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## **21-BSTD-01 2022 Energy Code Update Rulemaking**

*Additional submitted attachment is included below.*

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## **Re: 21-BSTD-01 2022 Energy Code Update Rulemaking**

Dear Commissioner McAllister and CEC staff;

I am a professor of Physics and Astronomy at University of British Columbia, a vision scientist and a developer of lighting systems. During the development of the 2016 Title 24 energy code I had followed the development of the lighting quality specification as contained in Joint Appendix JA8. This approach allowed for the use of screw in lamps as being considered high efficacy because the quality of light from JA8 certified lamps would more closely approach that of the incandescent lamps they replace. This avoided the risk of screw-in LEDs being replaced with incandescent lamps and enabled an “all high efficacy” residential lighting energy code.

In addition to the emphasis on lighting quality, what was particularly visionary by the Commission was the requirement of posting not just compliance but the actual measured values of CRI, noise, flicker, and lumen depreciation. Collecting this data does the following:

- Documents compliance of the products with JA8 limits
- Identifies the overall performance of the market for consideration of next generation quality requirements
- Qualifies products for reach codes or voluntary performance specifications
- Informs designers and specifiers on product performance that is hard to find elsewhere
- Provides lighting manufacturers performance data so they can benchmark their own products against the rest of the market
- Spurs market innovation along quality metrics that the lighting market finds to be valuable

I recently heard that the Commission is considering changing the requirements in Tables 150.0-A and 160.5-A that would exempt Title 20 general service lamps from the JA8 requirements. This change would be disappointing as much of the benefit of reporting performance described above would be lost. This is especially the case for flicker.

During the development of the 2016 Title 24 energy code, the IEEE Standard 1789-2015 "Recommended Practices for Modulating Current in High-Brightness LEDs for Mitigating Health Risks to Viewers" was under development and had not yet been finalized. This standard is completed, and for the 120 Hz frequency commonly associated with inadequate filtering of AC power supplies, the IEEE recommendation to limit risk is to control amplitude modulation to no more than 10%. In comparison, Title 20's maximum allowable amplitude modulation is 30% or three times higher than what the IEEE recommends for limiting health risk.

Exempting Title 20 general service lamps from JA8 performance disclosure and labelling would render JA8 obsolete for this entire large class of lamps used frequently in residential new construction. Given the relatively fast turnover of lighting products, JA8 database entries for general service lamps would become rapidly out of date and the benefits of product performance disclosure would be lost. With an uneven set of requirements for JA8 labelling there is a question of whether building enforcement would be looking for the JA8 mark at all.

What has been proposed in regard to residential lighting quality is a significant change. This should have the same level of preparation and scrutiny as was undertaken during the 2016 standards when the major revisions to the residential lighting standards were adopted. I recommend that the Commission not make the changes to Tables 150.0-A and 160.5-A this code cycle and consider next code cycle what options protect the quality of the visual environment while saving energy.

Yours sincerely,



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