



**NRDC Comments on Proposed Revisions to ENERGY STAR Lamp Specification**

Submitted By:

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On behalf of the Natural Resources Defense Council and our 2 million members and electronic activists we respectfully submit our comments on the Environmental Protection Agency's (EPA) proposed revisions to the ENERGY STAR lamp specification. NRDC has been an active participant during EPA's specification setting process and our comments supplement those we provided previously.

In summary, we support EPA's proposed changes to rated life and premature failure, efficacy, and omni-directionality, but do not support the proposed reduction of power factor from the current level of 0.7.

**Background** - Today, we are seeing an increasing number of non-ENERGY STAR LED lamps being introduced and offered for sale. Many of these lamps have much lower cost than comparable ENERGY STAR models. Some cost as little as \$2.50 per bulb and manufacturers achieve this price by cutting lamp life to 10,000 hours, reducing the arc of light being produced (lower omni directionality), and/or removing dimmability. As first price is often the top factor for consumers when they are shopping for light bulbs, many consumers who are open to buying a LED light bulb are likely to be drawn to and select

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these lower cost LEDs, especially if they are from a brand with high name recognition.

The big risk here is that these low cost bulbs may yield an inferior experience, such as premature failure, poor dimming (if a dimmable lamp), emitting unacceptable levels of noise or flicker, or not providing the illumination where it is wanted. If this happens frequently, then the word will get out and many consumers may switch away from LEDs and switch to halogen incandescents, which would result in massive lost energy savings. In order to help ensure the quality of many of these lower cost LED lamps, ENERGY STAR is proposing to reduce its requirements for a couple of criteria in order to help bring these lamps back into the ENERGY STAR program. We at NRDC think this is the right direction to go as it will help ensure that more of the LEDs being sold adhere to the minimum performance and quality requirements established and verified by ENERGY STAR. This in turn will ultimately result in greater adoption of LED lamps and the energy and environmental savings they deliver.

***1. NRDC supports EPA's proposal to reduce minimum rated lifetime to 15,000 hours.***

By allowing lamps with lifetimes less than 25,000 hours to be eligible for ENERGY STAR qualification, ENERGY STAR is helping reduce the first cost of qualified LEDs and preventing a potential race to the bottom in terms of product quality. As reducing lamp lifetime is one of the ways to reduce a lamp's manufacturing costs, this change will likely result in lower priced ENERGY STAR lamps.

We strongly believe that this change will help maintain/increase LED lamp quality as manufacturers will now be eligible and motivated to be eligible for the more than \$1 billion dollars in lamp rebates offered by utilities and other efficiency program administrators.

Other reasons why we support the reduction in minimum rated lamp life for LEDs include:



- a) *Increased affordability and greater leverage of utility incentive dollars –* Today’s ENERGY STAR general service LED lamps tend to cost between \$5 and \$10 per lamp, before rebates, and after the typical rebate of \$3, cost \$2 to \$7. This rebated LED lamps main competition is the incandescent halogen lamp that retails for around \$1.25 to \$1.50 each, when purchased in a multi pack. As such, the price sensitive customer who bases their decision largely on a product’s first cost, will continue to buy the halogen, even though it uses 3 to 4 times more power to operate.

If on the other hand the ENERGY STAR lamp only costs \$2.50 to \$3 before rebates, a rebate of \$2 per lamp will bring the price of the rebated LED **below** the cost of the competing halogen. In addition the utility can rebate more lamps and get more total energy savings for a specific total rebate budget as they don’t have to pay as large a rebate for each lamp.

- b) *Avoid “locking in” today’s LED bulb for 25,000 hours since it delays replacement with even more efficient LEDs in the future –* Most residential customers will be very satisfied with an energy saving lamp that lasts 10,000 hours or roughly 10 years, assuming 3 hours per day of operation. By requiring ENERGY STAR qualified lamps to have a minimum rated life of 25,000 hours, consumers will not replace these lamps for up to 25 years, rather than at year 10, and will miss out on the higher efficiency and energy savings by future lamps between years 10 and 25. As such NRDC supports EPA’s proposal to reduce the lamp lifetime to 15,000 hours and would also support a proposal of 10,000 hours. These recommendations are contingent upon ensuring that these lamps don’t fail prematurely. NRDC therefore urges EPA to move forward with and adopt its proposal that requires all 10 out of 10 samples be operational throughout the duration of life testing and included in the lumen maintenance calculations.
- c) *Lower minimum lamp life products are still wildly cost effective for the consumer –* We believe most residential consumers are more focused on



bringing down the initial cost of the LED they are considering to purchase rather than the additional savings they will achieve in years 15 to 25. At a purchase price of <\$5 per bulb, before a rebate, these lamps continue to be wildly cost effective even with a 15,000 hour lifetime, instead of 25,000 minimum requirement.

- d) *Utilities will not suffer from the proposed reduced minimum lamp lifetimes* – As the out years of 15 to 25 are so heavily discounted in the cost effectiveness calculations for LEDs installed in residential application, utilities will not be adversely effected by this reduction in minimum lamp life. For commercial customers, utilities could continue to require lamps have a minimum lifetime of 25,000 hours due to the much longer burn hours in commercial buildings.

We also want to point out that when LEDs were first introduced many of the models cost \$25 to \$50 each. At that time, the really long life was necessary to help justify the extremely high first cost and to achieve favorable returns on investment, in particular in commercial applications. This is no longer the case.

**2. *NRDC supports the increased efficacy levels and the tradeoff provided for high CRI lamps (CRI >90)***

The latest proposal by ENERGY STAR raises the bar for efficacy of new lamps. We support this move as it will provide additional energy savings by no longer allowing the least efficient models to qualify for ENERGY STAR and to receive the sales boost that comes from rebates for ENERGY STAR labeled products. As a limited percent of residential customers prefer high CRI bulbs and many commercial customers do, we support the tradeoff that allows these high CRI lamps to still qualify for ENERGY STAR. While these high CRI products may have a lower efficacy than those with a CRI in the low 80's, we believe these offerings should still be eligible for ENERGY STAR as they are still dramatically more efficient than competing halogen incandescents.



**3. *NRDC does not support EPA's proposal to reduce the minimum power factor from 0.7 to 0.5***

Given the billions of US sockets that may contain an LED bulb in the future, the system impacts of lower power factor lamps are significant. Higher utility infrastructure costs will occur due to the reactive nature of LED-based solid state lighting, which results in higher distribution currents that adversely affect power factor (PF) and, in turn create a larger demand on the power grid.<sup>1</sup>

EPA currently has a minimum power factor for LED lamps of 0.7 and this is consistent with the soon to be adopted minimum requirements for LED general service lamps in California.

While EPA has received some input from one or more manufacturers that reducing power factor from 0.7 to 0.5 will reduce lamp production costs and the lamp selling price, no specific evidence was provided. In the absence of compelling data, we cannot support this reduction. In fact a 0.7 power factor already reflects a compromise down from a potential power factor of 0.9 that would be worthy of a specification such as ENERGY STAR.

We also want to point out that many of the LED products have high power factor correction built into the driver and that the chip sets used in the drivers reportedly come with little to no incremental cost for power factor of 0.9. To investigate this further, we encourage EPA to discuss this issue further with leading solution providers such as Power Integrations, Onsemi and Texas Instruments.

**4. *NRDC supports a minor relaxation of the omni directional lamp requirements provided it will not adversely affect consumer satisfaction with LED lamps.***

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<sup>1</sup> Excerpted from - [http://www.ledlighting-eetimes.com/en/power-factor-and-solid-state-lighting-implications-complications-and-esolutions.html?cmp\\_id=71&news\\_id=222908451](http://www.ledlighting-eetimes.com/en/power-factor-and-solid-state-lighting-implications-complications-and-esolutions.html?cmp_id=71&news_id=222908451)



During the EPA led webinars there were conversations around the point that slight reductions in the omni-directionality requirements for LED lamps could result in meaningful cost reductions and that these changes would not be noticeable by consumers. If this is true, then NRDC would support such a change.

*We withhold our support for this change until further evidence can be provided regarding the lack of negative consumer impacts.* In its letter announcing the potential changes to its specification, EPA stated “EPA research indicates no discernable difference in consumer satisfaction for these emerging new designs which meet these slightly adjusted requirements.” To advance this conversation, we respectfully request EPA provide the findings of its research.