

Topic	Subtopic	Comment	EPA and DOE Responses
Adder Levels	APD adjustment for Adders	A stakeholder commented that the allowances for DVR, DOCSIS, and Multi-stream, may be too high if an STB is expected to go into low-power modes through auto-power down (APD). This stakeholder recommended that EPA specify lower allowances if APD is enabled by default, so the expected energy savings is more accurate.	The current adder and base levels for On Mode Power represent a challenging set of energy efficiency goals, with additional impact when used in combination with energy savings features including APD, Deep Sleep, and Scheduled Sleep. EPA is concerned that prorating the adder levels due to APD would increase the complexity of the spec, while potentially reducing the incentive to apply effective APD and sleep states to a STB, as this format could potentially increase the difficulty of qualifying a more efficient STB.
Adder Requirements	HEVP	A stakeholder commented that some HD STBs perform the High Efficiency Video Processing (HEVP) for reasons other than providing UHD content. This requires additional processing power and electronic components, so the HEVP adder should be given to an STB regardless of the presence of UHD. This stakeholder notes that this would have the added benefit of making the Thin Client requirements more achievable.	EPA considered this comment but concluded that when HEVP is used solely in the background, without providing UHD content, the function incurs energy cost but provides no visible consumer benefit. As such, EPA is proposing to retain the allowance only when used with UHD.

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APD	APD Time to Sleep	<p>A stakeholder recommended that EPA require APD in 4 hours or fewer for all Thin Clients. This stakeholder also recommends that users who wish to disable this functionality be encouraged instead to increase the APD time incrementally, which would maintain some of the energy savings benefits. This stakeholder notes that the use of APD is also significant in cases where a user's remote is not synchronized with the STB, which would result in the STB remaining on at full power with the TV off.</p> <p>This stakeholder also noted that bars and other venues with continuously operating TVs would continue to have the option of increasing the APD time.</p>	<p>EPA recognizes the importance of user preferences in consumer products, and has modified the APD requirements to allow users to increase the APD timeout to 12 hours. This represents a superior alternative to users completely opting out, capturing additional energy savings than if the user disabled APD completely.</p>
APD	Deployment Requirements	<p>A stakeholder commented that there are situations where an STB is shipped with APD, but when installed in the home, the installer may disable it manually.</p>	<p>EPA notes that this potential issue is addressed by the Partner Commitments, which require Service Providers to "Ensure that qualified set-top boxes continue to meet the requirements in the ENERGY STAR product specification for the duration of their deployment." Further, EPA has included a permanent note to highlight this requirement.</p>
Base Levels	Thin Client	<p>A stakeholder recommended that the TEC for Thin Clients be increased to 10 kWh.</p> <p>A different stakeholder recommended a Thin Client TEC of 15 kWh/yr, noting additional voltage regulators and their low conversion efficiency at lower power levels would undo some of the savings. Similarly, this stakeholder recommended that a 2 W Deep Sleep requirement would be much more cost effective.</p>	<p>EPA notes that low power Deep Sleep exists for several consumer electronic categories, including TVs supporting RVU, which perform the same functions as Thin Clients. The proposed requirements are achievable with Deep Sleep, as discussed for the case of OTT IP STBs, below.</p>

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Base Levels	OTT IP	A stakeholder requested the rationale for adjusting the TEC levels of OTT IP STBs from 10 kWh/yr to 7 kWh/yr.	EPA received additional OTT IP STB data from a stakeholder. After adding the data to the dataset and reviewing it, EPA has confirmed that the previously proposed levels are appropriate as a variety of OTT IP STBs can meet them by implementing Deep Sleep or comparable improvements. EPA also notes that the functionality offered by these products is similar to that offered by Thin-Clients.
Client Only Incentive		A stakeholder recommended that EPA remove the client-only incentive for STBs to simplify the specification. This is supported by the fact that there has not been a significant need to use the incentive. Additionally, this would make published values of TEC easier to compare and interpret, since there would no longer be a need to determine if the incentive was used to calculate TEC. This stakeholder also noted that this incentive would likely become obsolete due to the increasing trend towards DVGs.	EPA notes that this recommendation to eliminate the incentive was made by the stakeholder responsible for the majority of products claiming the Client Only Incentive, therefore EPA is proposing to eliminate this incentive. This modification has the additional benefit of more transparent TEC values and improved product comparisons.
Deep Sleep	Energy Savings	A stakeholder commented that the ability for Scheduled Sleep to reduce the TEC is limited unless the time spent in Scheduled Sleep is long. This stakeholder fears that this makes the requirement difficult to meet and would discourage ENERGY STAR Thin Clients.	EPA appreciates this feedback, and agrees that Deep Sleep, a low power Sleep Mode that is activated whenever the Set-top Box Auto-powers down or is turned off by the user, presents more savings than a 4-hour Scheduled Sleep.

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Deep Sleep	Wake Time	<p>A stakeholder commented that in a related study of Internet-connected TVs, they found wake times of 15 to 20 seconds, with sleep at less than 0.5 W. This stakeholder commented that 30 seconds might be too long for some consumers, and recommended that wake time from Deep Sleep be shortened to 15 to 20 seconds. This stakeholder also noted the EPA should look to other consumer devices, including notebook computers and OTT IP STBs, when setting the wake time requirement. If the wake time were shortened enough in the specification, there would be no motivation to incorporate a "Quick Start" setting with higher power draw.</p> <p>The stakeholder further commented that a Thin Client should have only two operating modes: On, where it is delivering content, and Deep Sleep. This stakeholder notes that this distinction should be made due to the possibility of "Quick Start" settings, which could dramatically increase Sleep Mode power draw.</p> <p>Another stakeholder recommended modifying the definition of Scheduled Sleep to note that once an STB returns to Sleep Mode from Scheduled Sleep, it be able to wake in 30 seconds or less.</p>	<p>To ensure user satisfaction with ENERGY STAR STBs, EPA is proposing to reduce the maximum allowed Deep Sleep to On Mode and Sleep to On Mode transition times to 15 seconds. EPA expects that this will eliminate the need for Quick Start or similar modes, and therefore does not propose preventing them through a specification requirement.</p> <p>Regarding the return of a quick transition time after leaving Scheduled Sleep, such a requirement is already located in Section 3.2.4 (vi) of the specification.</p> <p>EPA has updated this requirement to reflect the shorter 15 second transition time.</p>

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New Features	RVU Configuration	<p>A stakeholder recommended the STB specification include the RVU Server/Client Model as an energy savings approach superior even to the Primary STB/Thin Client Model. The RVU Server eliminates the need for Thin Clients at secondary locations in a home, as RVU can deliver DVR like functionality directly to supported TVs without the use of an STB. This stakeholder recommended leveraging the ENERGY STAR Television 7.0 specification, which is able to highlight TVs with Thin Client Capability. This stakeholder suggested the possibility of offering incentives for RVU support in STBs.</p>	<p>EPA recognizes the energy savings potential from DLNA-protocol (RVU, VidiPath) supporting equipment, and has added a Fleet incentive to the Service Provider Partner Commitments to encourage market participation. The Fleet incentive is provided for the verifiable elimination of a Thin Client by an RVU or VidiPath Device at a customer deployment.</p>
Sleep Modes	Deep Sleep/Scheduled Sleep	<p>A stakeholder commented that both Deep Sleep and Scheduled Sleep require shutting down almost all hardware, making it hard to justify the less than 30 second wake time from Deep Sleep. This stakeholder recommended that the Deep Sleep definition be merged with the Scheduled Sleep definition, or modified to remove the 30 second or less wake time. (Both options would remove the 30 second or less wake time from being a requirement of Deep Sleep).</p>	<p>EPA has modified the Scheduled Sleep definition to allow wake times greater than those required for Sleep and Deep Sleep. EPA has also introduced a requirement where Scheduled Sleep is defined to be less than or equal to 3 W or 15% of the On Power Draw, to encourage energy savings measures to be implemented across all STB types. Nonetheless, EPA is preserving the distinction between Deep Sleep and Scheduled Sleep, as the two methods may not be applicable to all STB types.</p>
Definitions	Deep Sleep/Scheduled Sleep	<p>One stakeholder commented that it is misleading to leave Deep Sleep State under the category of Sleep Mode while stating that Scheduled Sleep Mode achieves “additional energy savings beyond that offered by Sleep Mode,” because this implies that “Scheduled Sleep Mode” is somehow able to achieve lower power than Deep Sleep with its “power draw less than or equal to 1 W”.</p>	<p>EPA acknowledges that Deep Sleep State and Scheduled Sleep Mode may refer to similar modes, where the primary difference is the wake time allowed for Scheduled Sleep. EPA has modified the definitions for Deep Sleep and Scheduled Sleep, and believes this may reduce the confusion between the two terms.</p>

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Specificat	Effective D	<p>Two stakeholders commented that the January 1, 2018 Effective Date for Thin Client Requirements was too soon, and should be adjusted to January 1, 2019.</p> <p>Another stakeholder commented that they support the January 1, 2018 Effective Date, noting that the industry has had 3 years since the publication of STBs V4.1 to make the required hardware changes.</p>	<p>EPA has reached out to stakeholders and supply chain providers, and has received feedback that the technology to implement Deep Sleep is available. Therefore, EPA continues to propose January 1, 2018 as the target to recognize leadership in the market.</p>
TEC Equation		<p>A stakeholder noted that in the TEC Equation, there is a term referring to Deep Sleep; this stakeholder suggested this may intend to refer to Scheduled Sleep instead.</p>	<p>EPA appreciates this feedback and wishes to point out that the reference to Deep Sleep was correct as written (the user should not be able to distinguish between Deep Sleep and another Sleep Mode, so whichever provides the lowest power can be used for calculating TEC).</p> <p>EPA has further edited the variables and notes in the TEC equation for clarity and reviewed the edits with an author of CTA-2043 who is aligned with the approach and plans to consider these term changes for inclusion in CTA-2043 during an upcoming revision process.</p>
Test Method	Typograp hical Error	<p>A stakeholder commented that in Section 5.2 of the Draft 2 Test Method, there are two sections labeled A) and two labeled B).</p>	<p>DOE has corrected the section numbering in the Test Method.</p>

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Test Method	MIMO Power	A stakeholder commented that testing MIMO equipment at a distance of 10 feet between the server and client could lead to mistakenly classifying a high power transmitter ( $\geq 200$ mW) as a low power device, as the distance is too short to exercise the high power transmission.	EPA has removed the High Power MIMO adders from the STB specification, due in part to difficulty in testing. In order to ensure that the STB is transmitting in high power mode, the Test Method would have to require large distances or other potentially complicated testing scenarios. To avoid these potential issues, EPA has proposed that MIMO Base power levels and additional streams should be calculated at the Low Power SNE Adder Levels for all STBs.
Test Method	APD Disable Prompt	One stakeholder requested that EPA and DOE to include language in the test method to require STBs that prompt users to opt out of APD to be tested and reported without APD, similar to the testing of televisions.	DOE has added this requirement to the Test Method.
Test Method	References	A stakeholder wanted to confirm that the new Aug 2013 version being referred to in the I10Draft 2 Test Method is now published by ANSI/CTA and called Set-top Box (STB) Power Measurement ANSI/CTA-2043 August 2013.	DOE appreciates this feedback, and has modified the references in the Test Method.
Test Method	UHD	One stakeholder commented that the Test Method should specify bit rate and dynamic range for UHD content. This stakeholder also requested that DOE confirm that the input resolution must match the output resolution in the test method.	DOE appreciates these comments and notes that the Test Method uses the UltraHD Test Stream definition from the STB Specification which specifies the minimum resolution as 3840 X 2160 progressive scan at minimum frame rate of 24 frames per second. DOE also confirms that the input and output resolution of the STB must match.