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California Energy Commission

DOCKETED

15-BSTD-01

TN 75916

JUN 09 2015

June 9, 2015

Submitted via email: docket@energy.ca.gov

Mr. Andrew McAllister
Commissioner
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Re: Docket No. 15-BSTD-01

Lutron Electronics Co., Inc. Comments on the 15-Day Language for the 2016 Energy Efficiency Standards

Dear Commissioner McAllister,

Thank you for the opportunity to review and provide comments on the 2016 Title 24 Part 6 15-Day Language. These comments are submitted on behalf of Lutron Electronics Co., Inc.

As you may know, Lutron was founded in 1961 and is headquartered in Coopersburg, Pennsylvania. From dimmers for the home, to lighting management systems for entire buildings, the company offers more than 17,000 energy-saving products, sold in more than 100 countries around the world. In the U.S. alone, Lutron products save an estimated 10 billion kWh of electricity, or approximately \$1 billion in utility costs per year. The company's early inventions— including the first solid-state dimmer invented by Lutron's founder, Joel Spira—are now at the Smithsonian's National Museum of American History in Washington, DC.

Please find our detailed comments below. We look forward to working with you further on this important project. Please contact Michael Jouaneh at 610-282-5350 or mjouaneh@lutron.com if you have questions or would like more information on these comments. Thanks again for your consideration.

Respectfully submitted,



Pekka Hakkarainen, PhD
Vice President
Lutron Electronics Co., Inc.

The comments and suggested edits to the proposal are shown below as deleted text in ~~strikeout~~, and suggested new text in underline. The edits are shown in order of importance:

Items 1 and 2 below are so significant that we do not support adoption of the Standard without the Commission providing acceptable solutions to address them.

1. **JA8.1 Purpose and Scope.** The changes in the 15-Day Language have clarified the scope to include non-integral ballasts and drivers. This scope shift has now called into question the Start Time specification that smart LED drivers will not be able meet. We urge the commission to revise the 15-Day Language to fix the start time issue noted in #2 below.
2. **JA8.4.3 Start Time.** The current proposed language of no greater than 0.5 seconds start time is unacceptable for many reasons such as:
 - a. It would eliminate all smart LED drivers from qualifying as they perform checks of various control options and provide homeowners desired advanced functionality such as fade-to-on.
 - b. A longer start time is need for the startup sequence which includes steps such as (but not limited to):
 - i. The power supply starts up, and
 - ii. The microprocessor loads the Operating System, and
 - iii. The microprocessor then checks hardware, line voltage, and the control inputs to confirm that the product is safe to turn on, and
 - iv. The LED Driver then ramps up the output to LEDs to provide a fade-to-on of the light output.
 - c. Universal input voltage increases start time since it's not acceptable to have just 120v products.
 - d. We do not want the government dictating to consumers that they can't have features they want such as fade-to-on. This feature is intentionally built into our products to provide customers with the aesthetically pleasing lighting effect when turning lights on and off. Customers do not want their lights to abruptly come on. They prefer the nice glow effect when turning lights on.
 - e. In our experience users comfortable with up to 1 second start time and there is no evidence that suggests less than 1 second is problematic.
 - f. There are no feasible alternatives that customers want. Customers don't want lights to flash and flicker on while the LED driver boots up and finds their light level setting. Compliance to this specification would just add cost to consumers for worse performance.
 - g. We believe that LED driver boot up times are going to be getting longer not shorter over time as additional control functionality is added
 - h. State of the art lighting has 0.75 to 1.00 second start time as recognized by the new ENERGY STAR lamp and luminaire standards. (See 11.4 here <https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20Lamps%20V2.0%20Draft%20%20Specification.pdf>).

- i. The new Energy Star specifications for luminaires and lamps recognized this start time issue and have made the appropriate accommodations for this smart technology. The lighting industry is united in ensuring start time threshold is not less than 0.75 to 1.00 second. Comments from industry on the ENERGY STAR luminaire specification can be viewed here: http://www.energystar.gov/products/spec/luminaires_specification_version_2_0_pd. Below are some excerpts:

- i. Acuity: *"Luminaires enabled with dimming and other connected or control strategies require more than 500 ms to turn on."*
- ii. Cree: *"...would advocate that by driving reductions in Start Time this may hurt the performance of other characteristics that have more impact and importance on the consumer lighting experience."*
- iii. Juno: *"A source start time of 0.5 seconds can place undue stress on drivers while not providing the user with any greater perception of quality."*
- iv. OSRAM Sylvania: *"Wirelessly-controlled luminaires need to find and join a network, or create one, in order to operate. This may take longer than 0.5 seconds..."*

Thus, we strongly suggest the following changes to fix this issue:

1. Harmonize the start time threshold in JA8.4.3 to match the new ENERGY STAR lamp and Luminaire specification of not less than 0.75 for non-connected lighting and 1.0 seconds for connected lighting;

AND

2. Publish an interpretation of the start time test method to allow the testing to be done from a standby state (for products that have a standby state) to first continuous light output (not full lighting output).

The remaining items are important but we believe the Commission can address them many of them in guidance documents such as the User's Manual.

3. **JA5.3.1 Communication Interface.** The much need Ethernet addition was limited to non-residential buildings. Ethernet must be an option for residential buildings too. What's more is that JA5.3.1 seems to contradict footnote #1. Our interpretation is that footnote 1 to allow for OSCT thermostat systems overrides JA5.3.1 but this should be corrected so that it's clear that using a thermostat system with a bridge or gateway device connected via Ethernet to a WiFi router and communicates to the rest of the system in any protocol complies. Thus, we suggest the following change:

c. ~~for nonresidential, high-rise residential, and hotel-motel buildings,~~ eConnecting to an Ethernet network compliant with IEEE Standard 802.3.

4. **130.1(c)5 Areas where Occupant Sensing Controls are required to shut OFF All Lighting.** The requirements have changed to allow either partial-on sensors or vacancy sensors. We support these changes but want to ensure that occupancy sensors that are programmed to operate as partial-on or vacancy sensors can comply. Occupant sensing devices under Title 20 Appliance Efficiency Regulations does not allow for a vacancy sensor to be converted to automatic functionality. This makes sense for the Title 24 Part 6 residential control requirements since only vacancy sensors are allowed to comply. But on

the commercial side since a space can use either vacancy sensors or partial-on occupancy sensors, occupancy sensors that are set to operate as vacancy sensors or partial-on sensor should comply. Thus, we suggest the following language be added to the User's Manual:

Occupancy sensors that are set to operate as vacancy sensors or partial-on occupant sensors shall be permitted to comply.

5. **150.0(k)2J.** The current language prevents homeowners from using a automatic partial-on/automatic-off occupant sensor instead of a vacancy sensor even though partial-on sensors have been proven to save even more energy than vacancy sensors because occupants are usually satisfied with a 50% lighting level (see <http://lightingcontrolsassociation.org/cltc-study-demonstrates-major-energy-savings-for-bilevel-occupancy-sensors/>). What's more is that these are key spaces where users want lighting to automatically come on. For instance, homeowners usually have their hands full with a laundry basket when entering the laundry room making it difficult for them to manually turn lighting on. An automatic-on to not more than 50% light level is preferred. Then when they leave, lights will automatically turn off. We suggest the following changes:

J. In Bathrooms, Garages, Laundry Rooms, and Utility Rooms, at least one luminaire in each of these spaces shall be controlled by a vacancy sensor or partial-on occupant sensor.

6. **130.1(d) Automatic Daylighting Controls and 140.6(d) Automatic Daylight Controls in Secondary Daylight Zones.** We would like add some clarification language to the User's Manual in the Standard so that electrical contractors know that one daylight sensor can be used to control lighting separately in skylit daylit zone, primary sidelit daylight zone, and secondary daylit zone. We have had several think that the language in the Standard specifies a different daylight sensor for each daylight zone. While we have gotten emails from the CEC which stated that one sensor is acceptable, this issue keeps coming up. Thus, we suggest the following change to the User's Manual:

One daylight sensor shall be permitted to control the luminaires in the Skylit Daylit Zone and Primary Sidelit Daylit Zone provided that the luminaires in the zones can adjust lighting levels differently based on daylight conditions.

7. **130.5 Electrical Power Distribution Systems.** The 2016 Standard should focus more on energy monitoring over disaggregation of circuits. Disaggregation of circuits doesn't save energy or add value to the owner unless monitoring is done. Plus this aligns better with ASHRAE 90.1-2010 and 2013. The 15-Day Language has moved in the opposite direction as the previous language that allowed energy monitoring systems to comply has been removed.

Thus, we suggest bringing this language back so that buildings that have a system to monitor energy per TABLE 130.5-B complies:

EXCEPTION 1 to Section 130.5(b): Buildings for which a complete metering and measurement system is provided that at a minimum measures and reports the loads called for in TABLE 130.5-B.