

September 14, 2015

Peter Banwell  
US Environmental Protection Agency  
Ariel Rios Building 6202J  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

Dear Mr. Banwell:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to the *ENERGY STAR® Lamp Version 2.0 Draft 3 Criteria*, released by the US Environmental Protection Agency (EPA) on August 3, 2015.

CEE is the binational organization of energy efficiency program administrators and a staunch supporter of the ENERGY STAR® Program. CEE members are responsible for ratepayer-funded efficiency programs in 45 US states and seven Canadian provinces. In 2013, CEE members directed nearly \$6.4 billion of the \$8 billion in energy efficiency and demand response program expenditures in the two countries. These comments are offered in support of the local activities CEE members carry out to actively leverage the ENERGY STAR brand. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR so that it may continue to serve as our national marketing platform for energy efficiency.

CEE highly values the role ENERGY STAR plays in differentiating energy efficient products and services that the CEE membership supports locally throughout the US and Canada. We appreciate the opportunity to provide these comments.

## **CEE Supports the Proposed Changes to the Efficacy Requirements for Decorative Lamps**

CEE supports EPA's proposed efficacy requirement of 65 lumens per watt for all decorative lamps regardless of wattage. This position is backed by a review of product performance data of ENERGY STAR lamps, which indicates broad availability of products across different wattages. Consequently, CEE supports EPA's proposal to move towards a single efficacy requirement for each product category, consistent with the [CEE Specification for Integral Replacement Lamps Sold at Retail](#).

According to the August 21, 2015 ENERGY STAR lamp webinar, EPA shared that forty-eight percent of ENERGY STAR decorative lamps that use less than seven watts are able to meet the proposed efficacy level of 65 lumens per watt. These data demonstrate that while 65 lumens/watt is achievable, it could eliminate a significant portion of decorative lamps currently in the market. CEE carefully considered current product availability against the potential for further efficiency improvements and ultimately supports the proposed efficacy level. This support is based on the rapid development of more efficient technologies and projected increases in performance,<sup>1</sup> as well as an anticipated specification effective date of September 2016, which will give ample time for industry to react. In particular, Philips commented in March of 2015 that while about 25 percent of their ENERGY STAR qualified LED lamps do not meet the Draft 1 proposed efficacy specification, they did not perceive difficulty meeting these levels in one to one and half years.

## **CEE Supports Expanding the Scope to Include Additional Lamp Base and Shapes**

As manufacturers invest in and bring new types of energy efficient lamps to market, these products represent a growing opportunity for energy savings for consumers and programs. Similar to color tuning lamps, CEE sees the inclusion of “G4” and “G9” ANSI standard bases and “ST” ANSI standard lamp shape as opportunities to support manufacturers who are investing in these form factors and also meet the ENERGY STAR efficacy and quality requirements. CEE therefore supports the EPA proposal to include these lamp types within the scope of the ENERGY STAR Lamp Criteria.

## **Given the Risk of Consumer Dissatisfaction, CEE Recommends Careful Consideration of How Warmer Color Temperature Lamps are Included**

CEE previously provided data to EPA indicating modest demand for 2200K and 2500K color lamps, particularly in restaurants. One such data point came from an analysis of annual LED lamp sales within one CEE member’s commercial lighting program. These data demonstrated that a total of 17,304 lamps sold over a seven-month period, June 1, 2014 to year-end, were 2400K, and represented a little over 1.5 percent of all products that were moved through the program over that same period. CEE recognizes the energy saving opportunity for such products, approximately 24 kWh per year per lamp assuming baseline efficacy of 43 lumens per watt. However, CEE recommends that the inclusion of warmer color lamps in the ENERGY STAR specification be carefully considered by EPA. In particular, some members have expressed

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<sup>1</sup> US Department of Energy, Manufacturing Roadmap Solid State Lighting Research and Development, August 2014. [http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl\\_mfg\\_roadmap\\_aug2014.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_mfg_roadmap_aug2014.pdf)

concerns regarding the potential for consumer dissatisfaction due to a lack of understanding of color temperature leading to purchase of a lamp that is warmer than desired. One approach to address this potential concern would be to only allow 2200K and 2500K lamps to qualify under the ENERGY STAR decorative category. The rationale behind this approach is that warmer colors are most likely desired for decorative applications, and as such, it's more likely that a consumer would be dissatisfied with a warmer color lamp in an omnidirectional or directional application where cooler light (2700 or 3000K) is typically used. CEE recommends that EPA carefully consider a variety of avenues for including warmer lamps in order to identify the best approach for maximizing consumer options, savings, and overall experience.

## **Given the Risk of Consumer Dissatisfaction, CEE Recommends that EPA Consider Recent Data on LED Flicker to Inform Requirements**

Over the last few years, individual CEE members have experienced a large number of LED lighting products exhibiting serious visual flicker, in particular integral replacement lamps. Efficiency programs believe that light flicker needs to be considered carefully to avoid consumer dissatisfaction with this light source. As such, CEE would like to share with EPA that the Institute of Electrical and Electronics Engineering (IEEE) Committee PAR1789 has produced a draft document related to LED flicker (*Recommending practices for modulating current in High Brightness LEDs for mitigating health risks to viewers*<sup>2</sup>). This document is currently at the ballot stage and may be informative to additional program consideration regarding flicker. CEE encourages EPA to consider whether new requirements for flicker have the potential be included as part of the current lighting criteria revision.

## **CEE Supports the Lowest Possible Standby Consumption Level for Connectivity Until Potential Benefits and Use Cases are Better Understood**

While CEE is excited about the potential efficiency and other benefits represented by connected lamps, we are concerned with the additional standby or idle load they could represent. Most lamps currently represent a small individual load, especially when typical hours of operation average three hours per day<sup>3</sup>, are taken into consideration. Over time however, connected lamps could be expected to grow in popularity and begin to fill numerous sockets within a home. The current proposal to allow a power draw of up to 0.5 watt per lamp has the potential to become a

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<sup>2</sup> Institute of Electrical and Electronics Engineering PAR1789 Public Documents, <http://grouper.ieee.org/groups/1789/public.html>

<sup>3</sup> Average daily use hours from ENERGY STAR Light Bulb Savings Calculator, last updated February 2015. [http://www.energystar.gov/sites/default/files/asset/document/light\\_bulb\\_calculator\\_1.xlsx](http://www.energystar.gov/sites/default/files/asset/document/light_bulb_calculator_1.xlsx)

significant source of new load in buildings. In particular, since this load could potentially be present up to 24 hours per day, programs are concerned that consumers may lack awareness of the implications of standby energy consumption that is required to deliver connected functionality. To illustrate the potential for lost energy savings to consumers for lamps with connected functionality, a simple calculation follows.

Likely Energy Savings from ENERGY STAR Lamp*	Allowable Standby Power (watts)	Total Standby Power or Reduced Energy Savings (kWh/year)**	Percent Reduction in Savings from Standby Consumption
24 kWh/y	0.5	4.38 kWh/y	18%

\* Likely energy savings assumes an omnidirectional lamp where the incandescent efficacy is 43 lumens/watt (minimum efficiency standard for a 750–1049 lumen lamp) versus proposed ENERGY STAR efficacy of 65 lumens/watt operating three hours per day, 365 days per year.

\*\* Total standby power consumption assumes wattage draw 24 hours per day, 365 days per year.

This potential increase in load is of particular concern given that offsetting energy saving benefits of connected lighting are not yet understood or quantified. We therefore support EPA specifying the lowest possible standby consumption, and only then granting an allowance commensurate with the estimated utility and consumer benefits stemming from connectivity. Ultimately, any allowance shouldn't compromise cost-effective energy savings to the consumer. We also believe it is important for ENERGY STAR to encourage the development of connected lamps that can provide functionality with lowest standby energy consumption possible. In particular, we point to a [report from the International Energy Agency \(IEA\) Standby Power Annex](#) previously shared with EPA by Natural Resources Defense Council in their Draft 1 comments. This report showed Wi-Fi transceiver DC standby-idle power use of 0.004 to 0.13 watts, which converts to AC power draws of 0.036 to 0.25 watts, assuming a conventional power supply. This study is one indication that a 0.5 watt standby power requirement for connected lamps is high. Further, we recommend a requirement to inform customers of the annual energy implication.

## CEE Recommends a Requirement to include Actual Power Consumption Levels if EPA Desires to Enable Grid Capacity in the Future

The proposed reporting requirements for connected lamps do not require that actual power consumption be reported. Instead, EPA has provided a pathway where manufacturers can use look-up tables based on lamp, ballast, driver combinations and light levels to estimate the wattage draw of a lamp or fixture. Based on insights from an ongoing study at the Lawrence Berkeley National Laboratory (Berkeley Lab), CEE believes the accuracy of these look-up tables can vary significantly by manufacturer. Early findings from Berkeley Lab indicate that the variation in these look-up tables leads to a range in reported wattage values. Knowing there is a range in calculated values creates a challenge with determining which manufacturer estimates are accurate, and as a result, may prevent efficiency programs from being able to rely on this type of reporting particularly for providing grid capacity. While the exact variation in the wattage data

is still being documented, Berkeley Lab research raises general concerns related to relying on calculated values. In particular, if connected lamps are to provide any type of grid capacity in the future, utilities would likely require much tighter or “revenue grade” reporting. We recognize that reporting actual energy use represents an added cost to manufacturers, and that further assessment is required to determine whether the increase in data accuracy and potential grid benefits outweigh these costs. We recommend that EPA carefully consider the intended benefits of connected lamps when setting the energy reporting requirements.

Thank you for your consideration of these comments. Please contact CEE Senior Program Manager Eileen Eaton at [eeaton@ceel.org](mailto:eeaton@ceel.org) or (617) 337-9263 with any questions.

Sincerely,

A handwritten signature in blue ink that reads "Ed Wisniewski". The signature is written in a cursive style with a large initial "E".

Ed Wisniewski  
Executive Director