DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Product: Home Lighting & Recycling

Home Lighting product encourages the purchase of compact fluorescent lamps (CFLs) and Light Emitting Diodes (LEDs) and recycling of all fluorescent lamps.

Algorithms:

Electrical Energy Savings (Gross Annual kWh Saved at Customer per unit)	=Number_of_Bulbs x (kW_Savings_per_Bulb) x Hours
Electrical Demand Savings (Gross kW Saved at Customer per unit)	=Number_of_Bulbs x (kW_Savings_per_Bulb)
Electrical Energy Savings (Gross Generator kWh)	= Customer kWh / (1-TDLF)
Electrical Demand Savings (Gross Coincident kW Saved at Customer per Unit)	= Customer kW x CF / (1-TDLF)
Electrical Energy Savings (Net Generator kWh)	= Gross Generator kWh x NTG x Realization Rate
Electrical Demand Savings (Net Coincident kW Saved at Generator per Unit)	= Gross Generator kW x NTG x Realization Rate

Variables:

Number_of_Bulbs	= Number of bulbs sold
kW_Savings_per_Bulb	= kW savings per replaced bulb. We will subtract the manufacturer provided wattage for each CFL/LED from the wattage of the halogen bulb it replaces. The halogen wattages will be determined based on the CFL/LED wattage as seen in Table 1.
Hours of operation	= Hours of operation per year for the bulb. Hours of operation for residential installations is assumed to be ~~2.56 (934.4 hrs)~~ LED - 2.49 hours per day (909 hrs) and CFL - 2.34 hours per day (854 hrs) Reference 5. Hours of operation for non-residential purchases are 2,450.5 hours 94% of all bulbs purchased are assumed to be residential and 6% are assumed to be non-residential. Reference 1
Measure Life	= Measure life for the average bulb sold will be equal to the lifetime hours divided by the annual hours of operation. CFL lifetime hours = 10,000 LED lifetime hours = 25,000 Value LED lifetime hours = 15,000 Reference 1
CF	= Probability that peak demand of the bulb will coincide with peak utility system demand. 0.08 will be used for all residential CFLs\LEDs 0.7246 will be used for all non residential CFLs\LEDs. (From business program) Reference 1
TDLF	= Total Distribution Loss Factor, Residential = 7.69%, Non-residential = 6.51%

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Incremental Cost of Bulbs	= See Table 2
Net-to-Gross Factor	= We will use 79% for residential CFL's, 91% for residential LED's, and ~~86%~~ 85% for residential Value LED's. Reference 4 and Response to Comments on 60 Day Notice 1/6/2016
Realization Rate	= Future savings for bulbs purchased and put in storage and installed in later years. The net present value of the saving for all bulbs purchased = 99% of the savings if all bulbs are installed when purchased
O&M savings	= Operation and Maintenance savings are assumed to be zero.

Provided by product Vendor:
Number and type of bulbs purchased

Verified during M&V:
Yes

Assumptions:
The baseline bulb is a blend between the EISA standards (Halogen bulbs) and available incandescent bulbs
The baseline bulb cost is deemed as stated in table 2 below
The efficient LED bulb cost will be tracked and updated at the end of the year to account for the rapidy evolving market and cost for LED bulbs.
Non EISA impacted lights will use incandescent baseline

Table 1 - EISA impacted lighting wattage for residential lights

Bulb Wattage Table					
Eff Watts	Baseline Watt CFL	Baseline Watts LED	Eff Watts	Baseline Watt CFL	Baseline Watts LED
4		29.00	19	53.00	72.00
5		29.00	20	53.00	72.00
6		29.00	21	53.00	72.00
7	29.00	43.00	22	53.00	72.00
8	29.00	43.00	23	72.00	72.00
9	29.00	43.00	24	72.00	72.00
10	29.00	43.00	25	72.00	150.00
11	29.00	53.00	26	72.00	150.00
12	29.00	53.00	27	72.00	150.00
13	43.00	53.00	28	72.00	150.00
14	43.00	53.00	29	72.00	150.00
15	43.00	53.00	30	72.00	150.00
16	43.00	72.00	31	150.00	150.00
17	43.00	72.00	32	150.00	150.00
18	43.00	72.00	>=32	150.00	150.00

Table 2 - Average Cost Table	**CFLs**	LEDs 2015*	LEDs 2016*	Value LEDs 2016*
Gross Retail (per bulb)	$ 2.69	*$ 16.25*	*$ 14.88*	*$ 3.46*
Baseline (per bulb)	$ 0.95	$ 1.89	$ 1.89	$ 0.95
Incremental	$1.74	$ 14.36	$ 12.99	$ 2.51
Rebate	$ 1.15	$ 5.25	$ 4.75	$ 1.50
Net Retail	$0.59	$9.11	$8.24	$1.01

* = See note above on LED costs throughout the program year.

References:

1. Michaels Tech Assumptions Review 2013
2. 2013 Program Results compiled by WECC (program administrator)
3. Market survey 2015 (homedepot.com, lowes.com, samsclub.com, target.com, walmart.com, etc)
4. Evaluation of Xcel Energy's Home Lighting and Recycling Program, Jan 13 2016, The Cadmus Group, Inc.
~~5. Evaluation Report:Residential Energy Star Lighting presented to Commonwealth Edison Company, May 16, 2012, Navigant Consulting~~
5. Illinois 2015 Technical Reference Manual, ComEd PY5/PY6 Residential Lighting Program Evaluation conducted by Navigant in 2015