

NRDC, ACEEE, and NRDC Comments on ENERGY STAR VERSION 7, DRAFT 1 SPECIFICATION FOR TELEVISIONS

July 7, 2014

On behalf of the energy efficiency advocacy groups the Natural Resources Defense Council (NRDC), the Appliance Standards Awareness Project (ASAP), and the American Council for an Energy Efficient Economy (ACEEE) , we respectfully submit our comments on the ENERGY STAR Version 7.0 Draft 1 Specification for televisions (TVs). The ENERGY STAR program has been instrumental in the reduction of new TV energy use and we are concerned that a significant portion of these savings may potentially be lost due to the increased on mode power use of ultra-high definition TVs and dramatically increased standby power caused by TVs that connect to the internet. To help preserve these savings and continue to encourage ongoing improvements in the energy efficiency of new TVs in all operating modes, we provide the following feedback and recommendations:

1. We support ENERGY STAR's proposed on mode power requirements

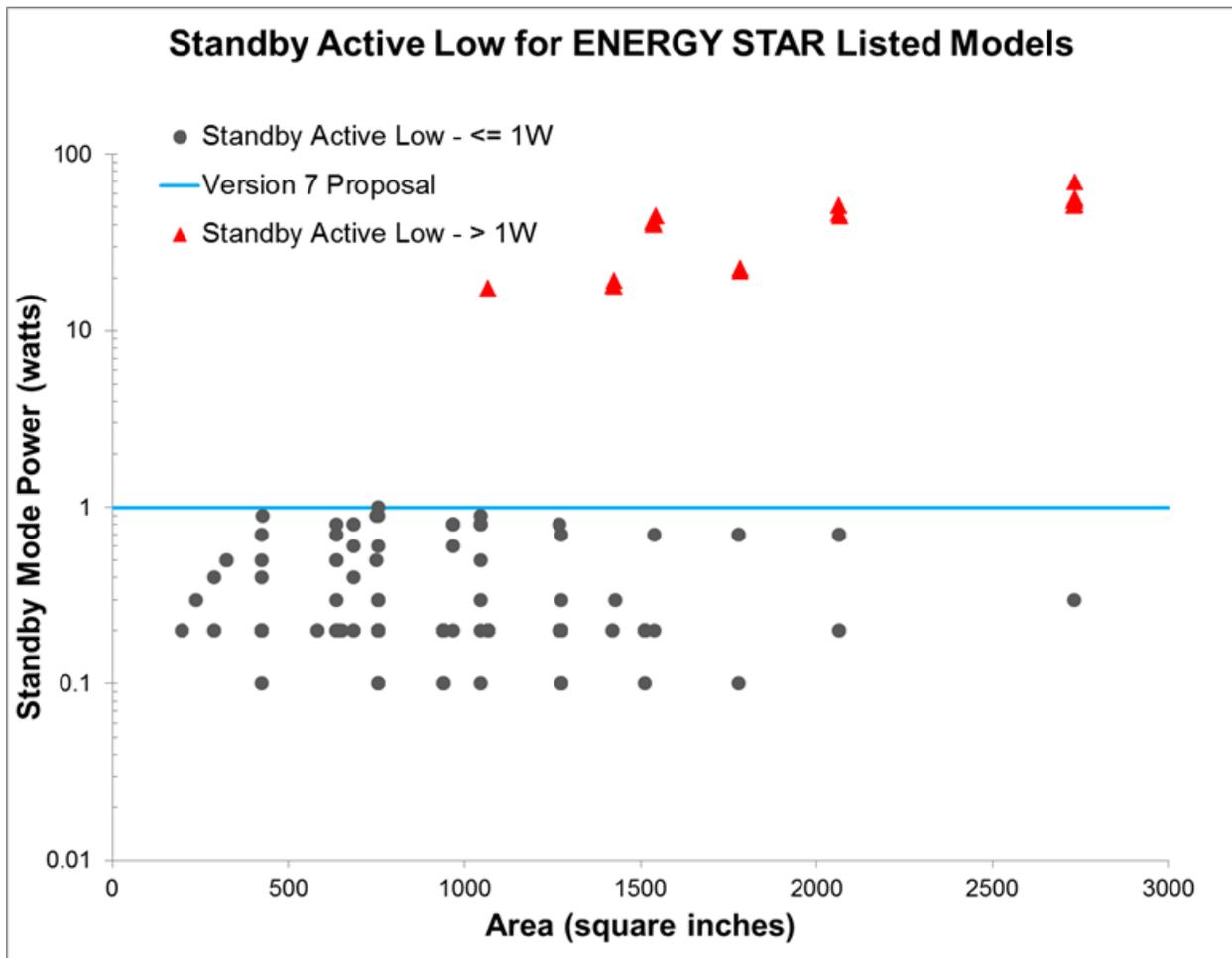
On multiple occasions, shortly after EPA's new specification for TVs has gone into effect, the market share of ENERGY STAR qualified models has quickly jumped from the specifications targeted level of 25% to 50-75+ % of the market. Until its specification is next updated by EPA, the ENERGY STAR label is not serving its intended market leadership role, and the value of the brand is compromised. To its credit, EPA is taking a forward looking view and has proposed Version 7 on mode power requirements which an estimated 15% of all high definition (HD) models in EPA's current database would meet. This value is below EPA's traditional target of 25% share of qualified models at the time its specifications are live. As the Version 7 specification is not due to go into effect until the summer of 2015, we can expect 25% or more of the models to meet the ENERGY STAR requirements by then. In summary, we believe EPA has set a sufficiently stringent on mode power requirement and encourage the agency to resist potential requests by other stakeholders to weaken this part of the specification.

2. We support EPA's proposal to include power limits for standby-active, low mode. Prior to finalizing the power limit for this mode, further analysis is needed by EPA to better understand the accuracy of the manufacturer reported values, and what functionality is being supported when TVs operate in this mode.

The data set shown by EPA during the webinar showed two distinct grouping of models regarding standby-active, low mode. Most of the models appeared to consume between 0.1 and 1 Watt, while others inexplicably consumed 20 to 70 Watts. (EPA should contact those manufacturers to better understand what functionality is being provided for those models consuming 20 or more Watts of power in this mode.) During the webinar one manufacturer suggested that many of the 1 Watt and below values might be incorrect as the test might not have been conducted properly -- with the TV's internet capabilities turned on and with the TV connected to a live internet connection. Per the test method, both of these conditions must be met as part of the set up conditions for standby-active low mode power test. (Note: standby-

active low mode represents the condition when an internet ready TV is first successfully connected to a live internet connection and then the TV is turned off via the remote, without disconnecting the Ethernet/wired connection to the internet or the manual cancellation of the internet connection.)

We believe the EPA’s initial proposal of 1 Watt for this mode is about right. Reference points for EPA’s consideration include Nintendo’s Wii U game console which consumes **0.4 watt** in Off mode, and wakes up every hour to connect to the internet to quickly check for downloads, then goes back to 0.4 watt after download and installation. This “scheduled wake” implementation would likely be sufficient for internet enabled TVs as well.



Some devices cannot rely solely on scheduled wake, as they need to respond interactively, for example for remote logon and immediate access or recording of local data on the device. Those devices need the capability to respond to a reactivation request from the network,

Various silicon vendors offer network reactivation capabilities (such as Wake on LAN and Wake on Wireless LAN for computers) for very low power levels (0.5W or less) that allow a device to stay sufficiently awake ready to receive a request to power up from the network. The European Union Ecodesign regulation for computers sets a 0.7 W allowance for Wake on LAN. For more information see information at Silicon Labs website:

<http://www.silabs.com/products/mcu/pages/wake-on-lan.aspx>. We encourage EPA to reach out to leading low standby power technology providers like On-Semi, Power Integrations and others to further explore the capabilities and power levels their products offer.

During the webinar, some manufacturers requested a value closer to 5W for active-standby, low power mode. This level does not seem warranted compared to best practices and power levels from <1 Watt to just over 1 Watt that are being observed in today's internet connected streaming boxes like Apple TV, well designed laptops, and the Wii U.

Setting a higher active-standby low power mode at 5W for TVs translates to 35 kWh/yr of standby power at 5 hours on/19 hours standby. This is quite significant as most of the 40 inch TVs on the ENERGY STAR website use a TOTAL of 65 kWh/yr. **If the industry recommendation of 5W is adopted, then over 50% of many new HD TVs' annual energy will be consumed when it is NOT being used.** This would be a huge and unnecessary step backwards and EPA should pursue the lowest standby active low mode power levels that are achievable with existing technologies.

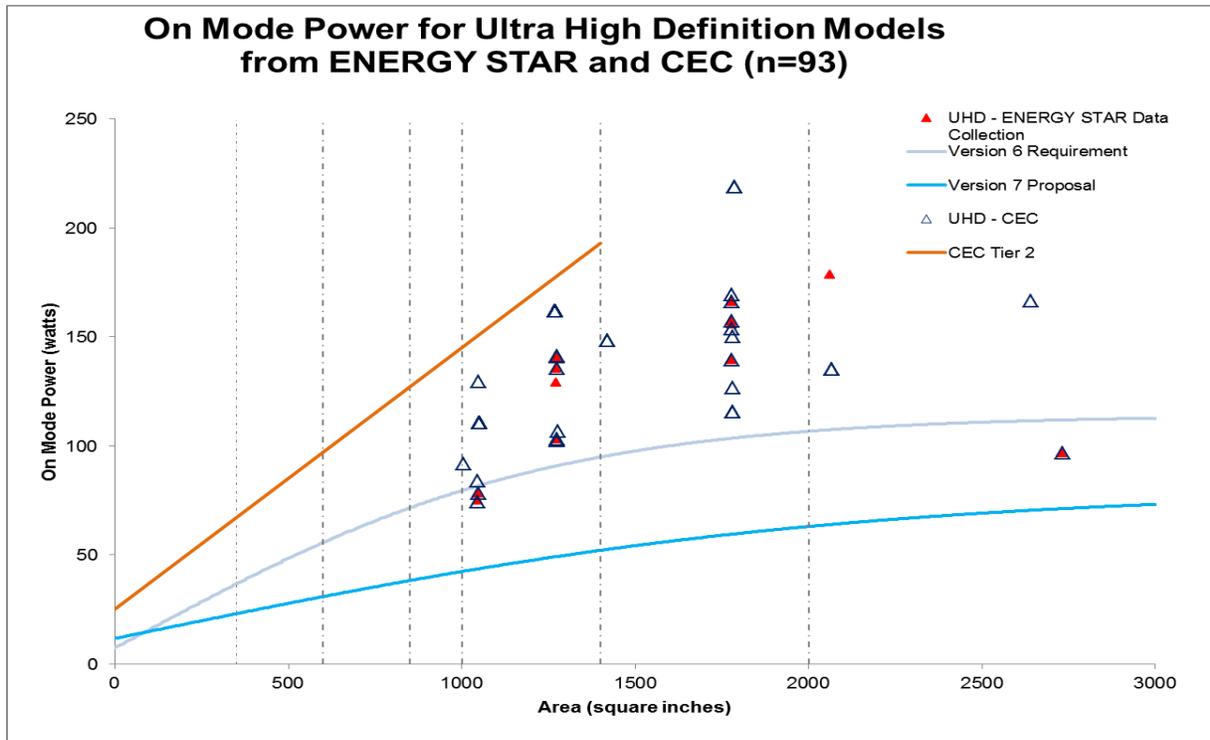
3. We encourage EPA to more closely review the on mode power use of ultra-high definition (UHD) TVs and based on the additional information it collects to develop an approach for encouraging energy reductions of UHD TVs.

A. More data and analysis is needed to understand the incremental power use of UHD TVs, as well as the range in power use of identical sized UHD TVs.

A better understanding of the energy use of TVs marketed as UHD is needed to better inform ENERGY STAR's treatment of this product type in Version 7. In many cases, the data shown by ENERGY STAR during its webinar showed that UHD TVs used almost twice as much on mode power as equal sized ENERGY STAR 6 qualified models. **If UHD sales grow significantly, as many predict, then much of the hard earned savings achieved by the TV industry and ENERGY STAR will be lost unless UHD TVs become dramatically more efficient.**

While we understand UHD TVs may require a brighter back light and more powerful chip to process and deliver images that are as bright as today's high definition (HD) TVs, the incremental power use of 40 to 100 watts seen today for many of these models appears excessive and perhaps implausible. (As a reference point, a single 10W light LED light bulb gives off 800 lumens or the equivalent of the old 60 Watt light bulb.)

The California Energy Commission's standards requires manufacturers to register TVs that have a diagonal screen size of less than 58 inches that are offered for sale in California. This database includes many more models and the same trend of increased power use for UHD models (see figure below). Also noteworthy is the fact that there is a large spread in power use of similar sized UHD models and that relatively small incremental power use levels compared to HD TVs already exist for some models on the market today.



The advocates recommend EPA work closely with the TV manufacturers to make sure EPA has the most up to date information possible, including the projected energy use of models that will be introduced later this year and in the first half of 2015. Simply relying on the reported data of the very first UHD models that were introduced on the market may result in EPA basing its specification on outdated data that would not reflect any of the improvements manufacturers might be making to bring down the energy use of their second iteration of their UHD TVs that will become available by the second half of 2015 when the new specification takes effect.

B. EPA should consider providing a functional adder (additional power allowance) for UHD TVs. Establishment of such an adder should be contingent upon receipt of up to date data and reflect best practice.

As UHD TVs are likely to represent a growing portion of the market, EPA should consider establishing an adder for on mode power for UHD TVs to minimize the incremental power they consume. This adder should reflect best practices and be as small as possible to prevent new ENERGY STAR qualified UHD TVs from consuming significantly more on mode power than today's typical HD TVs. As a general principle in establishing its revised specification, EPA should prevent backsliding by ensuring models that meet ENERGY STAR Version 7 (UHD or not), do not use more power than Version 6 allows.

EPA's inclusion of an UHD adder will set an initial target for manufacturers to aim for and to bring down the incremental power use of their new UHD TVs, which can be updated again at a later date.

In the event EPA has not received sufficient additional data from manufacturers, it may have to defer development of levels for UHD TVs till a subsequent ENERGY STAR specification revision. (During the EPA webinar, EPA stated that only 4 manufacturers supplied data in response to its data request, potentially leaving EPA with an incomplete picture of the market).

4. ENERGY STAR should continue to closely monitor the energy impacts of TVs that have “quick start” type features and require submission of additional data for those TVs that offer this feature.

The DOE test procedure lays out a scheme for measuring the power use of features like quick start, which allow the TV to start up more quickly. In lay language, the test method requires TVs to be tested with features such as Quick Start, if the TV is shipped with it enabled, or if the TV prompts the user to potentially select this feature. In this case, the incremental power use would be accounted for. If on the other hand the only way the user can access this feature is by seeking it out in a user menu at a later time, then the TV is tested with that feature disabled. This is an important matter as some of the initial implementations of Google TV introduced several years ago used 24 Watts of power continuously when Quick Start is selected. This translated to a whopping incremental annual energy use of 166 kWh/yr, which is 2 to 3 times the TOTAL annual energy use of today’s small to mid-sized TVs.

In order to better track the potential impacts of features like Quick Start, we encourage EPA to request manufacturers that have a Quick Start feature to report its power use, how much faster the TV starts (e.g. 2 seconds instead of 10 if not enabled), hours per day it stays in this mode when enabled, and to provide a digital screen shot of the menu where this feature is offered. This way EPA and DOE can assess how much power this type of feature uses and how actively the manufacturers promote this feature on their TVs, and allow the agencies to modify their test methods and requirements as necessary in the future.

In addition, we encourage EPA to reach out to Google and the two manufacturers Sony and Sharp that are reported to be implementing Google’s new smart TV software called [Android TV](#) to better understand how it would be implemented and what the power use impacts might be. We are hoping this has very low standby power draws, similar to those seen with recent product such as Google’s Chromecast, the plug-in media player from Google.

5. We support EPA’s proposal to set a power limit of 0.5 W for stand-by passive mode.

Stand-by passive is the amount of power a non-smart TV (e.g. one that cannot be directly connected to the internet) consumes after the user turns off their TV, yet can quickly wake up after receipt of a signal from the remote control. Per EPA analysis, 95% of current ESTAR 6 models already meet this level demonstrating that these levels are already being met by a wide range of manufacturers using existing technology.

We appreciate the opportunity to submit these comments and should you wish to discuss our comments further, please contact Noah Horowitz at nhorowitz@nrdc.org or 415-875-6100.

Respectfully Submitted By:

Noah Horowitz
Natural Resource Defense Council (NRDC)

Andrew Delaski
Appliance Standards Awareness Project (ASAP)

Sameer Kwatra
American Council for an Energy Efficient Economy (ACEEE)