

DOCKETED	
Docket Number:	17-AAER-12
Project Title:	Low-Power Mode
TN #:	260158
Document Title:	Lutron Electronics Comments - Lutron Comments to CEC LPM RFI
Description:	N/A
Filer:	System
Organization:	Lutron Electronics
Submitter Role:	Public
Submission Date:	11/19/2024 11:24:42 AM
Docketed Date:	11/19/2024

Comment Received From: Lutron Electronics
Submitted On: 11/19/2024
Docket Number: 17-AAER-12

Lutron Comments to CEC LPM RFI

Additional submitted attachment is included below.

18 November 2024

Submitted via email to: docket@energy.ca.gov

Ho Hwang
Appliance Office
California Energy Commission
715 P Street
Sacramento, CA 95814

**Lutron Comments to CEC on Low Power Mode Request for Information (LPM RFI)
Docket ID No. 17-AAER-12**

Dear Ho Hwang:

Lutron thanks you for the opportunity to provide the attached comments on the Low Power Mode Request for Information.

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 15,000 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 me at (610) 282-6468 or at sirving@lutron.com if you have questions or would like more information on these comments. Thanks again for your consideration.

In summary, for CEC to achieve its goals of energy savings through LPM categorization, Lutron recommends that the scope be simplified to include only product categories that have been vetted to be compatible with the proposed Data Collection Procedure. Focusing the scope will ensure that reported data is meaningful and will remove roadblocks to manufacturer participation.

Stephen R. Irving

Stephen Irving
Manager – Standards Development
Lutron Electronics Co., Inc.

I. Introduction

Low Power Modes (LPM) is a nuanced study, and collaboration among test labs, manufacturers, and regulators is key to achieving accurate and representative LPM measurements. Throughout this process, CEC and the CASE team have encouraged feedback from all stakeholders. We are presenting these comments in that same spirit and hope our feedback proves useful.

CEC has embarked on an ambitious goal to measure Low-Power Mode (LPM) energy consumption with a single test method. However, this test method should not be applied to product categories where the measured values don't appropriately reflect low-power mode energy consumption. Including these products will misrepresent their performance, mislead consumers, and discourage manufacturer participation. Worse, it could limit the use of energy-saving technologies, increasing the overall energy consumption of the State. To ensure a favorable outcome to California, it is important to vet the product categories included in the scope of this roadmap.

II. Data Collection Procedure and Scope Recommendations

Version 3 of the Data Collection Procedure (DCP) has been rewritten around trying to characterize *Automatic Power Down* (APD) behavior, and the DCP seems to provide three reasonable measurements for simple end-devices that utilize APD. However, in focusing on APD, the proposed test method now selects an inappropriate state to measure some products.

Fundamentally, the idea that “Low-Power Mode” is achieved simply by ceasing interaction with the Device Under Test (DUT) is flawed. Given CEC’s desire to move to the data collection phase, the most direct path is to remove those incompatible categories from the scope, allowing all parties to focus on the same set of products and generate meaningful data.

The Data Collection Procedure (DCP) has gone through several iterations, each making significant changes to the test method and interpretation of how to establish the LPM state. Due to the nature of the changes made, only Round-Robin testing per the proposed test method is relevant and should be considered for product category validation purposes. Specifically, data generated from v1 and v2 of the DCP evaluated products in a different state of operation and therefore cannot be used to validate product categories.

(a) Complex controls may not be tested consistently due to contradictions in the DCP. To protect the integrity of the program, they should be excluded from the scope associated with this DCP.

Lighting controls (like Wallbox dimmers) have several primary functions, one of which is to power other equipment (in this case, lamps and luminaires).

Some Wallbox dimmers have a second primary function of wireless communications. This is a key function of advanced dimmers which provide significant utility to the user. In fact, in the

definition of “Primary function”, the DCP explains that they are often featured in the product name. Some Lutron products with this feature include **RadioRa** and Maestro **Wireless**, clearly featuring the wireless function in the product name.

Testing of lighting controls is complex and may ultimately exceed the capability of a universal test method. The DCP describes testing these products in a contradictory manner:

Potential Result A: Section 3.3.2 introduces an exception to the setup for products which have a primary function of powering other products. According to this exception, such devices are evaluated without a connected load. Therefore, lighting controls should be tested without connection to a light source. In this configuration, some controls will power up and have a measurable LPM energy consumption while others will have an open circuit without any current flow.

Potential Result B: In the setup steps of 3.3.1, there is a note explaining that an LED lighting controller must be connected to a luminaire to operate, but that “during testing the controller will keep the luminaire turned off”. There is no further instruction on how to achieve the off state. Each method used (e.g., hard switch, soft switch, etc), would potentially yield a different LPM value.

Potential Result C: After setup, the test method used for all equipment describes placing the DUT in active mode and then ceasing operation with it. Following these instructions, one would set the dimmer to some active state and cease further operation. In this configuration, the load power would effectively be reported as LPM power. In a typical Wallbox dimmer, this could be anywhere from 10, to 300, 600, 1000, or even 2000 W.

A lab trying to use the current DCP could feasibly produce any of these results for the same product: LPM = 0, any quantity of small values, or load power up to 2000 W, making the value meaningless. Interestingly, most lighting controls need to have low standby power to remain compatible with LED loads, making them an unlikely candidate for further CEC action.

Reporting this data may cause marketplace confusion and would likely discourage manufacturers from participating in this program. Worse, conflicting data like this could erode trust in the program and in other data presented in MAEDbS.

While the DCP focuses on lighting controls, similar issues occur in other control devices, like fan speed controls.

Recommendation: Testing lighting controls and other similar devices is more complex than testing “stand-alone” appliances and is inadequately covered by the DCP. To protect the integrity of the program the CEC should do one of two things:

1. Remove lighting controls from the scope of the roadmap and from Appendix A, potentially to be considered during a future phase of the program; or
2. Amend the DCP to cover the complexity of testing products like lighting controls appropriately. It will need to be specific and clear about how to load the DUT, how

the DUT should be configured/set, and be clear for the need that all primary functions be inactive when measuring LPM.

- (b) Equipment for which the primary function never ceases were not intended to be part of this roadmap, are not tested appropriately using this DCP, and therefore should be excluded from its scope**

The CEC was clear that a product in LPM does NOT perform its primary function(s). In the background section of the DCP, the CASE team acknowledges this point:

The California Energy Commission is investigating the energy saving potential of products in an “inactive” condition – when not performing their primary function for a user.

Any product that continues its primary function during the DCP test state results in an Active power measurement, misrepresented as a “Low-Power Mode” measurement. Reporting active mode power consumption as a Low-Power measurement would confuse concerned citizens, lead to misinformed decision making, potentially increase overall energy usage by discouraging energy-savings technologies, and disadvantage manufacturers willing to participate in this work.

The CASE report attempts to skirt this issue by categorizing these products as “always on” in the definition of *DCP inactive condition*. A product cannot be “inactive” while being active. Manipulating the definition in this way does not resolve the concern and would add to confusion surrounding what this measurement means.

Recommendation: The definition of “DCP inactive condition” should be revised to be consistent with CEC intent and consumer expectations. Products that do not stop performing their primary function do not have a LPM state and should be removed from the scope of this road-mapping exercise.

In lighting, there are two examples of products that do not have an inactive mode in Appendix A – “Occupancy Sensors” and “Environmental & light level sensors”. These sensors are always “gathering [data]” and need to do so for proper function.

Recommendation: “Occupancy sensors” and “Environmental & light level sensors” should be removed from the scope and Appendix A.

While Lutron does not manufacture or sell “Smoke & carbon monoxide detectors”, these products may have the same issue and should be vetted with relevant manufacturers prior to inclusion in this roadmap. Like most sensors, they can be integrated into other building systems that rely upon their continuous function.

(c) LPM improvements have the potential to save energy in aggregate but should not be prioritized over larger energy savings techniques.

Manufacturers, regulatory bodies, utilities, energy-efficiency program administrators, and others are trying to quickly identify means to reduce energy use in buildings. Lighting is ubiquitous and therefore is frequently identified as an opportunity for additional energy savings. The networking of lighting controls creates many opportunities for additional energy savings and, potentially, for grid resilience.

Below are examples of further energy savings and grid resilience opportunities from networked lighting controls:

- a) Using occupancy data from the lighting system to reduce HVAC demand in unoccupied areas. Reference DesignLights Consortium work on NLC-HVAC integration.
- b) Using the lighting control system to accurately report energy consumption of the entire lighting system. Utilities urge reporting in 15-minute or fewer increments to substantiate energy savings and incentive programs. Reference ANSI C137.5.
- c) Using networked lighting controls as Distributed Energy Resources (DERs) to stabilize the grid through instantaneous changes in dimmed state (either down or up). Reference US DOE and National Labs.

Wireless adaptors enable the communication between the lighting system and outside networks necessary for each of the opportunities described above. Stakeholders are still working on standardizing aspects of these functions to be able to deploy them at scale. One key performance attribute is extremely low network latency.

Homes and buildings that implement these systems will typically only need one lighting wireless adaptor. Further, this adaptor uses a small amount of energy compared to many of the other products identified in Appendix A. LPM energy consumption is one performance metric that needs to be traded-off against other performance metrics, like system latency, resiliency, and frequency of data reporting. Prioritizing LPM performance for lighting wireless adaptors risks the entire lighting system's ability to contribute to these other opportunities. Given those other large opportunities for energy savings, the importance of grid stability in an increasingly electrified world, and their relatively low power consumption of these devices, we believe the inclusion of lighting wireless adaptors in the roadmap scope is premature.

Recommendation: "Wireless adaptors" for lighting should be removed from the scope of this roadmap and from Appendix A. The potential energy savings from the LPM mode of these devices is small compared to the other opportunities from energy savings and grid stabilization that may be unlocked due to lighting's ubiquitous nature and the system's ability to respond with very low latency.

(d) The scope of the roadmap needs to be unambiguous and clear

The Scope of CEC's RFI is effectively a scope by exclusion – loosely all products except those subjected to Federal or Title 20 rules including Low-Power Modes or Standby Power. Examples of in-scope products are then given in Appendix A. CEC then questions which products should be added to, or removed from, Appendix A, implying the scope is actually those “vetted products” listed in Appendix A.

Given concerns about scope and testing burden, it is important that CEC only apply this roadmap to the vetted product categories identified in a revised Appendix A. This offers clarity to impacted manufacturers and ensures that the data presented is meaningful and reliable. This clarity will also allow manufacturers to prioritize the evaluation of the product categories that are most relevant to the CEC.

Recommendation: Replace the current Scope with a reference to an amended Appendix A to provide more certainty to manufacturers considering participating in this project.

III. Road-mapping Process Recommendations

Lutron appreciates CEC's efforts to develop a non-regulatory approach to Low Power Modes. Like any other new process, this road-mapping exercise will likely need to be iterated several times for it to be effective. As described below, Lutron recommends further iteration before advancing to the next phase of this project.

In the RFI, CEC asks questions around manufacturer participation rates and data transparency. In several of the scope issues raised above, manufacturers would be discouraged from participating as the requested data would appear to misrepresent the performance of their products. The impact of sharing misleading data with the CEC is further amplified by the CEC's intention to make data publicly available. To improve participation, CEC should:

- a) resolve the scope issues identified in Section II of these comments, and
- b) develop a process where manufacturers can submit confidential data not made available to the public. This will encourage collaboration between manufacturers and the Commission to better understand additional product categories that may not be tested appropriately by the DCP.

For manufacturers to assess implementation costs, CEC needs to provide additional information about the scale of the data collection envisioned. Lutron offers 15,000+ products, and testing them all to the proposed DCP is not feasible. As the spirit of the roadmap is to assess general performance of product categories, we recommend requesting *representative* data of groups of similar products.

Depending on the scale of the data requested, CEC should also plan to give manufacturers sufficient time to test and report products. Tests proposed by this DCP represent up to 12 hours of energy monitoring per product, after setup, commissioning, and software updates. It will, therefore, be important for the CEC to work with manufacturers to establish a reasonable timeline based on the scale of a useful, manageable data set.

In earlier comments, we have also raised the issue of kits of products and recommended that the smallest level of component be tested separately, provided it functions in that state – without retesting different kits and combinations of products. For example, there is no value in retesting and reporting the LPM energy consumption of a three-pack of products as having three times the consumption as the unit product. This would not only be a waste of resources, but the three-pack would artificially appear to perform worse than the unit product – despite identical LPM performance and cost, packaging, and transportation efficiencies that support other environmental goals.

CEC also requested comments on the proposal to use a “clustered horizontal approach” to device categorization and presumably, future target setting. The high-level concept seems reasonable on the surface, but without details and context, it is impossible to provide meaningful comment. CEC needs to further explain how the product groups will be created to determine if such a grouping is appropriate. The notion of adders for additional features on top of a baseline limit within a product group makes sense, but again, identifying those groups and features and proposing values for the adders must be vetted with a more detailed proposal. Conceptually, this is similar to the approach used in NEMA’s standard LS 20003-2021 covering standby power for LED drivers.

There have been a few opportunities to comment on this work already. Although the test method has changed significantly over that time, there are still many useful comments to which neither the CASE team nor CEC have responded. We would encourage CEC staff to review the docket, particularly Lutron’s comments dated 11 October 2021. Issues yet to be addressed (and remain problematic in this proposed DCP) include environmental conditions during the test, the need for equitable treatment of conversion losses between mains-powered and dc-powered equipment, and combined equipment with multiple primary functions.

Based upon the issues raised above, Lutron does not recommend the data collection phase begin as proposed. CEC should first clarify and amend the scope to address concerns raised above. Further, CEC should provide direction on the nature of the LPM state, opportunities to request certain data to be kept confidential, scale of reporting expectations, and details of the clustered horizontal approach to device categorization. We recommend the next step to be a second RFI.