Is it Still Cost Effective to Promote Light Bulbs? Should We?

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Simply stated, program sponsors and regulators are unsure whether residential lighting programs should continue to promote CFLs given the change in standards brought about by the Energy Independence and Security Act of 2007 (EISA). Similarly, sponsors and regulators need to know if and when LED bulbs should be promoted. In this poster, we present an argument for the continued promotion of CFLs at least until 2020 and look also at the cost effectiveness of promoting LEDs over the same period and recommend targeted promotions for both.

In response to the EISA legislation, manufacturers have developed a new line of EISA compliant halogen (EC halogen) bulbs that are engineered to meet the EISA standards in each light output range (e.g. 72 watt EC halogen at 1490 lumens). These EC halogen bulbs, already available in the U.S. market, are the next generation baseline product for general purpose replacement lamps. A second tier standard was mandated by the EISA legislation to go into effect January 1, 2020 which requires that all general purpose lamps manufactured or imported into the U.S. market meet an efficacy of 45 lumens per watt.

U.S. lamp manufacturers anticipate EISA compliant halogen bulbs will gain significant market position beginning in 2015, and will quickly become the technology of choice for residential customers after the precipitous drop in incandescent bulb sales following the full phase in of the first tier EISA standards. Price estimates forecast a substantial drop in the prices of LED products (directional and omni-directional) reaching, on average, approximately $10/bulb for reflector LEDs and $5/bulb for A-Line LEDs by 2020. Standard incandescent bulbs are expected to hold steady at a very low cost per bulb while CFLs and EISA compliant halogen bulbs decrease steadily, but slowly. Based on this information from U.S. lamp manufacturers and the research of other in the EE industry (York, et. al., 2013; D&R, 2012; NEEP, 2012; EPA, 2011), EISA will not transform the residential lighting market on its own for many years to come.

Table 1: Gross Energy Savings Parameter Assumptions

PARAMETER	VALUE
Ave. Daily Operating Hours:	2.3 hrs/day
Rated Life of CFL:	10,000 hrs
Rated Life of LED:	25,000 hrs
Rated Life of Standard Incandescent/EISA Compliant Halogen:	1,000 hrs
CFL Ultimate Installation Rate (KEMA, 2010; p. 127, Table 77)**:**	0.973
LED Ultimate Installation Rate:	1.000

Table 2: Baseline Product Wattage Assumptions by Light Output (EPA, 2011)

Year	Light Output (lumens)				
	0-309	310-749	750-1049	1050-1489	1490-2600
2011 (pre-EISA)	25	39	59	73	97
2012	25	39	58	72	90
2013	25	37	55	64	80
2014	25	33	49	58	76
2015	25	33	49	58	76
2016	25	33	49	58	76
2017	25	33	49	58	76
2018	25	33	49	58	76
2019	25	33	49	58	76
2020 & after	25	12	20	28	45

Table 3: Net-to-Gross Ratios

Year	NTG	
	CFL	LED
2012	0.70	0.90
2013	0.67	0.86
2014	0.65	0.83
2015	0.62	0.80
2016	0.59	0.76
2017	0.57	0.73
2018	0.55	0.70
2019	0.53	0.68
2020	0.50	0.65

Table 4: Financial Estimates (Hornby, et. al., 2011)

Discount Rate:	**3.5%**
T&D Losses:	**7.0%**
Year	**Avoided Cost ($/kWh)**
2012	0.070615
2013	0.070968
2014	0.071323
2015	0.071680
2016	0.072038
2017	0.072398
2018	0.072760
2019	0.073124

Table 5: Promotional Costs

Year	CFL			LED-Reflector			LED-ALine		
	Incent	Admin	Total	Incent	Admin	Total	Incent	Admin	Total
2012	$1.35	$0.517	$1.87	$10.00	$0.517	$10.52	$10.00	$0.517	$10.52
2013	$1.35	$0.517	$1.87	$10.00	$0.517	$10.52	$8.00	$0.517	$8.52
2014	$1.35	$0.517	$1.87	$8.00	$0.517	$8.52	$6.00	$0.517	$6.52
2015	$1.35	$0.517	$1.87	$7.00	$0.517	$7.52	$5.00	$0.517	$5.52
2016	$1.35	$0.517	$1.87	$7.00	$0.517	$7.52	$5.00	$0.517	$5.52
2017	$1.35	$0.517	$1.87	$6.00	$0.517	$6.52	$5.00	$0.517	$5.52
2018	$1.35	$0.517	$1.87	$6.00	$0.517	$6.52	$4.00	$0.517	$4.52
2019	$1.35	$0.517	$1.87	$5.00	$0.517	$5.52	$4.00	$0.517	$4.52
2020 & after	$1.35	$0.517	$1.87	$5.00	$0.517	$5.52	$3.00	$0.517	$3.52

The analysis (*see poster for exact results*) demonstrates that both CFLs and LEDs can be cost effectively promoted at retail in the U.S. residential sector throughout this decade and beyond. In short, the answers to the questions asked in this poster are: **YES, it is,** and **YES, we should.**

For a more detailed discussion of the analysis and results please see:
http://www.appliedproactive.com/uploads/pdf/Craigo-Snell_IEPEC2013_PosterWrite-up.pdf

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