	na	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Power Management for Digital Photo Frames	Power management for digital photo frames was seen as important.	EPA is considering power management among other energy saving options to receive credit in Tier 2 of the Display specification.
Draft #1 Version 5.0	165	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Product Definition	The experts recommended to remove the requirement saying that the display screen and the electronics should be in a single housing.	This terminology is taken from the existing 4.1 specification definition. EPA would be interested in receiving further information on why this may be a constraint.
Draft #1 Version 5.0	190	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Product Definition	Regarding the definition, the experts could see a need for not including very small displays, but did not see a need to have an upper limit.	EPA did not receive any data to suggest that products above the 84 inch diagonal would qualify under the proposed specification power consumption levels. EPA would be interested in receiving data to support the inclusion or exclusion of an upper limit.
Draft #1 Version 5.0	Data	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Setting Qualification Levels	Member States experts commented on the general principle of using the 25 % qualification level for all specification setting instead of also including a technological approach. E.g. it was mentioned that it may look strange to have a sleep value of 1.4 W instead of 1 W.	The overall qualifying rate for all displays is 23%. The overall qualifying rate for computer monitors is approximately 25%, but the qualification rate by screen size does vary.
Draft #1 Version 5.0	458	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Test Requirements	In Product Testing Set-up and Conditions, the dark room conditions provided in Section C was not clear to the experts why they were needed.	The procedure follows from VESA FPDM Standard 2.0.

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Draft #1 Version 5.0	178	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	TV vs. Displays specification	The experts did not see a need of achieving consistency between the TV and the display specification.	In preparation for the Display specification development, EPA conducted an analysis of power consumption requirements of TVs and monitors and determined that since these product categories are similar/interchangeable in many aspects, they should eventually converge into one display specification. EPA is making changes to the existing computer monitor specification, and will eventually modify the TV specification, to ensure that all possible products are consistently and fairly covered.
Draft #1 Version 5.0	na	Jan Viegand & Paolo Bertoldi (European Commission)	9/16/2008	Verification	Verification of the product in EU was raised. The verification is a responsibility of the EU Member States.	ENERGY STAR has had considerable interest from external entities concerning the product verification aspects of the program. We are working towards resolving these issues and are piloting different approaches in several key product categories.
Draft #1 Version 5.0	370	Albert Xthona (BARCO Medical Imaging Division)	9/24/2008	Exemption of medical displays for sleep & off modes	<p>For both Tier 1 and Tier 2, we propose that medically-approved displays</p> <ol style="list-style-type: none"> 1. be subject to the same sleep-mode and off-mode requirements as all other displays; 2. be exempted from on-mode requirements <p>This exemption could be added to the specification by the following additions:</p> <ul style="list-style-type: none"> • Section 1a: After "...sold as televisions are not included in the specification.", add "Medical displays are displays that have received a 510(k) clearance from the Food and Drug Administration (FDA). Medical displays are included in this specification, however they are not subject to the on-mode requirements as medical display specifications are subject to criteria established by the FDA." • Following Section 3c: add "Note: While medical displays as defined in section 1 are not subject to on-mode criteria, they must comply with Sleep and Off mode criteria to be ENERGY STAR qualified." 	It is EPA's intention that, as in V4.1, all ENERGY STAR displays must qualify under all three separate energy efficiency modes - On, Sleep, and Off.
Draft #1 Version 5.0	370	Albert Xthona (BARCO Medical Imaging Division)	9/24/2008	Exemption of medical displays for sleep & off modes	Inclusion of medical displays in the ENERGY STAR program through compliance with sleep-mode and off-mode criteria will promote good design practices and enable healthcare facilities to make good, safe choices when buying new display systems. While we could work towards a separate specification of on-mode criteria for medically-approved displays, we believe that the regulations of the FDA that ensure safety and efficacy are most applicable.	It is EPA's intention that, as in V4.1, all ENERGY STAR displays must qualify under all three separate energy efficiency modes - On, Sleep, and Off.

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Draft #1 Version 5.0	545	Albert Xthona (BARCO Medical Imaging Division)	9/24/2008	Luminance	<ul style="list-style-type: none"> • Luminance uniformity over the entire screen surface. This consumes more power in three ways. Some light is absorbed in the process of making the screen uniform. The luminance measured in the center is present over the entire screen, thus more total light is emitted at a given measured value. Finally the associated circuitry consumes power. • Brightness is defined over viewing angle. More total light can be emitted by the medical display than by a display optimized for on-axis viewing. • Color temperature matches X-ray film. To match the color characteristics of blue base or clear base X-ray film, medical displays require additional power to reach the same luminance. • Initial luminance must be maintained over the lifetime of the displays. Medical displays are calibrated to a luminance level that will be maintained for five years. The displays perform automatic adjustment of the luminance level over time and in response to changing temperatures in the room. Feedback circuitry and internal sensors require additional power to accurately perform this automatic adjustment. 	EPA appreciates the comments on luminance, but since the comments are relevant only to medical devices and since medical devices do not qualify for ENERGY STAR under the criteria for the three modes, EPA is hesitant to apply these to the draft 2 display specification.
Draft #2 Version 5.0	350	Alvin Carter & Tom Shell (Lenovo)	11/12/2008	Sleep & Off Modes	With today's commercially available technology, it is possible for monitors to achieve power levels in "sleep mode" $\leq 1w$ and in "off mode" $\leq 0.5w$. [See tab "Lenovo" for proposed changes to the Tier 1 energy efficiency criteria for sleep and off modes in Table 3a of the specification.]	EPA appreciates the comment but the data we received do not support these levels at this time.
Draft #2 Version 5.0	193	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Sleep & Off Modes	MTP suggests re-wording the sleep mode definition since it contains repetition in the text of the phrase "that can initiate".	EPA agrees with the comment and will make the proposed changes in the next round (draft final) of the Displays specification.
Draft #2 Version 5.0	223	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Section 3.A - On Mode Requirements	<p>Proposed Tier 1 On Mode requirements based on equations, categories based on display diagonal screen size and resolution.</p> <ul style="list-style-type: none"> • These requirements should be revised to reflect default luminance data, in line with the recommended test approach. 	The On Mode power consumption requirements were based on data EPA received during the 2 calls for data. During the second round of data collection, we collected power consumption at various luminance settings. It is with this data that we set the current On Mode power consumption levels. The data used in establishing these levels are available on the ENERGY STAR Display Product Development Page.
Draft #2 Version 5.0	272	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Tier 2	MTP would strongly support a Tier 2 implementation, especially one which aims to harmonize with international approaches on TVs. MTP would encourage addressing considerations such as automatic brightness control etc in line with the approach to handling these for TVs.	EPA appreciates the support for the development of a Tier 2 for displays that addresses energy saving technologies.
Draft #2 Version 5.0	272	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Tier 2	MTP would not support future approaches based upon adders for additional display features such as speakers or USB ports – such considerations should be approached via a category based specification in Tier 2, if additional allowance is justified for these components in the modes addressed.	EPA has not specifically decided on an adder approach for displays as part of our unified strategy for all display technologies.
Draft #2 Version 5.0	319	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	ABC	MTP would support the ABC enabling approach as being , consistent with that of the TV specification and international TV approaches.	EPA appreciates the support for the ABC inclusion and approach.

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Draft #2 Version 5.0	350	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Sleep & Off Modes	<p>Tier 2 Sleep and Off Mode requirements of less than or equal to 1 watt.</p> <ul style="list-style-type: none"> • MTP would strongly support the Tier 2 sleep requirements of 1 Watt in sleep and off modes, but would question why the Tier 1 requirements for displays of greater than or equal to 30" diagonal screen size require a sleep mode of 4 watts and off mode of less 2 watts, as this off mode requirement will be inconsistent with European EuP standby requirements likely to come into force in 2010. • MTP would strongly support the application of sleep requirements across all sleep modes. 	EPA is committed to working towards a 1 W Sleep/Standby Mode requirement for all products, where feasible. As professional displays are a new product, we are setting the Sleep and Off mode efficiency criteria based on the data we have received. Under Tier 2, we anticipate requiring all ENERGY STAR products to meet the 1 W criteria for Sleep and Off.
Draft #2 Version 5.0	354	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Power Management Requirements	<p>"Power Management Requirements," state that displays must have at least one mechanism enabled by default that allows the display to automatically enter Sleep or Off Mode.</p> <ul style="list-style-type: none"> • MTP would support power management enabling as default. 	EPA appreciates MTP's support in ensuring that displays have a power management function. EPA is committed to ensuring that all ENERGY STAR models have at least one power management function enabled.
Draft #2 Version 5.0	510	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Luminance	<p>* Availability of default settings: Our MTP testing lab technicians have confirmed that monitors do normally have default settings and can also have different operational modes – meaning that an approach more consistent with IEC 62087 is an option. To ensure repeatability of tests, manufacturers could log luminance when declaring test data if required.</p> <p>Availability of "return to factory default" settings: Our MTP testing lab technicians have never tested a monitor which did not have a "return to factory defaults" option, so a used sample could certainly be tested at default settings if required.</p> <p>* Industry willingness to consider default approach: views on the luminance requirement at the September meeting were by no means conclusive – with a number of industry voices supporting a default specification if an Australian-style approach was taken.</p>	During Draft 1, EPA proposed testing at the default luminance setting. Based on feedback from the majority of manufacturing stakeholders, we have reverted to providing a set luminance (although now based on screen size) that approximates the as-shipped settings. EPA is open to exploring this issue under the Tier 2 process. For professional displays, since ENERGY STAR is proposing using the IEC 62087 test procedure, we anticipate requiring professional displays to be tested as shipped but report the luminance along with the on mode power consumption level.
Draft #2 Version 5.0	510	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Luminance	Difficulty in configuring monitors to precise luminance levels: Some industry suggested at the September stakeholder meeting that there was an issue with how easily luminance settings could be changed on a monitor compared to a TV - i.e. monitors usually just a sliding scale.	EPA appreciates the comments but to date has not received any compelling data or demonstrable results that adjusting the luminance of products has been challenging. The question discussed at the webinar was not how difficult is it to change the luminance of the display, but instead how many users actively change the luminance of their displays?
Draft #2 Version 5.0	510	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Luminance	Technological considerations of specified luminance levels: Issues with plasma monitors illustrate the problems with a specified luminance approach – likely to become increasingly relevant as other display technologies enter the mainstream market in future years.	EPA would welcome clarification of this comment, including a description of the issues/problems in question, and an explanation as to why the UK MTP believes they may grow more common. For professional displays, since ENERGY STAR is proposing using the IEC 62087 test procedure, we anticipate requiring professional displays to be tested as shipped but report the luminance along with the on mode power consumption level.

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Draft #2 Version 5.0	510	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Luminance	MTP would propose an approach more consistent with the revised IEC 62087, whereby the display is tested at default luminance as shipped for normal home/office use.	During Draft 1, EPA proposed testing at the default luminance setting. Based on feedback from the majority of manufacturing stakeholders, we have reverted to providing a set luminance (although now based on screen size) that approximates the as-shipped settings. EPA is open to exploring re-visiting this issue under the Tier 2 process. For professional displays, since ENERGY STAR is proposing using the IEC 62087 test procedure, we anticipate requiring professional displays to be tested as shipped but report the luminance along with the on mode power consumption level.
Draft #2 Version 5.0	510	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Luminance	<p>The luminance level for testing can be specified to avoid unreasonable default values, by defining the requirements in line with the Australian Greenhouse Office approach to TV luminance:</p> <ul style="list-style-type: none"> • A test on 22 TVs that showed that the recommended default home use mode had an approximate luminance level not less than 66% of the luminance level of the default mode with the highest luminance. • Compromise with Industry resulted in agreement that the recommended default level could be as low as 50% of the maximum default level. • There was some industry support for this type of approach in the September stakeholder meeting held in Washington DC. • The important aspect of this anti-cheating test is that an absolute luminance measurement does not have to be made to carry out the test. The luminance measurement is comparative (delivered mode setting compared with maximum luminance mode setting - this is much easier to achieve to smaller error limits - usually less than 3% - and overcomes LCD stabilisation issues. 	EPA appreciates the comments and will continue to explore testing as shipped for all displays in the interim between tier 1 and 2. Under Tier 1, all displays less than 30 inches will continue to test at prescribed luminance based on screen size and resolution. But, under Tier 1, all professional displays will test their products as shipped and report the luminance, based on a prescribed luminance testing method.
Draft #2 Version 5.0	510	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Luminance	<p>Taking into account that the controlling parameter in the old EPA luminance test for monitors was that the display should properly reproduce a grey scale at the test luminance setting, this approach could be adapted to ensure an out of the box setting was viable. An on-mode test could be achieved, avoiding luminance measurements at a prescribed level – and significantly reducing test effort, whilst increasing reproducibility of results. The MTP suggested approach is a dynamic test loop approach as in the TV methodology (this is already available for PC monitoring as part of the TV standard work) as follows:</p> <ol style="list-style-type: none"> 1. Disable automatic luminance control (ALC) 2. Check grey scale is acceptable at delivered setting of Monitor and determine the maximum luminance setting that is also still capable of providing an acceptable grey scale. 3. Check that ratio of luminance in the delivered setting to that of the luminance in the determined maximum setting is within the prescribed limits of the (to be) agreed set criteria (eg. > 0.5 as for Aus TVs) 	EPA appreciates the comments and will continue to explore testing as shipped for all displays in the interim between tier 1 and 2. Under Tier 1, all displays less than 30 inches will continue to test at prescribed luminance based on screen size and resolution. But, under Tier 1, all professional displays will test their products as shipped and report the luminance, based on a prescribed luminance testing method.

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Draft #2 Version 5.0	510	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Luminance	4) Underestimated power consumption figures: Specifying set luminance levels, which are not likely to match the actual luminance levels in use, mean that ENERGY STAR will be based off figures for power consumption which are not representative of actual use, underestimating the energy impact of displays and misleading consumers/procurers. The chart of prescribed vs draft luminance for the data set shows considerable scatter. A majority of the products have a luminance ratio of less than 1 – meaning that the prescribed luminance level is less than the default level for the majority of products. In fact, in a number of cases, the prescribed level is at least 50% lower than the default setting. Additionally, some products that may now be in scope, such as medical displays could have very high default luminance compared to other products, required by safety legislation. Testing these products at a lower luminance level will significantly skew results toward unrealistic levels.	As depicted in the Luminance at prescribed level chart, the prescribed luminance set by EPA covers more than half of the models. EPA thinks the set luminance levels are a good representation of the as-shipped luminance levels for traditional monitors. Based on the data we have, currently we do not have any devices that have very high default luminance (no medical devices meet our standby requirement). For professional displays, since moving to the IERC 62087 test procedure ENERGY STAR will require professional displays to be tested as shipped but report the luminance along with the on mode power consumption level. Under Tier 1, all displays less than 30 inches will continue to test at prescribed luminance based on screen size and resolution.
						But, under Tier 1, all professional displays will test their products as shipped and report the luminance, based on a prescribe luminance testing method. In the interim between Tier 1 and 2, EPA will continue to require default luminance setting for less than 30 displays but will assess this issue and may require.
Draft #2 Version 5.0	531	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Luminance	Inconsistency with TVs: This approach (setting a prescribed luminance) is not consistent with approaches being taken at an international level on TVs, especially relevant considering the opportunity for future convergence and harmonization with TV approaches.	During Draft 1, EPA proposed testing at the default luminance setting. Based on feedback from the majority of manufacturing stakeholders, we have reverted to providing a set luminance (although now based on screen size) that approximates the as-shipped settings. EPA is open to exploring re-visiting this issue under the Tier 2 process.
Draft #2 Version 5.0	635	Catriona McAlister (UK Market Transformation Programme)	11/11/2008	Effective Date	Proposed dates for the specification revision of: January 21, 2009 to finalize the specification, October 21, 2009 for the specification to become active, and October 2011 for Tier 2 to become active. • MTP would strongly support current proposed dates, as it is important that the new specification is available as soon as possible, considering the high market penetration of the current requirements.	No action necessary

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Draft #2 Version 5.0	59	Hiroaki Hashimoto (EIZO Nanao Corp., Japan)	11/12/2008	Labeling	We are aware that labeling requirements have been newly introduced to mandatory requirements in the draft. We have recognized the importance of the Energy Star mark because it is a mean of indicating a product is an Energy Star qualified product at the time a potential customer is considering purchasing a product. We disagree against the proposition of displaying the Energy Star mark on the products since significant frequency of labels could cause harmful influences on the environment. Moreover, the width of display bezels is becoming narrower and narrower nowadays. Hence, it is difficult to keep the space to label more marks. We suppose this is a contradicting proposition to EPA's mission, protecting the environment. Because of these reasons, we insist that the labeling requirement should stay as an optional requirement.	The labeling requirement is not a new requirement. During the Draft 2 process, we incorporated other labeling options that have been previously used for other product categories. The display does need to be labeled but there are several labeling options. Line 74 of the Draft 2 specification clearly notes that EPA will consider alternative approaches.
Draft #2 Version 5.0	223	Hiroaki Hashimoto (EIZO Nanao Corp., Japan)	11/12/2008	On Mode Requirements	Compared to the On Mode requirements from the Draft 1, we suppose that this is too strict for most displays to adopt. In fact, most of our monitors, and even other manufacturers' monitors would not be able to meet the tier 1 on mode requirements proposed in this Draft 2 while EPA insists that approximately 23% of display models would be able to meet the Tier 1 on mode requirements for this Draft. We do not see the points why the on mode requirements have to be tightened this much. The requirements should be revised with consideration of actual capacities of modern displays.	The ENERGY STAR program seeks to identify the top 25% performing models in the market in terms of energy efficiency. EPA modifies the 25% target as necessary to ensure consumers have a choice among products and manufacturers. Based on the data supplied by manufacturers, we have set the On Mode power to levels that nearly 25% of standard monitors can meet.
Draft #2 Version 5.0	317	Hiroaki Hashimoto (EIZO Nanao Corp., Japan)	11/12/2008	Automatic Brightness Control	We have recognized that requirements on the models with automatic brightness control have been newly added to the Energy Star specification. In the draft, it was not clarified whether a display with ABC had to be confirmed to both ON mode requirements on different luminance settings (100cd/m2, 175cd/m2, 200cd/m2, and 350cd/m2) and ABC related requirements or only with the requirements on the displays with ABC functions. It might cause misinterpretations among the partners. The requirements should be specified again for better understandings.	EPA will look into clarifying the language about On Mode power consumption requirements of products that have ABC enabled.
Draft #2 Version 5.0	372	Hiroaki Hashimoto (EIZO Nanao Corp., Japan)	11/12/2008	Lab accreditation	By starting this new requirement, the display must be tested in laboratory accreditation cooperation. We understand that the major points of this proposition is to conduct testing in support of qualification for ENERGY STAR. However, this would undoubtedly lead to strong cost pressure and time consuming for the all partners as a consequence. Our suggestion for this proposition is to allow the partner with ISO/IEC 17025 accredited laboratories to test in the laboratory. We strongly believe that this proposition should be eased for all the partners, too.	Prior to the Draft 2 Specification webinar, EPA provided stakeholders with a change in the language requiring lab accreditation. The proposed language in the draft final spec requires facilities to have quality control procedures in place and recommends ISO 17025 as an appropriate reference for sound quality control requirements.
Draft #2 Version 5.0	510	Hiroaki Hashimoto (EIZO Nanao Corp., Japan)	11/12/2008	Section 4.H - Luminance Test Patterns & Procedures	MTP strongly believe that the testing point for luminance should be at the center of monitors. During the luminance test, normally we set up the testing point finding the area that provides at least 175 cd/m2. During the process, there is a strong possibility to make mistakes even when finding the minimum number for this testing because the numerical value of luminance varies from the center of a monitor to the corner. As a result, the results from the same testing might vary among the testing agency. Moreover, since finding the area that provides at least 175cd/m2 is not a simple procedure, we need to spend so much time on this. Because of these reasons, we suggest that the testing point for luminance should be at the center of monitors for the facilitation and accuracy of luminance test patterns and procedures for shortening of hours.	ENERGY STAR appreciates the comments and will continue to explore testing as shipped for all displays in the interim between tier 1 and 2. Under Tier 1, all displays less than 30 inches will continue to test at prescribed luminance based on screen size and resolution. But, under Tier 1, all professional displays will test their products as shipped and report the luminance, based on a prescribe luminance testing method.

Document	Line number	Commenter	Date Submitted	Topic	Comment	Response
Draft #2 Version 5.0	548	Hiroaki Hashimoto (EIZO Nanao Corp., Japan)	11/12/2008	Test Method (interface)	We have been aware that EPA is planning to evaluate the power consumption requirements of multiple PC Display interfaces in each mode of operation. We suggest only widely used interfaces such as VGA and DVI are should be targeted and specified for new requirements since many of today's standard computer monitors are sold with these PC Display interfaces.	Currently the draft specification allows the technician to measure power consumption using whatever interface the display has. EPA appreciates the comment of evaluating the power consumption of the various display interfaces to ascertain if there is a discernable power variance between the various interfaces. This is something we will investigate during the interim of Tier 1 and 2.
Draft #2 Version 5.0	635	Hiroaki Hashimoto (EIZO Nanao Corp., Japan)	11/12/2008	Effective Date	We have recognized remarkable changes introduced to this draft 2; Version 5.0 from the current specification, Version 4.1 and suppose that many displays would not be able to meet the new requirement. Therefore, EPA should extend effective withdrawal date of version 4.1 and establishing some years transition period from Ver.4.1 to 5.0. By running both two version of specifications for a certain period of time (just like TCO standards has carried out the extension of effective withdrawal date for switching to '03 from '99), more display would be able to meet the new requirement smoothly with less difficulties.	EPA appreciates the comments but is committed to finalizing the specification and Tier 1 becoming effective in October 2009. The ENERGY STAR specification levels are established to recognize the top quartile of the products available on the market and are based on data supplied by manufacturers. At the time the Display specification goes final, we are estimating that nearly 25% of the displays on the market will meet the specification. ENERGY STAR does not have concurrent specifications in place as we feel that is confusing to our customer base.

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Draft #2 Version 5.1	223	Jan Viegand (ECESB WG)	11/26/2008	Resolution	The ECSEB WG is still concerned with the inclusion of the resolution in the formula because the correlation between area and power consumption is above 0.9. The technical or statistical reason to include the resolution should be explained.	EPA appreciates the comments but the data we have received to date does not reflect this perspective. EPA sets its specification as a function of resolution as it is a performance feature consumers base purchasing decisions on and more power is needed to meet that particular consumer expectation. The data EPA has received from display manufacturers shows that resolution is a greater factor than screen area in determining power consumption for small displays. EPA's analysis of the data also suggests that resolution is a better predictor of On Mode power consumption for units tested at default luminance settings, although incorporating screen area provides some marginal improvement. Our analysis further suggests that incorporating screen area provides more significant importance and flexibility in the context of designing an approach to encompass frames and signage, which have different On Mode power, mega pixel, and screen area relationships.
Draft #2 Version 5.1	350	Jan Viegand (ECESB WG)	11/26/2008	Sleep & Off Modes	The ECESB WG supports 1 W requirement for both sleep and off modes also to be consistent with the European EuP standby requirements. Based on the dataset we see the difficulties in reducing the requirement of both sleep and off to 1 W for all sizes. However, we recommend EPA to work with the industry to lower the sleep and off modes values to 1 W.	EPA is committed to working towards a 1 W stand by for all products, where feasible. As professional displays are a new product, we are setting the Sleep and Off Mode efficiency criteria based on the data we have received. Under Tier 2, all ENERGY STAR displays will be required to meet the 1 W criteria for Sleep and Off.
Draft #2 Version 5.1	354	Jan Viegand (ECESB WG)	11/26/2008	Power Management Requirements	The ECESB WG supports the broad power management requirements that apply to all displays comprised by the specification.	EPA appreciate the EC support in ensuring that displays have a power management function. EPA is committed to ensuring that all ENERGY STAR models have at least one power management function enabled.

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Draft #2 Version 5.0	510	Jan Viegand (ECESB WG)	11/26/2008	Luminance	The ECESB WG does not support the proposal of testing at the proposed fixed luminance levels. We believe that most consumers do not change the default settings of the display and therefore the power consumption measured and stated by the manufacturer should correspond to the default settings. Comparing the factory default luminance in the dataset with the proposed fixed test luminance levels shows that 64 % of the products are shipped with luminance levels higher than the proposed fixed test luminance levels. 15 % are shipped with 50 % higher luminance levels. Following the proposed test procedure, it means that more than half of the consumers cannot trust the power consumption stated by the manufacturers.	During Draft 1, EPA proposed testing at the default luminance setting. Based on feedback from the majority of manufacturing stakeholders, we have reverted to providing a set luminance (although now based on screen size) that approximates the as-shipped settings. EPA is open to exploring re-visiting this issue under the Tier 2 process. For professional displays, since ENERGY STAR is proposing using the IEC 62087 test procedure, we will require professional displays to be tested as shipped but report the luminance along with the on mode power consumption level.
Draft #2 Version 5.0	510	Jan Viegand (ECESB WG)	11/26/2008	Luminance	The proposed test procedure is furthermore not in line with the IEC 62087 ed. 2.0 for testing of TVs. In principle, it does not have to be in line with the IEC standard, however, if there is no reason not to be in line, we believe it should be in order not to confuse the industry and the consumers by having two different measurement methods for similar products. We do not see any problems in testing at default settings. However, the default settings could be combined with a minimum luminance setting either as a percentage of maximum or a fixed level.	Under Tier 1, all displays less than 30 inches will continue to test at prescribed luminance based on screen size and resolution. But, under Tier 1, all professional displays will test their products as shipped and report the luminance, based on a prescribe luminance testing method. In the interim between Tier 1 and 2, EPA will continue to require default luminance setting for less than 30 displays but will assess this issue and may require all displays to be tested as shipped under Tier 2.
Draft #2 Version 5.0	510	Jim Noecker (Panasonic)	10/29/2008	High APL	The vast majority of large format professional PDPs (over 40") are used with video content in hospitality (including hotels, bars/restaurants, etc.) and studios (video monitoring), yet the draft clearly targets only applications of high APLs for computer monitors and signage. Unlike LCDs which use the same power for any APL, PDP power is extremely content-dependent. So power usage on video (TV) content will be significantly lower on PDP compared to signage, and often much less than LCD. The 2 test patterns chosen with high APLs will unfairly penalize PDPs for their primary market that uses a much lower APL (i.e. 33% average APL for video vs. 80% APL for at least one of the chosen test patterns). Because of the large differential in power usage for PDPs depending on their application, it appears to me that at least 2 categories need to be defined, each with their own testing criteria. Computer monitor/signage apps could fall under the current test procedures while video/TV/studio use would use a test procedure commensurate.	In the draft final display spec, EPA is proposing to change the test procedure for displays greater than 30 inches from the VESA to the IEC 62087. This change in test procedures will require a new round of display testing, but only for professional displays. EPA believes that the IEC 62087 will provide more relevant energy consumption data and is more consistent with our interest in harmonizing with the TV specification and power requirements.
Draft #2 Version 5.0	173	Kenichi Takanashi (JEITA)	11/12/2008	Definitions	Note on Page 5 — Products with a tuner In Japan, products cannot apply for Energy Star as TVs. Therefore, from Tier 2 on, products with tuners would not be able to apply in Japan. Consequently, we would like the Draft changed so that products with tuners can continue to apply as display monitors as before even after Tier 2 is introduced.	The TV Tier 2 specification process will be completed prior to the Display Tier 2 process and thus products with tuners would qualify for the TV spec and not the display spec. If interested, Japan can expand the products covered under the ENERGY STAR MOU to go beyond office equipment and cover consumer electronics.

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Draft #2 Version 5.0	173	Kenichi Takanashi (JEITA)	11/12/2008	Maximum size	Maximum viewable diagonal screen sizes for eligible products The Draft sets the maximum viewable diagonal screen size at 84 inches. We believe, however, that no maximum screen size should be specified because the screen sizes of professional signage are increasing every year.	EPA agrees that product sizes are increasing every year, but EPA did not receive any power consumption data to suggest that products above the 84 inch diagonal would qualify under the proposed specification power consumption levels. EPA would be interested in receiving data to support the inclusion or exclusion of an upper limit.
Draft #2 Version 5.0	272	Kenichi Takanashi (JEITA)	11/12/2008	Tier 2	Tier 2 On Mode requirements: Will the maximum On Mode power consumption levels be defined in Final Draft 2 (planned for distribution on Dec. 10)? If not, when will they be defined?	EPA anticipates developing the Tier 2 On Mode power consumption in association with the Tier 2 specification development process.
Draft #2 Version 5.0	272	Kenichi Takanashi (JEITA)	11/12/2008	Tier 2	Display models with added functionality: Fair comparisons between products are not possible when measuring full-featured products considered in the Tier 2 requirements. Therefore, measurements should continue to follow the Tier 1 requirements.	EPA anticipates developing the Tier 2 On Mode power consumption in association with the Tier 2 specification development process. EPA has not specifically decided on an adder approach for displays.
Draft #2 Version 5.0	317	Kenichi Takanashi (JEITA)	11/12/2008	Automatic Brightness Control	Your calculation for the power consumption value of displays equipped with automatic brightness control assumes operation at an ambient light level of 300 lux for 80% of the time and at an ambient light level of 0 lux for 20% of the time. What is the rationale or basis for this calculation? Furthermore, why did you select 300 lux and 0 lux for the ambient light level conditions?	ABCs were addressed in another ENERGY STAR specification (TV V3.) and EPA incorporated the negotiated levels and power consumption equations into the Display specification.
Draft #2 Version 5.0	372	Kenichi Takanashi (JEITA)	11/12/2008	Lab accreditation	The requirement that displays must be tested in a laboratory accredited by an accreditation body will lead to increased costs and longer development times. Therefore, we would like the EPA to recognize self-testing by manufacturers as in the past. The reason for our request is that power consumption measurements require no special equipment or technology. (Manufacturers are fully capable of performing these tests on their own.)	Prior to the Draft 2 Specification webinar, EPA provided stakeholders with a change in the language requiring lab accreditation. The proposed language requires facilities to have quality control procedures in place and recommends ISO 17025 as an appropriate reference for sound quality control requirements.
Draft #2 Version 5.0	510	Kenichi Takanashi (JEITA)	11/12/2008	Luminance	We believe that displays that cannot be set to the luminance values specified in Table 4 should be tested at the display's maximum luminance. Thus, we feel the following paragraph should be added to this item in the same way as the Version 4.1 specification. [If the computer monitor's maximum luminance is less than the luminance value specified in Table 4 (e.g., 150 candelas per square meter), then the technician shall use the maximum luminance (e.g., 150) and report the value to EPA with other required testing documentation. Similarly, if the computer monitor's minimum luminance is greater than the luminance value specified in Table 4 (e.g., 400 candelas per square meter), then technician shall use the minimum luminance (e.g., 400) and report the value to EPA.]	EPA agrees with this comment and will add the relevant text to the Draft Final specification. EPA suggests the following language: "If Display's maximum luminance is less than the requirement (e.g., 200), then technician shall use the Display's maximum luminance (e.g., 175) and report the value to EPA. Similarly, if the Display's minimum luminance is greater than the requirement (e.g., 200), then technician shall use the minimum luminance (e.g., 250) and report the value to EPA."
Draft #2 Version 5.0	635	Kenichi Takanashi (JEITA)	11/12/2008	Effective Date	We would like the transition time set to one year. Otherwise, we would like the effective date to be Friday Jan. 1, 2010. In general, setting effective dates to the first day of a month is easier for manufacturers to control the production than other dates.	EPA is committed to a prompt but reasonable transition period for this specification revision and believes adequate notice of the effective date has been provided.

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Draft #2 Version 5.0	635	Kenichi Takanashi (JEITA)	11/12/2008	Effective Date	Can the Version 5.0 specification be applied after the final version is issued (Jan. 21, 2009)?	Manufacturers may begin qualifying Version 5.0 products as soon as the specification is final, however products labeled as ENERGY STAR and manufactured prior to the effective date must meet Version 4.1.
Draft #2 Version 5.0	85	Mark Hollenbeck (HP)	11/12/2008	User information commitments	This is new - similar to the requirements in the PC spec. we implemented over 1 year ago. We would need to develop a standard statement for product user manuals referring to PCs with power management capabilities as the PCs control power management – not typically the Displays themselves.	EPA acknowledges the power management function usually rests with the PC as opposed to with the display itself. EPA is interested in receiving feedback from manufacturers on their ability to provide power management language in the product manual or as a box insert.
Draft #2 Version 5.0	94	Mark Hollenbeck (HP)	11/12/2008	List of qualified models	As previously discussed (and noted in the input for the final PC spec.), the requirements should be modified to note that listing products via the OPS tool satisfies the requirement of updating the EPA with models that qualify. Additionally, we had reached agreement with ICFI and the EPA to use a standard product life cycle time period for each type of product, after which time products are removed from the list of qualified products (based on the date the product was listed).	The language referencing qualified product submittal in the Display Draft 2 specification is exactly the same as in the Computer V5.0 specification.
Draft #2 Version 5.0	174	Mark Hollenbeck (HP)	11/12/2008	Definitions	"We don't have plans for that topology (display screen and associate electronics encased into single housing), but it is possible to put the power supply in a box, the video circuits in another box and the display head in a 3rd."	In the draft Final version of the Display specification, EPA is seeking input from all partners on the relevancy of this single housing requirement. Removal of single housing language seems to make sense but we received only one set of comments on this specific issue. EPA has re-asked this question in the draft final.
Draft #2 Version 5.0	199	Mark Hollenbeck (HP)	11/12/2008	Off Mode (Power Switch Off)	We would prefer that the vacation switch is allowed for off mode independently of other switches	The objective is to measure Off Mode power consumption in the mode the user is most likely to use. This implies using the Off Mode engaged by the switch the user will find easiest to access. Since there is considerable variation in display buttons and design, we have defined the Off Mode button based on location rather than specific terminology.
Draft #2 Version 5.0	199	Mark Hollenbeck (HP)	11/12/2008	Off Mode (Power Switch Off)	Delete "that is most easily accessed by the user" because that reduces the power consumption the most.	The objective is to measure Off Mode power consumption in the mode the user is most likely to use. This implies using the Off Mode engaged by the switch the user will find easiest to access.
Draft #2 Version 5.0	248	Mark Hollenbeck (HP)	11/12/2008	Data Set	There are no plasma displays, only plasma TV	EPA would appreciate clarification of this comment. It is our understanding that professional displays are NOT televisions but a separate category.

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Draft #2 Version 5.0	283	Mark Hollenbeck (HP)	11/12/2008	Data Set	Approximately 24% (seems quite high)	The two rounds of data we have received from display manufacturers supports our assertion that approximately 24% of the models incorporate this technology.
Draft #2 Version 5.0	372	Mark Hollenbeck (HP)	11/12/2008	Lab accreditation	Regarding the proposal to require use of formally accredited labs for product qualification testing (lines #372 - #379): HP sees no value in requiring manufacturers to use accredited labs for product testing as this will slow down manufacturers' compliance testing processes, add additional expense to product development with no end user benefit. This input is consistent with the input HP and ITI provided on provided on the final PC specification (ITI letter dated November 6, 2008).	Prior to the Draft 2 Specification webinar, EPA provided stakeholders with a change in the language requiring lab accreditation. The proposed language requires facilities to have quality control procedures in place and recommends ISO 17025 as an appropriate reference for sound quality control requirements.
Draft #2 Version 5.0	372	Mark Hollenbeck (HP)	11/12/2008	Lab accreditation	SJEITA does not want the expense and delay of limiting the labs. As an alternative, we want at least 5 accredited labs identified in both Taiwan and China prior to the affectivity of ES 5.0.	EPA is not requiring third party testing. The Draft 2 and recently proposed language requires facilities to have quality control procedures in place and recommends ISO 17025 as an appropriate reference for sound quality control requirements.
Draft #2 Version 5.0	531	Mark Hollenbeck (HP)	11/12/2008	Table 4. Luminance Settings for Testing Displays	Disagree with luminance for displays "Less than 30" viewable diagonal screen size and greater than 1.1 MP resolution". Higher resolution displays are not TV and are operated at same conditions as other monitors. 175 nits	EPA appreciates the comments but our dataset suggests otherwise. EPA would appreciate any relevant additional data that supported this perspective.
Draft #2 Version 5.0	531	Mark Hollenbeck (HP)	11/12/2008	Table 4. Luminance Settings for Testing Displays	For displays "Greater than or equal to 30" viewable diagonal screen size 350 too high for 30" monitor. LP3065 max is 370 typical. Many less	For professional displays, since EPA is proposing using the IEC 62087 test procedure, we anticipate requiring professional displays to be tested as shipped but report the luminance along with the on mode power consumption level. Under Tier 1, all displays less than 30 inches will continue to test at prescribed luminance based on screen size and resolution. But, under Tier 1, all professional displays will test their products as shipped and report the luminance, based on a prescribe luminance testing method. In the interim between Tier 1 and 2, EPA will continue to require default luminance setting for less than 30 displays but will assess this issue and may require all displays to be tested as shipped under Tier 2.
Draft #2 Version 5.0	619	Mark Hollenbeck (HP)	11/12/2008	Submittal of Qualified Product Data to EPA	This is outdated language that must be updated to reflect the agreement reached with the EPA/ICFI to simply remove qualified displays from the list of qualified products x months after the product was listed. There is no reason to add additional burden requiring manufacturers to go back into the OPS tool and de-list products that may no longer be sold.	EPA will remove "as well as discontinued models" in the Draft Final version of the specification.

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Draft #2 Version 5.0	667	Mark Hollenbeck (HP)	11/12/2008	GHGs	<p>HP is opposed to the idea of expanding the ENERGY STAR program scope to include restrictions or controls on chemicals used in product manufacturing processes for a number of reasons. First, chemical restrictions in products and manufacturing processes are regulated by other regulations and industrial standards. Second, almost all displays are not manufactured in the US. The display manufacturers are already obligated to comply with all regulations and workplace standards in the countries where the displays are manufactured. Secondly, the strength of the ENERGY STAR program in the past has been the fact that it focused solely on the energy consumption of the product in the use phase, which can be measured and verified, and lower power can benefit the purchaser through lower energy bills. We feel that it is inappropriate to consider expanding the scope of the ENERGY STAR program beyond product energy efficiency into areas that can not be definitively measured and verified.</p> <p>We believe that the ENERGY STAR program should stick to the energy consumption of the product itself during use which can be verified (just like the mpg fuel efficiency rating looks at the vehicle efficiency and not manufacturing or other lifecycle stages or attributes that are difficult to measure and control). If the EPA decides to expand the scope of the ENERGY STAR program beyond product energy consumption in use, this potentially opens up everything -- manufacturing, distribution, end of life, etc. which would add additional complexity and uncertainty (un-measurable, can not be verified, etc.).</p>	EPA is initiating a discussion with stakeholders to explore ways in which the ENERGY STAR Program might address product attributes such as life cycle energy use and other environmental characteristics so as to ensure that products that display the ENERGY STAR label continue to meet consumer expectations. EPA is exploring the opportunity to reduce F-GHG emissions from LCD manufacturing by working with display and television producers and their suppliers to discuss options for incorporating requirements into future ENERGY STAR specifications or highlighting products that have this additional lifecycle benefit.
Draft #2 Version 5.0	Note at 184	Mark Hollenbeck (HP)	11/12/2008	N/A	Deleted "including digital photo frames" and "digital photo frames".	Digital photo frames are included in our data set and are a product category under this broader display specification.
Draft #2 Version 5.0	223	Patrick Summers (NEC Display Solutions of America)	11/12/2008	On Mode Requirements	We understand that the goal of the specification is to reduce the power consumption but it seems in some areas a large degree of screen performance will have to be sacrificed. This may prevent us from being able to address the current user with a user that wants to lower their power consumption. In a retail situation it will also appear that a non-ES5.0 product looks better visually than an ES5.0 rated display.	EPA hopes that by changing the professional display test procedure to the IEC 62087, that the testing and luminance levels will be more representative of the energy usage patterns.
Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Product Definition	We are positive regarding aspects in the revised specification such as broadening of the specification to include all displays and power management for all types of displays.	EPA appreciates the support for broadening the scope of products under this specification and our requiring power management for all product types. EPA is committed to ensuring that all ENERGY STAR models have at least one power management function enabled.

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Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Test Method (IEC 62087)	<p>We believe that the current test approach for displays under 30 inch diagonal is flawed for the following reasons:</p> <ul style="list-style-type: none"> • Not technology neutral - all products/technologies are not treated equally • Lack of harmonization – could have referenced IEC 62087 as for larger screens. • Specified luminance testing not representative of actual consumption. 	EPA continues to take a technology-neutral approach when developing specifications. EPA has concluded that there is currently insufficient data upon which to base performance requirements, consistent with ENERGY STAR program principles. Further, EPA believes that the Monitor 4.1 VESA test procedure may not adequately represent professional display's operations and use. During Draft 1, EPA proposed testing at the default luminance setting. Based on feedback from the majority of manufacturing stakeholders, we have reverted to providing a set luminance (although now based on screen size) that approximates the as-shipped settings. EPA is open to exploring re-visiting this issue under the Tier 2 process.
Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Test Method (IEC 62087)	<p>In addition, there is also the following issue for the use of the IEC test approach for displays over 30 inch diagonal:</p> <ul style="list-style-type: none"> • Use of only the static test pattern from the IEC 62087 test method does not provide meaningful luminance measurements. The static pattern test is not accurate for LCDs. Black level pattern often immediately triggers a low power state for the monitor giving an error in the final power calculation or making an accurate reading very transient and difficult to achieve. • The use of static test patterns of more than 35% Average Picture Level (APL) is risky on PDP monitors since they will almost certainly trigger power supply protection and provide a meaningless power measurement in the final formula. In the static pattern test three of the patterns, colour bar, three bar and white are 50% APL or more. This was the reason for introducing the broadcast and internet test loop methodology (to avoid misleading readings on some display technologies) 	We are gathering On Mode power consumption data from the 3 different test patterns (static, broadcast, and internet signals). Based on the data we receive from stakeholders, we will determine which test pattern provides the most accurate On Mode power consumption for professional displays. EPA appreciates the EU comments concerning the use of the static test pattern.
Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Test Method (IEC 62087)	Whilst it is believed that Tier 1 should ideally be aligned with IEC now, in order that the revised specification to be released as soon as possible, an alternative approach is suggested below. This approach should satisfy the interests of all parties and be in line with global harmonization principles (although achieving these later than anticipated).	EPA appreciates these comments but we have neither the data nor stakeholder support to set the Tier 2 limits nor the other program requirement suggested. During Tier 2, EPA will re-examine the market penetration of ENERGY STAR, re-evaluate the luminance requirements, move all products under the IEC 62087 test procedure, and continue to explore GHG emissions. EPA is still committed to addressing the issue of convergence and is working towards ensuring there is consistency between the TV and the Display specifications.
Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Tier 2	<p>The following is requested:</p> <ol style="list-style-type: none"> 1. A detailed outline of intentions for a Tier 2 specification is provided in the final display specification, stating that the Tier 2 revision will address the following: <ul style="list-style-type: none"> • Testing at default luminance using the IEC test approach (most important) • % peak luminance limit used to define reasonable boundaries for default luminance. • Reassessment of the need for resolution in the on mode formula based upon new data sets. • Harmonization with developments in TV specifications (ENERGY STAR and EU Energy Using Products (EuP) directive). 	

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Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Tier 2	2. In order to ensure that this harmonized Tier 2 approach can be taken into account in the development of EuP regulations, it will be necessary for the timescales for this specification to be shortened, so that a final specification is available much sooner: <ul style="list-style-type: none"> • Tier 2 discussions commence 2nd quarter 2009 • Tier 2 test methodology and energy- efficiency criteria principles finalized by end 2009 This would also need to be specified in the text provided on Tier 2 intentions in the final version 5.0 display specification.	EPA's response is the same for ECESB request #1 and #2.
Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Test Method (IEC 62087)	3. In order to ensure consistent testing of larger LCD screens using IEC 62087, the test loop methodology should be strictly adopted (without modification) at the delivered and other pre-set modes of the monitor. To address concern over manufacturers using marginal luminance levels, the manufacturer can be asked declare the peak luminance capability of the monitor and the ratio of that to delivered and other pre-set modes. EPA could then prescribe limits based on market averages e.g. monitor shall never be less than xxx Cd/M2 in maximum luminance pre-set mode and delivered mode should never be less than x% of this.	EPA appreciates the comment that professional displays be tested at as shipped levels. This will be a key discussion topic at the 2/18 webinar. EPA is reviewing the TV specification to ensure we treat these products similarly.
Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	On Mode Requirements	We are concerned about the levels that might be too high. A recent test in the German computer magazine c't shows that 4 out of 8 monitors tested complies with Energy Star. The market might already have moved towards more efficient monitors since the data collection. The test data can be submitted to EPA, if desired. It seems further that the compliance level for devices with a screen size of less than 30" and a resolution of less than 1.1 megapixels is already about 30 %.	The ENERGY STAR program is a voluntary initiative, not a standard, that identifies approximately the top 25% performing models in the market in terms of energy efficiency. EPA modifies the 25% target as necessary to ensure consumers have a choice among products and manufacturers. EPA has determined that the specified On Mode power equation will allow for a selection of qualified products in <30 inch range to qualify under the version 5.0 criteria.
Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Sleep & Off Modes	The off, sleep and on definitions have been changed since last draft and the reason seems not obvious. E.g. the off mode definition is hardly not a definition.	EPA has clarified the Off Mode definition in the final version of the specification. Changes were made in Draft 2 and Draft Final in response to stakeholder comments.

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Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Resolution	Resolution vs. area for on mode level requirement: We request that the categories based on a combination of resolution and area for the on mode requirement will be re-evaluated in Tier 2.	EPA sets its specification as a function of resolution as it is a performance feature consumers base purchasing decisions on and more power is needed to meet that particular consumer expectation. The data EPA has received from display manufacturers show that resolution is a greater factor than screen area in determining power consumption for small displays. EPA's analysis of the data also suggests that resolution is a better predictor of On Mode power consumption for units tested at default luminance settings, although incorporating screen area provides some marginal improvement. Our analysis further suggests that incorporating screen area provides more significant importance and flexibility in the context of designing an approach to encompass frames and signage, which have different On Mode power, mega pixel, and screen area relationships
Draft Final Version 5.0	N/A	Jan Viegand (ECESB WG)	1/21/2009	Sleep & Off Modes	Sleep and off mode requirements We further request to make the Energy Star specifications for sleep and off mode levels consistent with the EU ecodesign regulation (implementing directive for standby and off modes) for all monitors including the large (> 30 in) monitors. Manufacturers who wish to sell their products on the EU market will have to comply by law with the EU regulation as early as January 2010. Harmonization of these requirements will be an advantage of both procurers and manufacturers. The requirements are: <ul style="list-style-type: none"> • 1 year after regulation has entered into force expected by January 2010: 1 watt (2 W if including an in-formation or status display) for off and standby modes. • 4 year after regulation has entered into force expected by January 2013: 0.5 W (1 W if including an infor-mation or status display) in off and standby. These requirements should be stated as a target in Tier 1 specification. The on-mode levels should not be relaxed as a consequence of this request.	EPA is committed to working towards a 1 W Sleep/Standby Mode requirement for all products, where feasible. As professional displays are a new product, we are setting the Sleep and Off mode efficiency criteria based on the data we have received. Under Tier 2, we anticipate requiring all ENERGY STAR products to meet the 1 W criteria for Sleep and Off.
Draft Final Version 5.0	N/A	Kenichi Takanashi (JEITA)	12/26/2008	Screen Size	Maximum viewable diagonal screen sizes for eligible products The Draft sets the maximum viewable diagonal screen size at 84 inches. We believe, however, that no maximum screen size should be specified because the screen sizes of professional signage are increasing every year.	To date, EPA has not receive any power consumption data to suggest that products above the 84 inch diagonal would qualify under the proposed specification power consumption levels. EPA is continuing to explore larger screen displays while determining the On Mode power consumption criteria. EPA would be interested in receiving data to support the inclusion or exclusion of an upper limit.

Document	Line number	Commenter	Date Submitted	Topic	Comment	Response
Draft Final Version 5.0	N/A	Kenichi Takanashi (JEITA)	12/26/2008	Tuners	In Japan, products cannot apply for Energy Star as TVs. Therefore, from Tier 2 on, products with tuners would not be able to apply in Japan. Consequently, we would like the Draft changed so that products with tuners can continue to apply as display monitors as before even after Tier 2 is introduced.	The TV Tier 2 specification process will be completed prior to the Display Tier 2 process and thus industry has ample time to make changes to their products in order to meet the appropriate specification. EPA will not be changing its intention for products with tuners needing to qualify for the power consumption requirement under the TV spec and not the display spec. If interested, Japan can expand the products covered under the ENERGY STAR MOU to go beyond office equipment and cover consumer electronics. EPA looks forward to working with Japan to explore this expansion opportunity.
Draft Final Version 5.0	Annex 1 page 3	Kenichi Takanashi (JEITA)	12/26/2008	Luminance Test Patterns and Procedures	We believe that displays that cannot be set to the luminance values specified in Table 4 should be tested at the display's maximum luminance. Thus, we feel the following paragraph should be added to this item in the same way as the Version 4.1 specification. [If the computer monitor's maximum luminance is less than the luminance value specified in Table 4 (e.g., 150 candelas per square meter), then the technician shall use the maximum luminance (e.g., 150) and report the value to EPA with other required testing documentation. Similarly, if the computer monitor's minimum luminance is greater than the luminance value specified in Table 4 (e.g., 400 candelas per square meter), then technician shall use the minimum luminance (e.g., 400) and report the value to EPA.]	EPA concurs and has added language to Annex 1 to clarify that if the display's maximum luminance is less than the luminance prescribed for testing On Mode power, the tester should use the maximum luminance and report the value along with the other required documentation.
Draft Final Version 5.0	N/A	Kenichi Takanashi (JEITA)	12/26/2008	Effective Date	We would like the transition time set to one year (April 1, 2010). Otherwise, we would like the effective date to be Friday Jan. 1, 2010. In general, setting effective dates to the first day of a month is easier for manufacturers to control the production than other dates.	EPA is committed to a prompt but reasonable transition period for this specification revision and believes adequate notice of the effective date has been provided.
Draft Final Version 5.0	272	Kenichi Takanashi (JEITA)	12/26/2008	Tier 2	Tier 2 On Mode requirements: When will the maximum On Mode power consumption levels be decided?	EPA anticipates developing the Tier 2 On Mode power consumption in association with the Tier 2 specification development process in 2010.
Draft Final Version 5.0	Annex 1 page 4 & Annex 2 page 2	Kenichi Takanashi (JEITA)	12/26/2008	ABC	Your calculation for the power consumption value of displays equipped with automatic brightness control assumes operation at an ambient light level of 300 lux for 80% of the time and at an ambient light level of 0 lux for 20% of the time. What is the rationale or basis for this calculation? Furthermore, why did you select 300 lux and 0 lux for the ambient light level conditions?	ABCs were addressed in another ENERGY STAR specification (TV V3.) and EPA incorporated the negotiated levels and power consumption equations into the Display specification
Draft Final Version 5.0	N/A	Kenichi Takanashi (JEITA)	12/26/2008	Effective Date	Can the Version 5.0 specification be applied after the final version is issued (Jan. 30, 2009)?	There will be a period prior to the October 30 date by which manufacturers can begin to qualify their products via the Online Product Submittal (OPS) tool. There may be an opportunity for manufacturers to early qualify their products if interested, pending funding availability.

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Draft Final Version 5.0	N/A	Hiroyasu Kyozyuka (MouseComputer Corporation)	12/22/2008	Luminance	<p>1. Tested luminance for LCD Display.</p> <p><Final Draft> Two different luminance settings: Displays of less than or equal to 1.1 MP resolution shall be tested at 175 cd/m2, while displays of greater than 1.1 MP resolution shall be tested at 200 cd/m2.</p> <p><Request> Displays of less than or equal to 1.1 MP resolution and greater than 1.1 MP resolution shall be tested at 175 cd/m2.</p> <p>I think that 200 cd/m2 is too bright in the office environment.</p>	EPA determined testing should occur at these luminance settings after finding they were closer to the average as-shipped luminance levels of the two display resolution classes mentioned here.
Draft Final Version 5.0	N/A	Hiroyasu Kyozyuka (MouseComputer Corporation)	12/22/2008	On Mode Requirements	<p>2. On mode limit value</p> <p><Final Draft> Screen Resolution \leq 1.1 MP : PO = 6*(MP) + 0.05*(A) + 3 Screen Resolution \geq 1.1 MP : PO = 9*(MP) + 0.05*(A) + 3</p> <p><Request> When I compared New Energy Star with Now Energy Star, CCC has low 10-20W. Because I think that 10-20W is too big. I hope On mode limit value performs it step by step as follows.</p> <p>>Tier 1 On Mode Power Consumption Requirements Screen Resolution \leq 1.1 MP : PO = 6*(MP) + 0.05*(A) + 3 + 5 Screen Resolution \geq 1.1 MP : PO = 9*(MP) + 0.05*(A) + 3 + 5</p> <p>>Tier 2 On Mode Power Consumption Requirements Screen Resolution \leq 1.1 MP : PO = 6*(MP) + 0.05*(A) + 3 Screen Resolution \geq 1.1 MP : PO = 9*(MP) + 0.05*(A) + 3</p>	EPA determined these equations resulted in a pass rate of approximately 25% of the models in the dataset from which the equations were derived. This is consistent with EPA's goal of a 25% pass rate upon launch of a new specification or specification revision.
Draft Final Version 5.0	N/A	Mark Sharp (Panasonic)	1/21/2009	Test Method (IEC 62087)	As we have previously commented to ENERGY STAR, most of the applications for which our professional displays are commonly used do not require high APLs, thus obviating the need for a measurement using computer-generated input signals. Thus, we agree with EPA's decision that the measurement protocol be based on the IEC 62087 test procedure, not the VESA based method.	EPA believes that the Monitor 4.1 VESA test procedure may not adequately represent professional display's operations and use, and hopes that the IEC 62087 is a more appropriate test procedure.
Draft Final Version 5.0	N/A	Mark Sharp (Panasonic)	1/21/2009	Tuners	Panasonic models sold to the hospitality industry, bars, restaurants, and broadcast studios are sometimes sold without installed tuners, making these applications more appropriate for coverage under the ENERGY STAR TVs 3.0 specification. In many cases, these applications are complemented with set top boxes using HDMI or HD-SDI inputs, allowing for "tuner-free" use. As you know, ENERGY STAR qualified set top boxes are now widely available, which should further contribute to energy savings when paired with our ENERGY STAR qualified TVs.	The TV Tier 2 specification process will be completed prior to the Display Tier 2 process and thus industry has ample time to make changes to their products in order to meet the appropriate specification. EPA will not be changing its intention for products with tuners needing to qualify for the power consumption requirement under the TV spec and not the Display spec.
Draft Final Version 5.0	N/A	Mark Sharp (Panasonic)	1/21/2009	Tuners	Some customers request a "slide-in" slot card that is used to allow functional flexibility and accommodate specified tuners. When equipped with a tuner, the professional display will consume additional energy, when compared with displays not similarly equipped. Therefore, an allowance for the tuner is necessary in the specification to enable end users preferring this type of application to still be able to purchase ENERGY STAR qualifying models. Panasonic recommends an allowance of 40 watts to allow for this form of application.	(Continued on page 30)

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Draft Final Version 5.0	N/A	Mark Sharp (Panasonic)	1/21/2009	Tuners	Again, it is important that EPA recognize expansion slots for tuners allow for input of video signals, not computer generated inputs. Thus, this application should be allowed to use the TVs Version 3.0 specification to determine ENERGY STAR qualification. Consistent with specified applications being treated as TVs for purposes of ENERGY STAR qualification, internet content video should not be included for on mode testing. Typically, internet content is not used in this type of application, which is not computer input driven.	We are anticipating that since TV and professional displays will be using the same test procedure, the power consumption differences between similar sized/resolution models will be comparable.
Draft Final Version 5.0	N/A	Mark Sharp (Panasonic)	1/21/2009	Test Method	In addition, Panasonic supports an allowance for the testing condition using factory default settings with a "forced menu" option. This allowance is consistent with the TVs Version 3.0 specification and will help to ensure all models are tested in equivalent settings. It will also likely spur additional energy savings as end users upon setup will need to actively set the unit's power consumption, and often opt for a lower power-consuming option (typically known as standard brightness levels) offered as a means to most efficiently operate the unit.	EPA would welcome additional information on testing with a "forced menu" option, and how doing so would help ensure all models are tested in equivalent settings.
Draft Final Version 5.0	N/A	Mark Sharp (Panasonic)	1/21/2009	Luminance	Panasonic strongly recommends that EPA not establish any parameters for luminance. When used for plasma televisions, luminance measurements using four static signals, inherently vary considerably (APL variance between 1%-30%), thus creating unfair and adverse consequences. Simply stated, luminance parameters cannot equitably be used to compare different technologies (especially LCD and PDP). Also, any required or recommended luminance levels would need to vary considerably by application, purpose, circumstance, or content. For this reason, we recommend against any prescribed levels for luminance.	EPA is currently reviewing professional displays data pursuant to its effort to finalize the On Mode power consumption test method for displays greater than or equal to 30 inches viewable diagonal screen size. The inclusion of set luminance levels in this test method is under consideration pending the results of EPA's analysis of the Partner-submitted data.
Draft Final Version 5.0	N/A	Yasuhiro Tanaka (METI)	12/26/2008	Off Mode (Power Switch Off)	The second characteristic of displays in Off Mode that is described as being "engaged by a power switch" is not clear and may not describe Off Mode well. Please rephrase it with other words for clarification.	EPA has clarified the Off Mode definition in the final version of the specification. Changes were made in Draft 2 and Draft Final in response to stakeholder comments.
Draft Final Version 5.0	Page 6	Yasuhiro Tanaka (METI)	12/26/2008	Tuners	Since the differences between TVs and displays are becoming smaller, it is suggested to develop a comprehensive specification dealing both displays and TVs, such as Imaging Equipment Specification, instead of implementing Display Specification Ver5.0 Tier2 in 2011.	Since the inception of the Display specification in the October 2007 discussion guide and the November 2007 Display kickoff discussion, EPA has been working towards unifying the TV and Display specification into a cohesive strategy since these products seem to be converging. For us, the first steps are harmonizing definitions and test procedures.
Draft Final Version 5.0	Page 6	Yasuhiro Tanaka (METI)	12/26/2008	EPSs	Test voltage for EPS shall be the same one for Displays which the EPS will be used with.	Yes, if a display uses an EPS, then beyond the display power requirements, the EPS must meet the energy efficiency requirements in the current ENERGY STAR EPS specification.

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Draft Final Version 5.0	Annex 1 page 2, 4, 5	Yasuhiro Tanaka (METI)	12/26/2008	Sleep & Off Modes	According to the third step of Sleep Mode test method, the true average of all Sleep Modes shall be used for qualification if displays have automatically cycled Sleep Modes. In some cases, although some of these auto-cycled Sleep Modes exceed Sleep Mode criteria, the display model still qualify as ENERGY STAR with the true average. Does it have a consistency with Sleep Mode requirement (page 8 of Specification) that displays with multiple Sleep Modes are required to meet the criteria in all of the modes?	It is EPA's intent that if a display model has multiple sleep modes, then it must meet the Sleep Mode requirements in all modes. If the modes are cycled through automatically, then the true average - which is the value reported - must meet the Sleep Mode power requirement. In Tier 2, EPA will work with stakeholders to clarify this issue, if necessary.
Draft Final Version 5.0	Annex 1 page 2 & 3	Yasuhiro Tanaka (METI)	12/26/2008	Luminance	Displays are required to be tested with specified luminance settings. However, there may be some products which are not capable to achieve the provided luminance level. In Version 4.1, how to address such products is provided under Item F on Page 9. In short, the maximum luminance of a model is below the provided level, then the maximum luminance shall be used for testing; the minimum luminance of a model is over the provided level, then the minimum luminance shall be used for testing. It is recommended including the same clause in Version 5.0.	EPA concurs and has added language to Annex 1 to clarify that if the display's maximum luminance is less than the luminance prescribed for testing On Mode power, the tester should use the maximum luminance and report the value along with the other required documentation.