

Topic	Subtopic	Summary of Comments	EPA Responses
Additional Functionalities	New Functionalities	<p>To allow for continued innovation and adoption of server-client architectures, several stakeholders encouraged EPA to consider new Additional Functionality allowances including:</p> <ul style="list-style-type: none"> - Higher definitions beyond HD (1080p) - Transcoding/High Efficiency Video Coding (HEVC, H.265). Rather than include a new Additional Functionality, one stakeholder noted that the current definition of Advanced Video Processing includes transcoding and should be increased by additional 10 kWh/year to support its use in multi-room/gateway devices. - Networking: Network switching, wireless connectivity (including consumer- or carrier-grade), IP Network Router (with DHCP). Two stakeholders requested that separate allowances be available for each interface and network capability. - Internal mass storage media (larger hard disk drives to store whole home content) - 3D Video 	<p>EPA assesses the need for additional allowances based on data indicating a significant energy differential and the need to maintain consumer choice. At this time, EPA does not have data to support the inclusion of 3D and Ultra High Definition as these functions are not yet widely available. Thus, EPA proposes to postpone consideration of these functions to a future revision of the specification.</p> <p>Regarding Full HD/1080p, most STBs can already output video at this resolution, so EPA is not proposing to increase this allowance.</p> <p>Regarding Networking and Disc Drives, EPA believes that appropriate adders already exist within the specification for existing technologies (specifically Home Networking and DVR). Furthermore, new developments in networking technology (e.g., MoCA 2) are expected to reduce power during periods of inactivity while maintaining network connectivity. Lastly, there is only one HNI used during testing so no further adders will be provided for multiple types of network interfaces (e.g., both MoCA and Wi-Fi). Nonetheless, EPA is proposing a new adder for MIMO WiFi HNI to reflect the higher functionality of some new server STBs.</p> <p>Transcoding is not tested in the Proposed Test Method for Set-top Boxes, published by the U.S. Department of Energy (DOE) on January 23, 2013, 78 FR 5075, which is being proposed as the ENERGY STAR test method for STBs. Therefore EPA is not proposing any new allowances nor will be increasing the Advanced Video Processing allowance in the Draft 1 specification.</p>
Auto Power Down		<p>Two stakeholders commented on Auto Power Down (APD) requirements. One suggested requiring the device to automatically return to Sleep Mode in 15 minutes following recording (similar to the requirements for maintenance). The other suggested requiring APD enabled by default, rather than providing an incentive through the duty cycle.</p>	<p>EPA agrees with the stakeholder suggestion and proposes that the STB be required to return to Sleep Mode within 15 minutes following a scheduled recording.</p> <p>EPA is not proposing to require Auto Power Down (APD) by default at this point, but may do so in a future specification revision in association with more stringent sleep mode requirements.</p>

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Base Functionalities	Allowances	<p>Two stakeholders commented that the reduction in IP base allowance from V3.0 to V4.0 for IP STB is excessive and suggested a more moderate 24 percent reduction, in line with other Base Functionalities. One of the stakeholders also noted that there are two types of IP boxes: Over-the-Top and full STB boxes that require more power as they support a wider range of TV interfaces, networking with client devices, Wi-Fi, continual updates and specialized content some of it required by the FCC.</p> <p>Another stakeholder similarly noted that STBs of all platforms (IP, Cable, Satellite) share many of the same technologies so the reduction of allowances from V3.0 to V4.1 should be approximately 20% for all Base Functionalities rather than 20-50% as proposed in V4.0 for some base types, since savings of that amount will not be achieved by 2013. A second stakeholder further supported higher allowances for both Base and Additional Functionalities to account for the placement of critical functionality in the server that was not considered in the original development of V4.0.</p>	<p>EPA is proposing a separate base category for over-the-top (OTT) STBs given their different function and requirements. Doing so allows EPA to propose allowances that recognize top performers in each of the base type categories.</p> <p>EPA is proposing base allowances based on data for currently qualified models or stakeholder information. Stakeholders are invited to share data with EPA to further refine the proposed allowances.</p>
Base Functionalities	Cable DTAs	<p>One stakeholder commented that Cable DTAs perform many of the same functions as other Cable STBs, including conditional access, and requested that the Advanced Video Processing functionality be applicable to Cable DTAs.</p>	<p>EPA has removed Cable DTAs from the scope of the Version 4.1 ENERGY STAR specification because they are being phased out of the market. CEA predicts no shipments for these products beyond 2013.</p>
Low-Noise Block Downconverter		<p>While one stakeholder suggested testing Low-noise Block Downconverter (LNB) energy consumption with live satellite signal, two others commented that LNB energy use would be difficult to measure because it cannot be ascribed to a single STB but to the household; furthermore, including LNBs would single out satellite STBs and would further be inconsistent with the European Union approach.</p>	<p>The proposed DOE test method excludes LNB energy consumption and EPA is not proposing any further tests due to the testing difficulty involved.</p>

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Gateway Scope		<p>Two stakeholders commented on the inability of Gateways (STB devices that feature multiple different types of input and output interfaces and the ability to transcode between them) to meet the Version 4.0 allowances, though presented differing approaches to resolving this problem:</p> <ul style="list-style-type: none"> - One requested that Gateways be excluded from the V4.1 altogether to allow industry to promote the development of innovative devices with less overall energy consumption. - The other commented that customer awareness of ENERGY STAR is so strong that there is pressure for Gateways to also have the label. 	<p>EPA has included a proposed definition and test method for Displayless Video Gateways to encompass those devices that may not have a video output. Additionally, EPA has proposed multi-device content delivery scenarios and an incentive for powering down a Multi-room STB when delivering content to clients only. Displayless Video Gateways shall meet the same requirement levels as STBs. These proposals are intended to provide flexibility for manufacturers to develop innovative, comprehensive content delivery devices while saving energy.</p>
Multi-room		<p>Supporting EPA’s review of the V4.0 specification multi-room approach, one stakeholder stated that the deployment of server-client multi-room architectures is the best opportunity for significant energy savings.</p> <p>While the current V4.0 Multi-Room allowance is appropriate for first generation multi-room architectures (in which recorded content may be streamed from a DVR STB to another, non-DVR set-top box), several stakeholders commented that it is not adequate for server-client multi-room architectures. Some stakeholders therefore suggested that the Multi-room Additional Functionality allowance be increased to include the many functions a server STB provides, allow a server to claim allowances for the client devices it can simplify or replace, or allow a server to claim additional allowances for the specific functionalities it provides. Stakeholders specifically pointed to the energy requirements of receiving multiple video streams and delivering them to clients.</p> <p>On the other hand, one stakeholder noted that the current multi-room approach can be abused and may not be effectively targeting server-client multi-room solutions. This stakeholder noted that the current approach that allows manufacturers to choose whether or not the Multi-room-capable STB box is tested and certified for Multi-room operation is confusing. Some manufacturers may choose to only qualify boxes in either single- or multi-TV operation but not both, even though the box can be used in both manners. This stakeholder also suggested that the Multi-room allowance explicitly state that it may only be applied when boxes are tested in multi-room configuration.</p>	<p>Based on current market conditions, EPA is proposing to increase the multi-room allowance to 40 kWh/yr from the 30 kWh/yr reflected in Version 4.0 given the higher functionality of new server STBs. Coupled with refinements to the testing of multi-room scenarios, EPA believes the proposed new requirement to be reflective of the current market for these configurations.</p> <p>When developing the Draft 1 requirements, EPA has taken into account the proposed DOE test procedure, which measures the power consumed by Multi-room- and Multi-stream-capable STBs in both Single-room/Single-stream and Multi-room/Multi-stream configurations and uses these power measurements as part of its calculation of an Annual Energy Consumption (AEC) metric.</p> <p>By requiring testing in both single-room and multi-room modes, this proposed approach will also eliminate any questions with testing multi-room-capable boxes in a single-room configuration.</p>

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Savings Analysis		One stakeholder encourages EPA to provide information on ENERGY STAR market penetration, the incremental retail price effects of higher efficiency, and projected energy savings from V3.0 and upcoming V4.1 specifications.	EPA will provide projected energy savings upon development of the Final Draft Version 4.1 specification levels. EPA invites stakeholders to share information on the retail value of various set-top boxes. EPA has been unable to accurately assess this information due to the non-retail structure of this market.
Sleep Mode	Definitions	One stakeholder requested that EPA consider whether characterizing Deep Sleep State “by increased time required to return to full On Mode functionality” is still appropriate given that some manufacturers aim to develop STBs capable of operating in a low power mode (less than 5W) while preserving system architecture functions and the ability to quickly resume content delivery, recording, and network updates. Moreover, the stakeholder asked EPA to determine if next generation STBs will continue to have two different sleep states.	Although there is interest and activity surrounding the implementation of Sleep Mode for STBs, it is still too early to place requirements on this Mode until STBs can be redesigned and manufactured to more efficient specifications. EPA will therefore not make Deep Sleep mandatory for Version 4.1 but intends to do so in Version 5.0.
Deep Sleep		<p>Several stakeholders representing cable, satellite, and IP STBs objected to a Deep Sleep requirement, noting its current impossibility in some network configurations (e.g., satellite) or impact on functionality (e.g. telephone connectivity) in others. Some stakeholders also noted that cable STBs that can implement Deep Sleep will be field tested in 2014.</p> <p>A stakeholder further suggested tightening the Deep Sleep State (Section 3.2.4) requirements to avoid a scenario where the Deep Sleep State TEC coefficient is applied despite there being a low likelihood of actual operation in the home. For example, a STB user may need to engage the power button for 10 seconds to initiate Deep Sleep State. Instead, the stakeholder recommends that EPA require typical usage patterns to encourage Deep Sleep State operation such as setting two second maximum manual activation time.</p>	<p>EPA will maintain an incentive for implementing Deep Sleep for Version 4.1 but intends to require this functionality in Version 5.0 based on manufacturer information regarding the readiness of Deep Sleep in the Version 5 timeframe.</p> <p>Also, EPA is proposing to add a requirement that users be able to activate the Deep Sleep state within 2 seconds of pressing a button. Where network activities occur during the test.</p>

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Test Method		<p>In order to ensure that the STB is meeting certain operation requirements of the specification, one stakeholder suggested that following additions to the Test Method:</p> <ul style="list-style-type: none"> - Verify that the STB has engaged Auto Power Down (APD) after a period of inactivity less than or equal to 4 hours by having the lab technician measure and record the time it takes the Unit Under Test to engage APD (Section 7.7). - Verify that the UUT has automatically returned to Sleep Mode or Deep Sleep State in 15 minutes or less after completing maintenance activity. <p>Another stakeholder similarly suggested that the Test Method obtain average Sleep Mode power by taking an accumulated four hour energy measurement to ensure the UUT does cycle between a standby state and much higher power usage. In the event an extended download or network update occurs during the test, the procedure would be repeated.</p>	<p>The proposed DOE set-top box test procedure (10 CFR Parts 429 and 430), which is being proposed as the ENERGY STAR test method for STBs, measures both manual and APD Sleep Mode over at least 4 hours, and includes provisions for handling the case</p>
Test Method	Harmonization	<p>Two stakeholders recommended that EPA harmonize its test method with industry standards, with one recommending that EPA follow and encourage others to follow CEA 2043, which is currently under development.</p> <p>Another stakeholder seeks clarification from EPA on its intended timing for revising the specification to reference one or both of the identified test procedures. The stakeholder would also like to better understand implications to manufacturers, and others for resulting changes to product qualification that may derive from revising the specification's referenced test procedure (prior to the July 1, 2013, effective date, or at some time thereafter).</p>	<p>EPA intends to harmonize with the proposed U.S. Department of Energy set-top box test procedure (10 CFR Parts 429 and 430) released in January 2013 for STBs and CEA 2043 for Displayless Video Gateways.</p> <p>Since neither the DOE test procedure nor CEA 2043 are final, EPA will continue to monitor their development process and make adjustments to the specification as necessary. In the event that the specification is finalized prior to the finalization of either test method, EPA will require testing according to the draft test method(s) for qualification.</p> <p>Otherwise once the test method(s) are finalized, EPA will evaluate the STB qualification rate to determine the appropriate transition time to using the final test procedure, and either release an incremental revision (Version 4.2) or begin work on a Version 5.0 specification that references the final test procedure.</p> <p>Either way DOE and EPA will work with manufacturers to make this transition smoothly.</p>

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Timeline		<p>Stakeholders commended EPA for reviewing the V4.0 specification to ensure it is in line with market evolution. However, nearly all manufacturers of cable, IP, and satellite boxes commented that there are constraints imposed by the proposed July 2013 V4.1 effective date. In particular, the product development, field testing, and service provider implementation cycle takes at least two to four years to complete. Although much of this development is underway, stakeholders emphasize that the technology will not be available to implement deep sleep and in many cases to meet the Base and Additional Functionality allowances of V4.0.</p> <p>Stakeholders proposed delaying the effective date until 2014 to coincide with the deployment of deep sleep cable boxes and to allow for cost recovery of product development efforts. Alternatively, another stakeholder suggested that EPA make the energy use allowances less stringent should there be a July 2013 effective date.</p>	<p>EPA now intends to finalize Version 4.1 by June 2013. The effective date will occur no later than Spring of 2014, which would be approximately 2.5 years from the V3.0 effective date.</p> <p>Although EPA is mindful of other developments in the STB industry, including the implementation of Deep Sleep, EPA notes that this is a limited revision to requirements that were finalized in April 2011 and should not be considered comprehensive. Further issues can be considered in a subsequent specification revision.</p>
Maintenance Activity		<p>One stakeholder noted that it is difficult to ensure through testing that the maintenance activity requirements (Section 3.2.2 in the current Version 3.0) are always met and requested that EPA clarify that manufacturing partners shall ensure compliance with these requirements even when operating the STB with Service Provider software.</p>	<p>Currently, EPA allows manufacturers to "qualify and label" STBs sold to non-Service Provider Partners if they meet the requirements "in all possible hardware and software configurations, and under all potential operating scenarios." Otherwise, the responsibility falls on the Service Provider. EPA welcomes further suggestions on how best to promote compliance with the maintenance activity and other requirements given the complex nature of STBs and the market for them.</p>