



ENERGY STAR® Televisions Draft 2 Specification Webinar

May 15, 2017

ENERGY STAR Products Labeling Program



Webinar Details

- Webinar slides and related materials will be available on the Television Product Development Web page:
 - www.energystar.gov/RevisedSpecs
 - Follow link to “Version 8.0 is in Development” under “Televisions”
- Audio provided via teleconference:
 - Call in:** +1 (877) 423-6338 (U.S.)
+1 (571) 281-2578 (International)
 - Code:** 773-366 #
 - Phone lines will remain open during discussion
 - Please mute line unless speaking
 - Press *6 to mute and *6 to un-mute your line



Webinar Agenda

- Introductions
- Draft 1 Specification Feedback and Draft 2 Approach
 - General Feedback
 - Screen Brightness
 - Automatic Brightness Control (ABC)
 - Luminance Requirements
 - Alerting Changes in Power Consumption
 - Additional Energy Saving Features
- Timeline and Conclusion



Introductions

Time	Topic
1:00–1:05	Introductions
1:05–2:45	Draft 2 Specification
1:05–1:20	General Feedback
1:20–2:00	ABC Persistence and Screen Brightness
2:00–2:15	Alerting Changes in Power Consumption
2:15–2:45	Additional Energy Saving Features
2:45–3:00	Timeline and Conclusion



Introductions

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Version 8.0 Timeline to this point

Event	Date
<i>Launch and Data Assembly</i>	<i>August 5, 2016</i>
<i>Launch Webinar</i>	<i>October 3, 2016</i>
<i>Launch Data and Comment Deadline</i>	<i>November 1, 2016</i>
<i>Draft 1 Specification</i>	<i>March 10, 2017</i>
<i>Draft 1 Specification Webinar</i>	<i>March 20, 2017</i>
<i>Draft 2 Specification</i>	<i>April 21, 2017</i>
Draft 2 Specification Webinar	May 15, 2017



General Feedback

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General

- Several stakeholders provided input regarding EPA's proposal for the persistence of ABC and other energy saving features and minimum luminance requirements.
 - Stakeholders provided input on the UHD allowance and HDR testing requirements.
 - Most stakeholders supported an aggressive timeline for finalizing the specification in order to impact 2018 year models.
 - A stakeholder noted that the Draft 1 approach would result in numerous currently qualified products to no longer qualify and, as such, the proposed approach should be relaxed.
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- EPA intends to finalize the Version 8.0 specification in early Summer 2017 to affect the 2018 model year.
 - With Draft 2, EPA has made modifications to the Draft 1 proposal based on stakeholder feedback.



Scope

- A stakeholder agreed with the inclusion of Home Theater Displays (HTDS) in the scope
 - Another stakeholder suggested that educating consumers on the difference between an HTD and a television is important to prevent confusion
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- EPA is maintaining the inclusion of HTDs in the scope of the Version 8.0 specification.
 - On the ENERGY STAR TV product pages, EPA intends to provide consumers with a description of how HTDs differ from TVs.

TELEVISIONS

OVERVIEW

SPECIFICATION

BUYING GUIDANCE

It is estimated that more than 34 million televisions were shipped to the United States in 2015. With televisions getting bigger and using more energy, it's no wonder that most consumers say that energy efficiency will be a factor in their next television choice. Look for the ENERGY STAR label to save energy, save money, and help protect the climate.



ENERGY STAR certified televisions are on average, 27 percent more energy efficient than conventional models, saving energy in all usage modes: sleep, idle, and on. The label can be found on everything from standard TVs to large screen TVs with the latest features like ultra high-definition (UHD) and internet connectivity. Some models that earn the ENERGY STAR incorporate organic light emitting diodes (OLEDs), the latest in screen lighting technology.

Saving energy with ENERGY STAR certified home entertainment products helps protect the climate. A home equipped with TVs, set-top boxes, a Blu-Ray player, and a soundbar that have earned the ENERGY STAR, can save nearly \$140 over the life of the products. If each TV, DVD player, and soundbar purchased in the U.S. this year earned the ENERGY STAR certified, we would save more than \$220 million and prevent nearly 2.8 billion pounds of greenhouse gas emissions every year, equal to the emissions of nearly 275,000 cars.

[Learn how to save more energy by configuring the settings on game consoles to operate in the most efficient way possible.](#)



High Dynamic Range (HDR) Upscaling

Three stakeholders supported HDR upscaling testing and suggested that the results be made public by model. Two of these stakeholders requested that EPA add requirements for native HDR content and HDR upscaling in the next specification revision.

- EPA:
 - Maintained the testing of the HDR upscaling feature and will monitor the market to assess the energy efficiency opportunities
 - Supports stakeholder efforts to develop an updated test clip that addresses scene cut frequency and is more representative of the HDR-encoded (and native 4K) content increasingly being watched by purchasers of new televisions.



High Dynamic Range (HDR) Upscaling

A stakeholder has also noted that some manufacturers offer varying degrees or levels of HDR upscaling (e.g., light, medium, strong).

- EPA learned of the varying degrees of HDR upscaling since the release of the Draft 2 specification.
- EPA considers that the highest power consumptive degree/level of HDR upscaling should be tested and reported

EPA requests stakeholder feedback on accounting for varying degrees of implementation for an HDR upscaling feature.



UHD Allowances

- Several stakeholders recommended reducing the UHD adder in the next specification revision after the power consumption of Version 8.0 models is better understood.
- Others supported including a UHD adder reduction in V8.0 since:
 - UHD models comprise a significant portion of the current Qualified Product List.
 - Studies based on datasets from CA and the EU show UHD TVs consume approximately 13% more power than HD TVs.
- EPA shares stakeholder interest in reducing the power draw of UHD TVs, however, since the proposals in Version 8.0 will likely impact many currently qualified UHD models, EPA is choosing to wait until the next specification revision to address UHD power consumption.



Software Updates

Two stakeholders noted that software updates could potentially modify or disable some energy saving features and so recommended that EPA address this in Version 8.0 by requiring TVs to continue meeting the requirements following an update.

- Partners are required to update their certification if a software update changes the television's reported energy consumption.
 - Disabled energy saving features would be uncovered in the course of ENERGY STAR verification testing.

The screenshot shows the ENERGY STAR website. At the top, there is a navigation bar with 'ABOUT ENERGY STAR' and 'PARTNER RESOURCES'. Below the navigation bar is the ENERGY STAR logo and the tagline 'The simple choice for energy efficiency.' The main content area features four columns of text: 'ENERGY EFFICIENT products', 'ENERGY SAVINGS at home', 'ENERGY EFFICIENT new homes', and 'ENERGY STRATEGIES FOR buildings & plants'. Below this is a breadcrumb trail: 'Home > Partner Resources > Third-Party Certification > Verification Testing Roles and Responsibilities'. The main heading is 'ENERGY STAR Product Verification Testing Roles and Responsibilities'. The text below the heading states: 'Each year, post-market verification testing of a sampling of ENERGY STAR certified products helps maintain consumer confidence in the ENERGY STAR label and protect the investment of ENERGY STAR partners. [Certification Bodies \(CBs\)](#) recognized by the U.S. Environmental Protection Agency (EPA) to oversee this testing, and the product brand owners subject to it, each have certain basic responsibilities designed to make the process run more smoothly and efficiently.' On the right side, there is a section titled 'Third-Party Certification' with three links: '» [Third-Party Certification Directives](#)', '» [Documentation \(Archiv](#)



ABC Persistence and Screen Brightness

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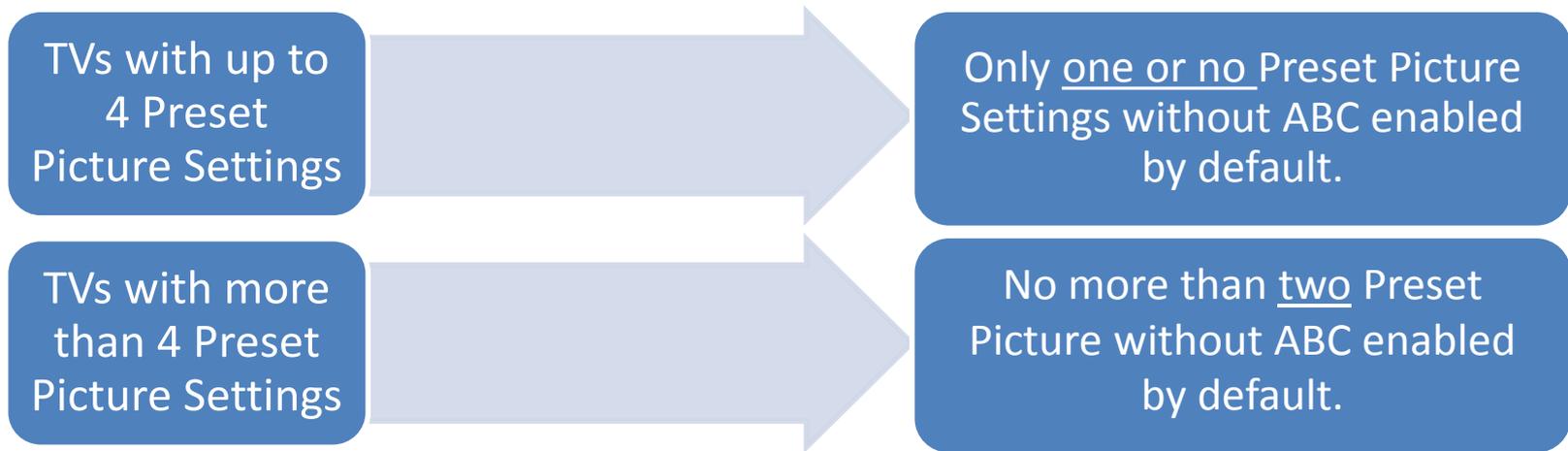
Automatic Brightness Control (ABC) Persistence

In regards to ABC, stakeholders have requested that EPA:

- Add language to require that ABC be turned back on automatically after HDR encoded content is played.
 - Require ABC and other energy saving features be enabled in all Preset Picture Settings.
 - Require that ABC deliver similar energy savings across Preset Picture Settings.
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- EPA proposes language in Section 3.2.5 requiring energy saving features to default back to on when entering preset picture settings where the features were initially enabled as shipped.

Automatic Brightness Control (ABC) Persistence

- EPA has retained the Draft 1 ABC requirements in Draft 2.
- Based on stakeholder requests that all Preset Picture Setting have ABC enabled and since at least one manufacturer is already doing so, EPA is considering requiring that TVs with ABC enabled by default have only one or no Preset Picture Setting without ABC enabled by default



Request for more information regarding which Preset Picture Settings, excluding Retail and ones that may only be visible with true HDR content, are unable to be implemented with ABC.



Luminance Requirements

In response to the luminance requirements proposed in Draft 1, stakeholders:

- Supported the proposed luminance requirements
- Offered alternate suggestions for the minimum screen brightness:
 - 100 cd/m², as it is recommended in the TCO Displays standard
 - 150 cd/m² as originally proposed
 - Instead of a minimum brightness, define a ratio of luminance in the 3 lux illuminance condition to luminance in the brightest selectable picture setting
- Requested that EPA allow a tolerance to account for luminance deviations caused by each module's brightness and light sensor



Luminance Requirements

- EPA has reduced the requirement to 125 cd/m² from 150 cd/m²
 - EPA proposed the minimum screen luminance of 125 cd/m² in Section 3.6.4 to balance ISF information with stakeholder feedback.
- Retained Section 3.6.3's requirements from Draft 1.

3.6 Luminance Requirements

- 3.6.1 For products with a luminance in the Brightest Selectable Preset Picture Setting (the greater value of $L_{\text{DEFAULT_RETAIL}}$ or $L_{\text{BRIGHTEST_HOME}}$) less than 350 cd/m², luminance in the Default Picture Setting ($L_{\text{DEFAULT_HOME}}$) shall be greater than or equal to 65% of the luminance in the Brightest Selectable Preset Picture Setting.
- 3.6.2 For products with a luminance in the Brightest Selectable Preset Picture Setting greater than or equal to 350 cd/m², luminance in the Default Picture Setting shall be greater than or equal to 228 cd/m².
- 3.6.3 For products that certify to the On Mode requirements with ABC enabled by default, the average luminance at the illuminance conditions of 3, 12, 35, and 100 lux with ABC enabled shall be greater than or equal to 50% of the TV's luminance in the Brightest Selectable Preset Picture Setting.
- 3.6.4 For products that certify to the On Mode requirements with ABC enabled by default, the luminance at 3 lux in the Default Picture Setting, with ABC enabled, shall be greater than or equal to 125 cd/m².



Luminance Requirements

- EPA conducted additional testing to fill in all the luminance values in the below table

	A2		A1		B2		E4		F1		C1		D1	
	Luminance (Nits)	Avg. Power (W)												
3 Lux Illuminance Condition	14.00	65.73	23.08	48.12	17.81	93.94	72.89	52.69	156.79	71.63	100	78.49	140.18	76.55
Darkened Room Picture Setting	380.25	133.51	199.27	121.73	146.65	136.20	152.37	76.81	188.86	113.65	251.36	121.31	106.19	72.99

- These results confirm that for all but one of these 7 models, the luminance and average power in the 3 lux illuminance condition with ABC enabled is much lower than that in the picture setting intended for viewing in a darkened room
 - On average, the luminance was ~50% lower in the 3 lux illuminance condition than in the darkened room picture setting



Luminance Preference Testing

- EPA conducted additional testing with human test subjects to assess subjective luminance preferences
 - 4 LCD TVs and 1 OLED UHD model
 - 6 test subjects participated
 - 4 male and 2 female
 - Ages between 19 and 55
- The test procedure details:
 - Backlight levels were manually adjusted in the dark room preset picture setting from default to minimum and maximum with ABC off in a room with 3 lux ambient illuminance levels
 - The test clip was a two minute excerpt from a Planet Earth II UHD Blu-Ray disc containing a wide range of average picture levels



Luminance Preference Testing

- Key findings:
 - Users prefer luminance levels significantly higher than the luminance that many TVs currently deliver with ABC enabled in a dark room
 - The average preferred luminance level among the test subjects was ~200 cd/m²

Qualitative Score	Much Too Dim	Too Dim	Preferred	Too Bright	Much Too Bright
Average Luminance (cd/m ²)	42.8	117.5	198.6	270.7	358.



Alerting Users to Changes in Power Consumption

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Alerting Consumers to Changes in Power Consumption

- Two stakeholders commented that this requirement was too broad and required clarity
 - One stakeholder stated that notifying consumers each time power is increased would cause consumer inconvenience
 - Two stakeholders asked EPA to consider that manufacturers may label or describe the non-ABC picture settings in a way that would encourage users to switch to them
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- EPA understands the concerns regarding the requirement to alert consumers to all changes in power consumption and in Draft 2 proposed modified language in Section 3.2.7, where the TV/HTD must provide an alert only when activation of a Special Function disables an energy saving feature.



Alerting Consumers to Changes in Power Consumption

- Stakeholders noted that TVs exist that encourage users to pick a non-ENERGY STAR certified Preset Pictures Setting
 - The DOE's Test Method requires the TV to enable the most energy consumptive features if consumers are provided with a prompt or information on whether to select them
 - However, this requirement in the Test Method only applies when a user is prompted during the TV set up, not where guidance is issued elsewhere in the menu system after the TV has already been configured.

As a result, EPA is considering adding a requirement that would prohibit language that encourages the user to switch to a non-certified Preset Picture Setting or disable an energy saving feature.



Energy Saving Features

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Energy Saving Features Stakeholder Feedback

In response to EPA's proposal to prohibit TVs with energy saving features that do not offer comparable energy savings during typical viewing experiences versus when tested, stakeholders expressed concern that without a well defined test, products would be vulnerable to later claims that savings features did not provide adequate energy savings.

Stakeholders:

- Requested that EPA clarify the meaning of "typical viewing experiences"
- Recommended that EPA participate in a process to revise the test clip to reflect typical viewing experiences if the IEC test clip is not representative as such.



Energy Saving Features

- To address concerns over vulnerability in determining savings across various "typical viewing experiences", EPA is offering to review new savings features prior to product certification.

3.2.3 Energy Saving Features: A TV/HTD may not be certified with any detectable or undetectable energy saving features (e.g., Motion Detection Dimming) that are enabled when tested according to Appendix H to Subpart B of 10 CFR Part 430 unless that feature provides comparable energy savings during typical viewing experiences (i.e., the duration of a variety of popular programming). This prohibition applies irrespective of whether the function's primary or intended purpose is energy savings.

Note: Manufacturers seeking to certify products with new or unvetted energy saving features enabled are encouraged to submit internal test data demonstrating results over a range of currently popular content to EPA for review and approval prior to submitting the product for certification.



Energy Saving Features

- Stakeholders provided additional feedback that all features delivering comparable energy savings-- not only ABC-- should persist across more Preset Picture Settings,
- EPA agrees and has clarified language in Sections 3.2.5 and 3.2.6 so that persistence requirements apply to any energy saving feature.



Timeline and Conclusion

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Next Steps for Version 8.0

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<i>Launch and Data Assembly Released</i>	<i>August 5, 2016</i>
<i>Launch Webinar</i>	<i>October 3, 2016</i>
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<i>Draft 1 Specification Released</i>	<i>March 10, 2017</i>
<i>Draft 1 Specification Webinar</i>	<i>March 20, 2017</i>
<i>Draft 1 Stakeholder Comments Due</i>	<i>April 5, 2017</i>
<i>Draft 2 Specification Released</i>	<i>April 21, 2017</i>
<i>Draft 2 Specification Webinar</i>	<i>May 15, 2017</i>
Draft 2 Comments Due	May 24, 2017
Final Draft Specification Release	June 2017
Specification Finalization	July 2017
Specification in Effect	March/April 2018



Comments

- Stakeholder comments on the Version 8.0 Draft 2 Specification are due on **Wednesday, May 24, 2017**. Please send all comments and data to:

Televisions@energystar.gov

- Unless marked as confidential, all comments will be posted to the TVs product development page at www.energystar.gov/products/spec/televisions_specification_version_8_0_pd
- Accessible through www.energystar.gov/RevisedSpecs and clicking on “Version 8.0 is in development” under “Televisions”



Thank you!

To be added to EPA's stakeholder listserve to receive specification updates, please email:

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