



# ComEd Rural Small Business Energy Efficiency Kits IPA Program Impact Evaluation Report

Energy Efficiency / Demand Response Plan:  
Plan Year 9 (PY9)  
(6/1/2016-12/31/2017)

Presented to  
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**FINAL**

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## 1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd's PY9 Rural Small Business Energy Efficiency Kits (Rural SBEEK) IPA program. It presents a summary of the energy and demand impacts for the total program and broken out by relevant measure details. The appendix presents the impact analysis methodology. PY9 covers June 1, 2016 through December 31, 2017.

## 2. PROGRAM DESCRIPTION

This program aims to cost-effectively capture electric savings in small commercial facilities located in ComEd's rural counties by targeting customers that operate office, restaurant, or retail facilities with electric hot water and building heating. This is an opt-in program where customers must request to receive an energy efficiency kit that includes self-install measures. The measures included in the energy efficiency kit depend on the type of facility the customer ordering the kit operates.

To participate in the program, the ComEd customer must have a peak electric load of 100 kW or below, take delivery from ComEd regardless of their choice of electric supplier, and cannot have participated in the current ComEd Small Business Energy Savings program. Franklin Energy (Franklin) implements the program which delivers kits by direct mail. Customers can order a kit via a telephone call, mail a reply card, or email a request. Resource Action Programs (RAP), a Franklin Energy company, creates and ships the small business energy efficiency kits directly to customer facilities. The kits contain products particularly selected for the specific business types as well as detailed installation instructions. A customer service representative follows up with a statistically representative random sample of customers within three weeks of energy kit receipt to verify that the customer received the kit, confirm what measures have been installed or the customers' plans to install the measures, answer any questions the customer may have about the measures or program, and determine customer satisfaction with the program.

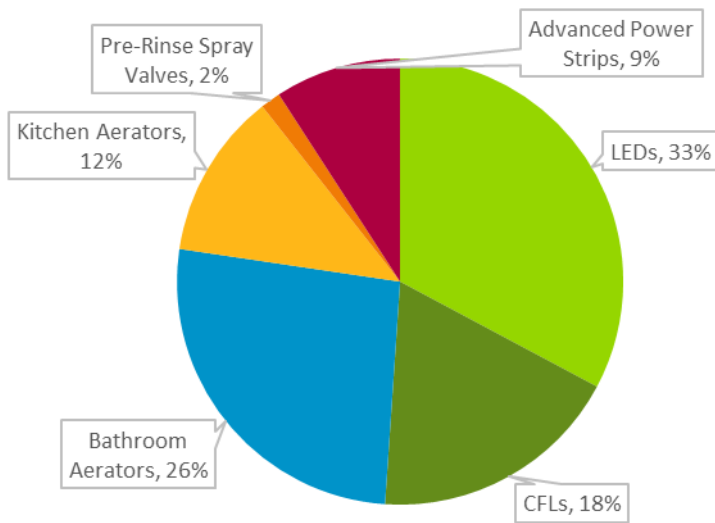
A total of 6,003 kits containing 45,706 measures were distributed as part of the program in PY9. Table 2-1 and Figure 2-1 detail the volumetric findings.

**Table 2-1. PY9 Volumetric Findings Detail**

Participation	Small Offices	Retail Stores	Restaurants	Total
Number of Measures Per Kit	8	6	8	
Number of Total Kits Distributed	4,179	1,159	665	6,003
Number of LEDs Distributed	8,358	4,636	1,995	14,989
Number of CFLs Distributed	8,358	0	0	8,358
Number of Bathroom Aerators Distributed	8,358	2,318	1,330	12,006
Number of Kitchen Aerators Distributed	4,179	0	1,330	5,509
Number of Pre-Rinse Spray Valves Distributed	0	0	665	665
Number of Advanced Power Strips Distributed	4,179	0	0	4,179
Number of Total Measure Distributed	33,432	6,954	5,320	45,706

*Source: ComEd tracking data and Navigant team analysis.*

Figure 2-1. Distribution of Measures by Type



Source: Evaluation Analysis

### 3. PROGRAM SAVINGS

Table 3-1 summarizes the incremental energy and demand savings the Rural SBEEK program achieved in PY9.

Table 3-1. PY9 Total Annual Incremental Savings

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Peak Demand Savings (kW)
Ex Ante Gross Savings	2,199,145	NR†	382
Program Gross Realization Rate	164%	NA	119%
Verified Gross Savings	3,612,400	11,208	455
Program Net-to-Gross Ratio (NTGR)	0.90	0.90	0.90
Verified Net Savings	3,251,160	10,087	409

Source: ComEd tracking data and Navigant team analysis.

†Not Reported

### 4. PROGRAM SAVINGS BY MEASURE

The program offered seven measures as shown in the following table. Pre-rinse spray valves and LEDs contributed the most savings (30 and 25 percent respectively).

Navigant determined that the C&I algorithms in the Illinois TRM v5.0 were not developed for business program kit measures. The evaluation used findings from the participant telephone survey for custom in-service rate (ISR) and %Electric DHW values. All the other input parameters for the savings algorithms were from the respective C&I section of the IL TRM v5.0. The telephone survey was conducted by the program implementation contractor (IC) on a sample of program participants and Navigant reviewed the final summary results along with the survey questions.

The custom ISR and %ElectricDHW values are higher than the values used in the ex ante calculations. The comparison between these values is detailed in Appendix 2. The discrepancy between the ex post and ex ante savings observed in the table below is largely due to the use of custom values, leading to a high program level realization rate.

**Table 4-1. PY9 Energy Savings by Measure**

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTGR *	Verified Net Savings (kWh)	Technical Measure Life	Persistence	Effective Useful Life (EUL)†
Lighting	LED 9W (Small Office)	378,161	114%	429,728	0.90	386,755	NA	NA	13
Lighting	LED 9W (Restaurant)	147,399	130%	192,065	0.90	172,859	NA	NA	8
Lighting	LED 9W (Retail)	50,290	132%	66,292	0.90	59,662	NA	NA	14
Lighting	MR16 LED 7 W (Retail)	324,372	74%	238,948	0.90	215,053	NA	NA	14
Lighting	CFL 13W (Small Office)	567,241	111%	630,322	0.90	567,290	NA	NA	3
Hot Water	Bath Aerator – Low Flow (Small Office)	56,790	143%	81,297	0.90	73,168	NA	NA	9
Hot Water	Bath Aerator – Low Flow (Restaurant)	45,815	400%	183,368	0.90	165,032	NA	NA	9
Hot Water	Bath Aerator – Low Flow (Retail)	22,995	360%	82,760	0.90	74,484	NA	NA	9
Hot Water	Kitchen Aerator – Low Flow (Small Office)	34,610	137%	47,293	0.90	42,564	NA	NA	9
Hot Water	Kitchen Aerator – Low Flow (Restaurant)	55,843	400%	223,502	0.90	201,152	NA	NA	9
Hot Water	Pre-Rinse Spray Valves (Restaurant)	231,540	477%	1,105,387	0.90	994,848	NA	NA	5
Consumer Electronics	Advanced Power Strip – Tier 1 (Small Office)	284,088	117%	331,436	0.90	298,293	NA	NA	4
<b>Total‡</b>		<b>2,199,145</b>	<b>164%</b>	<b>3,612,400</b>	<b>0.90</b>	<b>3,251,160</b>	<b>NA</b>	<b>NA</b>	

Source: ComEd tracking data and Navigant team analysis.

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY9\_Recommendations\_2016-02-26\_Final.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† EUL is a combination of technical measure life and persistence.

‡ Numbers do not sum exactly due to rounding.

**Table 4-2. PY9 Total Demand Savings by Measure**

End Use Type	Research Category	Ex Ante Gross Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Demand Reduction (kW)	NTGR*	Verified Net Demand Reduction (kW)
Lighting	LED 9W (Small Office)	NR†	NA	164	0.90	148
Lighting	LED 9W (Restaurant)	NR	NA	45	0.90	40
Lighting	LED 9W (Retail)	NR	NA	26	0.90	23
Lighting	MR16 LED 7 W (Retail)	NR	NA	94	0.90	84
Lighting	CFL 13W (Small Office)	NR	NA	241	0.90	217
Hot Water	Bath Aerator – Low Flow (Small Office)	NR	NA	3,387	0.90	3,049
Hot Water	Bath Aerator – Low Flow (Restaurant)	NR	NA	1,322	0.90	1,190
Hot Water	Bath Aerator – Low Flow (Retail)	NR	NA	2,299	0.90	2,069
Hot Water	Kitchen Aerator – Low Flow (Small Office)	NR	NA	1,971	0.90	1,774
Hot Water	Kitchen Aerator – Low Flow (Restaurant)	NR	NA	1,612	0.90	1,451
Hot Water	Pre-Rinse Spray Valves (Restaurant)	NR	NA	0	0.90	0
Consumer Electronics	Advanced Power Strip – Tier 1 (Small Office)	NR	NA	46	0.90	42
<b>Total‡</b>		<b>NR</b>	<b>NA</b>	<b>11,208</b>	<b>0.90</b>	<b>10,087</b>

Source: ComEd tracking data and Navigant team analysis.

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY9\_Recommendations\_2016-02-26\_Final.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† Not Reported

‡ Numbers do not sum exactly due to rounding.

**Table 4-3. PY9 Peak Demand Savings by Measure**

End Use Type	Research Category	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Peak Demand Reduction (kW)	NTGR*	Verified Peak Net Demand Reduction (kW)
Lighting	LED 9W (Small Office)	75	114%	85	0.90	77
Lighting	LED 9W (Restaurant)	23	130%	31	0.90	28
Lighting	LED 9W (Retail)	14	132%	18	0.90	17
Lighting	MR16 LED 7 W (Retail)	90	74%	67	0.90	60
Lighting	CFL 13W (Small Office)	113	111%	125	0.90	113
Hot Water	Bath Aerator – Low Flow (Small Office)	15	143%	22	0.90	20
Hot Water	Bath Aerator – Low Flow (Restaurant)	1	1697%	21	0.90	19
Hot Water	Bath Aerator – Low Flow (Retail)	3	360%	10	0.90	9
Hot Water	Kitchen Aerator – Low Flow (Small Office)	9	137%	13	0.90	11
Hot Water	Kitchen Aerator – Low Flow (Restaurant)	6	424%	26	0.90	23
Hot Water	Pre-Rinse Spray Valves (Restaurant)	0	NA	0	0.90	0
Consumer Electronics	Advanced Power Strip – Tier 1 (Small Office)	32	117%	37	0.90	33
	Total†	382	119%	455	0.90	409

Source: ComEd tracking data and Navigant team analysis.

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY9\_Recommendations\_2016-02-26\_Final.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† Numbers do not sum exactly due to rounding.

## 5. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

### 5.1 Impact Parameter Estimates

Navigant’s analysis of the ComEd PY9 Rural SBEEK program resulted in a verified gross energy and peak demand savings of 3,612,400 kWh and 455 kW respectively. The verified gross realization rates for energy and peak demand savings were 164 percent and 119 percent respectively. Verified net energy and peak demand savings were 3,251,160 kWh and 409 kW respectively and exceeded the PY9 net energy savings target of 1,954,000 kWh.

Table 5-1 details all the custom and deemed inputs used for calculating the energy and demand savings for each measure as well as their source. Navigant calculated savings for each measure following algorithms defined by the Illinois TRM version 5.0 which can be found in Appendix 1. Appendix 2 shows the input parameters used by Franklin Energy and Navigant to calculate verified energy and peak demand savings.

**Table 5-1. Verified Gross Savings Parameters**

Measure	Custom <sup>†</sup> Input Parameters	Deemed* Input Parameters	Deemed* Input Data Source
LEDs	WattsEE, ISR	Wattsbase, Hours, WHFe, WHFd, CF	IL TRM v5.0 Section 4.5.4
CFLs	WattsEE, ISR	Wattsbase, Hours, WHFe, WHFd, CF	IL TRM v5.0 Section 4.5.1
Bathroom Aerators	%ElectricDHW, ISR	GPM_base, GPM_low, Usage, EPG_electric, CF, Hours	IL TRM v5.0 Section 4.3.2
Kitchen Aerators	%ElectricDHW, ISR	GPM_base, GPM_low, Usage, EPG_electric, CF, Hours	IL TRM v5.0 Section 4.3.2
Pre-Rinse Spray Valves	%ElectricDHW, FLOeff, ISR	Tout, Tin, EFF_Elec, FLObase, HOURSday, DAYSyear	IL TRM v5.0 Section 4.2.11
Advanced Power Strips	ISR	Verified Gross kWh, Hours, CF	IL TRM v5.0 Section 5.2.1

<sup>†</sup> Based on the participant survey results provided by the implementer

\* State of Illinois Technical Reference Manual version 5.0 from <http://www.ilsag.info/technical-reference-manual.html>.

## 5.2 Other Impact Findings and Recommendations

PY9 impact findings and recommendations for each measure included in the kits are listed below.

### 5.2.1 LEDs and CFLs

**Finding 1.** The ex ante calculations used the ISR values deemed by the IL TRMv5.0.

**Recommendation 1.** The IL TRM algorithms were not developed for business program kit measures, therefore when sufficient data is available, custom ISR values should be calculated using the participant survey responses regarding what the customers reported that they installed.

### 5.2.2 Bathroom and Kitchen Low Flow Faucet Aerators

**Finding 2.** To estimate the proportion of water heating supplied by electric resistance heating (%ElectricDHW), the ex ante calculations used a value deemed by the IL TRM v5.0.

**Recommendation 2.** The IL TRM v5.0 recommends using custom values wherever more reliable %ElectricDHW values are available. Navigant recommends using the custom values calculated from the participant survey responses regarding what the customers reported that they installed.

**Finding 3.** The ex ante calculations used the ISR values deemed by the IL TRMv5.0 for both bathroom and kitchen low flow aerators.

**Recommendation 3.** Navigant recommends using the custom ISR values calculated from the participant survey responses regarding what the customers reported that they installed.

**Finding 4.** The aerators were distributed to both “sit-down” and “fast-food” restaurants and the ex ante calculations used average “Usage”, “Hours” and “CF” inputs of the two types of restaurants for calculating the savings.

**Recommendation 4.** Since the “sit-down” and “fast-food” restaurants have different deemed “Usage”, “Hours”, and “CF” values for aerators, Navigant recommends using a weighted average based on the number of kits distributed to each type of restaurant to calculate these values. Using a weighted average would provide a more accurate gross savings values.



### 5.2.3 High efficiency Pre-Rinse Spray Valves

**Finding 5.** The pre-rinse spray valves were distributed to both “sit-down” and “fast-food” restaurants and the ex ante calculator used an average hour of use per day (HOURSday) value to calculate the savings.

**Recommendation 5.** Since the “sit-down” and “fast-food” restaurants have different deemed values for the hours per day the high efficiency pre-rinse is used, Navigant recommends using a weighted average for the “HOURSday” based on the number of kits distributed to each type of restaurant. This will provide a more accurate gross savings value.

**Finding 6.** The ex ante calculation used an ISR value deemed by the IL TRMv5.0 for the pre-rinse spray valve.

**Recommendation 6.** The IL TRM algorithms were not developed for business program kits measures, therefore when sufficient data is available, custom ISR values should be calculated using the participant survey responses regarding what the customers reported that they installed.

**Finding 7.** To estimate the proportion of water heating supplied by electric resistance heating (%ElectricDHW), the ex ante calculations used a value deemed by the IL TRM v5.0.

**Recommendation 7.** The IL TRM v5.0 recommends using custom values wherever more reliable %ElectricDHW values are available. Navigant recommends using the values calculated from the participant survey responses regarding what the customers reported that they installed.

### 5.2.4 Advanced Power Strip – Tier 1

**Finding 8.** The ex ante calculations used the ISR values deemed by the IL TRM v5.0 for the CFL measure.

**Recommendation 8.** The IL TRM algorithms were not developed for business program kits measures, therefore when sufficient data is available, custom ISR values should be calculated using the participant survey responses regarding what the customers reported that they installed.

### 5.2.5 Participant Survey

**Finding 9.** Navigant received the survey questions after the participant survey was completed.

**Recommendation 9.** Navigant requests advance review of participant survey questions for surveys that produce savings calculations parameters. Otherwise, Navigant may not be able to use the survey results to estimate savings if appropriate survey protocols have not been followed.

**Finding 10.** Navigant only received the final summary results for the participant telephone survey conducted by Franklin.

**Recommendation 10.** Navigant requests access to raw survey data to verifying the survey summary results.

## 6. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

Navigant calculated verified gross and net savings using the following algorithms as defined by the IL TRM v5.0 in PY9.

## 6.1 LEDs and CFLs

Navigant used measure level inputs deemed by the IL TRM v5.0 and custom ISR values based on the participant survey results provided by the implementer to calculate the ex post savings. Navigant’s ex post energy and peak demand savings for these measures both increased compared to the ex ante values, highlighted in Table 4-1 and Table 4-3 respectively. Appendix 2 compares the input assumptions used by Navigant and the implementer in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the TRM:

### Equation 1. LED and CFL Savings Equation and Inputs, IL TRM v5.0 Section 4.5.4 and 4.5.1 respectively

$$\begin{aligned} \text{Verified Gross Annual kWh Savings} &= ((\text{WattsBase} - \text{WattsEE}) / 1000) * \text{ISR} * \text{Hours} * \text{WHFe} \\ \text{Verified Gross Annual kW Savings} &= ((\text{WattsBase} - \text{WattsEE}) / 1000) * \text{ISR} * \text{WHFd} * \text{CF} \end{aligned}$$

Where:

<i>WattsBase</i>	= Baseline wattage, based on lumens of the LED and CFL bulbs and program year installed
<i>WattsEE</i>	= Actual wattage of LED and CFL included in the kits
<i>ISR</i>	= In Service Rate, the percentage of units sent that are actually in service.
<i>Hours</i>	= Average hours of use per year
<i>WHFe</i>	= Waste heat factor for energy to account for cooling energy savings from efficient lighting
<i>WHFd</i>	= Waste heat factor for demand to account for cooling savings from efficient lighting.

## 6.2 Bathroom and Kitchen Low Flow Faucet Aerators

Navigant used measure level inputs deemed by the IL TRM v5.0 along with custom ISR and %ElectricDHW values based on the participant survey results provided by the implementers to calculate the ex post savings. Additionally, since the “sit-down” and “fast-food” restaurants have different deemed ‘Usage’, ‘Hours’, and ‘CF’ values for aerators, Navigant used weighted averages of these values using the participant survey results provided by the implementer. The verified energy and peak demand savings are highlighted in Table 4-1 and Table 4-3 respectively. Appendix 2 compares the input assumptions used by Navigant and the implementer in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the TRM:

### Equation 2. Low Flow Faucet Aerators Savings Equation and Inputs, IL TRM v5.0 Section 4.3.2

$$\begin{aligned} \text{Verified Gross Annual kWh Savings} &= \%ElectricDHW * ((\text{GPM\_base} - \text{GPM\_low}) / \text{GPM\_base}) * \text{Usage} * \\ &\quad \text{EPG\_electric} * \text{ISR} \\ \text{Verified Gross Annual kW Savings} &= \text{Verified Gross Annual kWh Savings} / \text{Hours} * \text{CF} \end{aligned}$$

Where:

<i>%ElectricDHW</i>	= proportion of water heating supplied by electric resistance heating
<i>GPM_base</i>	= Flow rate of the baseline aerator
<i>GPM_low</i>	= As-used flow rate of the low-flow aerator
<i>Usage</i>	= Estimated usage of mixed water (mixture of hot water from water heater line and cold water line) per faucet (gallons per year)
<i>EPG_electric</i>	= Energy per gallon of hot water supplied by electric
<i>ISR</i>	= In service rate of aerator
<i>Hours</i>	= Annual electric DHW recovery hours for faucet use

CF = Coincidence Factor for electric load reduction

### 6.3 Advanced Power Strip – Tier 1

Since the C&I section of the IL TRM v5.0 does not include this measure, Navigant used measure level inputs deemed by the residential section of the IL TRM v5.0 and custom ISR values based on the participant survey results provided by the implementer to calculate the ex post savings. This led to an increase in both ex post energy and peak demand savings for this measure, highlighted in Table 4-1 and Table 4-3 respectively. Appendix 2 compares the input assumptions used by Navigant and the implementer in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the TRM:

**Equation 3. 7-Plug Advanced Power Strip Savings Equation and Inputs, IL TRM v5.0 Section 5.2.1**

$$\text{Verified Gross Annual kWh Savings} = 103 \text{ kWh} * \text{ISR}$$

$$\text{Verified Gross Annual kW Savings} = \text{Verified Gross Annual kWh Savings} / \text{Hours} * \text{CF}$$

Where:

- ISR = In service rate of the Advanced Power Strip
- Hours = Annual number of hours during which the controlled standby loads are turned off by the Advanced Power Strip.
- CF = Summer Peak Coincidence Factor for measure

### 6.4 High efficiency Pre-Rinse Spray Valves

Navigant used measure level inputs deemed by the IL TRM v5.0 along with custom ISR and %ElectricDHW values based on the participant survey results provided by the implementer to calculate the ex post savings. Additionally, since the “HOURSday” values for “sit-down” and “fast-food” restaurants are different, Navigant used a weighted average of the “HOURSday” value. The verified energy and peak demand savings are highlighted in Table 4-1 and Table 4-3 respectively. Appendix 2 compares the input assumptions used by Navigant and the implementer in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the TRM:

**Equation 4 High Efficiency Pre-Rinse Spray Valve Savings Equation and Inputs, IL TRM v5.0 Section 4.2.11**

$$\text{Verified Gross Annual kWh Savings} = \Delta \text{ Gallons} * 8.33 * 1 * (\text{Tout} - \text{Tin}) * (1/\text{EFF\_Elec}) / 3,413 * \text{ISR}$$

$$\Delta \text{ Gallons} = (\text{FLObase} - \text{FLOeff}) * 60 * \text{HOURSday} * \text{DAYYear}$$

Where:

- $\Delta \text{Gallons}$  = amount of water saved
- 8.33 = specific mass in pounds of one gallon of water (lbm/gal)
- 1 = Specific heat of water: 1 Btu/lbm/°F
- Tout = Water Heater Outlet Water Temperature
- Tin = Inlet Water Temperature
- EFF\_Elec = Efficiency of electric water heater supplying hot water to pre-rinse spray valve
- Flag = 1 if electric or 0 if gas
- FLObase = Base case flow in gallons per minute (Gal/min)
- FLOeff = Efficient case flow in gallons per minute (Gal/min)
- 60 = Minutes per hour
- HOURSday = Hours per day that the pre-rinse spray valve is used at the site
- DAYYear = Days per year pre-rinse spray valve is used at the site

## 7. APPENDIX 2. IMPACT ANALYSIS DETAIL

The tables below show the comparison of input assumptions used by Navigant and Franklin Energy in ex ante and ex post calculations for each measure.

**Table 7-1. LED Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed/ Custom
LED Office				
29	29	Wattsbase	IL TRM 4.5.4	Deemed
9	9	WattsEE	Specifications	Actual
0.75	0.66	ISR	Survey	Custom
3088	3088	Hours	IL TRM 4.5.4	Deemed
1.11	1.11	WHFe	IL TRM 4.5.4	Deemed
1.31	1.31	WHFd	IL TRM 4.5.4	Deemed
0.52	0.52	CF	IL TRM 4.5.4	Deemed
LED Restaurant				
29	29	Wattsbase	IL TRM 4.5.4	Deemed
9	9	WattsEE	Specifications	Actual
0.86	0.66	ISR	Survey	Custom
4784	4784	Hours	IL TRM 4.5.4	Deemed
1.17	1.17	WHFe	IL TRM 4.5.4	Deemed
1.31	1.31	WHFd	IL TRM 4.5.4	Deemed
0.68	0.68	CF	IL TRM 4.5.4	Deemed
LED Retail				
29	29	Wattsbase	IL TRM 4.5.4	Deemed
9	9	WattsEE	Specifications	Actual
0.87	0.66	ISR	Survey	Custom
2935	2935	Hours	IL TRM 4.5.4	Deemed
1.12	1.12	WHFe	IL TRM 4.5.4	Deemed
1.29	1.29	WHFd	IL TRM 4.5.4	Deemed
0.71	0.71	CF	IL TRM 4.5.4	Deemed
LED MR16				
50	50	Wattsbase	IL TRM 4.5.4	Deemed
7	7	WattsEE	Specifications	Actual
0.49	0.66	ISR	Survey	Custom
2935	2935	Hours	IL TRM 4.5.4	Deemed
1.12	1.12	WHFe	IL TRM 4.5.4	Deemed
1.29	1.29	WHFd	IL TRM 4.5.4	Deemed
0.71	0.71	CF	IL TRM 4.5.4	Deemed

Source: Navigant Analysis

**Table 7-2. CFL Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed/Custom
43	43	Wattsbase	IL TRM 4.5.1	Deemed
13	13	WattsEE	Specifications	Actual
0.73	0.66	ISR	Survey	Custom
3088	3088	Hours	IL TRM 4.5.1	Deemed
1.11	1.11	WHFe	IL TRM 4.5.1	Deemed
1.31	1.31	WHFd	IL TRM 4.5.1	Deemed
0.52	0.52	CF	IL TRM 4.5.1	Deemed

Source: Navigant Analysis

**Table 7-3. Bathroom Aerator Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed/Custom	Non-Survey Related Discrepancies
<b>Bathroom Aerator Office</b>					
0.37	0.16	%ElectricDHW	Survey	Custom	-
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	-
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	-
2500	2500	Usage	IL TRM 4.3.2	Deemed	-
0.0795	0.0795	EPG_electric	IL TRM 4.3.2	Deemed	-
0.41	0.66	ISR	Survey	Custom	-
0.0064	0.0064	CF	IL TRM 4.3.2	Deemed	-
24	24	Hours	IL TRM 4.3.2	Deemed	-
<b>Bathroom Aerator Restaurant</b>					
0.46	0.16	%ElectricDHW	Survey	Custom	-
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	-
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	-
14288.70	12,674.50	Usage	IL TRM 4.3.2	Custom	Yes
0.0795	0.0795	EPG_electric	IL TRM 4.3.2	Deemed	-
0.815	0.66	ISR	Survey	Custom	-
0.02	0.01	CF	IL TRM 4.3.2	Custom	Yes
138.65	123.00	Hours	IL TRM 4.3.2	Custom	Yes
<b>Bathroom Aerator Retail</b>					
0.55	0.16	%ElectricDHW	Survey	Custom	-
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	-
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	-
3650	3650	Usage	IL TRM 4.3.2	Deemed	-
0.0795	0.0795	EPG_electric	IL TRM 4.3.2	Deemed	-
0.69	0.66	ISR	Survey	Custom	-
0.0043	0.0043	CF	IL TRM 4.3.2	Deemed	-
36	36	Hours	IL TRM 4.3.2	Deemed	-

Source: Navigant Analysis

**Table 7-4. Kitchen Aerator Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed/ Custom	Non-Survey Related Discrepancies
Kitchen Aerator Office					
0.37	0.16	%ElectricDHW	Survey	Custom	-
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	-
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	-
2500	2500	Usage	IL TRM 4.3.2	Deemed	-
0.0969	0.0969	EPG_electric	IL TRM 4.3.2	Custom	-
0.39	0.66	ISR	Survey	Custom	-
0.0064	0.0064	CF	IL TRM 4.3.2	Deemed	-
24	24	Hours	IL TRM 4.3.2	Deemed	-
Kitchen Aerator Restaurant					
0.46	0.16	%ElectricDHW	Survey	Custom	-
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	-
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	-
14288.70	12674.50	Usage	IL TRM 4.3.2	Custom	Yes
0.0969	0.0969	EPG_electric	IL TRM 4.3.2	Deemed	-
0.815	0.66	ISR	Survey	Custom	-
0.016	0.01	CF	IL TRM 4.3.2	Custom	Yes
138.65	123.00	Hours	IL TRM 4.3.2	Custom	Yes

Source: Navigant Analysis

**Table 7-5. Advanced Power Strip – Tier 1 Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed/ Custom
7129	7129	Hours	IL TRM 5.2.1	Deemed
0.8	0.8	CF	IL TRM 5.2.1	Deemed
0.77	0.66	ISR	Survey	Custom

Source: Navigant Analysis

**Table 7-6. High-efficiency Pre-Rinse Spray Valves Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed/ Custom	Non-Survey Related Discrepancies
0.55	0.16	%ElectricDHW	Survey	Custom	-
124.1	124.1	Tout	IL TRM 4.2.11	Deemed	-
54.1	54.1	Tin	IL TRM 4.2.11	Deemed	-
0.97	0.97	EFF_Elec	IL TRM 4.2.11	Deemed	-
1.9	1.9	FLObase	IL TRM 4.2.11	Deemed	-
1.1	1.1	FLOeff	Specifications	Actual	-
1.38	1.25	HOURSday	IL TRM 4.2.11	Custom	Yes
312	312	DAYSyear	IL TRM 4.2.11	Deemed	-
0.83	0.66	ISR	Survey	Custom	-

Source: Navigant Analysis

### 8. APPENDIX 3. TRC DETAIL

Table 8 1, the Total Resource Cost (TRC) variable table, only includes cost-effectiveness analysis inputs available at the time of finalizing the PY9 Rural SBEEK IPA Program impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to evaluation later. EUL information in this table is subject to change and is not final.

**Table 8-1. Total Resource Cost Savings Summary**

Measure/Project	Units	Quantity	Effective Useful Life (EUL)†	Ex ante kWh	Ex ante Peak kW Savings	Verified kWh Savings	Verified Peak kW Savings
LED 9W (Small Office)	Each	8,358	13	378,161	75	429,728	85
LED 9W (Restaurant)	Each	1,995	8	147,399	23	192,065	31
LED 9W (Retail)	Each	1,159	14	50,290	14	66,292	18
MR16 LED 7 W (Retail)	Each	3,477	14	324,372	90	238,948	67
CFL 13W (Small Office)	Each	8,358	3	567,241	113	630,322	125
Bath Aerator – Low Flow (Small Office)	Each	8,358	9	56,790	15	81,297	22
Bath Aerator – Low Flow (Restaurant)	Each	1,330	9	45,815	1	183,368	21
Bath Aerator – Low Flow (Retail)	Each	2,318	9	22,995	3	82,760	10
Kitchen Aerator – Low Flow (Small Office)	Each	4,179	9	34,610	9	47,293	13
Kitchen Aerator – Low Flow (Restaurant)	Each	1,330	9	55,843	6	223,502	26
Pre-Rinse Spray Valves (Restaurant)	Each	665	5	231,540	0	1,105,387	0
Advanced Power Strip – Tier 1 (Small Office)	Each	4,179	4	284,088	32	331,436	37

† EUL is a combination of technical measure life and persistence.  
 Source: ComEd tracking data and Navigant team analysis.