



# ENERGY STAR® Program Requirements Product Specification for Televisions

## Eligibility Criteria Draft 2 Version 6.0

Following is the Draft 2 Version 6.0 ENERGY STAR Product Specification for Televisions. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

**Note:** In January 2012, the U.S. Department of Energy (DOE) published the Test Procedure for Television Sets Notice of Proposed Rulemaking (TV TP NOPR) (77 FR 2830). The ENERGY STAR Specification for Televisions will ultimately reference the DOE TV Test Procedure Final Rule once it is published and, in an effort to provide partners with continuity and honor the Agency's intention to harmonize with the final DOE Test Method, this Draft 2 Version 6.0 proposes the use of the DOE TV TP NOPR, where applicable. The ENERGY STAR specification incorporates the definitions, scope, and testing requirements as outlined in the DOE TV TP NOPR, which build on, and are similar to, those of the ENERGY STAR Televisions 5.3 specification.

Given the current high market share of ENERGY STAR qualified Televisions, EPA intends to finalize Version 6.0 in March 2012, with the specification taking effect in early 2013. EPA commits to working with stakeholders in the period between Draft 2 and the finalization of the specification to address any differences between DOE's TV TP NOPR and ENERGY STAR's current test method. Depending on the timing of the publication and the extent of any changes made in the final DOE Test Procedure, if the publication of the final DOE Test Procedure does not impact qualification of products under Version 6.0, EPA will issue a modification (i.e. Version 6.1), referencing the final Test Procedure. Should DOE's final test method differ significantly from its TV TP NOPR, wherein the qualification of products under Version 6.0 is impacted, EPA will accelerate the development of a Version 7.0 such that manufacturers adhere to DOE's final test method. Stakeholders are invited to submit all written comments regarding the regulatory definitions and testing procedures to the public DOE Television Sets Public Docket via the Federal eRulemaking Portal: <http://www.regulations.gov> (EERE-2010-BT-TP-0026) no later than April 3, 2012.

More information on the Department of Energy's TV TP NOPR is available at:  
[http://www1.eere.energy.gov/buildings/appliance\\_standards/residential/tv\\_sets.html](http://www1.eere.energy.gov/buildings/appliance_standards/residential/tv_sets.html)

The DOE TV TP NOPR as published in the Federal Register is available at:  
<http://www.gpo.gov/fdsys/pkg/FR-2012-01-19/pdf/2012-687.pdf>

## 1 DEFINITIONS

### A) Product Types:

- 1) Television (TV): A product designed to be powered primarily by mains power having a diagonal screen size of fifteen inches or larger that is manufactured with a TV tuner, and that is capable of displaying dynamic visual information from wired or wireless sources including but not limited to:
  - a) Broadcast and similar services for terrestrial, cable, satellite, and/or broadband transmission of analog and/or digital signals; and/or
  - b) Display-specific data connections, such as Video Graphics Array (VGA), Digital Visual Interface (DVI), High-Definition Multimedia Interface (HDMI), DisplayPort, used typically for a computer or workstation that is not physically attached to the display; and/or

- c) Media storage devices such as a USB flash drive, a memory card, or a DVD; and/or
- d) Network connections, usually using Internet Protocol, typically carried over Ethernet or WiFi.
- A TV may contain, but is not limited to, one of the following display technologies: liquid crystal display (LCD), light-emitting diode (LED), cathode-ray tube (CRT), and plasma display panel (PDP).
- 2) Rear-projection TV: A television product in which the display device is a projector that focuses images onto a screen located inside the TV enclosure.
- 3) Direct-view TV: A television product in which the display device emits light either directly from the screen surface or transmits light from a source mounted directly behind the screen.
- 4) TV Combination Unit: A television product in which the TV and one or more additional devices (e.g., DVD player, Blu-ray Disc player, Hard Disk Drive) are combined into a single enclosure, and which meets all of the following criteria:
- a) it is not possible to measure the power of the individual components without removing the product housing; and
- b) the product connects to a wall outlet via a single power cord.
- 5) Component Television: A television product composed of two or more separate components (e.g., display device and tuner) that is marketed and sold as a television under a single model or system designation. A component television may have more than one power cord.
- 6) Hospitality Television: A television product which includes the following features:
- a) a control port for bi-directional communication (DB-9, RJ11, RJ12, RJ45, coaxial cable, or HDMI-CEC);
- b) activated hospitality protocol software (e.g., SmartPort, MPI, MTI, Serial Protocol) to provide direct access to Video-On-Demand (VOD) systems or a digital media player designed for hospitality-specific applications; and
- c) a power state that meets the definition of Download Acquisition Mode.
- 7) Analog Television: A television product which has an NTSC, PAL, or SECAM tuner, and may have analog video inputs (e.g., composite video, component video, S-video, RGB).
- 8) Digital Television: A television product which has at least one digital tuner or at least one digital video input (e.g., HDMI). Products with an analog tuner and both analog and digital inputs are considered digital products under this specification.
- B) Additional Functions: Functions that are not required for the basic operation of the device. Additional functions include, but are not limited to a VCR unit, a DVD unit, a HDD unit, a FM-radio unit, a memory card-reader unit, or an ambient lighting unit.
- C) Home Picture Setting (or default picture setting): The picture setting which is recommended by the manufacturer from the initial set up menu or the mode that the television comes shipped in if no setting is recommended.
- D) Retail Picture Setting: The preset picture setting in which the TV produces the highest luminance during the on mode conditions.

- 76 E) Native Vertical Resolution: The physical pixel count for the vertical axis of the television (e.g., a  
77 television with a screen resolution of 1920 x 1080 (horizontal x vertical) would have a native vertical  
78 resolution of 1080).
- 79 F) Electronic Program Guide (EPG): An interactive on-screen menu of TV program information  
80 downloaded from an external source (e.g., program time, date, descriptions).
- 81 G) External Power Supply (EPS): Also referred to as External Power Adapter. A component contained in  
82 a separate physical enclosure external to the television casing, designed to convert line voltage ac  
83 input from the mains to lower dc voltage(s) in order to provide power to the television. An EPS  
84 connects to the television via a removable or hard-wired male/female electrical connection, cable,  
85 cord or other wiring.
- 86 H) Point of Deployment (POD) Module: A conditional access module for digital cable signal reception.
- 87 I) Luminance: The photometric measure of the luminous intensity per unit area of light traveling in a  
88 given direction, expressed in units of candelas per square meter ( $\text{cd/m}^2$ ).
- 89 J) Automatic Brightness Control (ABC): The self-acting mechanism that controls the brightness of a  
90 display as a function of ambient light.
- 91 K) Operational Modes:
- 92 a) On Mode: The power mode in which the product is connected to a mains power source, has  
93 been activated, and is providing one or more of its principal functions.
- 94 b) Power Overhang State: A limited-duration power state within On Mode that is intended to  
95 facilitate a product's rapid return to full On Mode functionality or provide time for the product  
96 to perform functions required for safe shutdown (e.g. operation of cooling fans) after being  
97 switched into a low power state by the user.
- 98 2) Standby-Passive Mode: The mode in which the TV is connected to a power source, produces  
99 neither sound nor picture but can be switched into another mode with the remote control unit or  
100 an internal signal.
- 101 3) Standby-Active, High Mode: The mode in which the TV is connected to a power source, produces  
102 neither sound nor picture but can be switched into another mode with the remote control unit or  
103 an internal signal, and with an external signal, and is exchanging/receiving data with/from an  
104 external source.
- 105 a) Download Acquisition Mode (DAM): The power mode in which the product is connected  
106 to a mains power source, produces neither sound nor picture, and is actively  
107 downloading data. Data downloads may include channel listing information for use by an  
108 electronic programming guide, TV setup data, channel map updates, firmware updates,  
109 monitoring for emergency messaging/communications or other network communications..
- 110 4) Standby-Active, Low Mode: The mode in which the TV is connected to a power source, produces  
111 neither sound nor picture but can be switched into another mode with the remote control unit or  
112 an internal signal and can additionally be switched into another mode with an external signal.
- 113 5) Off Mode: The mode where the TV is connected to a power source, produces neither sound nor  
114 picture and cannot be switched into any other mode with the remote control unit, an external or  
115 internal signal.

**Note:** The following definitions have been revised or added in this draft to align with the DOE TV TP NOPR: TVs, Additional Functions, Home Picture Setting, Retail Picture Setting, Luminance, On Mode, Standby-Passive Mode, Standby-Active, High Mode, Standby-Active, Low Mode, and Off Mode. EPA and DOE are aware that ENERGY STAR specifications traditionally incorporate a sleep mode definition. In order to be consistent with the DOE TV TP NOPR, the ENERGY STAR specification has incorporated standby modes and definitions instead of sleep mode.

EPA and DOE welcome comments on these definitions as well as other definitions that stakeholders believe are necessary.

L) Screen Area: The viewable screen area of the product, calculated by multiplying the viewable image width by the viewable image height.

M) Product Family: A group of product models that are (1) made by the same manufacturer, (2) subject to the same ENERGY STAR qualification criteria, and (3) of a common basic design. Product models within a family differ from each other according to one or more characteristics or features that either (1) have no impact on product performance with regard to ENERGY STAR qualification criteria, or (2) are specified herein as acceptable variations within a product family. For Televisions, acceptable variations within a product family include:

1) Color, and

2) Housing.

## 2 SCOPE

### 2.1 Included Products

2.1.1 Products that are (1) marketed to the consumer as a television (e.g., television is the primary function), (2) capable of being powered from either a wall outlet or a battery unit that is sold with an external power supply, and (3) meet one of the following product type definitions, are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.2:

- i. Televisions
- ii. Television Combination Units
- iii. Component Televisions
- iv. Hospitality Televisions
- v. Products with a computer input port (e.g., VGA) that are marketed and sold primarily as televisions.
- vi. Dual-function televisions / computer monitors that are marketed and sold as dual-function televisions / computer monitors.

**Note:** Products that are capable of being powered by a battery are not included within the scope of the DOE TV TP NOPR. However, EPA seeks to retain such products in its scope of the Version 6.0 ENERGY STAR specification. In this case, EPA will work with stakeholders to ensure that such products that are excluded from the DOE TV TP NOPR are provided with an ENERGY STAR test method if they are not able to be tested under required testing conditions put forth in the DOE TV TP NOPR. To this end, EPA proposes that the ENERGY STAR test method proposed under the Draft 1 of the Version 6.0 Televisions specification (which is the same as the test method for Version 5.3) be the basis for a test method for products that not included in the scope of DOE TV TP NOPR.

157

## 158 **2.2 Excluded Products**

159 2.2.1 Products that are covered under other ENERGY STAR product specifications are not  
160 eligible for qualification under this specification. The list of specifications currently in  
161 effect can be found at [www.energystar.gov/products](http://www.energystar.gov/products).

162 2.2.2 Products that satisfy one or more of the following conditions are not eligible for  
163 ENERGY STAR qualification under this specification:

- 164 i. Products with a computer input port (e.g., VGA) that are marketed and sold primarily  
165 as computer monitors,
- 166 ii. Products that do not have a power state meeting the definition of Standby-Passive  
167 Mode (e.g., Public Alert CEA-2009-A certified models which offer 24/7/365 active  
168 public alert features), with the exception of Hospitality Televisions that meet the  
169 requirements specified in Section 3.7.

170 **Note:** EPA is aware of a revised Public Alert specification, CEA-2009-B, and welcomes comment on any  
171 differences between the two versions, and whether the above reference should be updated.

## 172 **3 QUALIFICATION CRITERIA**

### 173 **3.1 Significant Digits and Rounding**

174 3.1.1 All calculations shall be carried out with directly measured (unrounded) values.

175 3.1.2 Unless otherwise specified, compliance with specification limits shall be evaluated using  
176 exact values without any benefit from further rounding.

177 3.1.3 Directly measured or calculated values that are submitted for reporting on the ENERGY  
178 STAR website shall be rounded to the nearest significant digit as expressed in the  
179 corresponding specification limit.

### 180 **3.2 General Requirements**

181 3.2.1 External Power Supply (EPS): If the product is shipped with an EPS, the EPS shall  
182 meet the level V performance requirements under the International Efficiency Marking  
183 Protocol and include the level V marking. Additional information on the Marking Protocol  
184 is available at [www.energystar.gov/powersupplies](http://www.energystar.gov/powersupplies).

- 185 i. External Power Supplies shall meet level V requirements when tested using the Test  
186 Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and  
187 Ac-Ac Power Supplies, Aug. 11, 2004.

188 3.2.2 Power Management:

**Note:** EPA understands that manufacturers are developing and implementing innovative power management functions for Televisions such as occupancy sensors, proximity sensors or timer functions. As additional information about these technologies becomes available, EPA is exploring ways to encourage use of such measures in ENERGY STAR Televisions. Therefore, EPA seeks additional information about these functions, their savings, and projected market presence.

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

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

**3.2.4 Forced Menu:** Any product that includes a forced menu upon initial start-up shall:

- i. Provide users with a choice of “home” picture mode or “retail” picture mode. Partners may use alternative terminology if approved by EPA.
- ii. Upon selection of “retail” picture mode at initial start-up, either (1) display a second prompt requiring the user to confirm the choice of “retail” picture mode, or (2) display information on the start-up menu that the “home” picture mode is the mode in which the product qualifies for ENERGY STAR. If option (2) is selected, additional detail about ENERGY STAR qualification and energy consumption expectations shall be included in printed product literature and on the product information page on the Partner’s website.

**Note:** EPA is considering revising this requirement to double prompt the user anytime the television is taken out of the “home” picture mode. Based on research findings, EPA has learned that close to 50 percent of consumers may change the picture settings (e.g. to “vivid,” “sports,” “movie” modes) after purchasing a new TV. Asking users to confirm their choice of any picture mode other than “home” picture mode is intended to raise greater awareness among consumers that the “home” picture mode is the mode in which the product qualifies for ENERGY STAR and that other picture modes may not deliver the same energy savings. EPA seeks stakeholder feedback on this proposal.

**3.2.5 Component Televisions:** For component television products, the total power of all components shall be considered for evaluation against any power requirement in this specification.

### **3.3 On Mode Requirements**

**3.3.1** For products with Automatic Brightness Control (ABC) enabled by default, On Mode power ( $P_{ON}$ ), as calculated per Equation 1, shall be less than or equal to the Maximum On Mode Power Requirement ( $P_{ON\_MAX}$ ), as calculated per Equation 2.

**Equation 1: Calculation of On Mode Power for  
Products with ABC Enabled by Default**

$$P_{ON\_ABC} = W_{10}P_{10} + W_{50}P_{50} + W_{100}P_{100} + W_{300}P_{300}$$

*Where:*

- $P_{ON\_ABC}$  is the power consumed for on mode with ABC enabled;
- $P_{10}$  is the power consumed for on mode, ABC enabled, 10 lux, with a direct light source;
- $P_{50}$  is the power consumed for on mode, ABC enabled, 50 lux, with a direct light source;
- $P_{100}$  is the power consumed for on mode, ABC enabled, 100 lux, with a direct light source;
- $P_{300}$  is the power consumed for on mode, ABC enabled, 300 lux, with a direct light source;
- $W_{10}$  is the percent weighting for on mode, ABC enabled, while the room illuminance is 10 lux;
- $W_{50}$  is the percent weighting for on mode, ABC enabled, while the room illuminance is 50 lux;
- $W_{100}$  is the percent weighting for on mode, ABC enabled, while the room illuminance is 100 lux;
- $W_{300}$  is the percent weighting for on mode, ABC enabled, while the room illuminance is 300 lux;
- $W_{10} = W_{50} = W_{100} = W_{300} = 0.25$

**Note:** EPA is committed to adopting the television test procedure currently under development by the U.S. Department of Energy (DOE). The ENERGY STAR Version 6.0 TV specification is planned to be finalized in March 2012 and, in the interim, while the DOE's final Test Procedure is still under development, EPA proposes using the Automatic Brightness Control test procedure as written in the DOE TV TP NOPR as a basis for testing the On Mode Power of televisions shipped with ABC active.

Once DOE's test method is final, EPA will issue a modification to Version 6.0 so that manufacturers adhere to DOE's final test method as required. To the extent that the final test method does not impact qualification of products under Version 6.0, EPA will maintain its typical revision schedule for televisions (i.e., every two years). Should revisions to the test method impact qualification, EPA will accelerate revision to the specification to ensure that under the new test, the eligibility criteria continue to align with program principles (i.e., test highlights a good selection of top performing, cost effective products).

New studies also show typical room lighting levels to be low for average TV viewing. Many homes assessed in both the CEA and CLASP studies, conducted in Fall 2011, demonstrate that viewing often occurs at or under 10 lux and under 50 lux. Therefore, while the DOE test method is not yet final, the proposed room illumination points of 10, 50, 100 and 300 lux are more representative of the light levels in viewing environments than are the 0 lux and 300 lux points found in Version 5.3.

In addition, EPA understands that the new ABC test method will affect the reported On Mode power of a television. In order to preserve the utility of its large dataset and avoid retesting all products, EPA conducted additional testing and analysis and derived a correction factor, which was used to estimate how televisions tested under the old ABC test method would perform under the new method. Additional information on this correction can be found in the attached document "Proposed Data Correction for ABC."

3.3.2 For products that do not offer ABC, or for which ABC is not enabled by default, On Mode power ( $P_{ON}$ ), as measured per the ENERGY STAR test method shall be less than or equal to the Maximum On Mode Power Requirement ( $P_{ON\_MAX}$ ), as calculated per Equation 1.

#### Equation 2: Calculation of Maximum On Mode Power

$$P_{ON\_MAX} = 100 * \tanh(0.00085 * (A - 140) + 0.052) + 14.1$$

Where:

- $P_{ON\_MAX}$  is the maximum allowable On Mode Power consumption in W,
- $A$  is the viewable screen area of the product in square inches
- $\tanh$  is the hyperbolic tangent function

**Note:** EPA has developed a new proposal for calculating Maximum On Mode Power. In establishing the proposed performance levels, EPA re-evaluated its data associated with nearly 1700 current and previously ENERGY STAR qualified television models that stakeholders indicated are reasonably reflective of the current TV market. A masked version of the dataset is attached to this distribution. The proposed requirements represent the current top 15% of TVs in the EPA dataset (a dataset of 2011 models). Based on this dataset, EPA has proposed 2013 performance levels intended to differentiate top performers while allowing for good selection of products across all screen sizes available at a price that remains cost effective.

3.3.3 Measured Power Overhang state power shall be less than or equal to the Maximum On Mode Power Requirement ( $P_{ON\_MAX}$ ), as calculated per Equation 2.

### 3.4 Standby-Passive Mode Requirements

3.4.1 Measured Standby Mode power ( $P_{STANDBY-PASSIVE}$ ) shall be less than or equal to 1.0 W.

3.4.2 For products that offer more than one Standby Mode, the Standby Mode with the lowest power consumption shall be enabled by default.

**Note:** The Standby Mode Requirements are intended to be the same as the requirements EPA would propose under the "Sleep Mode" definition found in Draft 1 of the Version 6.0 Televisions specification. EPA seeks feedback from stakeholders as to whether the definition of Standby-Passive Mode corresponds to the previous definition of Sleep Mode. The two definitions are referenced below for stakeholders to compare and comment:



*Proposed Standby-Passive Mode (this draft, see Definitions):* “The mode in which the TV is connected to a power source, produces neither sound nor picture but can be switched into another mode with the remote control unit or an internal signal.”

*Sleep Mode (from proposed Draft 1, Version 6.0 and finalized Version 5.3 ENERGY STAR TV specifications):* “The power mode, sometimes referred to as “Standby,” in which the product is connected to a mains power source, is not providing a principal function, and offers one or more of the following user oriented or protective functions, which may persist for an indefinite time:

- a) to facilitate the activation of other modes (including activation or deactivation of On Mode) by remote switch (including remote control), internal sensor, timer.
- b) continuous function: information or status displays including clocks.
- c) continuous function: sensor-based functions.

Sleep Mode is defined as the time when the product is connected to a power source, produces neither sound nor picture, neither transmits nor receives program information and/or data (excluding data transmitted to change the unit’s condition from Sleep Mode to On Mode), and is waiting to be switched to On Mode by a direct or indirect signal from the consumer (e.g., with the remote control).”

EPA has amended the Standby- Passive Mode (intended to reflect the former Sleep Mode) requirement to include only the default standby mode as shipped. EPA is interested in demonstrating the power use of televisions in alternate standby modes, especially related to internet connectivity, thus the test procedure is requiring the testing of TVs in an internet connected standby. EPA intends to gather data on the power use of televisions while connected to a network and propose a limit when more information is available.

### 3.5 Luminance Requirements

- 3.5.1 Measured peak luminance in the “home” (or default, as-shipped) picture mode ( $L_{HOME}$ ) shall be greater than or equal to 65% of measured peak luminance in the “retail” (or brightest-selectable) preset picture mode ( $L_{RETAIL}$ ).

**Note:** EPA is aware that the DOE TV TP NOPR has changed the luminance test to require that luminance in the retail picture setting is measured before being in the home picture setting. DOE has found that, during testing, some TVs do not provide the ability to switch into the “retail” picture setting once placed into the “home” picture setting.

### 3.6 Download Acquisition Mode (DAM) Requirements

- 3.6.1 A product may automatically exit Standby-Passive Mode and enter Download Acquisition Mode according to a predefined schedule, in order to:
- i. Download channel listing information for use by an electronic programming guide,
  - ii. Monitor for emergency messaging/communications, or
  - iii. Communicate via a network protocol.
- 3.6.2 Measured DAM energy consumption for all DAM states ( $E_{DAM}$ ) shall be less than or equal to 40 watt-hours per day (0.04 kWh/day).

### 3.7 Hospitality Television Requirements

- 3.7.1 Hospitality Television TEC ( $TEC_{HOSP}$ ), as calculated per Equation 3, shall be less than or equal to the Maximum Hospitality Television TEC Requirement ( $TEC_{HOSP\_MAX}$ ), as calculated per Equation 4.

3.7.2 For Hospitality Televisions that feature an always-on DAM, measured DAM power ( $P_{DAM}$ ) shall be less than or equal to 1.0 W when tested per the Standby-Passive Mode test procedures.

**Equation 3: Calculation of TEC for Hospitality Televisions ( $TEC_{HOSP}$ )**

$$TEC_{HOSP} = (P_{ON} \times 5) + (P_{STANDBY} \times 19) + E_{DAM}$$

Where:

- $TEC_{HOSP}$  is the calculated Hospitality Television TEC;
- $P_{ON}$  is the measured On Mode power Section 3.3;
- $P_{STANDBY}$  is the measured Standby Mode power; and
- $E_{DAM}$  is the measured DAM energy over a 24 hour period.

**Equation 4: Calculation of Maximum TEC Requirement for Hospitality Televisions ( $TEC_{HOSP\_MAX}$ )**

$$TEC_{HOSP\_MAX} = 500 * \tanh(0.00085 * (A - 140) + 0.052) + 129.5$$

Where:

- $TEC_{HOSP}$  is the calculated Hospitality Television TEC;
- $A$  is the viewable screen area of the product in square inches
- $\tanh$  is the hyperbolic tangent function

### 3.8 Toxicity and Recyclability Requirements

3.8.1 Television products shall contain restricted levels of the following materials, where the maximum concentration values tolerated by weight in homogeneous materials are: lead (0.1%), mercury (0.1%), cadmium (0.01%), hexavalent chromium (0.1%), polybrominated biphenyls (PBB) (0.1%), or polybrominated diphenyl ethers (PBDE) (0.1%). Batteries are exempt. The following exemptions are granted for components in Televisions:

- i. Lead in glass of fluorescent tubes not exceeding 0.2% by weight.
- ii. Copper alloy containing up to 4% lead by weight.
- iii. Electrical or electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix.
- iv. Lead in dielectric ceramic in capacitors for a rated voltage of 125V AC or 250 V DC or higher.

3.8.2 Television products shall be designed for ease of disassembly and recyclability where external enclosures, sub-enclosures, chassis and electronic subassemblies are easily removable with commonly available tools, by hand, or by a recycler's automated processes. Products shall identify and provide ease of access to, and removal of, materials with special handling needs.

3.8.3 For purposes of third-party certification, toxicity and recyclability requirements shall not be reviewed when products are initially qualified or during subsequent verification testing. Instead, consistent with the RoHS Directive (for toxicity) and IEEE 1680 standard (for design for recyclability), manufacturers shall maintain documentation on file that products meet these requirements. EPA reserves the right to request this documentation at any time.

3.8.4 To the extent product models are sold in countries other than the U.S., they are not subject to requirements in 3.8.1, 3.8.2 and 3.8.3.

**Note:** In response to stakeholder comments related to third party certification, EPA has clarified that these requirements are exempt from the ENERGY STAR third-party certification process. Further, also in response to stakeholder comment, EPA added language making clear that the non-energy requirements proposed here are not intended for international adoption.

In developing these requirements, EPA seeks to avoid associating the ENERGY STAR label with poor quality or otherwise undesirable products. EPA drew from existing standards for toxicity and design for recyclability. EPA looked to the RoHS Directive for a toxicity limit because Television manufacturers have extensive experience with designing products free from certain toxic materials in compliance with RoHS. Most global manufacturers have been in compliance with RoHS since 2006, when the directive first took effect. EPA drew from the IEEE 1680.1 standard for the recyclability requirement because many manufacturers have years of experience with design for recyclability for displays, which use virtually identical materials to those found in TVs. Currently, over 700 products offered by the majority of the ENERGY STAR Partners who manufacture displays meet the minimum criteria for design for recyclability under IEEE1680.1, which has been in place since 2006. Further, new criteria are currently under consideration for the forthcoming IEEE 1680 standard for TVs, indicating the achievable nature of the above proposed requirements. Finally, many manufacturers and retailers share over a decade of experience with TV recycling, thus likely generating an understanding as to which materials or designs are more easily disassembled or recyclable.

EPA intends to harmonize with the RoHS Directive by adding language in Section 3.8 allowing the same exemptions as those outlined in the current RoHS Directive. EPA continues to seek stakeholder assistance in identifying all exemptions applicable to TVs. The exemptions proposed in this section are harmonized with exemptions 5(b), 6(c), 7(c)-I. and 7(c)-II in the revised RoHS Directive. Additionally, EPA is requesting feedback on whether the exemption in the revised RoHS Directive (#39) for "cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm<sup>2</sup> of light-emitting area) for use in solid state illumination or display systems" (due to expire July 1, 2014) is applicable to TVs. EPA does not intend to require documentation of the need for exemption beyond what is needed by the Partner to demonstrate compliance with the RoHS Directive.

## 4 TESTING

### 4.1 Test Methods

4.1.1 When testing Television products, the test methods identified in Table 1 shall be used to determine ENERGY STAR qualification.

432

**Table 1: Test Method for ENERGY STAR Qualification**

| Product Type                 | Test Method   |
|------------------------------|---|
| Ac Mains-powered Televisions | The proposed test method is available in a Notice of Proposed Rulemaking published in the Federal Register 77 FR 2864. Once effective, the DOE test procedure adopted will be found in 10 CFR § 430 Appendix H. |
| Battery-powered Televisions  | ENERGY STAR Test Method for Televisions, Rev. Aug-201   |

433

**Note:** EPA is committed to adopting the television test procedure currently under development by the U.S. Department of Energy. In an effort to provide partners with certainty now and honor the Agency's intention to harmonize with the final DOE Test Method, this Draft 2 Version 6.0 proposes the use of the DOE TV TP NOPR. The DOE TV TP NOPR references test methods found in the ENERGY STAR TV Version 5.3 specification: *ENERGY STAR Test Methods for Televisions, Rev. Aug-2011*; *IEC 62087, Ed. 3.0: Methods of Measurement for the Power Consumption of Audio, Video and Related Equipment*; *IEC 62301, Ed. 2.0: Household Electrical Appliances – Measurement of Standby Power*; *CEA: Procedure for DAM Testing*.

442

Battery-powered televisions are excluded from the scope of the DOE TV TP NOPR. Therefore, EPA proposes that the ENERGY STAR test method proposed under the Draft 1 of the Version 6.0 Televisions specification (which is the same as the test method for Version 5.3) be used for these products.

445

## 4.2 Number of Units Required for Testing

4.2.1 Representative Models shall be selected for testing per the following requirements:

- i. For qualification of an individual product model, a product configuration equivalent to that which is intended to be marketed and labeled as ENERGY STAR is considered the Representative Model;
- ii. For qualification of a product family, any product configuration within the family may be considered the Representative Model.

## 4.3 International Market Qualification

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

## 5 USER INTERFACE

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

## 6 EFFECTIVE DATE

6.1.1 Effective Date: The Version 6.0 ENERGY STAR Televisions specification shall take effect on [TBD]. To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on its date of manufacture. The date of manufacture is specific to each unit and is the date (e.g., month and year) on which a unit is considered to be completely assembled.

**Note:** At this time EPA anticipates finalizing Version 6.0 in early Spring 2012, where the specification would then become effective in early 2013.

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

## APPENDIX A: Sample Calculations

| Viewable Diagonal<br>Screen Size<br>(inches) | Aspect<br>Ratio | Viewable<br>Screen<br>Size, w x h<br>(Inches) | Screen<br>Area, A<br>(sq-inches) | P <sub>ON, MAX</sub><br>(watts) |
|--|-----------------|---|----------------------------------|---------------------------------|
| 20   | 16:9            | 17.4 x 9.8                                    | 170.9                            | 21.9                            |
| 32   | 16:9            | 27.9 x 15.7                                   | 437.6                            | 43.7                            |
| 42   | 16:9            | 36.6 x 20.6                                   | 753.8                            | 65.9                            |
| 50   | 16:9            | 43.6 x 24.5                                   | 1068.2                           | 82.7                            |
| 60   | 16:9            | 52.3 x 29.4                                   | 1538.3                           | 98.7                            |