



April 25, 2017

Ms. Varena Radulovic
Office of Air and Radiation
U.S. Environmental Protection Agency
William Jefferson Clinton Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Subject: Draft 1 Version 8 ENERGY STAR® Television Specification

Dear Ms. Radulovic:

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SCGC), San Diego Gas and Electric (SDG&E), and Southern California Edison (SCE) in response to the updates proposed in the Environmental Protection Agency (EPA) Draft 1 Version 8 ENERGY STAR Television Specification.

The signatories of this letter, collectively referred to herein as the California Investor Owned Utilities (CA IOUs), represent some of the largest utility companies in the Western United States, serving over 35 million customers. As energy companies, we understand the potential of the ENERGY STAR program to cut costs and reduce energy consumption while maintaining or increasing consumer utility of the products. For decades, the EPA's ENERGY STAR program has provided large energy savings for our customers. We have a responsibility to our customers to advocate for meaningful efficiency requirements that identify the most efficient models available on that market and accurately reflect the climate and conditions of our respective service areas, so as to maximize ENERGY STAR's positive effects.

The ENERGY STAR program for televisions has been overwhelmingly successful over the years in identifying the most efficient models on the market. It is a compliment to EPA, their manufacturing partners, and other stakeholders that meaningful requirements have been established and industry has rapidly innovated to meet the requirements and leverage the ENERGY STAR brand. We are encouraged by the almost immediate response by industry to implement cost effective efficiency options soon after an ENERGY STAR specification takes effect. We strongly urge EPA to consider the following comments.

1. The CA IOUs generally agree with EPA's proposals outlined in the Draft 1 Version 8 specification.

As EPA understands, based on publicly available energy consumption testing of televisions by various stakeholders, some televisions may not be performing in the field as tested using the current test procedure.¹ One of the important aspects of a test procedure is to ensure the power measured and reported is representative of power use when installed in the home. The U.S. Department of Energy (DOE) raised issues regarding the representativeness of the test procedure in the pre-publication Federal Register advance notice of proposed rulemaking (ANOPR).² With the proposal outlined in Draft 1 Version 8, the CA IOUs believe that EPA is taking the first step in proper implementation of energy saving features,

¹ 10 CFR 430, Subpart B, Appendix H

² https://energy.gov/sites/prod/files/2017/01/f34/tv_tp_anopr_2017-1-19_4.pdf

such as automatic brightness control (ABC), to ensure the ENERGY STAR label remains meaningful to our customers.

EPA's proposals in the Draft 1 Version 8 document are strong first steps in addressing concerns we have had with elements of the test procedure and the implementation of some features to ensure the energy savings and performance expected from our customers who purchase an ENERGY STAR television are delivered.

2. If a television is certified with the ABC feature enabled by default, ABC should not be automatically disabled, unbeknownst to the viewer, in all preset picture settings.

ABC was first implemented in the ENERGY STAR Version 3 specification, finalized in 2008, as a feature to limit the brightness of the television screen (and thereby the power consumption) depending on the ambient room lighting conditions. EPA, with limited data at the time, included a power credit for models that shipped with this feature enabled by default, as a way to incentivize the adoption of this feature. Over the years, various test efforts led by DOE and independent groups have studied ABC in televisions in an effort to ensure proper implementation of ABC.^{3,4,5}

In the course of testing, ABC has been found in some cases to be implemented in a way that limits the energy savings or encourages the viewer to disable the feature. To address some of these issues, DOE specified additional testing provisions for televisions shipped with ABC enabled by default in the final DOE test procedure. Since then, based on other testing efforts, some televisions certified with ABC enabled by default for ENERGY STAR only have been found to be easily disabled without the knowledge of the viewer. We believe that if a television is certified with ABC enabled by default that the feature should persist unless the user purposely disables the feature in the settings menu.

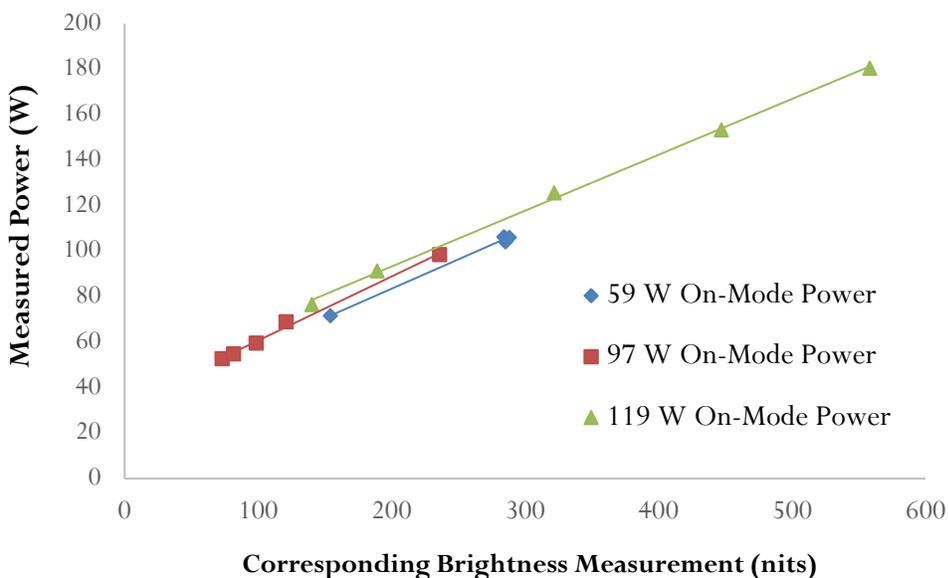
Consumer opinion of ABC may also depend on their specific viewing experience, because the algorithm that controls the backlight is proprietary and varies among brands and models. Some manufacturers gradually decrease screen brightness linearly with ambient light while maintaining reasonable levels of brightness across the range of the lighting conditions. Other manufacturers, as evidenced by EPA and CLASP testing, maintain relatively constant brightness levels at all ambient light conditions except for the darkest condition, where screen brightness is then reduced to near-zero brightness levels. Since ABC has not been well-defined, and since on-mode testing is performed under default settings, manufacturers can "game" the test procedure by setting unreasonably low brightness levels for one or more of the lighting conditions under which on-mode power is tested. Television models that exploit this loophole typically disable ABC automatically when any picture setting (e.g. brightness, contrast, backlight) is changed, including changes due to a forced menu, such as a calibration menu. The resulting loophole can be thought of as a special reduced-power mode under which televisions are tested, but then go on to function differently under real-world viewing. This grants some manufacturers an unfair pathway for meeting television standards without any true efficiency improvements. Moreover, it

³ <https://www.regulations.gov/document?D=EERE-2010-BT-TP-0026-0030>

⁴ <https://www.regulations.gov/document?D=EERE-2010-BT-TP-0026-0041>

⁵ <https://www.nrdc.org/sites/default/files/costs-manufacturers-exploiting-loopholes-tv-energy-test-report.pdf>

weakens consumer confidence in ABC by creating a misleading narrative of the tradeoff between picture quality and energy savings.



Source: ENERGY STAR Television Test Dataset, October 2016

The above figure shows how three different 55-inch UHD models can exhibit very similar power draw profiles, but report drastically different on-mode powers due to different brightness and dimming levels. In reviewing available data, ABC settings are the largest reason for variations in reported on-mode power.

We support EPA’s proposal of limiting the conditions where ABC, an energy savings feature, can be automatically disabled without the consumer knowing if the television is certified with the ABC feature enabled and taking advantage of the ABC allowance as provided in the test procedure. We ask EPA to go one step further and require that ABC not be automatically disabled in all preset picture settings⁶ in order for televisions to be certified with ABC enabled by default. This provision would close any loopholes and ensure the persistence of this energy savings feature in modes commonly used by viewers. Given that multiple major manufacturers, such as LG, Sony, and Phillips, are able to implement ABC in all preset picture modes, there is no technical reason or picture viewing limitation for not implementing ABC properly in **all preset modes**.

We believe this recommendation will limit the opportunities for a consumer to disable this energy saving feature without their knowledge. Multiple major manufacturers are doing this already with no sacrifice to picture quality. We do not believe requiring ABC being enabled in all preset modes is overly prescriptive since manufacturers always have the option of certifying their television with ABC disabled if for some reason they do not wish to implement this feature in all preset picture modes. Additionally, viewers always have the ability to manually deselect ABC in the menu options if they decide to disable the ABC feature.

⁶ With the exception of retail configuration or when displaying true high dynamic range (HDR) content, since both of these modes may have brightness requirements that are not compatible with the ABC feature.

Also, we request ENERGY STAR include language that software updates, which may be implemented any time after initial set-up in the home, are not permitted to change ABC enablement from the default settings. Finally, if a viewer disables the ABC feature by manually changing the television's settings, and then the viewer sometime later switches to a preset picture setting, ABC should be re-enabled as it was initially implemented by the manufacturer. These provisions will further ensure the performance and efficiency that is expected by the ENERGY STAR consumer. The CA IOUs also support the additional proposed luminance provisions for televisions certified with ABC enabled by default to ensure a positive customer experience with the ABC feature, namely a minimum brightness level of 150 nits and a requirement that the average luminance for ABC be greater than 50 percent of the maximum luminance in the brightest selectable preset setting.

3. The CA IOUs support the inclusion of home theater displays in the scope of this specification.

The current market for tuner-free displays primarily intended to display the same video programming as televisions is small but growing. Many viewers stream or watch live television content from cable and satellite boxes, which already contain tuners, so a tuner within the television is not needed. Some manufacturers are currently selling these products, and various retail websites are currently promoting "tuner free displays" under the "televisions" category.^{7,8} Because these products are intended to be used as televisions, we support EPA's proposal to include them in this specification. In the Version 9 specification update, as these products gain in market share, EPA should study the power requirements of these tuner free displays to determine the need to set separate power requirements.

4. To ensure the energy savings and performance expected from our customers who purchase an ENERGY STAR television are delivered, any energy saving feature enabled during testing should be enabled during typical viewing conditions unless manually disabled by the viewer.

Based on testing conducted by several organizations and referenced by EPA, we support the provision in Section 3.2.3 regarding features, such as motion detection dimming, being enabled for testing, also being enabled during typical viewing conditions. The power output of the test procedure should reasonably be representative of the power drawn during normal operation. Testing of a television with features that are automatically enabled (or disabled) only under the specified test conditions (e.g., the video clip, ambient test room conditions) would not be representative and should not be allowed. The CA IOUs also ask EPA to consider additional language to clarify that any energy consuming feature normally activated automatically during actual viewing should be enabled during testing. We are not aware of a specific example of such a feature at this time, but adding this language would provide clarity and close a potential loophole.

5. EPA should reduce the on mode power allowance for ultra-high definition televisions (i.e., native vertical resolution greater than or equal to 2160 lines) to better reflect the additional power drawn by these products over regular high definition products.

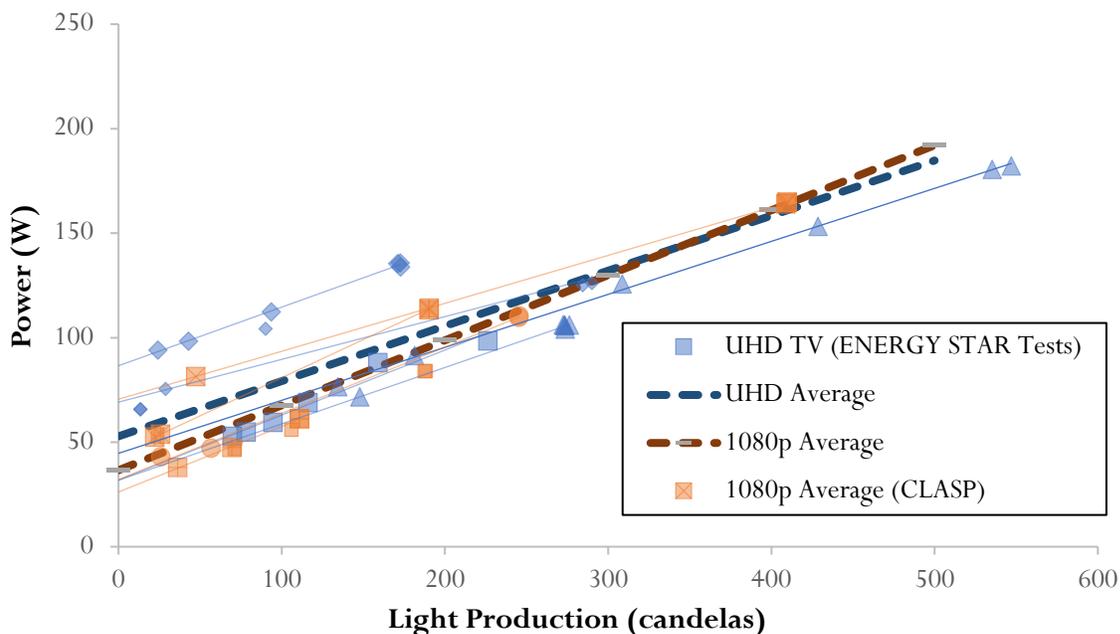
We support the comments and analysis submitted by the Northwest Energy Efficiency Alliance that strongly supports a reduction in the on-mode power allowance for ultra-high definition (UHD)

⁷ <http://www.consumerreports.org/lcd-led-oled-tvs/new-vizio-smartcast-tvs-arent-really-tvs/>

⁸ <https://www.costco.com/televisions.html>

televisions. Analysis of robust datasets for both the U.S. and European markets overwhelmingly indicate the narrowing gap of power consumption between UHD and regular high definition (HD) models. The current additional power allowance of 50% is too generous for current models.

From ABC measurements performed by ENERGY STAR and CLASP, power-light output curves can be plotted for several UHD and 1080p TVs. ENERGY STAR tests used 55-inch UHD models manufactured in 2015 or 2016. The CLASP tests used 1080p direct-lit LED models considered to be new when the report was released in 2011. These tests separately report each measured on-mode power of TVs at various brightness settings, which was determined by the TV in response to ambient light conditions since ABC was enabled. It is worth noting that the resulting data does not show true efficacy, but instead shows the on-mode power, tested using the IEC test clip, at various settings that produce a certain brightness when tested using the 3-vertical-bar broadcast signal. However, since all TVs were tested this way, the curves are comparable. The figure below shows the curves plotted and averaged by UHD/1080p.



Source: California Energy Commission Appliance Database , October 2016

The slope for UHD TVs was found to be less than that of 1080p TVs. This is interpreted to mean that UHD TVs produced in 2015 or 2016 have more efficient backlights, or dimming techniques, than 1080p TVs produced in 2010 or 2011. However, the intercept for UHD TVs suggests an increased computing power (expected for higher resolution). The difference of the intercepts is about 16 watts.

An assessment of the televisions listed in the CEC Appliance Database shows that UHD models on average produce 23 candelas more light (about 20 nits more) than their 1080p counterparts, which equates to about 6 watts of power. If UHD TVs are designed to be operated at higher brightness levels, as evidenced by their default settings, **this analysis suggests a flat UHD adder of 22 watts** is more appropriate than a percentage that scales with power.

Therefore, we recommend EPA consider updating the UHD power allowance, if not in Version 8 due to time and scope constraints, then most certainly in the Version 9 specification. If the timeline for the Version 8 process is extended for any reason, the UHD power allowance update should be included in the scope since data analysis is available to support a significant reduction.

6. The CA IOUs recommend data collection and examination of power draw of high dynamic range (HDR) models displaying HDR content and upscaled standard dynamic range content.

In playing HDR content, televisions must operate at high brightness while also using high processing power. For this reason, testing had found that televisions consume significantly more power when displaying HDR content in HDR modes.⁹ When standard 1080p content is played on these units, power draw is lower. This means that as HDR grows in popularity, the IEC test clip, which does not display HDR content, becomes less representative.

EPA should start collecting performance data for HDR televisions with the intention of assessing the data for the Version 9 specification development. HDR was the major theme for television manufacturers in the 2017 Consumer Electronics Show. Market research firms are projecting sales of HDR models are expected to explode by almost six-fold in 2017 and beyond compared to historical sales. Given the larger projected market share, it is critical that ENERGY STAR assess the power impacts for these models displaying both HDR-upscaled content and native HDR content.

Other information EPA should begin collecting and analyzing for the Version 9 specification development process includes: power draw of televisions with ABC disabled; power draw and luminance measurements of ABC in present picture settings; power draw impacts of other features that are commonly enabled during the test procedure or under typical viewing conditions; and relevant test procedure modifications.

In conclusion, we would like to reiterate our strong support of EPA's proposals outlined in the Draft 1 Version 8 specification. We thank EPA for the opportunity to be involved in this process and encourage EPA to carefully consider the recommendations outlined in this letter.

Sincerely,



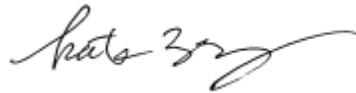
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⁹ <https://www.nrdc.org/sites/default/files/costs-manufacturers-exploiting-loopholes-tv-energy-test-report.pdf>