



July 3, 2014

Ms. Verena Radulovic
United States Environmental Protection Agency
Office of Air and Radiation
1200 Pennsylvania Ave NW
Washington, DC 20460

Subject: Follow up Comments to the ENERGY STAR Draft 1 Version 7.0 Proposal

Dear Ms. Radulovic,

On behalf of the Northwest Energy Efficiency Alliance (NEEA) and Sacramento Municipal Utility District (SMUD), we respectfully submit comments in regards to the ENERGY STAR Draft 1 Version 7.0 Television specification issued June 2nd, 2014.

As organizations involved in supporting the introduction and commercialization of energy efficient products into the market, we support EPA's efforts to update the ENERGY STAR Televisions specification. The ENERGY STAR specification promotes the adoption of energy efficient products by providing valuable product differentiation within the highly competitive television market. These efficient models will save US consumers and businesses substantial sums of money from reduced electricity bills and help to reduce greenhouse gas emissions.

A summary of our primary recommendations are:

- Increase the stringency of its proposed On Mode Power requirements to ensure that Version 7 does not achieve prematurely high levels of market penetration (Recommendation #1);
- Continue characterization of the impacts of UHD and network connectivity on energy consumption (Recommendations #2 and #3); and
- Integrate UHD and Network Connectivity into the Version 7 specification to incentivize the efficient operation of these features (Recommendations #2 and #3).

As promoters of energy efficiency and sponsors of utility incentive programs for a variety of plug loads and appliances, we work with market actors to help consumers become more informed about the benefits of purchasing energy-efficient products. For

example, our TV programs have provided financial incentives and marketing support to encourage manufacturers and retailers to educate, promote and sell the most energy-efficient TVs on the market. We recognize ENERGY STAR as a powerful tool for promoting market transformation towards more efficient products. Thus, we have a strong interest in continuing to support the development of a strong ENERGY STAR specification.

1) We commend EPA for its forward looking approach in developing On Mode Power requirements. We recommend that EPA develop more stringent requirements by reducing the pass rate to 10% to account for the fact that there are 1-2 product cycles between now and the specification effective date in late 2015. A more stringent qualifying level will ensure that the V7 specification does not prematurely achieve high levels of market penetration prior to its effective date.

EPA developed the Version 6 On Mode power requirements using a 15% pass rate with the intention that natural improvements in the market would result in a 25% pass rate when the specification became effective 18 months later.¹ This was an important recognition of the rapid improvements in television efficiency. The timing of the requirements and the effective date meant that there was effectively one TV product cycle between setting the On Mode requirements and the time that they took effect. By the time the Version 6 specification took effect in June 2013, we estimate that it had over 75% market penetration. As of May 2014, Version 6 has an estimated market penetration of over 85%.

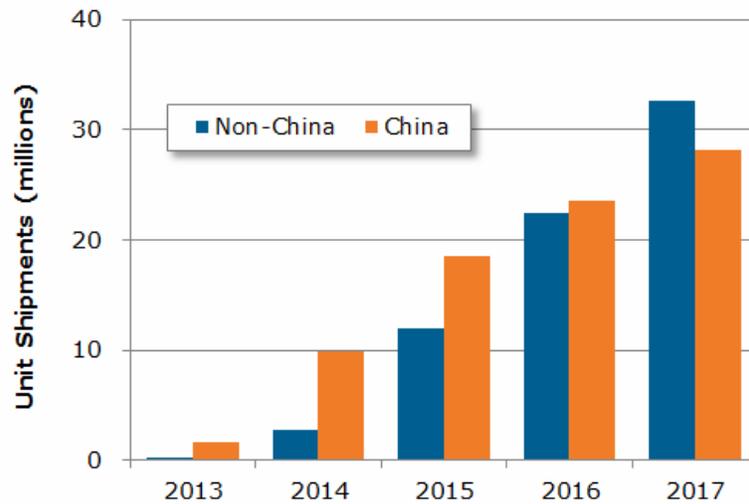
In such a fast-paced industry as televisions, we recognize the challenge of setting specification requirements 12-18 months ahead of its effective date while simultaneously maintaining EPA's goal of capturing 25% of the market. We believe that setting a 14% pass rate will likely result in market penetration rates well above EPA's goal of 25% when the specification takes effect. We strongly recommend that EPA reduce its pass rate to 10% to ensure that the Version 7 specification maintains its relevance over time.

2) We support EPA's efforts to include Ultra High Definition (UHD) televisions in the Version 7 specification. We are concerned that increased use of UHD television in Active Mode will result in a significant increase in energy consumption, and recommend that EPA take steps towards integrating efficiency requirements for UHD TVs in the Version 7.0 specification.

¹ The existing ENERGY STAR Version 6 On Mode Power requirements were released in February 2012 as part of the Draft 2 specification, and levels were maintained in the Final specification released July 2012, with an effective date of June 1, 2013.

Ultra High Definition (UHD) televisions are expected to gain significant market share over the next few years. According to DisplaySearch, unit shipments of UHD TV models are expected to increase by roughly 10x from 2013-17 (see Figure 1).

Figure 1: 4K Ultra HD TV Shipment Forecasts 2014-2017

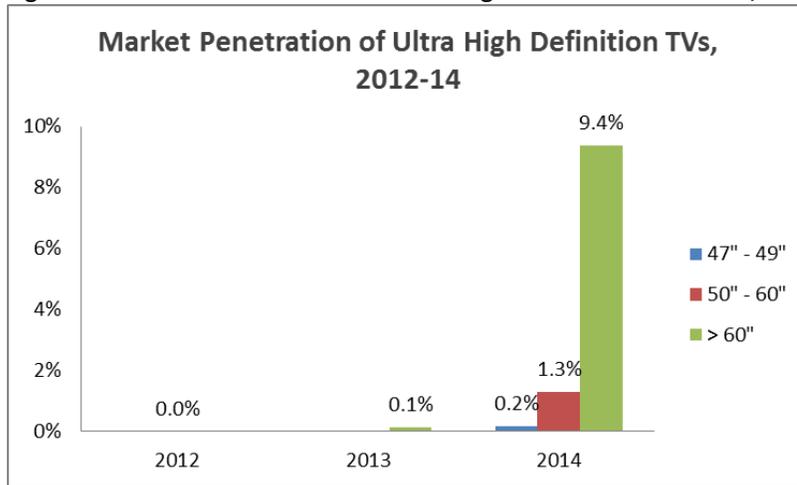


Source: DisplaySearch²

Our analysis of 2012-14 UHD sales supports these projections (see Figure 2). Although UHD TVs represent roughly 1% of total TV US sales, it is rapidly growing in the largest screen size bins. Within the >60" TV size bin, UHD market penetration increased almost 100x over the past year from 0.1% in 2013 to 9.4% in 2014. Similarly, TVs within the 50-60" size bin made substantial gains in 2014, and as UHD technology costs continue to decline, we expect to see cascading effects and greater UHD adoption in smaller TV sizes. If UHD sales meet current projections, they will represent a significant fraction of TV sales when the ENERGY STAR specification goes into effect in Q3 2015, especially in the largest, and most energy consumptive, screen sizes.

² CE Pro.com. '4K Ultra HD TV Shipment to Increase dramatically in 2014.' December 24, 2013. http://www.cepro.com/article/4k_ultra_hd_tv_shipments_to_increase_dramatically_in_2014/

Figure 2: US Market Penetration of Ultra High Definition Televisions, 2012-14 ³



Data Source: The NPD Group/Market Tracking Service

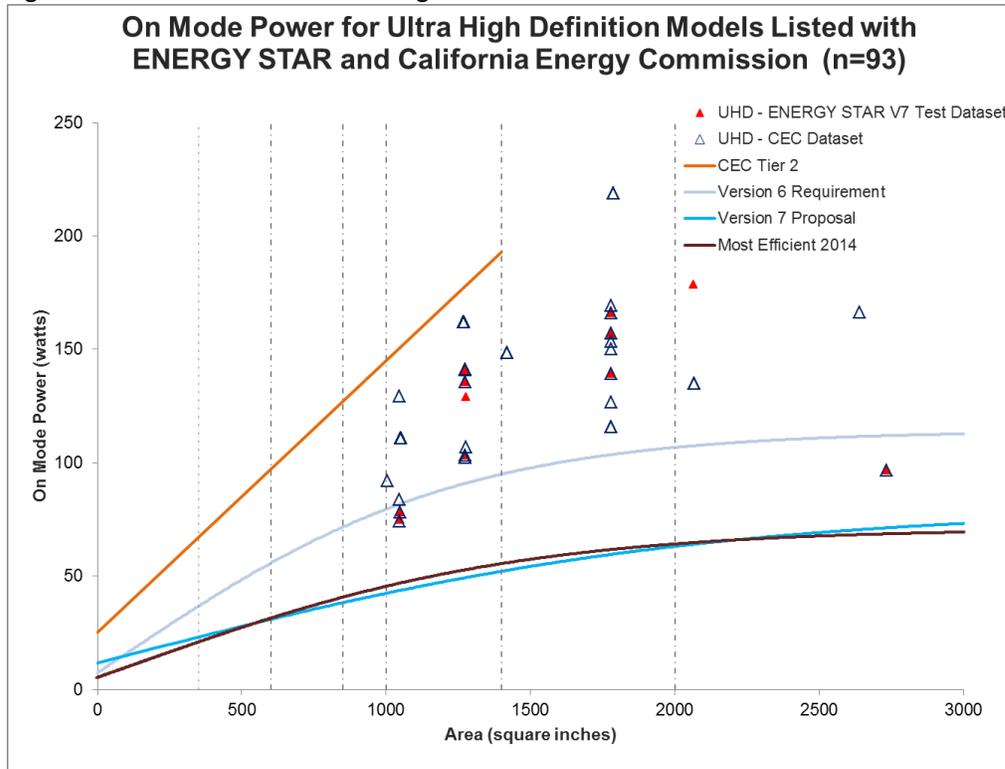
While UHD content is not yet readily available, most of these UHD TVs improve picture quality by ‘upconverting’ existing HD content to UHD through a process of pixel interpolation.⁴ Based on product test data from the ENERGY STAR Draft 1 Version 7 test dataset and California Energy Commission’s (CEC) Appliance Efficiency Database, UHD televisions consume substantially more energy than HD TVs while streaming standard HD content (see Figure 3). Very few UHD models meet ENERGY STAR Version 6 requirements,⁵ and no existing UHD televisions meet Version 7 requirements.

³ Sales data based on January – May intervals of each calendar year. Sales are based on the monthly sales data for the Northwest (WA, OR, ID, and MT). Since retailers make stocking decisions on a national basis, we assume that this data is representative of national trends.

⁴Upconverting HD content is a requirement of CEA’s recently updated ‘Characteristics for Ultra High-Definition Displays’, released June 25, 2014. <http://www.ce.org/News/News-Releases/Press-Releases/2014/CEA-Updates-Characteristics-for-Ultra-High-Definit.aspx>

⁵ On the June 17 EPA webinar, some manufacturers expressed skepticism that UHD TVs could qualify for Version 6.

Figure 3: On Mode Power for Ultra High Definition television models



This dramatic increase in energy consumption threatens to eliminate the substantial energy savings achieved by ENERGY STAR under the Version 5 and Version 6 specifications. Given its potential to dramatically increase TV energy consumption, we urge EPA to work with manufacturers to better characterize and identify opportunities to reduce UHD energy consumption. Specifically, we recommend that EPA integrate efficiency requirements for UHD into the Version 7 specification by incorporating an adder that incentivizes efficient power consumption of UHD TVs. We recommend that this adder decrease over time so that manufacturers are incentivized to decrease UHD energy consumption with each UHD generation.

In addition, we recommend that EPA work with industry to develop an UHD test procedure to measure energy consumption while watching UHD content. While there is very limited UHD content available now, it is important that EPA characterize and address the potential energy consumption impacts before UHD gains additional market share.

3) We support EPA’s continued efforts to characterize power consumption in Standby-Active and Standby-Low. However, we are concerned that high power in Standby-Low mode may contribute to a significant increase in energy consumption.

As televisions have evolved to include more functionality, it is a natural progression for the specification to track energy consumption when the unit is not in On Mode. EPA’s efforts to characterize and develop requirements for network connectivity are important to encourage the most efficient implementation of that feature as possible. As Figure 4 indicates, there is a dramatic difference in Standby Active – Low mode between models with and without network connectivity (note the logarithmic scale – models with Full Network connectivity have power consumption levels that look more like On Mode instead of Standby mode). For models with Full Network connectivity, the data also suggests that there is a correlation between power draw and screen area (see Figure 5).

Figure 4: Standby Active Low for models in the ENERGY STAR dataset (logarithmic scale)

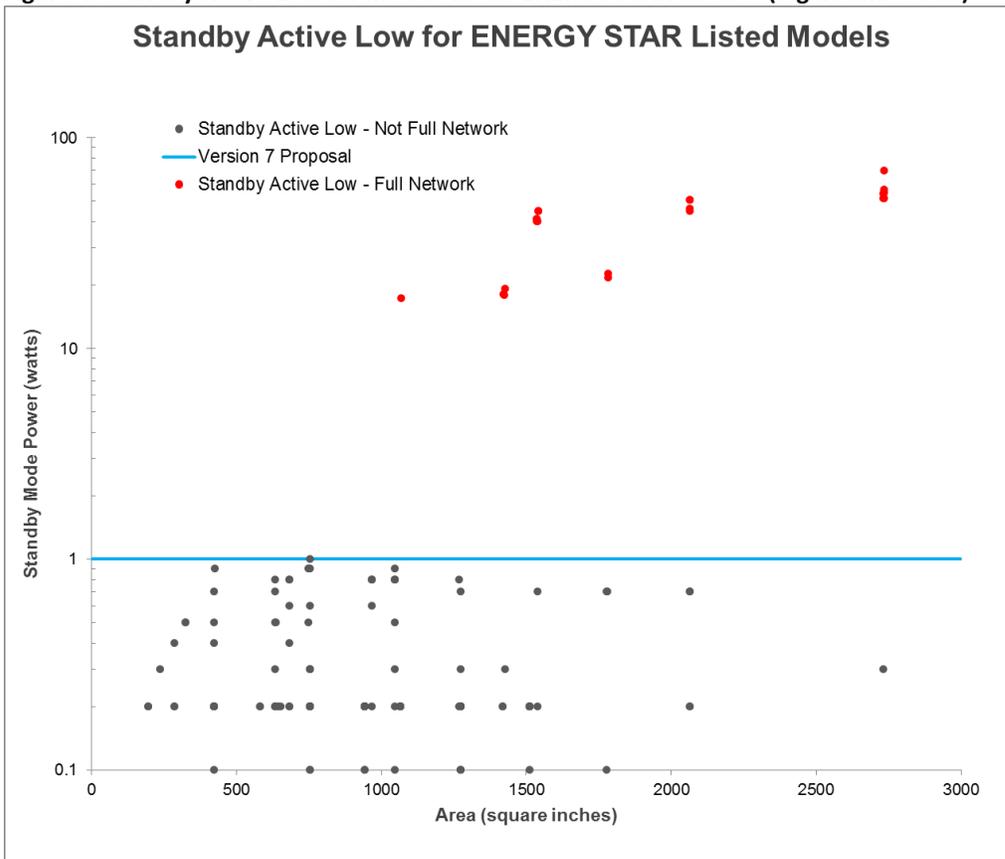
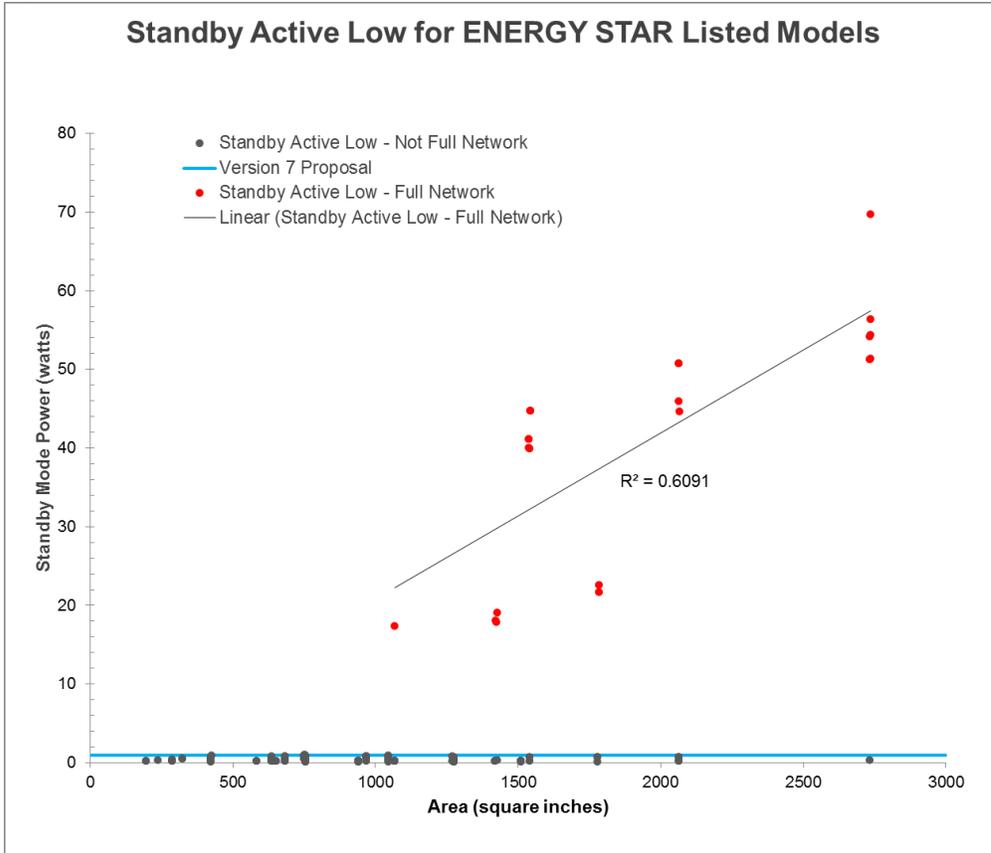


Figure 5: Standby Active Low for models in the ENERGY STAR dataset (standard scale)

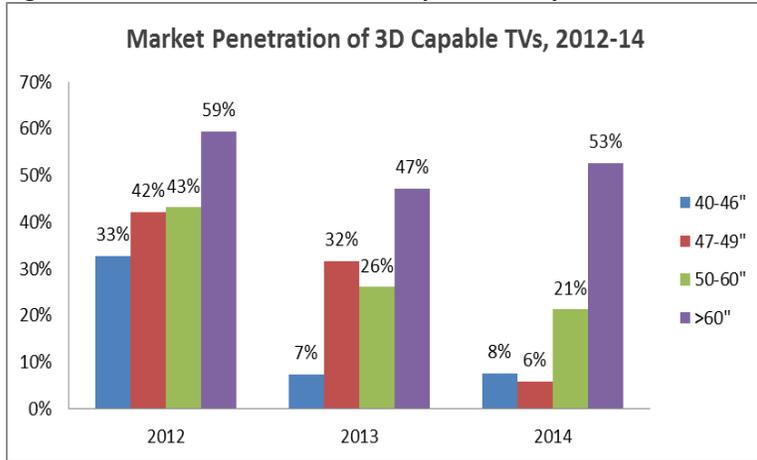


By definition, Standby Active Low mode does not include the transmission of data from an external source, which suggests that this increase in power is due to an internal setting which is keeping the TV active, possibly the Quick Start menu. It is unclear why these models have such high power draw in Standby mode, and we recommend that EPA further investigate the root cause of this increased power draw and incorporate measures in the specification to actively address it.

4) We recommend EPA further characterize the energy consumption of 3D enabled televisions

While 3D enabled televisions have achieved limited market share to date and has actually seen decreasing market share since 2012, 3D functionality persists as an integrated product feature for roughly 10% of the TV market. This functionality is primarily included screen sizes above 40" (see Figure 6).

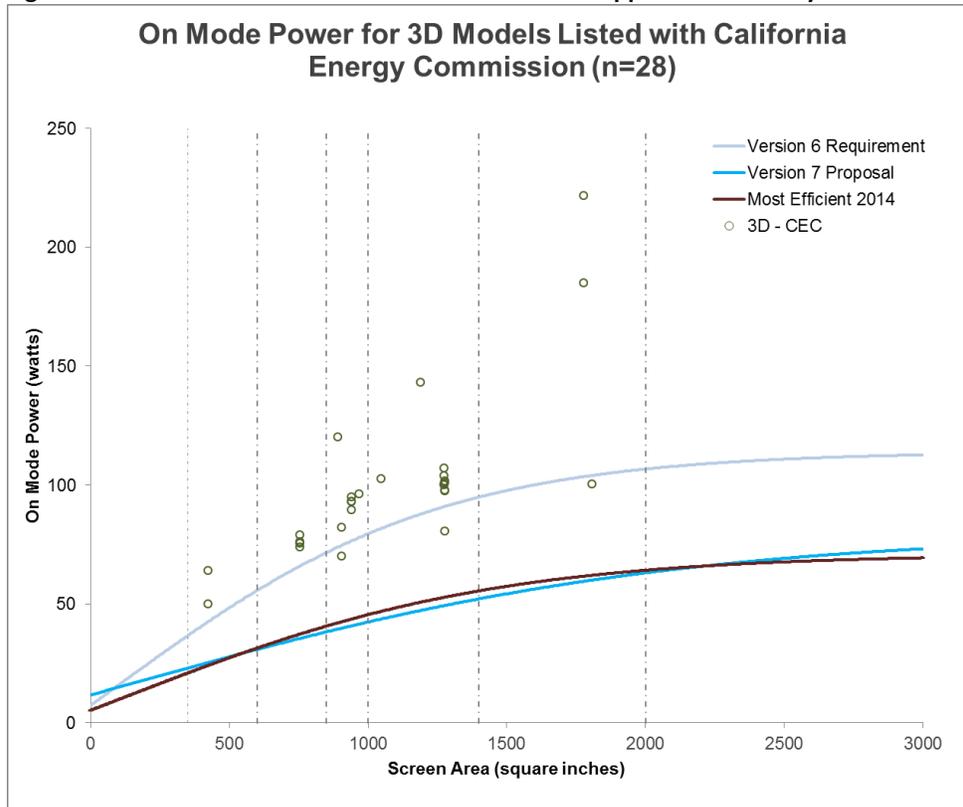
Figure 6: Market Penetration of 3D Capable TVs by screen size bin, 2012-14



Data Source: The NPD Group/Market Tracking Service

Based on our analysis of the CEC Appliance Efficiency Standards dataset, only 10% of TVs with 3D capability meet ENERGY STAR Version 6 requirements and they consume substantially more energy than non-3D enabled televisions when viewing standard HD content (see Figure 7). It is unclear why this is occurring since the televisions are being tested with a standard TV broadcast test clip. We recommend that EPA investigate this further and, if this is indeed verified, identify strategies for reducing power draw of 3D televisions while viewing standard 2D content.

Figure 7: On Mode Power for 3D listed with the CEC's Appliance Efficiency Standard Database



5) We support EPA's efforts to harmonize the ENERGY STAR specification with DOE's Final Rule on the Television Test Procedure and update its definitions to reflect new product features in the television market

The DOE Final Television Rule, published in October 2013, requires all new televisions be tested to the updated DOE television test procedure. We support EPA's efforts to harmonize its specification with the Final Rule, which streamlines the testing process and provides clear direction for manufacturers.

In addition, we support EPA's efforts to update the specification definition to reflect products that are entering the market. There are a number of emerging product features, such as UHD and Networking Capability that could dramatically impact product energy consumption. While it is uncertain how these additional features will impact future TV energy consumption, we support EPA's efforts to establish consistent definitions for these new features. This will ensure that the television specification accurately reflects the most efficient models on the market as the product space continues to evolve.

6) We support EPA's efforts to promote the integration of standalone devices, such as set top boxes, into televisions and recommend that EPA conduct additional research to further characterize the energy savings opportunity and how this feature can be appropriately integrated into the ENERGY STAR specification.

Consolidating standalone devices such as set-top boxes into televisions may cause the TV to use more energy but, by eliminating a separate box, may decrease overall household energy consumption. The net effect of device consolidation is not well understood and so we recommend EPA conduct additional study to better characterize its energy saving potential. In the interim, we support EPA's effort to add this feature as an optional field, which allows manufacturers to highlight this capability.

Sincerely,



Ty Stober
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Northwest Energy Efficiency Alliance



Paula Robertson
Product Service Specialist
Sacramento Municipal Utility District