

Re: Comments on EPA's ENERGY STAR Program Product Specification for Lamps (Light Bulbs), Version 1.0, DRAFT 3

Dear Ms. Jantz-Sell:

As the executive director of the Solid State Lighting and Energy Center (SSLEC) at UCSB, I believe I am uniquely qualified to comment on the proposed ENERGY STAR product specifications. The SSLEC is the largest academic center on LED research in USA with over 40 PhD students and \$5m in annual research expenditures.

Currently, light quality and cost are the main factors holding back LED lighting from widespread adoption. For consumers to be motivated to purchase LED lamps over incandescent lamps, they must see LED based light sources as high-quality products worth the initial higher price differential. Therefore, LED lamps must provide performance that is measurably better than CFLs, including higher color rendering. Given the critical importance of light quality, **we strongly recommend that EPA address quality of light, specifically higher Color Rendering Index (CRI)**, in the new lamp specification. The ENERGY STAR qualification must be associated with LED lamps that provide a better quality of light. To do otherwise would damage the credibility of LED lighting, and hamper widespread adoption. I do not want to see a repeat of the poor light quality experience of CFLs.

For white Led lighting we estimate that there is approximately a 2% penalty in luminous efficacy per point of CRI Therefore when raising the CRI of an LED to 90, versus a lower quality LED of 80, there is a ~20% penalty in lm/W. To address this penalty and provide consumers the option for higher CRI ENERGY STAR qualified LED lamps, we suggest that EPA add to the 9.1. Luminous Efficacy: All Lamps table a column for Minimum Lamp Efficacy (initial lm/W) for lamps with a CRI of ≥ 90 . A new column for CRI >90 LED sources should have an across the board 20% reduction in lm/W for each lamp type.

If you have any further questions on white LED sources, please feel free to contact me at (805) 886-3816 or email at: denbaars@engineering.ucsb.edu.

Sincerely,

Steven DenBaars

Professor and Executive Director,

Solid State Lighting and Energy Center