Memorandum

To: California Energy Commission
Dockets Office, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

Date: 9 April 2012

From: Michael Lindsey
IALD Representative

Pages: 4

cc:

Project: 2013 Building Energy Efficiency Standards
45 Day Language Review
Docket No. 12-BSTD-1

Sent via: Email

Regarding: T-24 2013 Building Energy Efficiency Standards – 45 Day Language Review

Comments:

Dear California Energy Commission,

On behalf of the IALD Energy & Sustainability Committee, I'm pleased to submit the following comments regarding the 45 day lighting language for consideration in the upcoming 2013 California Building Energy Efficiency Standards.

Please review the items listed below noting that recommended revisions or additions to the code are indicated within the language as **BOLD** and items recommended for removal are indicated as ~~strikethrough.~~ Other items are simply listed as comments for consideration that we would like your team to be aware of as you finalize the language of the code.

Determination of Outdoor Lighting Zones and Administrative Rules for Use		
Location:	Language:	Proposed Language Revision
Section 10-114	N/A	(a) Lighting Zones. Exterior lighting allowances in California vary by Lighting Zones (LZ). **Lighting Zones can be determined utilizing the U.S. 2000 Census Map.**

Comments:

We often find that people have questions regarding how to determine a lighting zone for a specific project and don't know where to look. We recommend including direction, similar to the above, to better direct parties to where they can find this information.

As this information is touched on in Table 10-114-A, perhaps a more definitive map location could be provided within the language.

Definition and Rules of Construction		
Location:	Language:	Proposed Language Revision
Section 100.1	IES Lighting Handbook is the Illuminating Engineering Society National Association document entitled "The IES Lighting Handbook: Reference and Applications, Tenth Edition" (2010).	IES Lighting Handbook is the Illuminating Engineering Society ~~National Association~~ document entitled "The IES Lighting Handbook: Reference and Applications, Tenth Edition" (~~2010~~ 2011).

Comments:

IESNA actually refers to the "Illuminating Engineering Society of North America", not "National Association". The handbook is also not just specific to North America so the society should be referenced in it's complete form.

Also, the copyright of the book is dated 2011.

Location:	Language:	Proposed Language Revision
Section 100.1	SCONCE is a wall mounted decorative accent luminaire	~~SCONCE~~ Sconce is a wall mounted decorative accent luminaire

Comments:

Simple proofreading recommendation that we assume the entire word was not meant to be capitalized.

Section 100.1	Landscape lighting is a type of……	N/A

Comments:

As there is an earlier section in the definitions which captures "LIGHTING definitions", we recommend moving this definition under that heading.

All Mandatory Lighting		
Location:	Language:	Proposed Language Revision
Section 110.9	(f) 2. Have a ballast factor of not less than 0.90 for non-dimming ballasts and a ballast factor of not less than 0.85 for dimming ballasts.	N/A

Comments:

Currently the lamp/ballast manufacturers have made great strides in developing lamp/ballast systems that deliver the same light output as previous 1.0 BF ballasts utilizing a 0.71 BF ballast (reference Osram Sylvania Xtreme lamp/ballast system).

For a single 4' T8 lamp system, the energy usage is reduce to 25W instead of the normal 32W while the delivered light is the same.

We are concerned that requiring a 0.90 BF eliminates the ability for us to achieve more energy savings utilizing this low ballast factor ballast.

NR Mandatory Lighting Controls and Building Power		
Location:	Language:	Proposed Language Revision
Section 130.0 (c), 6., B., i.	The wattage of the lamp/ballast combination determined in accordance with Section 130.0(c)2A when using the wattage of the initially installed lamp/ballast combination; or	The wattage of the lamp/ballast combination determined in accordance with Section 130.0(c)~~2~~ 1A when using the wattage of the initially installed lamp/ballast combination; or

Comments:

Language references portion of the code that does not exist (130.0 (c)2A). We believe it is supposed to direct someone to compliance with Section 130.0 (c)1A.

Location:	Language:	Proposed Language Revision
Section 130.0 (c), 6., B., iii.	As noted on a permanent, pre-printed, factory-installed label, as specific by UL.	~~As noted on a permanent, pre-printed, factory-installed label, as specific by UL.~~

Comments:

Language is redundant if earlier note "i." references section 130.0 (c)1A as anticipated.

Location:	Language:	Proposed Language Revision
Section 130.0 (c), 6., B	The wattage of a compact fluorescent or high intensity discharge luminaire that can accommodate a range of wattages without changing the luminaire housing, ballast, or wiring shall be the larger of:	The wattage of a compact fluorescent or high intensity discharge luminaire that can accommodate a range of wattages without changing the luminaire housing, ballast, or wiring shall ~~be the larger of:~~ as noted on a permanent, pre-printed, factory installed label, as specified by UL 1598. If label is not present, it shall be the average wattage of all of the lamp/ballast combinations for which the luminaire is rated.

Comments:

The above revision is meant to support the use of wattage restriction labels as a valuable tool for designers. My experience has shown that maintenance staffs focus on the currently installed lamp and wattage restriction labels when maintaining fixtures. This more clearly indicates what the fixture is designed for.

For example, designers are likely to specify a 26W CFL lamp for energy savings and include a factory installed wattage restriction label. Under the current wording, they would need to account for the larger of the label or the lamp/ballast combination which would mean they still account for a 32W CFL.

If a permanent wattage restriction label is not present, then accounting for the average of all lamp/ballast combinations is appropriate.

NR Prescriptive Lighting		
Location:	Language:	Proposed Language Revision
Table 140.6-C – Lobby Area	Lobby Area (Hotel Lobby) = 1.1[1] Lobby Area (Main Entry Lobby) = 1.5[1]	Lobby Area (Hotel Lobby) = 1.1[~~1~~3] Lobby Area (Main Entry Lobby) = 1.5[~~1~~3]

Comments:

Lobby areas currently carry footnote "1" for additional allowance for specialized task work. We would not classify this area as needing a specialized task work allowance but would recommend including footnote #3 for ornamental lighting.

Decorative lighting is prominent and an important feature within any lobby space but without additional allowance is very difficult to meet code requirements.

Thank you for allowing us the opportunity to be involved in this process and provide our comments as we believe that with our organizations active involvement, we can continue to work as partners in influencing energy legislation in a positive manner. We look forward to reviewing the upcoming 55 day language as it addresses everyone's collective contribution thus far to legislative language.

Finally, we have again included the Energy Codes Statement that was developed through the IALD as position statement on how we view the future of energy code legislation and how we would like to influence these steps moving forward.

Feel free to contact me directly should you have any questions regarding the submitted comments.

Regards,

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INTERNATIONAL ASSOCIATION OF LIGHTING DESIGNERS IALD

ENERGY CODES: MOVING FORWARD

INTERNATIONAL ASSOCIATION OF LIGHTING DESIGNERS

12 APRIL 2011

BACKGROUND

In the United States, new versions of the model energy codes have been completed, and the next three-year code development cycle is about to begin. In the past, the US Department of Energy has set aggressive energy reduction goals for the model codes. For the next code cycle, we would not be surprised to see a further reduction in building energy use from the recently completed ANSI/ASHRAE/IES 90.1 and IECC-2012. How might this be achieved? The IALD Energy and Sustainability Committee and the IES have considered this question and both organizations have come to some conclusions to help guide energy code and green building codes development efforts. Because these conclusions concern fundamental approaches, they may also be applicable to energy code development worldwide.

Lighting Power Densities

Lighting Power Density (LPD) is the principal method for regulating lighting power limits in the US.

- The LPDs in the recently completed model codes are as low as they can be, based on 2009 technology.
- While lighting power density limits should be as low as possible, they should still allow quality lighting results. We believe that the current method of developing LPDs (90.1 Lighting Subcommittee modeling and consensus, with DOE technical support) is basically sound.
- LPDs must always be based on reasonable models using available technology. Some small reductions in LPDs might be possible in the next code cycle due to ongoing improvements in the efficacy of various light source technologies.
- Large reductions in lighting energy use will not be achievable solely by reducing LPDs.

Lighting Controls

The new versions of the model codes significantly expand the prescriptive lighting control requirements. There are still opportunities for some additional controls requirements to be added to the codes.

- We support more extensive use of occupancy sensors and daylight responsive controls, and other control techniques that will reduce lighting energy use without reducing lighting quality.
- We do not think significant reductions in lighting energy use are likely due to additional controls requirements.

Daylighting

The only way we are going to see significant reductions in lighting energy use is by lighting our buildings with daylight, and leaving the electric lighting systems for night-time use.

- Daylight should be the primary source of light for buildings whenever practical.
- To realize major reductions in lighting energy use through daylight optimization, a major shift in the way we design and site our buildings is required – this is not just a matter of designing electric lighting systems and controls differently.
- We support mandatory energy code provisions that require daylighting of buildings to reduce building energy use while improving indoor environmental quality. We understand that developing daylighting energy code requirements is extremely difficult. We are committed to this effort and are already at work on it though supporting the International Green Construction Code (IGCC), LEED, and other development processes.

Integrated Design Process and Performance Path Compliance

Improved energy performance in buildings will not be achieved without considering trade-offs among building systems in order to find the optimal balance. An integrated design process is promoted by the performance path and will likely lead to better performing buildings because it will inspire design for maximum energy savings across the building as a whole.

- We support increased use of a performance path, possibly including mandatory use for buildings of certain size and/or type.
- We call on the DOE and others to improve the capabilities of energy modeling software. This is essential to the success of the performance path as an energy savings method. Current software does not always accurately predict lighting energy savings from lighting controls and daylighting, thus discouraging their use. Software must be able to consider more variables to more accurately predict the implications of design decisions.
- Performance based methods should accommodate atypical building designs, and should not discourage innovative energy saving designs. They should properly measure and give full credit for all energy saving techniques used.

Post-Occupancy Commissioning and Code Enforcement

In the US, energy codes can ensure that regulate how buildings is are *designed and constructed* to code. But there is no mechanism in the codes that ensures that the building *performs* as designed. In many cases the energy savings anticipated by the code are never realized.

- We support the development of mandatory energy code provisions for post-occupancy commissioning of lighting controls. These provisions must require the certification of commissioning and/or inspection and verification by code officials or other qualified entities.
- We support the inclusion of detailed inspection checklists for lighting systems in the energy code, and call on DOE to provide greater funding for training of building code officials to help them enforce the codes and monitor results over time.

Outcome Based Codes

Even if buildings are designed, constructed, and commissioned properly, they will not achieve the predicted energy savings if they are poorly operated and maintained. Significant building energy savings can be realized if buildings are operated effectively over time to maintain initial design efficiencies, or appropriately upgraded with new technologies.

- Up to 30% of a building's energy consumption is currently unregulated (plug loads, computers, refrigeration, etc.) We support the development of post-occupancy enforcement mechanisms in energy codes (known as Outcome Based Codes) which have the effect of regulating all aspects of building energy use. We acknowledge that there are significant procedural and legal issues with this approach that will have to be resolved, but we believe that this could be the most effective way of regulating and reducing building energy use in the long run.

CONCLUSION

Lighting power density limits will probably continue to be the primary means of regulating lighting efficiency, but large improvements in lighting efficiency will not be realized by reductions in LPD values alone. If significant reduction in the energy use of new and existing buildings is going to be realized, new energy code methods and procedures must be developed, and changes to fundamental building design approaches must be explored. In order to save significant amounts of energy, codes of the future must move toward regulation of energy consumption (post-occupancy) as well setting standards for building performance.

We support the exploration of new code methods that will reduce building energy use without reducing lighting quality. Codes should not prevent good design results, nor should they be the cause of bad results. New methods should be based on sound data on building and human performance, and what is possible with known technologies. Proposed methods should be shown – through predictive modeling or studies of existing buildings – that they will reduce energy use. Metrics should never be based on arbitrary energy reduction amounts.

The approaches presented above could lead to significant reductions in building energy use. IALD and IES members are already discussing these issues. Through our collective involvement with the development of the IECC, Standard 90.1, the IGCC, Standard 189.1, and LEED, we will work to develop new methods that can significantly reduce energy use *and* allow the design of high-quality lighting in buildings to produce effective, comfortable, safe, and pleasing environments.