

| Topic                   | Subtopic                      | Stakeholders Comment Summary   | U.S. Environmental Protection Agency Response  |
|-------------------------|-------------------------------|--|--|
| Definitions             | Monitors and Signage Displays | <p>One stakeholder suggested 30 inch diagonal screen size demarcation is more appropriate than pixel density for defining Monitors (&lt; 30") and Signage Displays (≥30"). Under Draft 1, a 4K resolution Signage Display with a screen diagonal less than 62.3 inches would have resolution ≤5,000 pixels and would be considered a Monitor. This issue would be worse for future 8k displays.</p> <p>Another stakeholder suggested EPA consider distinguishing Monitors from Signage Displays with a marketing description rather than physical criteria to prevent a model from inadvertently being placed in the wrong category. The stakeholder noted a brief review of brand and retailer websites indicated the two product types are marketed distinctly and completely separately.</p> <p>A third stakeholder suggested that the delineation between "Monitors" and "Signage Displays" be based on a combination of a minimum diagonal screen size and maximum luminance values.</p>          | EPA understands that pixel density alone may no longer be appropriate for differentiating between Monitors and Signage Displays. Therefore, EPA has proposed a set of criteria based on brightness, pixel density, and screen size. A Display must meet two of the criteria to be classified as a Signage Display. With this approach based on physical criteria, EPA aims to eliminate any ambiguity within the product classifications while still testing and assessing the products according to their intended environments.  |
| Definitions             | Enhanced Performance Displays | One stakeholder commented, "given that regulators globally often classify products according to the ENERGY STAR Program Requirements, Industry prefers that the separate definition for Enhanced Performance Displays be maintained in the product definitions section of the ENERGY STAR specification (as a subset of Electronic Displays that are in scope)."   | EPA notes that the criteria are continually updated to capture the latest market developments in high performance products. Therefore, EPA will not include Enhanced Performance Displays in the Definitions section acknowledging that these types of products change over time and are not permanently fixed into one category.  |
| Definitions             | Color Gamut                   | One stakeholder noted that much of the color information in the EPA data set is in terms of the NTSC gamut designed for analog television and that the color space is not consistently noted among models. The stakeholder suggested EPA define color gamut and require consistent reporting in terms of percentage of sRGB coverage in the CIE 1976 (u'v') color space which is more uniform than the CIE 1931 space, reflects the current practice in color science, and helps better differentiate model performance.   | EPA agrees with the stakeholder and has proposed in Draft 2 that shall be reported in the CIE 1976 u' v' color space. To minimize ambiguity and harmonize with the latest industry standards, EPA has additionally referenced the Section 5.18 Gamut Area of the Information Display Measurements Standard Version 1.03 for guidance on measurement and reporting.   |
| Definitions             | Touch Technology              | One stakeholder suggested revising the definition of Touch Technology to "Enables the user to interact with a display by touching areas on the display screen" to include only the displays screen and eliminate touch functions related to other surfaces such as a track pad on a keyboard or a surface of a switch.   | EPA thanks the stakeholder for the suggestion and has revised the definition of Touch Technology in the Draft 2 specification to include only the screen and eliminate touch functions related to the other surfaces. However, EPA also notes that it is no longer proposing an adder for touch functionality due to a lack of clarity whether monitors with touch technology were tested with it enabled, resulting in insufficient data on which to base an allowance. EPA welcomes stakeholder clarification on whether existing test data in EPA's dataset accounts for touch functionality enabled by default and any additional data referencing power consumption related to touch functionality. |
| Definitions             | Product Family                | One stakeholder welcomed further discussion of the Product Family definition around the differences between "common basic screen design" and "housing" as they could be considered contradictory.  | For clarification, EPA has modified the definition of Product Family slightly to refer to "External housing" to differentiate it from internal screen components.  |
| Scope                   | Power Source                  | One stakeholder commented that products "powered directly from ac mains or via an external power supply" should be included in the scope.  | EPA has clarified that products powered via an external power supply are included in Draft 2.  |
| Scope Included Products | Signage Displays              | Two stakeholders expressed support for including Signage Displays over 60 inches under the scope of the Version 7.0 specification with one stakeholder noting that this size category will comprise over 14 percent of the Signage Display market in the near future.  | EPA has maintained the expanded scope from Draft 1, such that it includes Signage Displays over 60 inches.   |
| Scope Excluded Products | TV Tuners                     | One stakeholder agreed with the simplified exclusion of products with TV tuners.   | EPA has kept products with tuners out of the proposed scope. To better understand how Display and TV products continue to evolve and converge, EPA welcomes information on forthcoming Display products with tuners, and conversely, TV products without tuners.   |
| Scope Excluded Products | KVM Monitors                  | One stakeholder argued that Monitors with keyboard, video, mouse (KVM) switch functionality should be excluded from scope because the proposed Total Energy Consumption Requirement duty cycle and Test Method power source procedures are not appropriate for the typical use of KVM. "To access and activate the KVM, the server rack must be opened, and the trays extended. After work is performed, the KVM is folded down and stowed back into the rack where the KVM enters Sleep Mode" for the majority of the time. Therefore the proposed Total Energy Consumption duty cycle of 35 percent of time spent in On Mode is not appropriate for KVM that are rarely in On Mode. The stakeholder further pointed out that although KVM are shipped with an AC power cord, the majority of dc products are powered via a Power Distribution Unit (PDU) whereas the Draft 2 ENERGY STAR Test Method only allows testing with dc power if it is the only available source of power for the products. | <p>EPA thanks the stakeholder for the comment. While the Total Energy Consumption usage profile may not fit every product within the scope, it does provide greater flexibility for specialty products by allowing the manufacturer to achieve power savings in either Sleep or On Modes depending on its unique functionalities to meet the singular TEC requirement.</p> <p>Therefore, EPA proposes to keep KVM products within scope, and test them with ac power if possible. EPA welcomes any comments regarding these products' ability to meet the Draft 2 requirements.</p>  |
| Scope Excluded Products | Computers                     | One stakeholder suggested that Displays with internal batteries and processors be removed from scope to eliminate overlap with Computers, and not confuse Signage Displays with internal processors with Portable All-in-one Computers.  | EPA notes that the Draft 1 list of excluded products mentioned integrated or replaceable batteries. However, EPA has further clarified this proposal to exclude products with integrated or replaceable batteries to support mobility and explicitly mention Portable All-in-one Computers as an example.  |

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| General Requirements              | Power Factor                | <p>Two stakeholders recommended EPA require a power factor of at least 0.9 at 100 percent rated load for Signage Displays. Low power factor leads to higher losses in Signage Displays for the following reasons:</p> <ul style="list-style-type: none"> <li>• Signage Displays have higher power levels than Monitors and other consumer products; and</li> <li>• Commercial buildings where Signage Displays are installed have longer wiring runs than residential buildings.</li> </ul> <p>The 0.9 requirement would align with the current internal power supply requirement in the Version 6.1 Computer specification.</p>  | <p>To address the stakeholders' concern, EPA is proposing that Signage Displays have a True Power Factor in On Mode greater than or equal to 0.7 to ensure products address broader losses while improving efficiency. Rather than develop an additional test for 100 percent rated load, EPA is basing the requirement on the existing True Power Factor measurement in On Mode already required under the ENERGY STAR Test Method. Data indicate that Signage Displays across all sizes and maximum luminance criteria are capable of meeting this Power Factor level. EPA welcomes stakeholder feedback on the impact of this proposed requirement.</p>   |
| General Requirements              | Power Management            | <p>One stakeholder group recommended revising the power management requirements (Section 3.2.2 text) to note that Monitors must be capable of being power managed by the host device/computer, versus the display itself being designed to implement power management. The stakeholder noted that Monitors do not power manage themselves (with certain exceptions) and instead support VESA Display Power Management Signaling (DPMS).</p> <p>Another stakeholder suggested that the Monitor be required to power down after a period of 5 minutes rather than 15 minutes upon disconnection from the host/computer arguing that this change would unlikely impact user experience.</p>  | <p>EPA notes that the requirement to have at least one power management feature includes but is not limited to VESA Display Power Management Signaling. Internal or host management, or both, may be employed for both Monitors and Signage Displays. Thus, EPA has not modified the existing language so that it may apply more generally to all products without being overly prescriptive.</p> <p>EPA agrees that the stakeholder's suggested requirement of a 5 minute power down is unlikely to impact the user experience, and has included it in Draft 2.</p>   |
| Total Energy Consumption Proposal |                             | <p>While they acknowledged the intended flexibility for manufacturers, three stakeholders disagreed with EPA's Monitor Total Energy Consumption proposal released with the Draft 1 specification for the following reasons:</p> <ul style="list-style-type: none"> <li>• Sleep Mode efficiency may decrease as the On Mode power of Monitors improves;</li> <li>• Only 1 percent of Monitors in the current EPA dataset have Sleep Mode power that exceeds the modal limit of 0.5 W;</li> <li>• Application and use case vary significantly for Monitors (office, home office, gaming, primary screen, extended desktop, etc.) making it difficult to pinpoint a representative duty cycle;</li> <li>• The Draft 1 TEC proposal is more lenient than the Draft 1 modal requirements;</li> <li>• A TEC approach adds complexity and makes the requirements less intuitive; and</li> <li>• Should unanticipated Sleep Mode functions arise, EPA could consider a minor update to the Version 7.0 specification after it is effective</li> </ul> <p>One of these stakeholders suggested EPA could propose a Total Energy Consumption approach under Version 8.0 where there would be a greater opportunity to vet the data and assumptions.</p>  | <p>In Draft 2, EPA is proposing to include the Total Energy Consumption (TEC) approach introduced in Draft 1. The TEC approach has been successfully used in the ENERGY STAR Computer, Set-top Box, and Imaging specifications, where it has led to a variety of benefits without losing efficiency gains in low-power modes. In particular, a TEC approach:</p> <ul style="list-style-type: none"> <li>• Provides more flexibility for manufacturers to take different design approaches to saving energy overall, rather than focusing only on individual limits. As such, a TEC approach focuses on the total energy and cost savings, rather than on specific components.</li> <li>• Allows for a requirement that is more stringent overall than is possible with a modal limit, given that today's monitors are both significantly more efficient and fully featured that models from previous years. Under a modal limit, as products become more fully featured, the likelihood becomes greater that multiple requirements must each be made less stringent to account for the interactions between features. A TEC approach maintains stringency in limits on power consumption, but the amount of Sleep Mode allowances become less critical to the overall energy performance of the product. Under a TEC approach, additional efficiency improvements would be needed in On Mode to counter any potential increases in energy consumption in Sleep Mode.</li> </ul> <p>EPA is sensitive to the concern that a TEC approach could slow further savings in low power modes. However, past experience suggests that for products with expanding functionalities, a TEC approach ultimately allows for more stringent requirements than a modal approach in combination with adders. EPA therefore believes it can set lower TEC levels than would be possible with a modal approach in combination with adders for energy using features.</p> |
| Monitors On Mode Requirements     | Hyperbolic Tangent Approach | <p>One stakeholder expressed support for the hyperbolic tangent On Mode Power requirement introduced in Draft 1, rather than a linear requirement, because it:</p> <ul style="list-style-type: none"> <li>• "Does not contain joints at arbitrary points,</li> <li>• Is a single, straightforward equation, and</li> <li>• Limits the power consumption of the largest sized, most power consumptive models."</li> </ul> <p>Conversely, another stakeholder argued that a linear function is more appropriate because "display power increases proportionally to screen area", so a hyperbolic tangent function penalizes larger displays relative to smaller displays.</p>   | <p>EPA proposes to retain its approach proposed in Draft 1, where larger products will reflect greater efficiencies. This approach continues to allow for a good selection of products across all sizes, including those in the larger sizes.</p>  |
| Monitors On Mode Requirements     | Requirement Level           | <p>One stakeholder expressed conditional support for the proposed Draft 1 Monitor On Mode power requirements, noting the age of the dataset and pace of technical advancement. A second stakeholder also supported the pass rate but noted that EPA should account for the ac-dc conversion for Dc-powered products.</p> <p>Three stakeholders requested less stringent On Mode power requirements for Monitors. One stakeholder argued that the manufacturing cost of TN panels would increase by 5 percent to meet the Draft 1 proposal and ultimately raise prices for consumers. The second stakeholder noted that industry has been "reducing 5-10 percent of power consumption every year" and "will hardly catch up" with the Draft 1 proposal. The third stakeholder commented that EPA did not take into account all Displays on the market.</p> <p>Conversely, two other stakeholders commented that the Draft 1 proposal will result in much higher qualification rate than EPA's target of 25 percent at the effective date of the new specification, as was the case with the Version 6 specification. Therefore, the stakeholders recommended that EPA set Monitor On Mode limits at 10-15 percent, with one again noting the age of models in the dataset. One stakeholder noted this target is particularly important for monitors in the 21-24 inch diagonal screen size category, which represent the majority of the market and where EPA proposed levels appear to correspond to relatively high qualification rates.</p> | <p>Recognizing the pace of innovation in the Monitors and Signage Display industries, EPA has proposed an approach that captures the current top performing products in the market. Since the release of Draft 1, EPA reassessed the dataset, which increased from 962 to 1051 models, and slightly increased the stringency of its On Mode power requirements to continue capturing only the current top performing products in the market. EPA seeks to ensure that ENERGY STAR remains a market differentiator for efficiency in monitors when the specification takes effect in 2016.</p> <p>In Draft 2, EPA has incorporated a Total Energy Consumption approach that captures models across all sizes and performance features (resolution, color gamut, and viewing angle). Despite the lower pass rate in monitors with 19-22 inch diagonal screen sizes, EPA notes that there is a small spread in energy use for these monitors, indicating only incremental improvements in efficiency are needed to meet the proposed criteria.</p> <p>Per the stakeholder's comment, EPA has removed the dc-powered products when developing the requirement since they were not tested with the Version 7.0 direct dc measurement procedures.</p>  |

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| Monitor On Mode Requirements | Resolution                    | One stakeholder expressed support for the continued incorporation of a screen resolution allowance because resolution does not necessarily scale linearly with screen size and it ensures availability at the most popular screen resolutions. Further the stakeholder supported the Draft 1 proposal to reduce the Version 6 coefficient of 6 W per megapixel resolution to a 2 W per megapixel. Another stakeholder, however, recommended EPA set the resolution allowance at 4 W per megapixel to make the overall criteria less stringent.   | EPA has maintained the Draft 1 On Mode resolution coefficient of 2 W per megapixel and translated it into the proposed Total Energy Consumption requirements. The data do not support an increased resolution allowance of 4 W as the subtraction of this allowance from measured On Mode power values results in negative values for several models. The 2 W coefficient sufficiently captures models across a wide range of resolutions up to 4K/Ultra High Definition.   |
| Monitor On Mode Requirements | Viewing Angle                 | One stakeholder commented that viewing angles affect Monitor On Mode power when size and resolution are held constant. Therefore, the stakeholder requested that wider viewing angles receive a power allowance in the On Mode criteria, similar to resolution and color gamut.  | Using existing data reported to EPA under the Version 6.0 specification, EPA classified Monitors by viewing angle performance:<br>1: Less than 89° at either horizontal or vertical from the perpendicular<br>2: At least 89° at both horizontal and vertical from the perpendicular<br>3: A contrast ratio of at least 60:1 measured at a horizontal viewing angle of at least 85° from the perpendicular (Version 6.0 Enhanced Performance Display requirement)<br><br>Under the proposed Monitor TEC requirements, there is a good representation of models among these three classifications, indicating additional allowances are not warranted. EPA welcomes suggestions on how to further define viewing angle performance and specific examples of models unable to meet the TEC criteria because of viewing angle performance.   |
| Monitor On Mode Requirements | Color Gamut                   | Three stakeholders recommended EPA include a color gamut allowance in the Monitor On Mode Power calculation noting that higher color gamut models with other factors held constant (area and resolution) use more power. The inclusion of the allowance would enable partners to use color gamut to differentiate their products while maximizing efficiency.  | Under Draft 1, the enhanced performance allowance was proposed to apply to Displays that meet 99 percent sRGB color gamut in addition to contrast, viewing angle, and resolution requirements. In reviewing color gamut data submitted under the Version 6.0 specification, EPA estimates that nearly half the dataset covers the sRGB gamut indicating that this level of performance is representative of middle-tier rather than premium models.<br><br>EPA is therefore proposing limiting the allowance to models with larger color gamuts including those that meet Adobe RGB. Data indicate that models covering over 95 percent of Adobe RGB may require more power. (See Monitor On Mode Requirements Enhanced Performance Displays response below).   |
| Monitor On Mode Requirements | Automatic Brightness Control  | One stakeholder commented that Monitors in the EPA dataset do not appear to need the ABC allowance to reach the 25 percent qualification threshold. To better ensure actual energy savings, the stakeholder therefore suggested that the incentive require best practice ABC implementation based on efficient control curves that complement the ability of the human eye to resolve bright and dark sections of a display screen.  | EPA notes that to apply the allowance an ABC model must decrease power by 20 percent or more between 300 lux and 12 lux, ensuring the ABC functionality is delivering savings. Given that models with ABC enabled by default comprise only 2.5 percent of the dataset, EPA has maintained the existing structure of the allowance to further encourage wider adoption of the functionality.   |
| Monitor On Mode Requirements | Enhanced Performance Displays | One stakeholder commented that the color gamut requirement for the enhanced performance monitors allowance should reference the AdobeRGB color space, rather than the older sRGB color space since sRGB has already been achieved by 72 percent of models.<br><br>Another stakeholder separately commented that the Enhanced Performance Displays over 27 inches are normally positioned in high-end product segments that require higher luminance and more precise color accuracy. The stakeholder therefore suggested that these models receive a larger allowance: 75 percent of the Maximum On Mode Power, rather than the 30 percent proposed in Draft 1.<br><br>A third stakeholder commented generally that the Enhanced Performance Display allowance is too aggressive and will eliminate too many models. | Due to limited feedback, EPA proposes to retain the description of Enhanced Performance Displays (EPDs) from Draft 1, adding that "alternate color spaces are allowable as long as 99 percent or more of defined sRGB colors are supported."<br><br>However, based on feedback on color gamut, EPA further classified models, normalizing data on color performance to the CIE 1976 color space. By doing so, EPA found that nearly half of all monitors in the dataset cover the sRGB gamut, indicating that this level of performance is no longer limited to premium models.<br><br>However, holding resolution and area constant, EPA also found that increased color gamut performance does require more power. EPA is therefore proposing a tiered allowance level approach for EPDs as follows:<br>- 25 percent allowance for models meeting current EPD criteria<br>- 65 percent allowance for models meeting the current EPD criteria with color gamut greater than or equal to 99 percent of sRGB and 96 percent Adobe RGB.<br><br>Of models that meet the contrast ratio requirement of at least 60:1 measured at a horizontal viewing angle of at least 85° from the perpendicular and have HD resolution, the above approach achieves a nearly equal representation of 99 percent sRGB and Adobe RGB models meeting the proposed requirements.<br><br>EPA requests additional stakeholder feedback and data regarding how viewing angle and color and brightness uniformity affect power consumption. In particular, EPA is interested in understanding the predominant industry-accepted standard measurements for viewing angle and uniformity, and how these distinguish premium from entry-level models. |
| Signage On Mode Requirements | Percentage of Models Passing  | One stakeholder expressed support for the proposed Draft 1 Signage Display On Mode criteria noting that the percentage of models meeting is appropriate.   | EPA has corrected an error in the Draft 1 On Mode requirement equation for Signage Displays. As such, although the Draft 2 requirement is different from Draft 1, together with the power factor requirement, it now accurately captures the top 25 percent of signage products in EPA's dataset, as proposed in Draft 1.   |

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| Signage On Mode Requirements           | Luminance                           | <p>One stakeholder expressed support for the Draft 1 Signage Displays On Mode luminance allowance given the wide range of as-shipped luminance depending on application. The stakeholder additionally agreed with EPA's proposal to cap the allowance so that Signage Displays are not shipped too bright.</p> <p>A second stakeholder recommend increasing the luminance allowance from the Draft 1 proposal of 75 W per total megacandela to 100 W per total megacandela to better accommodate Signage Displays intended for high brightness environments. Additionally this stakeholder asked EPA to clarify that the Area unit in the luminance allowance calculation is intended to be square inches and not square meters since the latter is more common.</p> <p>In contrast, a third stakeholder disagreed with the proposed Draft 1 luminance allowance and suggested that all Signage models be tested at 200 candelas per square meter, like Monitors, with no luminance allowance. This would encourage efficiency (ratio of performance to power consumption), enable comparisons among models, while not encouraging excessive as-shipped luminance.</p> | <p>EPA notes that the luminance allowance is based on the Maximum Measured Luminance and therefore will not affect the As-shipped Luminance value. In Draft 2, EPA has additionally clarified the interplay between the luminance (in candelas per square meter) and area (in square inches).</p> <p>EPA is proposing to maintain testing at the As-shipped Luminance value to accommodate displays that operate in a wide range of illumination conditions. In the current dataset largely consisting of indoor products, the average As-shipped Luminance for Signage Displays is 387 candelas per square meter. Testing at 200 cd/m<sup>2</sup> would be far below representative conditions. Additionally, multiple luminance conditions would be needed to accommodate very bright displays over 1000 cd/m<sup>2</sup> Maximum Measured Luminance intended to operate in both indoor and outdoor conditions. Given the wide range of conditions for Signage Displays, EPA intends for the measured power values to reflect actual usage conditions to the extent possible.</p> <p>Under Draft 2, absent additional data, EPA proposes to retain the luminance allowance of 75 W per total megacandela (expressed as <math>7.5 \times 10^{-5} \times \ell \times A</math> in the Draft 2 Signage Display On Mode requirement equation).</p> |
| Signage On Mode Requirements           | Automatic Brightness Control (ABC)  | <p>One stakeholder recommended applying the same Automatic Brightness Control (ABC) allowance to Signage Displays as proposed for Monitors (0.05 times the Maximum On Mode Power) for models with ABC enabled by default, since some Signage Displays are designed to operate in a wide range of ambient conditions (indoor lighting to bright sunlight outdoors).</p> <p>A second stakeholder requested EPA harmonize ambient light conditions with the U.S. Federal TV procedure where possible while noting that signage may demand different treatment due to variable high ambient light conditions. Therefore, the stakeholder supports a call for data from industry regarding ambient light conditions and control curves of typical products.</p>   | <p>EPA anticipates savings opportunities for signage due to ABC and has proposed an allowance of 5 percent, consistent with monitors. EPA welcomes any data on the savings opportunity and feedback on the allowance.</p> <p>EPA is also interested in better understanding of the ambient light conditions for signage displays, anticipating that they will vary from those of residential televisions. EPA will continue to monitor the market and work with stakeholders to gather data as more signage products enter the market.</p>  |
| Sleep Mode & Full Network Connectivity | Definition and Reporting            | <p>For clarity and consistency, one stakeholder recommended EPA consider replacing the Draft 1 Sleep Mode term with Standby-Passive Mode, Standby-Active, Low Mode, and Standby Active, High Mode terms from the recently finalized Version 7.0 ENERGY STAR Television Specification. The stakeholder argued this revision would be clearer to consumers and other market actors since many of the same features and functionalities occur in the different standby modes for electronic Displays and Televisions.</p> <p>A second stakeholder similarly commented that Signage Displays do not have a Sleep Mode (in terms of VESA Display Power Management Signaling (DPMS)) and instead meet the definition of Standby Mode. A third stakeholder also commented that Full Network Connectivity is not a capability of the typical Sleep Mode host/device computer connection, requesting further clarification.</p>   | <p>EPA is continuing to propose using the mode names from the Version 6.0 Displays specification. Due to the lower prevalence of network connectivity in Displays than TVs, EPA proposes continuing to use Sleep Mode, supplemented with a notation whether Full Network Connectivity (in the Display device itself, rather than the host computer) is present.</p> <p>EPA also wishes to clarify that the VESA DPMS mode names do not align with those in the ENERGY STAR specification, with all the VESA low-power modes (Standby, Suspend, and Off) corresponding to Sleep Mode. Since this has not caused confusion in the past, EPA proposes to keep the existing ENERGY STAR definitions and mode names.</p>   |
| Sleep Mode                             | Power Requirements                  | <p>One stakeholder requested EPA provide more data and analysis to support the proposed Draft 1 Sleep Mode criteria. Further, the stakeholder suggested that EPA clarify when allowances apply and simplify where possible, by combining allowances and tying them directly to those features tested.</p>  | <p>EPA is no longer proposing an allowance for touch functionality in Draft 2 due to a lack of clarity whether monitors with touch technology were tested with it enabled, resulting in insufficient data on which to base an allowance. EPA welcomes further data. EPA has also clarified that allowances may only be applied once and only when features are active during testing.</p>   |
| Sleep Mode                             | Full Network Connectivity Allowance | <p>One stakeholder agreed with the Draft 1 proposal of a 0.5 W Sleep Mode allowance for Monitors with Full Network Connectivity. Another stakeholder, however, recommended that EPA adopt the ENERGY STAR Version 7.0 Televisions specification 3.0 W allowance due to "the commonality of network connection circuitry used for Signage Displays and televisions."</p> <p>A second stakeholder commented that it is unclear if Sleep Mode covers functions beyond Display Power Management Signaling (DPMS), in particular Full Network Connectivity and Wake-via-Infrared (IR).</p>  | <p>Due to the transition to a TEC requirement, which allows for more flexibility in implementing energy efficiency across On Mode and Sleep Modes, EPA proposes retaining the 0.5 W allowance (converted to kWh) for Full Network Connectivity.</p>   |
| Sleep Mode                             | Bridging Allowances                 | <p>One stakeholder commented that the Sleep Mode Bridging Allowances provided under Version 6.0 should not be eliminated as the existing designs and technologies for bridging have not changed and still require additional power in Sleep Mode.</p>  | <p>EPA's analysis of model data showed these functions did not require a significant amount of power, so EPA is not proposing any allowances in Draft 2.</p>  |
| Sleep Mode                             | Occupancy Sensor Allowance          | <p>Two stakeholders supported the Draft 1 proposal to retain the Version 6.0 Sleep Mode allowance of 0.5 W for an Occupancy Sensor because it provides energy saving benefits.</p>   | <p>EPA agrees with stakeholders that the occupancy sensor has the potential to save energy; Nonetheless, implementing such a sensor should take very little power, such that a limited allowance is necessary.</p> <p>EPA also welcomes feedback on any barriers that are currently preventing the wider adoption of this technology.</p>   |

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| Off Mode                                      | Power Requirement | One stakeholder requested EPA include a 0.25 W allowance in Off Mode for dc-powered products because they are "typically a secondary display (integrated into the housing of the primary display) that is provided for Commercial products where the computer user needs to share content with another person (typically a customer)."   | EPA thanks the stakeholder for the feedback. Per the example provided, unless both displays in such an integrated product are powered by Standard dc, the product shall still be considered ac-powered (even if one of the displays then takes dc power from the primary display and its power supply). However, if the two displays are sold as separate models for later integration by the end-user, then the dc-powered display can be tested separately without accounting for the losses of the rest of the system, such that no additional allowance appears necessary.<br><br>EPA welcomes further feedback on this issue. |
| Section 5: User Interface                     |                   | One stakeholder group recommended EPA "remove the User Interface standard reference, as the use cases are very different today from those that existed for the 2002 standard."   | The IEEE 1621 user interface standard was reaffirmed in 2014 and continues to evolve. EPA is proposing to continue referencing the standard, and has updated the Internet URL to: <a href="http://energy.lbl.gov/controls/">http://energy.lbl.gov/controls/</a> .  |
| Test Method                                   | Luminance         | One stakeholder expressed support for continuing to test Monitors at a luminance of 200 cd/m <sup>2</sup> and also recommended this approach be adopted for Signage Displays.<br><br>A second stakeholder disagreed with testing at a fixed luminance for Monitors. The stakeholder commented that most users likely do not adjust the brightness settings of the out-of-box configuration. Additionally, based on the stakeholder's testing, there was a 19 percent increase in reported power when luminance was tested at its default setting compared to at 200 cd/m <sup>2</sup> .  | DOE notes that average As-shipped Luminance for Monitors is 230 cd/m <sup>2</sup> , not significantly greater than the 200 cd/m <sup>2</sup> test condition, and has therefore maintained test conditions in Draft 2.  |
| Market Penetration Monitoring & Tier Proposal |                   | In order to address the issue of ENERGY STAR market share increasing well above the target under Version 7.0, two stakeholders recommended EPA consider either a tiered criteria approach or shortening the traditional 9 month period between finalization and effective date of the specification. Tier 1 might be effective at specification finalization, while a more stringent Tier 2 would be effective once Tier 1 market penetration reaches 50 percent.<br><br>To apply the tiered approach and to assess the progress of the specification more generally, the stakeholders asked EPA to work with industry to monitor the market penetration in real-time, where possible.   | EPA considers that its proposed Draft 2 levels are stringent enough to drive efficiency for the foreseeable future and is not considering a tiered approach.   |
| Test Method                                   | Luminance         | One stakeholder commented that the Test Method Automatic Brightness Control ambient lighting level should be updated from 10 lux to 12 lux as proposed in the Draft 1 Specification.   | DOE has updated the ambient lighting level in the Test Method from 10 lux to 12 lux.   |
| Test Method                                   | Sleep Mode        | One stakeholder requested EPA and DOE clarify the following section as to "whether the term "multiple sleep modes" in the text below refers to distinctly different power modes or a single sleep mode with different functionalities (i.e. different levels of network connectivity) which can be enabled or disabled."<br><br><i>C) Multiple Sleep Modes: If the product offers multiple Sleep Modes, the power during all Sleep Modes shall be measured and recorded. All Sleep Mode Testing shall be carried out as per Section 6.5.</i><br><br><i>The stakeholder suggested the text be revised to:</i><br><i>C) Multiple Sleep Modes: If the product offers multiple Sleep Modes or provides different functionalities in a sleep mode, the power during all Sleep Modes and with all functionalities both enabled and disabled, shall be measured and recorded. All Sleep Mode Testing shall be carried out as per Section 6.5.</i> | DOE has clarified the language surrounding multiple sleep modes in Section 5.1 C).   |
| Test Method                                   | Editorial         | One stakeholder commented that there is a reference to the ENERGY STAR Version 6.0 specification in the document which should be updated to reference the ENERGY STAR Version 7.0 specification. For purposes of clarity a reference should also be made to "displays". The stakeholder further suggested that the test method document should be updated if the ENERGY STAR specification changes to 7.1, etc.  | DOE has corrected the referencing error.   |