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California Energy Commission
Docket Unit, MS-4
Docket No. 21-BSTD-01
1516 Ninth Street
Sacramento, California 95814-5512
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Re: 21-BSTD-01 2022 Energy Code Update

Proposed 2022 Express Terms Reduce Residential Lighting Quality

Dear Commissioners,

Thank you for your consideration of these comments in advance of the release of the 15 day express terms. My recommendations are:

1. Reverse all changes on the scope of JA8 back to their 2019 requirements. This includes the changes to Table 150.0-A, Table 160.5-A, Section 150.0(k)1B and Section 160.5(a)1B.
2. Place on the agenda for the 2025 code cycle, a fully vetted code change proposal for these sections and JA8 that is well researched, well documented and has full public participation.

I understand that there may be small clarifications and simplification to the standards that do not need to go through the exhaustive review that the CEC demands of code change proposals in the New Measure Template.¹ However, even if the proposed JA8 exemptions were limited to Title 20 general service lamps, this would still be a significant reduction in the stringency and consumer protection in the residential lighting standard.

Given the importance of the JA8 standard on lighting quality and health it is problematic to have a change this large without having a well-documented proposal and sufficient opportunity for detailed public engagement. The small amount of documentation in ISOR and in the single slide on this topic does not meet the standard of documentation that the CEC calls for in their new measure template and it does not rise to the level of care and detail associated with the research,² stakeholder meetings, detailed CASE proposal report³ and public engagement associated with the 2016 residential lighting code requirements including JA8.

The negative impacts to visual quality and health associated with exempting Title 20 general service lamps to the JA8 requirements, were addressed concisely by Dr. Arnold Wilkins from University of Essex⁴:

- The Title 20 requirement of 30% amplitude modulation “*limit does not sufficiently protect health, although it is better than nothing.*”
- “*The publication of flicker test results would incentivize healthy lighting*”

¹ <https://www.energy.ca.gov/media/3538>

² https://www.mchughenergy.com/papers/McHugh-QuantifyingFlicker_2016IES_ConfPaper-v4.pdf

³ http://title24stakeholders.com/wp-content/uploads/2017/10/2016_CASE-Report_Residential-Lighting.pdf

⁴ <https://efiling.energy.ca.gov/GetDocument.aspx?tn=238629&DocumentContentId=72014>



- “There is a need for more restrictive flicker standards.”
- “The changes envisaged are major and have not been subject to the detailed analysis and public review that has occurred with other major changes.”

I have quoted extensively from Dr’ Wilkins’ short letter as he is an expert on the physiological effects of flicker including the survey showing a link between magnetically ballasted fluorescent lighting and headaches.⁵ He was also a contributor to the IEEE-1789 flicker standard.

Dr. Lorne Whitehead of University of British Columbia also highlighted the value of quantified lighting metrics as contained in the JA8 database from minimum compliance to competing on a variety of lighting quality metrics. He also notes that minimal flicker compliance to the T-24/T-20 standards is three times higher than the amplitude modulation recommended by the IEEE flicker standard. Thus disclosing actual flicker performance benefits a wide range of uses including: base and reach codes, voluntary standards, benchmarking, green product specification and marketing based on product quality.

The simplicity of the current JA8 requirements are that all LEDs installed indoors must be labelled JA8. The building inspector does not need to look this up in a database, require the services of a HERS rate to do this, it is very straight forward. As outlined in my prior letter to this docket,⁶ the definition of what is a Title 20 general service lamp is arcane and there is no Title 20 labelling requirement. Exempting a significant fraction of lamps would likely undermine the entire regulatory regime.

As documented in the Sierra Club letter⁷, a similar effort to reduce the scope of the JA8 requirements and render them less enforceable was attempted during the 2019 Title 24 standards development. This attempt was reversed in response to compelling arguments this would not be in the public interest. Dr. Whitehead notes the enforcement issues associated with some lamps required to comply with JA8 and others exempted, “*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.*”

An even broader range of commenters noted the public process problems behind the residential lighting changes. The CEC has worked in a vacuum and proposed major changes to the standards without having a well-developed rationale, documentation or public consensus process. Note the similarity in comments from a wide range of stakeholders. Even those who might support these changes are uncomfortable with how little public consensus and due diligence is being applied to the residential lighting standards.

In NEMA’s March 9, 2021, letter they had this to say about the public process for residential standards (red font added here for emphasis):⁸

3. We note with strong concern that there are portions of the pre-rulemaking text that apply to residential locations and to the Joint Appendices for Lighting products. These topics were thought to be out of scope, or not a focus of CEC efforts and interest for this cycle. NEMA Members recall hearing as much at workshops and other meetings. It comes as a surprise therefore to find significant additions and changes to portions of Title 24 outside of the nonresidential scope. These unexpected proposals were not part of public discussions or other

⁵ <https://www.essex.ac.uk/people/wilki51608/arnold-wilkins>

⁶ <https://efiling.energy.ca.gov/GetDocument.aspx?tn=238382&DocumentContentId=71687>

⁷ <https://efiling.energy.ca.gov/GetDocument.aspx?tn=238637&DocumentContentId=72023>

⁸ <https://efiling.energy.ca.gov/GetDocument.aspx?tn=237046&DocumentContentId=70225>



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opportunities to offer constructive criticism, review supporting data or discuss analyses. We believe more time is needed for discussion and proper analysis than has been afforded.

4. The lack of advance notice of the substantive proposal for residential sections gives rise to concern that proper process is not being followed. *Substantive changes demand more careful review and justification.*

5. CEC should undertake the following to rectify this situation: 1) redact all proposals in the Draft 2022 Energy Code Express Terms that apply to residential applications and that were not subject of detailed public discussions; 2) *make the redacted portions subject of a second rulemaking event, not tied to the non-residential efforts;* 3) *publish a working draft document and hold public workshops and working groups for this redacted language;* and 4) *include with the draft document all supporting information, data and rationale.*

With no more information forthcoming on the basis of the residential proposal, NEMA followed up with this letter dated June 21, 2021:⁹

We stand by our previous comments, that dozens of changes proposed in the new 2022 code are not understood and have not been adequately explained. While perhaps done in spirit of reducing confusion, unexplained changes can tend to personal opinions and create more confusion as a result. By determining which "improvements" should be made in private, the rulemaking process for Title 24 is deprived of decades worth of subject matter expertise available from industry and the public. Unlike the public Title 24 Stakeholders process run by the Investor Owned Utilities (IOU) Codes And Standards Enhancement (CASE) process, in the case of dozens of small changes in the subject proposal CEC staff apparently chose to work without the benefit of public input. Rather than maintain the potential for confusion that these privately developed changes might cause, we reiterate that proposals in the 45-day language that were not workshopped and which lack clear explanation should be pulled from this code cycle and submitted to a more proactive public process to ensure maximum beneficial outcome from these potential changes and a better, more understandable, outcome as a result.

Acuity Lighting submitted the following comments in a letter dated March 9, 2021 after the draft express terms were released:¹⁰

1. Residential Lighting –

a. There are several unexpected proposed updates to Single-Family Residential Buildings, Mandatory Features and Devices Section 150.0 (k) Residential Lighting; none of which were identified or the focus of staff pre-rulemaking workshops or CASE reports. Although many of the updates appear to clean up the code language, there are also a number of changes that are either more stringent or less stringent. Without reviewing the market analysis, energy savings, and cost effectiveness data associated with the proposed changes, it is very challenging to provide adequate review and comment for consideration. A few of these updates include:

i. EXCEPTION 2 to Section 150.0(k)2F that states luminaires connected to a circuit with controlled lighting power of less than 50 watts are not required to have dimming controls.

ii. High luminous efficacy without JA8 certification

⁹ <https://efiling.energy.ca.gov/GetDocument.aspx?tn=238312&DocumentContentId=71606>

¹⁰ <https://efiling.energy.ca.gov/GetDocument.aspx?tn=237092&DocumentContentId=70271>



1. Inseparable Solid-State Lighting (SSL) luminaires and colored light sources that are installed to provide decorative, accent, display, or special effect lighting

2. Dim-to-warm and tunable-white LED light sources with at least one light source controller setting of 4000K or less and color rendering index (CRI) rating of 80 or greater

3. Color-tunable LED light sources

Recommendation: *Commission staff should provide a recent market analysis along with energy savings and cost effectiveness data for public review. Additionally, the staff should conduct a pre-rulemaking workshop with an extended comment period to allow for public comment and discussion.*

This recommendation was not followed. Acuity Lighting followed up with this comment in a letter dated June 21, 2021:¹¹

1. Residential Lighting –

As mentioned in our comments on the draft express terms, we remain concerned with the Commission’s inclusion of several unexpected proposed updates to Single-Family Residential Buildings, Mandatory Features and Devices Section 150.0 (k) Residential Lighting; none of which were identified in or the focus of staff pre-rulemaking workshops or CASE reports. Many of the updates appear to clean up the code language however, several changes are more stringent or less stringent than the 2019 code. Without reviewing the market analysis, energy savings projects, and cost effectiveness data associated with the proposed changes, it is impossible to provide adequate review and detailed comment for consideration. We also reviewed the published Initial Statement of Reasons and found many of the explanations insufficient or inapplicable.

Dr. Michael Siminovitch from the California Lighting Technology Center (CLTC) also expressed concerns about the unintended consequences of modifying JA8 without the same level of careful research and review that went into developing JA8:¹²

A lot of time and effort was put into the original JA8 and its subsequent modifications that have resulted in the wide availability of high quality lighting products to the benefit of consumers here in California. Its evolution and changes have been subject to a fairly rigorous public process that allowed the time for careful analysis and review. The industry has made tremendous progress relative to lighting quality and there are a lot of products that currently meet or exceed the JA8 specification for residential. We fear the potential for unintended consequences in removing or modifying JA8.

In summary, one can see that a wide range of commenters had very similar recommendations to CEC in regards to residential lighting; pull this proposal back and have something more developed next code cycle.

NEMA: “...we reiterate that proposals in the 45-day language that were not workshopped and which lack clear explanation should be pulled from this code cycle and submitted to a more proactive public process to ensure maximum beneficial outcome from these potential changes and a better, more understandable, outcome as a result.”

¹¹ <https://efiling.energy.ca.gov/GetDocument.aspx?tn=238384&DocumentContentId=71684>

¹² <https://efiling.energy.ca.gov/GetDocument.aspx?tn=238658&DocumentContentId=72038>



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Acuity Lighting: Commission staff should provide a recent market analysis along with energy savings and cost effectiveness data for public review. Additionally, the staff should conduct a pre-rulemaking workshop with an extended comment period to allow for public comment and discussion.

Michael Siminovitch: The proposed changes to JA8 (Title 24 residential) related to lamp quality and flicker specifications should be put off to the next round Title 24 -2024. so that a more detailed public review and process can be achieved.

Sierra Club: In summary, we recommend that the CEC remove these harmful changes to Table 150.0-A, Table 160.5-A, Section 150.0(k)1B and Section 160.5(a)1B.

Dr. Wilkins: The rationale for the changes in the initial statement of reasons does not evaluate the ramifications of the change. Careful evaluation should take place next code cycle.

Dr Whitehead: 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.

Jon McHugh: I recommend that the Commission reverse course on dismantling the lighting quality specification as implemented through enforcement of JA8 for all indoor LEDs that are capable of producing white light.

I have pulled these comments together so that the Commissioners and their staff appreciate that there is a broad consensus on the need to be less reflexive and more deliberative when modifying residential lighting requirements. I recommend that the CEC “first do no harm” and return the residential high efficacy lighting requirements to that in the 2019 Title 24, part 6 standards.

I recommend the Commission consider in their planning for the 2025 standards, research in support of advanced lighting standards for residences that are: simple, enforceable, protective of health, enable productivity and save energy.¹³

Sincerely,

Jon McHugh, PE

¹³ A good place to start would be to evaluate Dr Jim Stewart’s recommendations in the EIR docket: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=237519&DocumentContentId=70719>