



ENERGY STAR® Program Requirements Product Specification for Televisions

Eligibility Criteria Final Draft Version 7.0

1 Following is the Version 7.0 ENERGY STAR Product Specification for Televisions. A product shall meet
2 all of the identified criteria if it is to earn the ENERGY STAR.

3 **1 DEFINITIONS**

4 A) Product Types:

5 1) Television (TV)¹: A product designed to produce dynamic video, contains an internal TV tuner
6 encased within the product housing, and that is capable of receiving dynamic visual information
7 from wired or wireless sources including but not limited to:

8 a) Broadcast and similar services for terrestrial, cable, satellite, and/or broadband transmission
9 of analog and/or digital signals;

10 b) Display-specific data connections, such as HDMI, Component video, S-video, Composite
11 video;

12 c) Media storage devices such as a USB flash drive, a memory card, or a DVD; or

13 d) Network connections, usually using Internet Protocol, typically carried over Ethernet or Wi-Fi.

14 2) Hospitality Television: A TV product which includes the following features:

15 a) A control port for bi-directional communication (DB-9, RJ11, RJ12, RJ45, coaxial cable, or
16 HDMI-CEC); and

17 b) Activated hospitality protocol software (e.g., SmartPort, Meeting Professionals International
18 (MPI), Multiple Television Interface (MTI), Serial Protocol) to provide direct access to Video-
19 On-Demand (VOD) systems, non-video hotel services or a digital media player designed for
20 hospitality-specific applications.

21 B) Operational Modes:

22 1) On Mode²: The power mode in which the product is connected to a mains power source, has
23 been activated, and is providing one or more of its principal functions.

24 2) Standby-Passive Mode³: The mode in which the TV is connected to a power source, produces
25 neither sound nor picture, but can be switched into another mode with the remote control unit or
26 an internal signal.

27 3) Standby-Active, Low Mode⁴: The mode in which the TV is connected to a power source,
28 produces neither sound nor picture, but can be switched into another mode with the remote
29 control unit or an internal signal, and with an external signal, and is not exchanging/receiving data
30 with/from an external source.

1 10 CFR 430.2

2 10 CFR 430, Subpart B, Appendix H, Section 2.14

3 10 CFR 430, Subpart B, Appendix H, Section 2.18

4 10 CFR 430, Subpart B, Appendix H, Section 2.20

- 31 4) Standby-Active, High Mode⁵: The mode in which the TV is connected to a power source,
32 produces neither sound nor picture, but can be switched into another mode with the remote
33 control unit or an internal signal, and with an external signal, and is exchanging/receiving data
34 with/from an external source.
- 35 a) Download Acquisition Mode: The power mode in which the product is connected to a mains
36 power source, produces neither sound nor picture, and is actively downloading data. Data
37 downloads may include channel listing information for use by an Electronic Program Guide,
38 TV setup data, channel map updates, firmware updates, monitoring for emergency
39 messaging/communications or other network communications.
- 40 5) Off Mode⁶: The mode where the TV is connected to a power source, produces neither sound nor
41 picture, and cannot be switched into any other mode with the remote control unit, an internal
42 signal, or an external signal.
- 43 C) Additional Functions⁷: Functions that are not required for the basic operation of the device. Additional
44 functions include, but are not limited to, a VCR unit, a DVD unit, an HDD unit, a FM-radio unit, a
45 memory card-reader unit, or an ambient lighting unit.
- 46 1) Thin Client Capability: The ability of the TV to receive, decrypt, and display encrypted content
47 provided by a Multichannel Video Programming Distributor (MVPD) over the Local Area Network
48 via a server device co-located on the customer premises without the need for a client device at
49 the TV.
- 50 2) Full Network Connectivity: The ability of the TV to maintain network presence while in Standby-
51 Active, Low mode. Presence of the TV, its network services, and its applications, is
52 maintained even if some components of the Television are powered down. The TV can elect to
53 change power states based on receipt of network data from remote network devices, but should
54 otherwise stay in Standby-Active, Low mode absent a demand for services from a remote
55 network device. Full network connectivity is not limited to a specific set of protocols. Also referred
56 to as “network proxy” functionality and described in the Ecma-393 standard.
- 57 D) Special Functions⁸: Functions that are related to, but not required for, the basic operation of the
58 device. Special functions include, but are not limited to, special sound processing, power saving
59 functions (e.g., Automatic Brightness Control).
- 60 1) Automatic Brightness Control (ABC): The self-acting mechanism that controls the brightness of a
61 display as a function of ambient light.
- 62 2) Gesture Recognition: Ability to recognize non-verbal communication through a movement of the
63 body, head, or limbs to express or emphasize an idea, sentiment, or command.
- 64 3) Voice Recognition: Ability to recognize spoken words or phrases and to convert said
65 communication into text or commands to which meaning has been assigned.
- 66 E) Television Settings and Menus:
- 67 1) Preset Picture Setting⁹: A preprogrammed factory setting obtained from the TV menu with pre-
68 determined picture parameters such as brightness, contrast, color, sharpness, etc. Preset picture
69 Settings can be selected within the Home or Retail Configurations.

5 10 CFR 430, Subpart B, Appendix H, Section 2.19

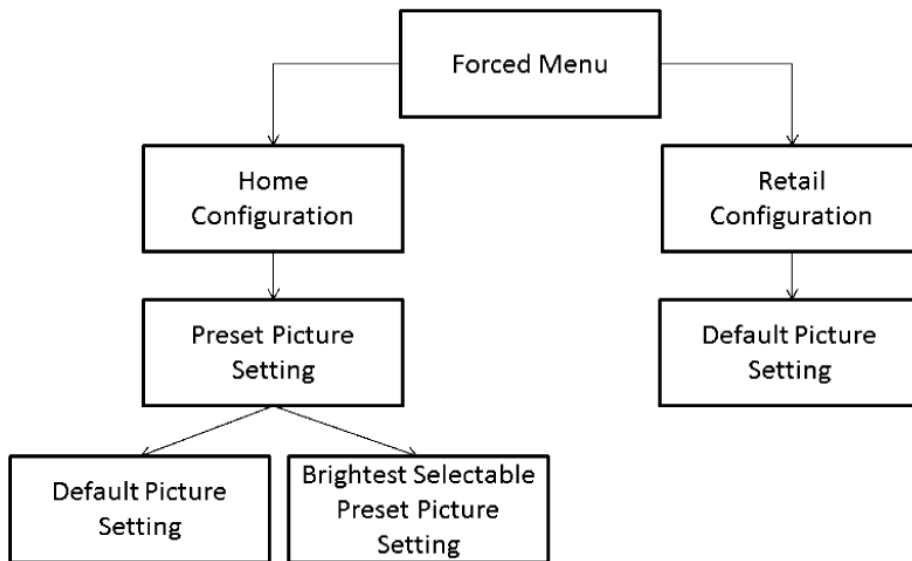
6 10 CFR 430, Subpart B, Appendix H, Section 2.13

7 10 CFR 430, Subpart B, Appendix H, Section 2.1

8 10 CFR 430, Subpart B, Appendix H, Section 2.17

- 70 2) Default Picture Setting¹⁰: The Preset Picture Setting that the TV enters into immediately after
 71 making a selection from the Forced Menu. If the TV does not have a Forced Menu, this is the as-
 72 shipped preset picture setting.
- 73 3) Brightest Selectable Preset Picture Setting¹¹: The Preset Picture Setting in which the TV
 74 produces the highest screen luminance within either the Home or Retail Configuration.
- 75 4) Home Configuration¹²: The TV configuration selected from the Forced Menu which is designed
 76 for typical consumer viewing and is recommended by the manufacturer for home environments.
- 77 5) Retail Configuration¹³: The TV configuration selected from the Forced Menu which is designed to
 78 highlight the TV's features in a retail environment. This configuration may display demos, disable
 79 configurable settings, or increase screen brightness in a manner which is not desirable for typical
 80 consumer viewing.
- 81 6) Forced Menu¹⁴: A series of menus which require the selection of initial settings before allowing
 82 the user to utilize primary functions. Within these menus contains an option to choose the viewing
 83 environment between Retail and Home Configurations.
- 84 7) Electronic Program Guide (EPG): An interactive on-screen menu of TV program information
 85 downloaded from an external source or embedded interstitially in broadcast video streams (e.g.,
 86 program time, date, and descriptions).

87 **Figure 1: Illustration of Picture Settings for TVs with a Forced Menu**¹⁵



88

9 10 CFR 430, Subpart B, Appendix H, Section 2.15

10 10 CFR 430, Subpart B, Appendix H, Section 2.4

11 10 CFR 430, Subpart B, Appendix H, Section 2.3

12 10 CFR 430, Subpart B, Appendix H, Section 2.6

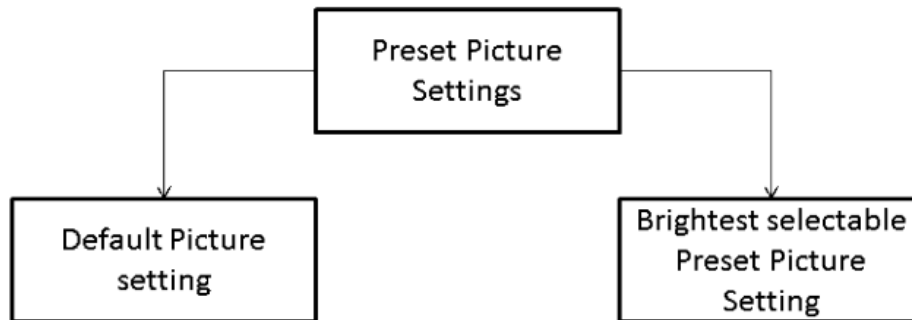
13 10 CFR 430, Subpart B, Appendix H, Section 2.16

14 10 CFR 430, Subpart B, Appendix H, Section 2.5

15 U.S. Department of Energy, Energy Conservation Program: Test Procedures for Television Sets; Final rule, *Federal Register*, October 25, 2013, 78 FR 63828.

89

Figure 2: Illustration of Picture Settings for TVs without a Forced Menu¹⁶



90

91 F) Power Devices:

92 1) External Power Supply (EPS)¹⁷: Also referred to as External Power Adapter. An external power
93 supply circuit that is used to convert household electric current into dc current or lower-voltage ac
94 current to operate a consumer product.

95 2) Main Battery¹⁸: A battery capable of powering the TV to produce dynamic video without the
96 support of mains power.

97 G) Product Characteristics:

98 1) Luminance: The photometric measure of the luminous intensity per unit area of light traveling in a
99 given direction, expressed in units of candelas per square meter (cd/m²).

100 2) Screen Area: The viewable screen area of the product, calculated by multiplying the viewable
101 image width by the viewable image height. For curved screens, the measurements shall be made
102 along the curvature on the face of the screen rather than along a straight line/chord.

103 3) Native Vertical Resolution: The number of visible physical lines along the vertical axis of the TV
104 (e.g., a TV with a screen resolution of 1920 x 1080 (horizontal x vertical) would have a Native
105 Vertical Resolution of 1080).

106 **Note:** Per stakeholder comment, EPA has modified the definition Native Vertical Resolution to refer to the
107 'number of visible physical lines' instead of the 'number of visible physical pixels.'

108 H) Basic Model¹⁹: All units of a given type of product (or class thereof) manufactured by one
109 manufacturer, having the same primary energy source, and which have essentially identical electrical,
110 physical, and functional characteristics that affect energy consumption and energy efficiency.

16 U.S. Department of Energy, Energy Conservation Program: Test Procedures for Television Sets; Final rule, *Federal Register*, October 25, 2013, 78 FR 63829.

17 10 CFR 430.2

18 10 CFR 430, Subpart B, Appendix H, Section 2.12

19 10 CFR 430.2

111 I) Multichannel Video Programming Distributor (MVPD)²⁰: A person such as, but not limited to, a cable
112 operator, a multichannel multipoint distribution service, a direct broadcast satellite service, or a TV
113 receive-only satellite program distributor, who makes available for purchase, by subscribers or
114 customers, multiple channels of video programming.

115 J) Unit Under Test (UUT): The unit currently undergoing testing.

116 2 SCOPE

117 2.1 Included Products

118 2.1.1 Products that are: (1) marketed to the consumer as a TV (i.e., TV is the primary function); (2)
119 capable of being powered from a wall outlet with an external power supply; and (3) meet one
120 of the following product type definitions, are eligible for ENERGY STAR certification, with the
121 exception of products listed in Section 2.2:

- 122 i. TVs
- 123 ii. Hospitality TVs

124 2.2 Excluded Products

125 2.2.1 Products that are covered under other ENERGY STAR product specifications are not eligible
126 for certification under this specification. The list of specifications currently in effect can be
127 found at www.energystar.gov/specifications.

128 2.2.2 Products that satisfy one or more of the following conditions are not eligible for ENERGY STAR
129 certification under this specification:

- 130 i. Televisions with a Main Battery that enables operation without connected mains power.
- 131 ii. Products with a computer input port (e.g., VGA), that are marketed and sold primarily as
132 computer monitors or other displays, and that do not contain an integrated TV tuner encased
133 within the product housing.

134 3 CERTIFICATION CRITERIA

135 3.1 Significant Digits and Rounding

136 3.1.1 All calculations shall be carried out with directly measured (unrounded) values.

137 3.1.2 Unless otherwise specified, compliance with specification limits shall be evaluated using exact
138 values without any benefit from further rounding.

139 3.1.3 Directly measured or calculated values that are submitted for reporting on the ENERGY STAR
140 website shall be rounded to the nearest significant digit as expressed in the corresponding
141 specification limit.

20 As defined in 47 USCS § 522(13)

142 **3.2 General Requirements**

143 3.2.1 External Power Supplies (EPSs): Single- and Multiple-voltage EPSs shall meet the level VI or
144 higher performance requirements under the International Efficiency Marking Protocol when
145 tested according to the Uniform Test Method for Measuring the Energy Consumption of
146 External Power Supplies, Appendix Z to Subpart B of 10 CFR Part 430.

- 147 i. Single- and Multiple-voltage EPSs shall include the level VI marking.
- 148 ii. Additional information on the Marking Protocol is available
- 149 at <http://www.regulations.gov#!documentDetail;D=EERE-2008-BT-STD-0005-0218>.

150 **Note:** EPA has added that "...EPSs shall the meet the level VI *or higher performance* requirements" in
151 order to allow for the specification to remain current should the requirements for EPSs become more
152 stringent in the future.

153 3.2.2 General User Information: The product shall ship with consumer informational materials located
154 in either (1) the hard copy or electronic user manual, or (2) a package or box insert. These
155 materials shall include:

- 156 i. Information about the ENERGY STAR program,
- 157 ii. Information on the energy consumption implications of changes to default as-shipped
158 Television configuration and settings, and
- 159 iii. Notification that enabling certain optional features and functionalities (e.g., instant-on), may
160 increase energy consumption beyond the limits required for ENERGY STAR certification, as
161 applicable.

162 3.2.3 Forced Menu: Any product that includes a Forced Menu upon initial start-up shall:

- 163 i. Provide users with a choice of Home Configuration or Retail Configuration. Partners may use
164 alternative terminology if approved by the U.S. Environmental Protection Agency (EPA).
- 165 ii. Upon selection of Retail Configuration at initial start-up, either (1) display a second prompt
166 requiring the user to confirm the choice of Retail Configuration, or (2) display information on
167 the start-up menu that the Home Configuration is the setting in which the product qualifies for
168 ENERGY STAR. If option (2) is selected, additional detail about ENERGY STAR certification
169 and energy consumption expectations shall be included in printed product literature and on
170 the product information page on the Partner's website.

171 3.2.4 Preset Picture Setting Menu: For any product where consumers have the option of selecting
172 different picture settings from a preset menu at any time:

- 173 i. The product shall display on-screen information that the Default Picture Setting reflects the
174 setting under which the product qualifies for the ENERGY STAR. For example, such
175 information may be indicated by including an electronic ENERGY STAR mark alongside the
176 name or description of that picture setting or in the form of a message displayed each time
177 any setting other than the Default Picture Setting is selected.
- 178 ii. Products with a physical ENERGY STAR mark affixed to the front or top of the TV may
179 alternatively display on screen information that enabling picture settings other than the
180 Default Picture Setting may change the energy consumption of the product.
- 181 iii. Optional: The product may display on-screen information indicating that factory-configured
182 picture settings other than the Default Picture Setting meet ENERGY STAR if a TV in those
183 settings can also meet the Section 3.3 On Mode Requirements. For purposes of ENERGY
184 STAR certification, Partners shall report the presence of these settings which also meet the
185 requirements in the specification to the EPA-recognized certification body and maintain
186 internal documentation. EPA reserves the right to request this documentation at any time.
187 The settings shall not be third-party tested or reviewed during certification and verification
188 processes.

189 **Note:** Based on further input from stakeholders citing the complexity in changing product software if the
190 qualification of a TV model changes once a new specification takes effect, EPA proposes an additional
191 approach for TVs that have a physical ENERGY STAR label affixed to the front or top of the product. TVs
192 with a physical label affixed to the TV would be allowed to use alternative language to communicate
193 changes in energy consumption among different settings without needing to reference the ENERGY
194 STAR, since the consumer already has a visual indicator that the model ENERGY STAR-certified. A
195 model without the physical label affixed to the TV shall continue to provide on-screen information
196 regarding the Default Picture Setting with the electronic ENERGY STAR mark or reference to ENERGY
197 STAR as currently required under the Version 6.0/6.1 specification.

198 3.2.5 Standby-Passive Mode and Standby-Active, Low Mode Settings: If users can select and enable
199 Standby-Passive Mode or Standby-Active, Low Mode functions from a display prompt in On
200 Mode or a settings menu other than a Forced Menu, and if these functions may alter power
201 consumption from the default, as-tested Home Configuration:

- 202 i. The product shall display on-screen information that the default as-shipped settings reflect
203 the settings under which the product qualifies for the ENERGY STAR. For example, such
204 information may be indicated by including an electronic ENERGY STAR mark alongside the
205 name or description of the default as-shipped settings or in the form of a message displayed
206 each time any setting other than the default as-shipped setting is selected.
- 207 ii. Products with a physical ENERGY STAR mark affixed to the front or top of the TV may
208 alternatively display on-screen information that enabling settings other than the default as-
209 shipped settings may change the energy consumption of the product.

210 **Note:** In the Final Draft, per stakeholder feedback, EPA has harmonized the on-screen information
211 requirements for Preset Picture Setting Menus and Standby-Passive Mode and Standby-Active, Low
212 Mode Settings. EPA is proposing that Partners may meet Standby Mode on-screen informational
213 requirements by including ENERGY STAR messaging next to the default as-shipped configuration if the
214 product does not have a physical ENERGY STAR mark affixed to the front of the TV. If the TV does have
215 a physical label, the manufacturer has the option of providing a more general message such as ‘this
216 selection may change the energy consumption of your product.’

217 3.2.6 Thin Client Capability and MVPD-ready Information: Products that meet with Thin Client
218 Capability or are otherwise MVPD-ready shall:

- 219 i. Report the presence of Thin Client Capability and supporting information including, but not
220 limited to, interoperability protocols, decryption, and decoding functions for display on the
221 ENERGY STAR certified products list; and
- 222 ii. Inform the consumer in the user manual and/or on-screen prompt that the TV may be
223 capable of operating without a set-top box from an MVPD.

224 3.2.7 Standby-Active, High Mode Capability: TVs with Standby-Active, High Mode shall automatically
225 return to the default as-tested Standby-Active, Low Mode or Standby-Passive Mode following a
226 manufacturer firmware update or other maintenance operation in Standby Active, High Mode
227 within a period less than or equal to 15 minutes from the completion of said update/maintenance
228 operation.

229 **3.3 On Mode Requirements**

230 3.3.1 For all TVs, On Mode power, as tested per Section 7.1.2 *On Mode Test for TVs without ABC*
231 *Enabled by Default* or Section 7.1.3.2 *On Mode Power Calculation* (for TVs with ABC Enabled
232 by Default) in Appendix H shall be less than or equal to the Maximum On Mode Power
233 Requirement (P_{ON_MAX}) and high resolution allowance, as shown in Equation 1.

234 **Equation 1: On Mode Power Requirement for All TVs**

$$P_{ON} \leq P_{ON_MAX} + P_{HR}$$

235
236 *Where:*

- 237 ▪ P_{ON} is On Mode Power in watts;
 - 238 ▪ P_{ON_MAX} is the Maximum On Mode Power requirement in watts calculated in Equation 2; and
 - 239 ▪ P_{HR} is a high resolution allowance in watts, as applicable, calculated in Equation 3.
- 240

241 3.3.2 The Maximum On Mode Power Requirement (P_{ON_MAX}) in watts shall be calculated per
242 Equation 2.

243 **Equation 2: Maximum On Mode Power Requirement**

244
$$P_{ON_MAX} = 78.5 \times \tanh(0.0005 \times (A - 140) + 0.038) + 14$$

245 *Where:*

- 246 ▪ P_{ON_MAX} is the maximum allowable On Mode Power consumption in watts;
- 247 ▪ A is the viewable Screen Area of the product in square inches; and
- 248 ▪ \tanh is the hyperbolic tangent function.

249 3.3.3 TVs with Native Vertical Resolution greater than or equal to 2160 lines are eligible for a high
250 resolution On Mode Power Allowance (P_{HR}) as calculated per Equation 3.

251 **Equation 3: Calculation of On Mode Power Allowance for TVs with Native Vertical Resolution**
252 **Greater than or Equal to 2160 lines**

254
$$P_{HR} = 0.50 \times P_{ON_MAX}$$

255 *Where:*

- 256 ▪ P_{HR} is the high resolution On Mode Power Allowance in watts; and
 - 257 ▪ P_{ON_MAX} is the maximum allowable On Mode Power consumption in watts.
- 258

259 **Note:** In response to stakeholder feedback that the Draft 2 On Mode Power requirements were
260 recognizing disproportionately fewer large models (above 60 inches), EPA has revised the coefficients in
261 the P_{ON_MAX} equation raising the limit slightly with increasing screen area. Accordingly, EPA has adjusted
262 the high resolution allowance from 55 percent in Draft 2 to 50 percent in this Final Draft to maintain the
263 same stringency that was proposed in Draft 2 for TVs, given that most TVs with greater than or equal to
264 2160 lines are above 60 inches in size.

265 The EPA Final Draft dataset includes all of the California Energy Commission models supplemented with
266 models from the EPA ENERGY STAR Version 6.1 database tested to the DOE Final Rule for a total of
267 2207 unique models. The overall dataset Final Draft On Mode Power pass rate is nearly 16 percent. The
268 pass rate for TVs with ultra high resolution greater than or equal to 2160 lines is over 13 percent. At least
269 10 major manufacturers are represented among the set of models meeting the proposed Final Draft On
270 Mode Power Requirements. Based on how rapidly the television market evolves, EPA continues to
271 anticipate a more than adequate selection of ENERGY STAR certified models by the time the
272 specification takes effect in late 2015.

273 Finally, EPA is also proposing to remove the May 1, 2017 expiration date for the ultra-high resolution
274 allowance. Doing so enables EPA to watch the market closely and adjust the allowance when appropriate
275 to ensure the ENERGY STAR continues to recognize the top performing products with ultra-high
276 resolution.

277 3.4 Standby-Passive Mode Requirements

278 3.4.1 Standby-Passive Mode power ($P_{\text{STANDBY-PASSIVE}}$), as measured per Section 7.3.3
279 Standby-Passive Mode of Appendix H, shall be less than or equal to 0.5 W.

280
281 EPA has decided to retain the 0.5 W limit, rather than reduce the limit to 0.3 W since the power savings
282 would be very small and EPA understands that moving to 0.3 W would prevent some products with very
283 efficient On Modes from qualifying for ENERGY STAR.
284

285 3.5 Standby-Active, Low Mode Requirements

286 3.5.1 Standby-Active, Low Mode, as measured per Section 7.3.3 Standby-Active, Low
287 Mode of Appendix H, shall be less than or equal to 3.0 W.

288 3.6 Luminance Requirements

289 3.6.1 For products with a luminance in the Brightest Selectable Preset Picture Setting (the greater
290 value of $L_{\text{DEFAULT_RETAIL}}$ or $L_{\text{BRIGHTEST_HOME}}$) less than 350 cd/m^2 , luminance in the Default
291 Picture Setting ($L_{\text{DEFAULT_HOME}}$) shall be greater than or equal to 65% of the luminance in the
292 Brightest Selectable Preset Picture Setting.

293 3.6.2 For products with a luminance in the Brightest Selectable Preset Picture Setting greater than
294 or equal to 350 cd/m^2 luminance in the Default Picture Setting shall be greater than or equal to
295 228 cd/m^2 .

296 **Note:** In Draft 2, EPA proposed that products with a Brightest Selectable Preset Picture Setting greater
297 than or equal to 450 cd/m^2 luminance have a luminance of greater than or equal to 293 cd/m^2 in the
298 Default Picture Setting. This approach was intended to permit products with brighter maximum screen
299 luminance to be optimized for home use.

300 Stakeholders generally supported this Draft 2 proposal with some stakeholders noting that it could be
301 further adjusted such that the as-shipped luminance be 228 cd/m^2 , which is closest to the median As-
302 Shipped Luminance of TVs today, rather than 293 cd/m^2 . EPA confirmed that the median as-shipped
303 luminance among its dataset of qualified products is approximately 232 cd/m^2 and therefore proposes
304 adopting this revised proposal. In the Final Draft, products with Brightest Selectable Preset Picture
305 Setting luminance greater than or equal to 350 cd/m^2 , must have a luminance in the Default Picture
306 Setting of greater than or equal to 228 cd/m^2 (which is 65 percent of 350 cd/m^2).

307 Since approximately 88.5 percent of EPA's dataset has Brightest Selectable Preset Picture Setting
308 luminance below 350 cd/m^2 , this revised proposal still only applies to a small subset of currently certified
309 models. The proposal still intends to guard against TVs being shipped too dim, while permitting products
310 with brighter maximum screen luminance to be optimized for home use.

311 3.7 Download Acquisition Mode (DAM) Requirements for Hospitality TVs

312 3.7.1 A product may automatically exit Standby-Passive Mode or Standby-Active, Low Mode and
313 enter Download Acquisition Mode according to a predefined schedule, in order to:

- 314 i. Download channel listing information for use by an electronic programming guide,
- 315 ii. Monitor for emergency messaging/communications, or
- 316 iii. Communicate via a network protocol.

317 3.7.2 DAM energy consumption for all DAM states (E_{DAM}), as measured per the CEA Procedure for
 318 DAM Testing, shall be less than or equal to 40 watt-hours per day (0.04 kWh/day).

319
 320 **Note:** Products intended for sale in the US market are subject to minimum toxicity and recyclability
 321 requirements. Please see ENERGY STAR Program Requirements for Televisions: Partner Commitments
 322 for details.

323 **4 TESTING**

324 **4.1 Test Methods**

325 4.1.1 Test methods identified in Table 1 shall be used for certification as applicable.

326 **Table 1: Test Methods for ENERGY STAR Certification**

Product Type	Test Method
All Ac Mains-powered TVs	Uniform Test Method for Measuring the Energy Consumption of Television Sets incorporated in Appendix H to Subpart B of 10 CFR Part 430.

327

328 **4.2 Additional Required Test for TVs with Standby-Active, Low Mode**

329 4.2.1 The following method in Table 2 shall be used for TVs with a Standby-Active, Low mode:

330 **Table 2: Methods for TVs with Standby-Active, Low**

Product Type	Method
TVs with Standby-Active, Low Mode	CEA-2037-A, Determination of Television Set Power Consumption

331

332 4.2.2 If the TV is network-enabled and tested in Standby-Active, Low per Appendix H, the following
 333 additional test is required for ENERGY STAR certification:

- 334 i. Perform all procedures specified in Section 6.7.5 Standby-active, Low of CEA-2037-A with
 335 the additional preconditions:
 - 336 1) Place the UUT in On Mode as tested per Appendix H and momentarily press the power
 337 button on the remote control; and
 - 338 2) Wait 5 minutes after pressing the power button before beginning the Section 6.7.5
 339 procedures in CEA-2037-A.
- 340 ii. TVs, for which availability can be confirmed with one of the methods in Section 6.7.5.2
 341 Availability of CEA-2037-A, shall be reported as having Full Network Connectivity.

342 **4.3 Additional Required Test for Hospitality TVs**

343 4.3.1 DAM energy consumption of Hospitality TVs shall be measured using the following method in
344 Table 3:

345 **Table 3: Method for Hospitality TVs**

Product Type	Method
Hospitality TVs	CEA Procedure for DAM Testing: For TVs, Rev. 0.3, Sept. 2010

346 **4.4 Number of Units Required for Testing**

347 4.4.1 One of the following sampling plans shall be used to test for ENERGY STAR certification:

- 348 i. A single representative unit shall be selected for testing the Basic Model;
- 349 ii. Units shall be selected for testing per the sampling requirements defined in 10 CFR 429.25,
350 which references 10 CFR 429.11.

351 **4.5 International Market Certification**

352 4.5.1 Products shall be tested for certification at the relevant input voltage/frequency combination for
353 each market in which they will be sold and promoted as ENERGY STAR.

354 **5 USER INTERFACE**

355 5.1.1 Partners are encouraged to design products in accordance with the user interface standard
356 IEEE 1621: Standard for User Interface Elements in Power Control of Electronic Devices
357 Employed in Office/Consumer Environments. For details, see <http://eetd.LBL.gov/Controls>.

358 **6 EFFECTIVE DATE**

359 6.1.1 Effective Date: The Version 7.0 ENERGY STAR Televisions specification shall take effect on
360 **September 30, 2015**. To qualify for ENERGY STAR, a product model shall meet the
361 ENERGY STAR specification in effect on its date of manufacture. The date of manufacture is
362 specific to each unit and is the date on which a unit is considered to be completely assembled.

363 **Note:** EPA anticipates finalizing this specification revision in late December 2014, with the specification
364 taking effect nine months later.

365 6.1.2 Future Specification Revisions: EPA reserves the right to change this specification should
366 technological and/or market changes affect its usefulness to consumers, industry, or the
367 environment. In keeping with current policy, revisions to the specification are arrived at
368 through stakeholder discussions. In the event of a specification revision, please note that the
369 ENERGY STAR certification is not automatically granted for the life of a product model.

370 **7 CONSIDERATIONS FOR FUTURE REVISIONS**

371 7.1.1 Standby-Active, High Mode: EPA and DOE are interested in learning more about Standby-
372 Active, High Mode. EPA anticipates exploring this issue and potential power limits and duty
373 cycle requirements in the next specification revision.

374 7.1.2 Trends and Improvements in Energy Efficiency: EPA anticipates continued gains in energy
375 efficiency to be achieved in the next few years with advances in technology such as LED
376 efficacy, the addition of reflective polarizing film, power supply improvements, lower screen
377 reflectance, improved backplanes (Low Temperature Polysilicon and Indium Gallium Zinc
378 Oxide), quantum dot technology, and next generation Organic Light Emitting Diodes (OLED).
379 As such, EPA anticipates an opportunity for proposing further limits on power consumption in
380 future revisions.