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Philips Lighting Comments on the 2019 Building Energy Efficiency Standards 45-day Express Terms

Additional submitted attachment is included below.

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February 20, 2018

Submitted via website: https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=17-BSTD-02

Mr. Andrew McAllister
Commissioner
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Docket No.: 17BSTD-02

Philips Lighting Comments on the 45-day Express Terms for the 2019 California Building Energy Efficiency Standards, California Code of Regulations, Title 24, Part 6

Dear Commissioner McAllister,

Philips Lighting appreciates the opportunity to provide the attached comments on the 45-day Express Terms for the lighting provisions of the 2019 California Building Energy Efficiency Standards California Code of Regulations, Title 24, Part 6.

Philips Lighting is a global leader in lighting products, systems and services. Our understanding of how lighting positively affects people coupled with our deep technological know-how enable us to deliver digital lighting innovations that unlock new business value, deliver rich user experiences and help to improve lives. Serving professional and consumer markets, we sell more energy efficient LED lighting than any other company. We lead the industry in connected lighting systems and services, leveraging the Internet of Things to take light beyond illumination and transform homes, buildings, and urban spaces.

Please contact me if you have any questions about these comments.

Sincerely,

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Philips Lighting Comments on the 45-day Express Terms for the 2019 California Building Energy Efficiency Standards, California Code of Regulations, Title 24, Part 6

General Comments

We thank the Energy Commission for improving the way of working with industry during the 2019 code cycle. We sincerely appreciate the willingness of Staff to dialogue with us on topics and concerns, and work through proposals.

Section 100.0 Scope

Considering the removal of device references and requirements from Part 6 (which we support), we recommend that an informative note be added to Section 100.0 for clarity. Users may be familiar with either the California Appliance Efficiency standards (Title 20) or the California Building Energy Efficiency Standards (Title 24) and not be familiar with both or the relationship between the two Standards. We believe this necessitates the addition of a note within the scope. As the desire for an informative note to be added to the Standard was indicated by Staff at the Hearing, please find our proposal for this language below:

> **(i) Device, Installation, and Application Requirements and References.** Part 6 is limited to application and installation requirements for buildings and associated references. Device requirements and references shall be found in the State's Appliance Efficiency Standards (Title 20).

Section 100.1 Definitions and Rules of Construction

We applaud the CEC's and the Statewide CASE Team's efforts to align the language in Title 24 Part 6 to national Standards and recommend that the definitions also be aligned with national Standards wherever possible. Alignment of definition improves ease of use and clarity for all users of the code.

We recommend that the 2019 Building Energy Efficiency Standards adopt the ANSI definition for solid-state driver instead of the definition in RP-16 because the ANSI definition is referenced within an official Standard, ANSI C82.16-2015, whereas RP-16 is a IES Recommended Practice, and although it is an excellent reference document, it is not a formal Standard.

The ANSI definition[1] for electronic driver is as follows: "Devices that use semiconductors to control and supply dc power for LED starting and operation. The drivers operate from multiple supply sources of 600 V maximum at a frequency of 50 or 60 hertz."

We submit these changes to the proposed definition:

[1] ANSI C82.16-2015. Section 1.1.

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Driver, when used in relation to solid state lighting, is a device ~~comprised of a power source and solid state lighting control circuitry designed to operate solid state lighting.~~ that uses semiconductors to control and supply dc power for LED starting and operation. The driver operates from multiple supply sources of 600 V maximum at a frequency of 50 or 60 hertz.

Section 110.9

We support the proposed changes in Section 110.9 that remove lighting control device references and requirements from Building Energy Efficiency Standards, while allowing the installation and application requirements to remain. This content distinction clarifies the applicability of the Standards and improves usability.

Section 130.0(c)6

The 45-day Express Term language states: "For other modular lighting systems served by a driver, power supply or transformer, including but not limited to low-voltage lighting systems, the wattage of the system shall be the maximum rated input wattage of the driver, power supply or transformer published in the manufacturer's catalogs, as specified by UL 2108 or 8750."

As outlined in our oral comments at the Hearing, we oppose this language because it does not address smart building technology, and IoT and connectivity conditions that will likely be mainstream by 2020 when the code becomes effective. Modular lighting systems such as new Power over ethernet (PoE) systems should not be charged the full input wattage of the power supply that, in many cases is not a dedicated power supply and may power much more than lighting such as wireless access points (WAPs), voice over IP (VoIP), and IP video surveillance equipment.

The ASHRAE Standard 90.1 Committee has also considered these new modular lighting systems and has passed and proposed new language (Addendum AH) to update Section 9.1.4(e) of the 2016 Standard, which is presently out for public review.

Addendum AH first public review draft:
https://osr.ashrae.org/sitepages/showdoc2.aspx/ListName/Public%20Review%20Draft%20Standards/ItemID/1845/IsAttachment/N/90.1ah(2016)_1stPPRDraft+1-29-18.pdf

e. The wattage of a DC low voltage *lighting system* that employs flexible cabling for plug-in connection of the lighting *equipment* and a remote power supply, shall be the labeled maximum wattage of the *system* power supply. For *systems* that also provide power to *equipment* other than lighting, the wattage shall be the labeled maximum wattage of the *system* power supply reduced by the wattage of the non-lighting *equipment* connected to the *system*.

We recommend that the 2019 Building Energy Efficiency Standards adopt this language as Section 130.0(c)6C.

C. For systems that also provide power to equipment other than lighting, the wattage shall be the labeled maximum wattage of the system power supply reduced by the wattage of the non-lighting equipment connected to the system.

Section 130.1(f) Controls interaction

We reiterate our support for this new section to define controls interactions as it adds much needed clarification for the interaction and functionality of installed lighting controls. We suggest the following changes to further clarify and improve the proposed language as requested by the Energy Commission at the Hearing:

(f) Control Interactions. Each lighting control installed to comply with Section 130.1 shall permit or incorporate the functions of the other lighting controls required by this Section.

1. For general lighting, the manual area control shall permit the level or amount of light provided while the lighting is on to be set or adjusted by the controls specified in Section 130.1(b), (c), (d), and (e).

2. The manual area control shall permit the shutoff control to turn the lighting down or off.

3. The multi-level lighting control shall permit the automatic daylighting control to adjust the electric lighting level as the amount of daylighting increases or decreases, so that the total amount of light remains stable.

4. The multi-level lighting control shall permit the demand responsive control to ~~increase or decrease~~ adjust the lighting during a demand response event and to return it to the level set by the multi-level control after the event.

5. The shutoff control shall permit the manual area control to turn the lighting on. If the on request occurs while an automatic time switch control would turn the lighting off, then the on request shall be treated as an override request consistent with Section 130.1(c)3.

6. The automatic daylighting control shall permit the multi-level lighting control to make further adjustments to the level of lighting to allow for user preference.

7. For lighting controlled by multi-level lighting controls and by occupant sensing controls ~~that provide an automatic-on function~~ that turn the lighting on automatically, the controls shall provide a partial-on function that ~~is capable of automatically~~ that allows activat~~ing~~ion ~~between~~ of 50-70 percent of controlled lighting power.

130.2(b) Luminaire Cutoff Requirements

The Energy Commission is proposing that the maximum zonal lumen requirements (BUG ratings) of Title 24, Part 11, Section 5.106.8 (CA Green Building Standards Code, CALGreen) apply to all outdoor luminaires with outputs > 5500 lumens.

While we support luminaire cutoff requirements for high wattage outdoor luminaires, we oppose the proposed reduction to the exemption for luminaire cutoff requirements and the change in limits from power (watts) to luminous flux (lumens).

Our outdoor portfolio like that of many other manufacturers contains numerous product families of street and urban pole-mounted luminaire. This change would place undue hardship on our outdoor products teams by requiring review of each and every photometric package against the BUG ratings of Title 24, updating of all affected product specification sheets, marketing brochures, regulatory materials, webpages, and would necessitate new training.

The change from a wattage limit to a luminous flux limit for cutoff requirements seems to imply that there is a simple correlation between input power (watts) and luminous flux (light output in lumens) which there is not, especially with LED luminaires. Due to the complex relationship between input power and luminous flux there may be products that may be disallowed by this requirement, thus unintentionally limiting the choices of architects and lighting designers.

Section 130.2(c) Total Wattage on an Occupancy Control

We thank the Energy Commission for removing the wattage limit for occupancy controls. We think that the importance of both wattage limits and area limits for occupancy-based controls will decline as the market moves beyond traditional control installations and toward networked, site-wide outdoor lighting systems. The control requirements already in place within the code ensure energy savings levels.

Section 140.6(a)4. Luminaire Classification and Power Adjustment

The proposed inclusion of an additional lighting power allowance for tunable-white luminaires and dim-to-warm luminaires in the 2019 Building Energy Efficiency Standards is a promising way to encourage usage and market acceptance for dynamic lighting which offers both energy and non-energy benefits (NEBs).

However, we continue to oppose an aperture size limit for the additional lighting power allowance because tunable-white and dim-to-warm luminaires are available now in many shapes, sizes, and form factors. Spectrally tuned LED luminaires are in no way limited to small aperture form factors and efficacy, especially as part of multi-channel LED systems, changes irrespective of aperture size. Small aperture does not accurately describe or classify tunable-white and dim-to-warm luminaires.

We continue to encourage the Energy Commission to broaden the allowed space types for the proposed power allowance for tunable-white and dim-to-warm luminaires beyond healthcare spaces to office and conference spaces, classrooms and childcare spaces, multipurpose rooms, gymnasiums, retail spaces, and hospitality and dining spaces.

While healthcare facilities and hospitals are the primary location for the installation of spectrally tuned lighting systems *for circadian support and wellbeing*, we believe there is solid support for broad application of tunable-white and dim-to-warm luminaires, as part of dynamic interior environments. This support will continue to grow and expand as metrics to measure non-energy benefits are developed and implemented. Clearly, dynamic lighting environments are beneficial to occupants in many applications, including offices and classrooms. Creating engaging healthy spaces that increase occupant comfort and wellbeing is not

limited to healthcare applications and is indeed highly relevant and applicable to tomorrow's schools, offices, and retail spaces.

Section 140.6(c)2.A

We reiterate our support for inclusion of language that permits the user to select a reasonably equivalent space type if the primary function area type is not listed in Table 140.6-C when determining the lighting power allowance for an indoor space. We commend the alignment of this language with ANSI / ASHRAE / IES 90.1-2016, as it will make the determination of indoor lighting power allowances easier for all users of the code.

Section 141.0 – Nonresidential, High-Rise Residential, and Hotel/Motel Occupancies – Additions, Alterations, and Repairs, Section 141.0(b)2I and Table 141.0-E

We commend the Energy Commission's decision to rewrite the code language for lighting alterations. Removal of the alteration sub-types (entire luminaire modifications, luminaire component modifications, and lighting wiring modifications) results in language that is significantly simpler and clearer in meaning.

We applaud the adoption of nearly the entire California Energy Alliance (CEA) CASE proposal on alterations. We also support the CEA's proposal to reduce the exception for one-for-one luminaire alterations of up to 50 luminaires either per complete floor of the building or per complete tenant space, per annum.

Section 150.0(k)B Residential Lighting Luminaire Requirements

We thank the Energy Commission for its decision to remove the proposed language which would have mandated a correlated color temperature (CCT) of 3500K in low-rise residential applications.

Joint Appendix JA8

JA 8.4.2 Power Factor

We reiterate our prior comments on this proposed language. 'Nominal rated wattage' is a misnomer. 'Rated wattage' and 'nominal wattage' are common industry terms. We suggest that 'nominal rated wattage' be changed to 'rated wattage' for clarity and alignment.

ENERGY STAR allows a power factor of 0.70 for most lamps. Some lamps <10W may have a power factor of 0.6. We recommend that the Energy Commission align the power factor requirements in JA 8 with those of ENERGY STAR for clarity and consistency.

JA 8.4.4 Color Rendering

We continue to oppose the mandate of CRI 90 and R9 of 50 for all low-rise residential applications. We have outlined our reasoning in previous comments to the Energy Commission and will provide these comments at any time on request.

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JA 8.4. 6 Dimming, Reduced Flicker Operation and Audible Noise

We continue to recommend that NEMA 77 be reinstated as a method for qualifying products to Title 24 JA8. Use of NEMA 77 should be considered a strengthening of the requirements for temporal light artifact (TLA), not a weakening. NEMA 77 is a robust, real-world approach that applies the latest science and metrics (SVM and P_{st}) to the measurement of temporal light artifacts (TLA) and recommends appropriate limits for general lighting applications. It is founded on peer-reviewed studies published in journals such as Lighting Research and Technology, LUEKOS, and the Journal of the Optical Society of America. We refer the Energy Commission to our comments on this topic submitted to the docket on February 14, 2018 and to the detailed NEMA comments on this topic submitted to the docket on February 20, 2018.

JA 8.5 Marking

We commend the Energy Commission on its decision to remove the elevated temperature test from JA8.3.6 in favor of alignment with ENERGY STAR requirements and adherence to the ENERGY STAR Lamps Specification Version 2.1.

Thank you for your consideration of Philips Lighting comments on the 45-day Express Terms for the 2019 California Building Energy Efficiency Standards, California Code of Regulations, Title 24, Part 6.