

January 14, 2011

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

Dear Mr. Baker:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to the ENERGY STAR Luminaire Final Draft Version 1 Specification, released by the Environmental Protection Agency (EPA) on December 20, 2010. The following comments, which were developed by the CEE Residential and Commercial Lighting Committee (the Committee), are supported by the organizations listed below.

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 U.S. states and 8 Canadian provinces. In 2010, CEE members directed over \$7.5 billion of energy efficiency program budgets in the two countries. In short, CEE represents the groups that are actively working to make ENERGY STAR the relevant platform for energy efficiency across North America.

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.

## Commercial Luminaires

We understand that EPA remains committed to an ENERGY STAR strategy for commercial and industrial markets that emphasizes whole building and facility performance, not individual product

performance. Managers of commercial lighting programs have evaluated the current proposal to cover two new types of commercial products within the luminaires specification and they support the inclusion of these product categories. However, at the ENERGY STAR Program level, CEE seeks a greater engagement with EPA on the rationale for introducing these commercial products and not others and on the potential implications to previously supported whole building programs such as the ENERGY STAR Label for Buildings and Plants.

## Test Procedures

In its past comments, CEE has underscored the importance of relying on industry standard test procedures to ensure that tests yield results that are reliable, repeatable, and can serve as a basis for differentiating one product from another. Based on our review of the final draft specification, CEE understands that the following industry standard test procedures are not yet finalized:

- Test Procedure: IES LM-xx-1x: IES Approved Method for the Characterization of LED Light Engines and Integrated LED Lamps for Electrical and Photometric Properties as a Function of Temperature
- Needed For: Luminous Efficacy and Output Requirements: Solid State: LED Light Engines
- Needed For: Lumen Maintenance Requirements: Directional and Non-Directional Luminaires: Solid State Option 2: Luminaire or LED Light Engine Performance
- Needed For: Correlated Color Temperature (CCT) Requirements: All Indoor Luminaires: Solid State: Non-Directional Luminaires
- Needed For: Color Rendering Index (CRI) Requirements: All Indoor Luminaires: Solid State: Non-Directional Luminaires
- Needed For: Color Maintenance Requirements: Solid State Indoor Luminaires
- Needed For: Maximum Measured Ballast or Driver Case Temperature Requirement: Directional and Non-Directional Luminaires: Solid State Non-Directional
- Test Procedure: IES TM-21-11 (in draft): Projecting Long Term Lumen Maintenance of LED Packages
- Needed For: Lumen Maintenance Requirements: Directional and Non-Directional Luminaires: Solid State Option 1: LED Package, Module or Array Performance

Further, we see in the final draft specification that no test procedure is referenced for several other performance requirements:

- Source Start Time Requirements: Directional and Non-Directional Luminaires: HID
- Source Run-Up Time Requirements: Directional and Non-Directional Luminaires: HID
- Power Factor Requirements: Solid State

Lastly, we understand that standardized test procedures are currently not available for the following performance requirements:

- Source Start Time Requirements: Directional and Non-Directional Luminaires: Solid State
- Source Run-Up Time Requirements: Directional and Non-Directional Luminaires: Fluorescent: Linear and Circline and Solid State
- Source Replaceability Requirements: Directional and Non-Directional Luminaires: Solid State Non-Directional
- Dimming Requirements: All Luminaires Marketed as Dimmable: Fluorescent (compact, self-ballasted compact, circline), HID, and Solid State
- Off-State Power Consumption Requirements: Directional and Non-Directional Luminaires
- Operating Frequency Requirements: Directional and Non-Directional Luminaires: Solid State
- Ballast/Driver Replaceability Requirements: Directional and Non-Directional Luminaires
- Noise Requirements: Directional and Non-Directional Luminaires
- Minimum Operating Temperature Requirements: Directional and Non-Directional Outdoor Luminaires
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The absence of standardized test procedures for the performance requirements described above is a concern for CEE. We recognize that EPA is working with the IES to finalize LM-xx-1x and TM-21-11 and encourage EPA's continued efforts on that front. In addition, we ask EPA to evaluate whether the specification can effectively serve its function of differentiating more efficient products in the absence of standardized test procedures. Lastly, if EPA determines that it is appropriate for the specification to move ahead without standardized test procedures for all performance requirements, CEE asks EPA to provide stakeholders with additional guidance on how to determine if products meet the required performance thresholds.

## Dimming Requirements

In addition to communicating our concerns regarding the lack of a dimming test procedure, CEE would also like to inform EPA of a concern with the specific dimming requirements listed for fluorescent and SSL luminaires. According to the final draft specification, manufacturers that advertise their fluorescent and SSL luminaires as dimmable must ensure that they can dim to at least 35% of maximum light output. According to the IES Lighting Handbook, as lamps are dimmed, light output decreases but the human eye may perceive a higher light output and light level than is actually present. This is because the human eye overcompensates for diminished light

level by allowing more light to enter into its pupil. The effect is predictable according to the square law:  $\text{Perceived Light (\%)} = 100 \times \text{square root} (\text{Measured Light (\%)} / 100)$ . Therefore a luminaire that only dims down to 35% will actually be perceived by the consumer as dimming to 60% light output. As a result, CEE is concerned that ENERGY STAR luminaires will not meet consumers' expectations for dimming (which we assume are based on their experience with incandescent lighting—a source that can dim to near 1% of maximum light output).

Based on this concern, as it finalizes the dimming requirements in the specification, we encourage EPA to set the dimming requirements at light output levels considerably lower than 35% of maximum light output for luminaires using fluorescent and LED technology. (We have not assessed the appropriateness of the 50% dimming requirement for HID sources and thus, our comments are limited to fluorescent and LED.) We believe lower light output levels to be achievable based on our review of reported dimming capability of luminaires on the ENERGY STAR product list and our discussions with lighting industry stakeholders. We have not completed a thorough technical analysis and therefore are not recommending any specific dimming levels in this comment letter.

## Qualified Products List

As currently proposed, the luminaire specification includes efficacy requirements that vary based on application (e.g., luminaire efficacy ranging from 35 LPW for accent lights to 70 LPW for inseparable SSL luminaires). Energy efficiency programs who wish to promote qualified fixtures will use these LPW values as inputs to their program cost effectiveness calculations (along with other inputs such as estimated hours of use, incremental retail price, etc.). Due to the wide variation in LPW values for the different luminaire product categories in the specification, luminaires with lower efficacy requirements may not be cost effective for some energy efficiency programs to promote. To help program administrators assess their ability to promote products included under the ENERGY STAR luminaires specification and to help customers determine whether individual products will qualify for incentives, CEE requests that EPA indicate the product category for which a luminaire was qualified on the qualified product list (e.g. Directional Accent Light).

Thank you for your consideration of these comments. Please contact CEE Program Manager Eileen Eaton at (617) 337-9263 with any questions.

Sincerely,



Marc Hoffman

Executive Director

## Supporting Organizations

Avista

Cape Light Compact

DTE Energy

Efficiency Vermont

Hydro-Québec

Long Island Power Authority

National Grid

NEEP

NSTAR

NYSERDA

PUD #1 of Snohomish County

Seattle City Light

Southern California Edison

SMUD

Tacoma Power

Wisconsin Focus on Energy