DEEMED SAVINGS TECHNICAL ASSUMPTIONS

Product: Home Lighting & Recycling

Description:

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 LED - 2.49 hours per day (909 hrs) and CFL - 2.34 hours per day (854 hrs) Hours of operation for non-residential purchases are 5,187 hours 94% of all bulbs purchased are assumed to be residential and 6% are assumed to be non-residential. Reference 4, 5
Measure Life	= The Measure Life for LEDs and CFLs is determined by the planned elimination of the baseline halogen bulbs. The analysis assumes that that halogens will be available to install for 2 years after they can no longer be sold (January 1, 2020). The lifetime is therefore = minumum of the lamp life divided by the annual hours or 2023 +(Halogen Lamp Life/annual hours of operation) - program year. CFL lifetime hours = 10,000 LED lifetime hours = 20,000 for 2017, 15,000 for 2018 Value LED lifetime hours = 10,000 Halogen Lamp Life = 1,000 hours
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 0.636 will be used for all non residential CFLs\LEDs. (From business program) Reference 1, 5
TDLF	= Total Distribution Loss Factor, Residential = 7.69%, Non-residential = 6.51%
Incremental Cost of Bulbs	= See Table 2
Net-to-Gross Factor	= We will use 79% for CFLs, ~~91~~61% for LEDs, and ~~85~~61% for Value LEDs
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.

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Provided by product Vendor:	**Verified during M&V:**
Number and type of bulbs purchased	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 and wattage 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 - Baseline wattage for residential lights

Lumens	EISA Baseline Wattage (halogen)	Non-EISA Baseline Wattage (incandescent)
310-749	29	40
750-1049	43	60
1050-1489	53	75
1490-2600	72	100

Table 2 - Average Cost Table

	CFLs	LEDs 2017*	LEDs 2018*	Value LEDs 2017*	Value LEDs 2018*
Gross Retail (per bulb)	$2.29	$9.56	$8.61	$3.46	$3.11
Baseline (per bulb)	$1.28	$2.19	$2.19	$1.24	$1.24
Incremental	$1.00	$7.37	$6.41	$2.22	$1.87
Rebate	$1.15	$5.25	$4.75	$1.50	$1.50
Net Retail	-$0.15	$2.12	$1.66	$0.72	$0.37

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

Table 3 - Baseline Costs

	EISA Baseline Wattage (halogen)			Non-EISA Baseline (Incandescent)	
Lumens	LED Watts*	CFL Watts	Baseline Cost	LED Watts*	Baseline Cost
310-749	5-7	9	$1.24	5-8	$2.32
750-1049	8-12	13	$1.24	9-12	$3.32
1050-1489	13-15	17	$1.49	14-15	$8.97
1490-2600	18-22	23	$1.49	16-23	$9.97

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

References:

1. Michaels Tech Assumptions Review 2016
2. 2015 Program Results compiled by WECC (program administrator)
3. Market survey 2015 (homedepot.com, lowes.com, samsclub.com, target.com, walmart.com, etc)
4. Illinois 2015 Technical Reference Manual, ComEd PY5/PY6 Residential Lighting Program Evaluation conducted by Navigant in 2015
5. CO Lighting Efficiency Program