

December 9th 2011

Dear Mr. Baker,

Thank you for the opportunity to provide comments to the Draft 1 of the ENERGY STAR Lamps V1.0 specification. Please accept LG Electrics' comment on the new proposal in the Draft 1.

If you have further questions, please contact me directly. Thank you,

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Comments on LPW requirement for Decorative lamp

It is found that LPW requirements for several lamp types are raised by 5 points. Considering the fact that LED lamps are hyped to deliver energy saving and long life time, it is understandable there is the sense of expectation that LPW of LED lamp would ever-improve as time goes by. Simply, higher LPW is perceived as more energy saving. However, there is the other side of story about higher LPW. As LPW goes higher, the effect of energy saving diminishes and the cost and technical difficulty involved improving it sky-rockets. One should pay considerable attention to this statement because LED lamp is struggling to penetrate general consumer market due to high price tag though many expect it the future of lighting.

Here is the simple example of the diminishing effect of energy saving, comparison between two types of B10 lamps, incandescent and LED with various LPW.

	LPW	Lumen (lm)	Wattage (W)	Energy saving (W)
Incandescent B10	12	300	25	-
LED lamp	40	300	7.5	17.5
	45	300	6.7	18.3
	50	300	6.0	19.0

We assume all the lamps emit exact same lumen. It is no brainer there is sizable energy saving when 25W incandescent B10 is replaced with 40LPW LED B10, which is 17.5W. However, 45LPW LED B10 delivers only slightly better energy saving by 0.8W, compared to 40LPW one. It becomes lot worse when a lamp only meets Energy Star requirement on 25W replacement, that is, 150lm.

	LPW	Lumen (lm)	Wattage (W)	Energy saving (W)
Incandescent B10	12	300	25	-
LED lamp	40	150	3.75	21.25
	45	150	3.3	21.7
	50	150	3.0	22.0

45LPW B10 only saves 0.45W more than 40LPW B10 does. It is needless to say the

effect of energy saving by higher LPW lamp is almost washed out.

Let's look at the side- effect of the enhancement of LPW. Anyone who ever develops LED lamps could appreciate how difficult to improve LPW while delivering higher lumen. Especially a small form factor lamp like B10 poses lot more challenges to developers. Not to mention cost also goes up. **Our internal study shows 6 more months of development time and BOM cost increases about \$1 to improve LPW by 5LPW which is translated to roughly \$3 increase in retail price.** Higher upfront cost would discourage general consumers to pick up LED lamps from the shelf. Like I mentioned before, the penetration by LED lamp is accelerated by the reasonable price tag. To support faster market penetration, EPA should find a sweet spot of LPW, meaning that the appropriate requirement of LPW helps the industry to develop energy saving products while continuing their effort to lower BOM cost. The simple mindset like "Higher LPW is better" is very risky to LED lighting industry that is still in the infancy.

I would like to thank you for reading the long comment of ours. I really hope it makes EPA on same page with us. Thank you for your continuous support to LED lighting industry.