

DOCKETED

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Letter including planned remarks to be made 10-3-18

Additional submitted attachment is included below.

October 2, 2018

California Energy Commission
Via Email/Web

Re: Docket 17-BSTD-03 CalGreen Lighting Color Temperature Restrictions

Ladies and Gentlemen,

Yesterday I received notice of the hearing and was invited by staff to attend and present for up to five minutes. Fortunately, I will be able to be there. Rather than ramble for my time, I have prepared the following speech.

(BEGIN) I am a registered professional electrical engineer in California directly responsible for the design and specification of over 100,000 LED street lights in California as well as advising on over 500,000 street lights throughout the US and Canada. To stay current, I have attended numerous conferences, built large scale demonstration projects, and conducted extensive public reviews in communities. I rely heavily on the publications of the Illuminating Engineering Society, of which I am a Fellow, and various articles and papers from reputable scientists. I also have retained the counsel of Dr. Alan Lewis as a co-consultant and project advisor when the complex issues of human vision at night are raised. Finally, I served on the Board of Directors and the Technical Committee of the International Dark Sky Association and in 2009 I was among the first to identify the spectral issues of LED that cause anthropogenic sky glow and disrupt the circadian systems of all living beings much more than legacy light sources.

I firmly believe the following key points:

1. According to Dr. Lewis, for human vision in outdoor lighting, at adaptation levels of 3 candela per square meter or more, lumens are lumens and color temperature is not a factor. Experiments in the past two years seeking to prove visual advantages of high CCT LED light sources in situ were unsuccessful.
2. Most outdoor lighting has employed spectrally deficient high-pressure sodium at 2200 Kelvins and CRI of less than 20 for over 50 years. Changing to LED lumen-for-lumen will incur negative impacts on the night sky due to the increased short wavelength light and the resultant increased anthropogenic sky glow due to Rayleigh scattering.

3. High CCT LED lighting emits considerable light around 450 nanometers, which has been demonstrated to cause a human stress response that is often interpreted with being “brighter”. But the effect often has a negative response from citizens, being referred to as “prison lights” in Oceanside and “zombie lights” in Seattle.
4. High CCT LED lighting is being removed from Monterey for failure to address CEQA and the resultant outcry of citizens. The California Coastal Commission now recognizes that white lights exceeding 3000K should be avoided for environmental reasons, and lower CCT including amber should be used around sensitive environmental areas. The high CCT of lights on the Sundial Bridge in Redding was proven to disrupt the Sacramento River salmon run, nearly wiping it out.
5. I designed and oversaw the Hemet, California LED test bed project in which over 250 community leaders from throughout Southern California could physically review and compare over 50 LED options in situ in residential, commercial and highway settings, and by far the highest-ranking installations were 2700K in residential areas and either 2700K or 3000K in commercial areas.
6. Working with Nancy Clanton and others, I helped develop the BUG system and the modernization of the Lighting Zone system used by California Title 24 Parts 1, 6 and 11. I built upon this to develop a state of the art lighting ordinance adopted this year by the City of Malibu that limits all outdoor lighting to 3000K and declares the City to be Lighting Zone 1, the first city in the state and nation to do so.
7. Kruithof’s Curve predicts that at adapted light levels of less than 5 footcandles, the appropriate range of color temperature is around 2000K-3000K. An exception in CalGreen might be considered for sports lighting and certain types of outdoor sales lighting where much higher light levels exist (and not in Lighting Zones 0 or 1).
8. It is understandable that LED lighting was quickly embraced for its energy efficiency and long life, and that several years ago, high CCT LED lighting held a significant efficiency advantage over 3000K and lower. That is no longer true and the small advantage of high CCT LED lighting is only meaningful in high light level applications like sports lighting.

In summary, CalGreen was adopted to address planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. There is more than adequate scientific evidence that increased color temperature has negative environmental impacts on all living beings and other impacts including hiding the celestial wonder of the night sky. Since there is no down side in almost all applications, I feel that a 3000K limit in CalGreen is a practical compromise that supports our ongoing commitment to the environment without increasing cost or energy use. (END)

Thank you for the opportunity to speak out on this subject. I remain available to Commission staff and leadership and living in Davis, a community with 2700K street lights, I am happy to continue my 43-year support of the Energy Commission, Title 24 and especially, Parts 6 and 11 and the leadership that this work has provided for the world.

Sincerely,

James R Benya, PE, FIES, FIALD

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