Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy
Natural Resources Defense Council
Northwest Energy Efficiency Alliance

May 6, 2022

Dr. Stephanie Johnson
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Building Technologies, EE-2J
1000 Independence Avenue SW
Washington, DC 20585

RE: Docket Number EERE-2019-BT-STD-0040: Energy Conservation Standards for Ceiling Fan Light Kits

Dear Dr. Johnson:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), American Council for an Energy-Efficient Economy (ACEEE), Natural Resources Defense Council (NRDC), and the Northwest Energy Efficiency Alliance (NEEA) on the preliminary technical support document (PTSD) for ceiling fan light kits (CFLKs). 87 Fed. Reg. 12621 (March 7, 2022). We appreciate the opportunity to provide input to the Department.

DOE's preliminary analysis in the PTSD suggests that amended efficiency standards for ceiling fan light kits could provide meaningful, cost-effective energy savings. These energy and cost savings are available from higher efficiency LED CFLK lamps. Overall, we generally support DOE's approach for the preliminary analysis, including use of a single CFLK product class, as adopted in the January 2016 Final Rule,[1] which helps prevent potential market distortions arising from multiple product classes. However, we encourage DOE to incorporate the higher-lifetime lamps examined in DOE's analysis into the no-new-standards case. We also encourage DOE to refine the equation-based efficiency levels in the preliminary analysis to ensure that they adequately reflect the relationship between efficacy and lumen output. These and other issues are discussed in more detail below.

We encourage DOE to include the 25,000-hour lifetime lamps examined in DOE's analysis in the no-new-standards case. Candidate standard level (CSL)2 and CSL1 are predicted to be the baseline LED CFLK lamp efficiency levels by the assumed 2027 compliance date in DOE's reference and alternative scenarios, respectively. The PTSD discusses that DOE conducted a market survey indicating that both 15,000-hour and 25,000-hour lifetime LED lamps were widely available at both CSL1 and CSL2.[2] Thus, DOE analyzed lamps with each lifetime since both are readily available in the market and each have unique life-cycle costs (LCCs) and payback periods. However, per DOE's LCC spreadsheet,[3] it appears that DOE assumed that all consumers in the no-new-standards case would purchase the 15,000-hour LED lamp rather than the 25,000-hour lamp. This assumption seems inconsistent with the fact that the

[1] 81 Fed. Reg. 580 (January 2016).
[2] EERE-2019-BT-STD-0040-0006, p. 2-17, 18. www.regulations.gov/document/EERE-2019-BT-STD-0040-0006
[3] EERE-2019-BT-STD-0040-0008, www.regulations.gov/document/EERE-2019-BT-STD-0040-0008

higher-lifetime LED lamps are readily available on the market and that DOE determined they warranted their own analysis. In fact, DOE based their cost model on estimates for 25,000-hour CSL1 lamps, citing information from retailers and manufacturers suggesting that they were the more commonly sold lamp at CSL1.[4] Therefore, we encourage DOE to estimate the market share of 25,000-hour lamps at CSL1 and CSL2 and then assign that percentage of consumers the higher-lifetime lamps for the downstream analysis.

We encourage DOE to further refine the equation-based efficiency levels to ensure that they adequately reflect the relationship between efficacy and lumen output. CFLK efficacy is reported in lumens (i.e., brightness) per Watt, and the minimum standard increases with lumen output. DOE asserts that fixed losses in lamps, such as power consumption by the integrated ballast/drive, become proportionally lower at higher lumen outputs, thereby increasing efficacy.[5] The January 2016 Final Rule determined a relationship between efficacy and lumens in the form of an exponential function.[6] In the PTSD, DOE conducted regression analyses on several different equation forms to best fit the efficacy trend of lamps for currently-available CFLKs; a sigmoid equation was used along with the current standard level to set higher CSLs.

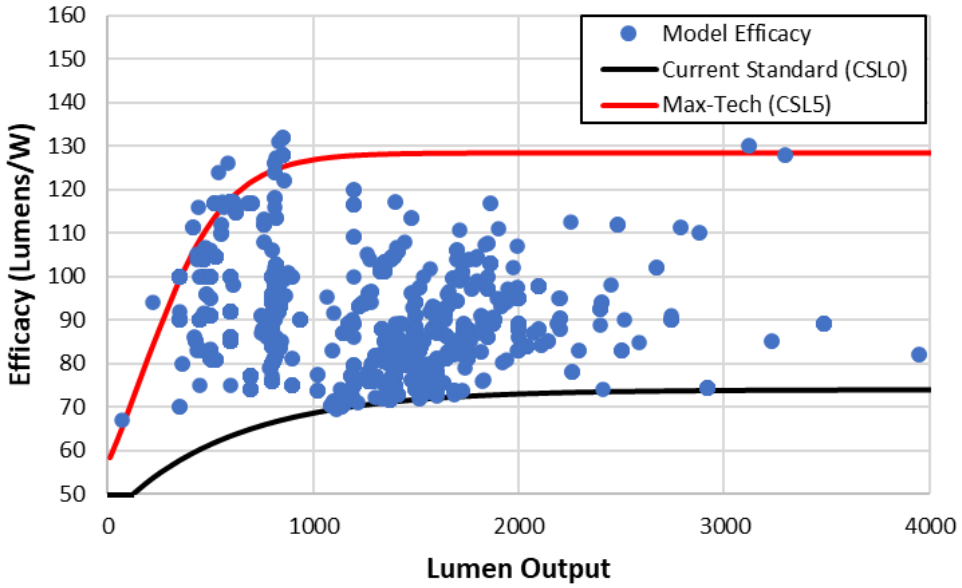

Figure 1: MAEDbs CFLK model efficacy (blue dots), the current DOE minimum standard (black line) and the evaluated max-tech level (red line) vs. CFLK lumen output.

However, it is unclear whether the CSLs evaluated in the PTSD appropriately reflect CFLK efficacy as a function of lumen output. Figure 1 plots CFLK efficacy versus lumen output for CFLK models in the CEC Modernized Appliance Efficiency Database System (MAEDbS)[7] along with the current standard (CSL0) and the evaluated maximum technologically feasible (max-tech) CSL5 level. There are multiple models at lower lumen outputs that exceed the max-tech level. In particular, there are several models at approximately 850 lumens, near the representative LED lamp outputs of 800-810 lumens in DOE's

[4]EERE-2019-BT-STD-0040-0006, p. 5-12. www.regulations.gov/document/EERE-2019-BT-STD-0040-0006
[5]EERE-2019-BT-STD-0040-0006, p. 5-4. www.regulations.gov/document/EERE-2019-BT-STD-0040-0006
[6]81 Fed Reg. 596.
[7]MAEDbS Database (Accessed April 22, 2022). cacertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx

analysis, that have similar efficacy (130 lm/W) as a model at 3100 lumens. Overall, these results suggest that the higher CSLs evaluated in the PTSD may be easier to meet at lower lumen outputs. Thus, we encourage DOE to further investigate the relationship between efficacy and lumen output.

The average life-cycle cost (LCC) savings in the PTSD, as presented, are somewhat misleading. We understand that the reported average LCC savings consider the base case efficiency distribution but exclude unaffected consumers. Hence, Table 7.5.2 shows that the highest average LCC savings for affected consumers are at CSL1 and CSL2. However, these results obscure the fact that only 2.4% of consumers—those who would purchase a CFL rather than LED lamp—are affected. In other words, the reference no-new-standards case assumes that the other 97.6% of consumers would already be at CSL2 by the 2027 compliance date. Thus, setting a potential standard level at CSL2 would have little overall impact on the market average energy and cost savings. We believe this distinction is important in the context of selecting a potential new standard level for CFLKs.

We support a single product class for all CFLKs. The prior standards rulemaking for CFLKs reduced the number of product classes from three, establishing one product class including all CFLKs. For the preliminary analysis, DOE reviewed CFLKs with various base types, bulb shapes, lumen outputs, color outputs, lamp component locations, etc.[8] The PTSD states that DOE did not identify any CFLK lamp characteristics that resulted in efficacy differences that would necessitate separate standards to preserve any unique utility provided to the consumer. Absent additional data, we continue to support this single product class as we believe it eliminates potential market distortions arising from multiple product classes.

Thank you for considering these comments.

Sincerely,

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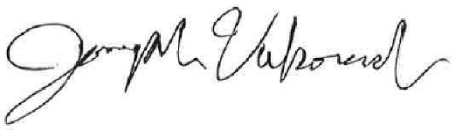

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[8]EERE-2019-BT-STD-0040-0006, p. 2-7. www.regulations.gov/document/EERE-2019-BT-STD-0040-0006