



ComEd Rural Small Business Energy Efficiency Kits Impact Evaluation Report

Energy Efficiency / Demand Response Plan:
Program Year 2018 (CY2018)
(1/1/2018-12/31/2018)

Presented to
ComEd

FINAL

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Prepared by:

Kyle McKenna
EcoMetric Consulting

Mike Frischmann
EcoMetric Consulting

Christy Zook
Navigant Consulting

Sagar Deo
Navigant Consulting

Palak Thakur
Navigant Consulting



www.navigant.com



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Submitted to:

ComEd
Three Lincoln Centre
Oakbrook Terrace, IL 60181

Submitted by:

Navigant Consulting, Inc.
150 N. Riverside Plaza, Suite 2100
Chicago, IL 60606

Contact:

Randy Gunn, Managing Director
312.583.5714
Randy.Gunn@Navigant.com

Jeff Erickson, Director
608.497.2322
Jeff.Erickson@Navigant.com

Rob Neumann, Associate Director
312.583.2176
Rob.Neumann@Navigant.com

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1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd's CY2018 Rural Small Business Energy Efficiency Kits (Rural SBEEK) Program. It presents a summary of the energy and demand impacts for the total program and broken out by relevant measure and program structure details. Appendix 1 presents the impact analysis methodology. CY2018 covers January 1, 2018 through December 31, 2018.

2. PROGRAM DESCRIPTION

This program aims to cost-effectively capture electric savings in ComEd's rural counties by targeting customers that operate small office, restaurant, or other 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 the 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 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 customer's plans to install the measures, answer any questions the customer may have about the measures or program, and determine customer satisfaction with the program.

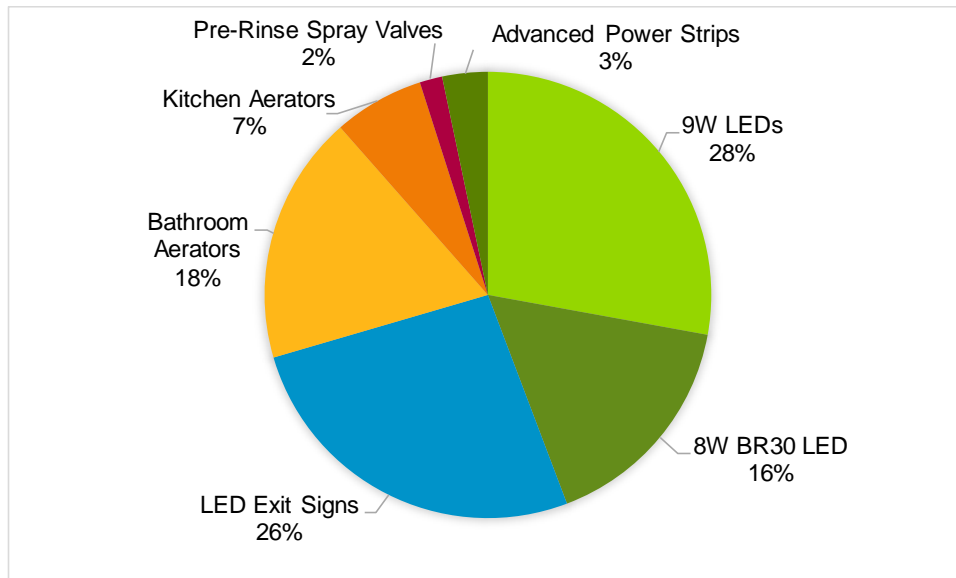
The energy efficiency kits included a combination of LED bulbs, faucet aerators, pre-rinse spray valves, and advanced power strips. The program had 4,012 participants in CY2018 and distributed 30,591 measures as shown in Table 2-1 and Figure 2-1.

Table 2-1. CY2018 Volumetric Findings Detail

Participation	Small Offices	Other Stores	Restaurants	Total
Number of Measures/Kit	5	4	5	
Number of Total Kits Distributed	1,007	2,505	500	4,012
Number of 9W LEDs Distributed	2,014	5,010	1,500	8,524
Number of BR30 8W LEDs	0	5,010	0	5,010
Number of LED Exit Signs Distributed	2,014	5,010	1,000	8,024
Number of Bathroom Aerators Distributed	2,014	2,505	1,000	5,519
Number of Kitchen Aerators Distributed	1,007	0	1,000	2,007
Number of Pre-Rinse Spray Valves Distributed	0	0	500	500
Number of Advanced Power Strips Distributed	1,007	0	0	1,007
Number of Total Measure Distributed	8,056	17,535	5,000	30,591

Source: ComEd tracking data and Navigant team analysis.

Figure 2-1. Number of Measures Installed by Type



Source: ComEd tracking data and Navigant team analysis.

3. PROGRAM SAVINGS DETAIL

Table 3-1 summarizes the incremental energy and demand savings the Rural SBEEK Program achieved in CY2018. The gas savings are only those that the gas utilities are not claiming and ComEd can claim.¹ The ex ante and verified savings in Table 3-1 also include carryover savings from PY9 as a separate line item. Total net savings reported is 2,049,602 kWh.

¹ The evaluation will determine which gas savings will be counted toward goal while producing the portfolio-wide Summary Report.

Table 3-1. CY2018 Total Annual Incremental Electric Savings

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Summer Peak Demand Savings (kW)
Electricity			
Ex Ante Gross Savings	2,648,524	NR	377
Program Gross Realization Rate†	0.76	NA	0.89
Verified Gross Savings	2,002,487	3,169	336
Program Net-to-Gross (NTG) Ratio	0.90	0.90	0.90
PY9 Verified Net Carryover Savings	247,364	95	57
Total Verified Net Savings including Carryover	2,049,602	2,946	360
Converted from Gas*			
Ex Ante Gross Savings	2,866,012	NA	NA
Program Gross Realization Rate	0.40	NA	NA
Verified Gross Savings	1,158,363	NA	NA
Program Net-to-Gross (NTG) Ratio	0.90	NA	NA
Verified Net Savings	1,042,527	NA	NA
Total Electric Plus Gas			
Ex Ante Gross Savings	5,514,536	NR	377
Program Gross Realization Rate†	0.57	NA	0.89
Verified Gross Savings	3,160,850	3,169	336
Program Net-to-Gross (NTG) Ratio	0.90	0.90	0.90
PY9 Verified Net Carryover Savings	247,364	95	57
Total Verified Net Savings including Carryover	3,092,129	2,946	360

†The verified gross realization rate does not include carryover savings.

* Gas savings converted to kWh by multiplying therms * 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh).

Note: The coincident Summer Peak period is defined as 1:00-5:00 PM Central Prevailing Time on non-holiday weekdays, June through August.

NR = Not reported

NA = Not applicable

Source: ComEd tracking data and Navigant team analysis.

4. CUMULATIVE PERSISTING ANNUAL SAVINGS

The measure-specific and total verified gross savings for the Rural SBEEK Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2018 are shown in the following tables and figure. The total CPAS across all measures is 2,049,602 kWh. The program achieved 1,042,527 kWh CPAS equivalent of gas savings converted to electricity that might be counted towards ComEd's goal² (the middle table in the following set of tables). Adding the savings converted from gas savings to the electric savings produces a total of 3,092,129 net kWh of total CPAS.

The ex ante savings did not include an estimate for carryover savings from light bulbs distributed in PY9 but installed in CY2018. The Navigant team included an estimate for PY9 carryover into CY2018 in the CPAS shown in Table 4-1 through Table 4-3 below.

The evaluation team applied the Energy Independence and Security Act (EISA) baseline for LED lamps starting in 2021. The EISA baseline shift only applies to LED omnidirectional bulbs and not to BR30

² The evaluation will determine which gas savings will be counted toward goal while producing the portfolio-wide Summary Report.

directional bulbs or LED exit signs. Beginning in 2021 the LED baseline shifts from 29 watts to 11.8 watts for LED lamps included in the kits.

The evaluation team used measure-specific custom in-service rates (ISR) to calculate verified energy savings for the Rural SBEEK Program. Navigant calculated the ISRs using survey response data provided by Franklin. Franklin selected a random sample of customers who received a kit and targeted them for a follow-up phone survey. Franklin compiled the customer responses and provided them to the evaluation team with the remainder of the end of year data.

Franklin used the ISRs from the residential section of the IL TRM v6.0 to determine the CY2018 ex ante savings since the survey responses were not available at the time the ex ante calculations were performed. During the wave 1 analysis, the Navigant team used the TRM ISRs as well due to a very small number of survey responses received to date. However, Navigant indicated that custom ISRs would be used if enough data was available at the close of CY2018³.

The CY2018 custom ISRs are less than the ISRs found during the PY9 evaluation⁴ for all measures. Similarly, the CY2018 custom ISRs are less than the values shown in the residential section of the IL TRM v6.0, which is being used in the ex ante calculations, for each measure with the exception of the 9W LED lamps in the Other/General kit. The lower ISRs are the largest reason for lower verified energy savings when compared to the ex ante savings.

³ ComEd Rural Small Business Kits Program Wave 1 Data Review and Analysis. Navigant Consulting, December 12, 2018.

⁴ ComEd Rural Small Business Energy Efficiency Kits IPA Program Impact Evaluation Report. Navigant Consulting, August 1, 2018.

Table 4-1. Cumulative Persisting Annual Savings (CPAS) – Electric

End Use Type	Research Category	CY2018 Verified		NTG*	Lifetime Net Savings†	Verified Net kWh Savings								
		EUL	Gross Savings			2018	2019	2020	2021	2022	2023	2024	2025	2026
Lighting	9.0-watt LED - Small Office	15.0	73,674	0.90	310,316	66,307	66,307	66,307	9,283	9,283	9,283	9,283	9,283	9,283
Lighting	9.0-watt LED - Restaurant	10.5	102,068	0.90	372,038	91,861	91,861	91,861	12,861	12,861	12,861	12,861	12,861	12,861
Lighting	9.0-watt LED - Other General	15.0	280,104	0.90	1,179,800	252,094	252,094	252,094	35,293	35,293	35,293	35,293	35,293	35,293
Lighting	BR30 LED - Other General	15.0	476,409	0.90	6,431,523	428,768	428,768	428,768	428,768	428,768	428,768	428,768	428,768	428,768
Lighting	Exit Sign LED - Small Office	16.0	94,831	0.90	1,365,569	85,348	85,348	85,348	85,348	85,348	85,348	85,348	85,348	85,348
Lighting	Exit Sign LED - Restaurant	16.0	56,330	0.90	811,157	50,697	50,697	50,697	50,697	50,697	50,697	50,697	50,697	50,697
Lighting	Exit Sign LED - Other General	16.0	436,690	0.90	6,288,332	393,021	393,021	393,021	393,021	393,021	393,021	393,021	393,021	393,021
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	9.0	12,963	0.90	104,996	11,666	11,666	11,666	11,666	11,666	11,666	11,666	11,666	11,666
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	9.0	51,799	0.90	419,568	46,619	46,619	46,619	46,619	46,619	46,619	46,619	46,619	46,619
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	9.0	46,243	0.90	374,565	41,618	41,618	41,618	41,618	41,618	41,618	41,618	41,618	41,618
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	9.0	7,900	0.90	63,988	7,110	7,110	7,110	7,110	7,110	7,110	7,110	7,110	7,110
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	9.0	62,165	0.90	503,537	55,949	55,949	55,949	55,949	55,949	55,949	55,949	55,949	55,949
Hot Water	Pre-rinse Spray Valve- Restaurant	5.0	238,731	0.90	1,074,290	214,858	214,858	214,858	214,858	214,858				
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	7.0	62,580	0.90	394,254	56,322	56,322	56,322	56,322	56,322	56,322	56,322		
Carryover	PY9 Carryover	9.6§	274,849	0.90	1,232,120	247,364	247,364	184,994	119,214	119,214	119,214	27,712	27,712	26,618
CY2018 Program Total Electric CPAS			2,277,336		20,926,054	2,049,602	2,049,602	1,987,233	1,568,626	1,568,626	1,353,768	1,262,267	1,205,944	1,204,851
CY2018 Program Expiring Electric Savings‡								62,369	480,976	480,976	695,834	787,336	843,658	844,751

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	9.0-watt LED - Small Office	9,283	9,283	9,283	9,283	9,283	9,283						
Lighting	9.0-watt LED - Restaurant	12,861	6,430										
Lighting	9.0-watt LED - Other General	35,293	35,293	35,293	35,293	35,293	35,293						
Lighting	BR30 LED - Other General	428,768	428,768	428,768	428,768	428,768	428,768						
Lighting	Exit Sign LED - Small Office	85,348	85,348	85,348	85,348	85,348	85,348	85,348					
Lighting	Exit Sign LED - Restaurant	50,697	50,697	50,697	50,697	50,697	50,697	50,697					
Lighting	Exit Sign LED - Other General	393,021	393,021	393,021	393,021	393,021	393,021	393,021					
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office												
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant												
Hot Water	Bathroom Aerator (1.0 GPM) - Other General												
Hot Water	Kitchen Aerator (1.5 GPM) - Small Office												
Hot Water	Kitchen Aerator (1.5 GPM) - Restaurant												
Hot Water	Pre-rinse Spray Valve- Restaurant												
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office												
Carryover	PY9 Carryover	26,000	26,000	26,000	25,473	9,243							
CY2018 Program Total Electric CPAS		1,041,271	1,034,840	1,028,410	1,027,883	1,011,654	1,002,410	529,066					
CY2018 Program Expiring Electric Savings‡		1,008,332	1,014,762	1,021,192	1,021,719	1,037,949	1,047,192	1,520,536	2,049,602	2,049,602	2,049,602	2,049,602	2,049,602

Note: The green highlighted cell shows program total first year electric savings.

* A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Expiring savings are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.

§ This is the weighted average EUL for all the lamps included in the carryover calculations from PY9. The PY9 carryover savings do not expire until 2031

Source: Navigant analysis

Table 4-2. Cumulative Persisting Annual Savings (CPAS) – Gas

End Use Type	Research Category	EUL	CY2018 Verified Gross Savings (Therms)	NTG*	Lifetime Net Savings†	Verified Net Therms Savings												
						2018	2019	2020	2021	2022	2023	2024	2025	2026				
Lighting	9.0-watt LED - Small Office	15.0	-	0.9	-													
Lighting	9.0-watt LED - Restaurant	10.5	-	0.9	-													
Lighting	9.0-watt LED - Other General	15.0	-	0.9	-													
Lighting	BR30 LED - Other General	15.0	-	0.9	-													
Lighting	Exit Sign LED - Small Office	16.0	-	0.9	-													
Lighting	Exit Sign LED - Restaurant	16.0	-	0.9	-													
Lighting	Exit Sign LED - Other General	16.0	-	0.9	-													
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	9.0	1,419	0.9	11,490	1,277	1,277	1,277	1,277	1,277	1,277	1,277	1,277	1,277	1,277	1,277	1,277	1,277
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	9.0	5,439	0.9	44,052	4,895	4,895	4,895	4,895	4,895	4,895	4,895	4,895	4,895	4,895	4,895	4,895	4,895
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	9.0	4,499	0.9	36,445	4,049	4,049	4,049	4,049	4,049	4,049	4,049	4,049	4,049	4,049	4,049	4,049	4,049
Hot Water	Kitchen Aerator (1.5 GPM) - Small Office	9.0	865	0.9	7,004	778	778	778	778	778	778	778	778	778	778	778	778	778
Hot Water	Kitchen Aerator (1.5 GPM) - Restaurant	9.0	6,528	0.9	52,880	5,876	5,876	5,876	5,876	5,876	5,876	5,876	5,876	5,876	5,876	5,876	5,876	5,876
Hot Water	Pre-rinse Spray Valve- Restaurant	5.0	20,771	0.9	93,472	18,694	18,694	18,694	18,694	18,694								
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	7.0	-	0.9	-													
Carryover	PY9 Carryover	9.6	-	0.9	-													
CY2018 Program Total Gas CPAS (Therms)			39,521		245,344	35,569	35,569	35,569	35,569	35,569	16,875	16,875	16,875	16,875				
CY2018 Program Total Gas CPAS (kWh Equivalent)‡			1,158,363		7,191,018	1,042,527	1,042,527	1,042,527	1,042,527	1,042,527	494,596	494,596	494,596	494,596				
CY2018 Program Expiring Gas Savings (Therms)§											18,694	18,694	18,694	18,694				
CY2018 Program Expiring Gas Savings (kWh Equivalent)‡§											547,930	547,930	547,930	547,930				

Note: The green highlighted cell shows program total first year gas savings in kWh equivalents.

* A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ kWh equivalent savings are calculated by multiplying therm savings by 29.31.

§ Expiring savings are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.

Source: Navigant analysis

Table 4-3. Cumulative Persisting Annual Savings (CPAS) – Total

End Use Type	Research Category	CY2018 Verified			Lifetime Net Savings†	Verified Net kWh Savings (Including Those Converted from Gas Savings)									
		EUL	Gross Savings	NTG*		2018	2019	2020	2021	2022	2023	2024	2025	2026	
Lighting	9.0-watt LED - Small Office	15.0	73,674	0.9	310,316	66,307	66,307	66,307	9,283	9,283	9,283	9,283	9,283	9,283	
Lighting	9.0-watt LED - Restaurant	10.5	102,068	0.9	372,038	91,861	91,861	91,861	12,861	12,861	12,861	12,861	12,861	12,861	
Lighting	9.0-watt LED - Other General	15.0	280,104	0.9	1,179,800	252,094	252,094	252,094	35,293	35,293	35,293	35,293	35,293	35,293	
Lighting	BR30 LED - Other General	15.0	476,409	0.9	6,431,523	428,768	428,768	428,768	428,768	428,768	428,768	428,768	428,768	428,768	
Lighting	Exit Sign LED - Small Office	16.0	94,831	0.9	1,365,569	85,348	85,348	85,348	85,348	85,348	85,348	85,348	85,348	85,348	
Lighting	Exit Sign LED - Restaurant	16.0	56,330	0.9	811,157	50,697	50,697	50,697	50,697	50,697	50,697	50,697	50,697	50,697	
Lighting	Exit Sign LED - Other General	16.0	436,690	0.9	6,288,332	393,021	393,021	393,021	393,021	393,021	393,021	393,021	393,021	393,021	
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	9.0	54,541	0.9	441,781	49,087	49,087	49,087	49,087	49,087	49,087	49,087	49,087	49,087	
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	9.0	211,201	0.9	1,710,731	190,081	190,081	190,081	190,081	190,081	190,081	190,081	190,081	190,081	
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	9.0	178,120	0.9	1,442,771	160,308	160,308	160,308	160,308	160,308	160,308	160,308	160,308	160,308	
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	9.0	33,245	0.9	269,283	29,920	29,920	29,920	29,920	29,920	29,920	29,920	29,920	29,920	
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	9.0	253,513	0.9	2,053,455	228,162	228,162	228,162	228,162	228,162	228,162	228,162	228,162	228,162	
Hot Water	Pre-rinse Spray Valve- Restaurant	5.0	847,543	0.9	3,813,941	762,788	762,788	762,788	762,788	762,788	762,788	762,788	762,788	762,788	
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	7.0	62,580	0.9	394,254	56,322	56,322	56,322	56,322	56,322	56,322	56,322	56,322	56,322	
Carryover	PY9 Carryover	9.6§	274,849	0.9	1,232,120	247,364	247,364	184,994	119,214	119,214	119,214	27,712	27,712	26,618	
CY2018 Program Total CPAS			3,435,699		28,117,073	3,092,129	3,092,129	3,029,759	2,611,153	2,611,153	1,848,365	1,756,863	1,700,541	1,699,447	
CY2018 Program Expiring Savings‡								62,369	480,976	480,976	1,243,764	1,335,266	1,391,588	1,392,682	

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	9.0-watt LED - Small Office	9,283	9,283	9,283	9,283	9,283	9,283						
Lighting	9.0-watt LED - Restaurant	12,861	6,430										
Lighting	9.0-watt LED - Other General	35,293	35,293	35,293	35,293	35,293	35,293						
Lighting	BR30 LED - Other General	428,768	428,768	428,768	428,768	428,768	428,768						
Lighting	Exit Sign LED - Small Office	85,348	85,348	85,348	85,348	85,348	85,348	85,348					
Lighting	Exit Sign LED - Restaurant	50,697	50,697	50,697	50,697	50,697	50,697	50,697					
Lighting	Exit Sign LED - Other General	393,021	393,021	393,021	393,021	393,021	393,021	393,021					
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office												
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant												
Hot Water	Bathroom Aerator (1.0 GPM) - Other General												
Hot Water	Kitchen Aerator (1.5 GPM) - Small Office												
Hot Water	Kitchen Aerator (1.5 GPM) - Restaurant												
Hot Water	Pre-rinse Spray Valve- Restaurant												
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office												
Carryover	PY9 Carryover	26,000	26,000	26,000	25,473	9,243							
CY2018 Program Total CPAS		1,041,271	1,034,840	1,028,410	1,027,883	1,011,654	1,002,410	529,066					
CY2018 Program Expiring Savings‡		2,050,858	2,057,288	2,063,719	2,064,245	2,080,475	2,089,718	2,563,063	3,092,129	3,092,129	3,092,129	3,092,129	3,092,129

Note: The green highlighted cell shows program total first year electric savings (including direct electric savings and those converted from gas).

* A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

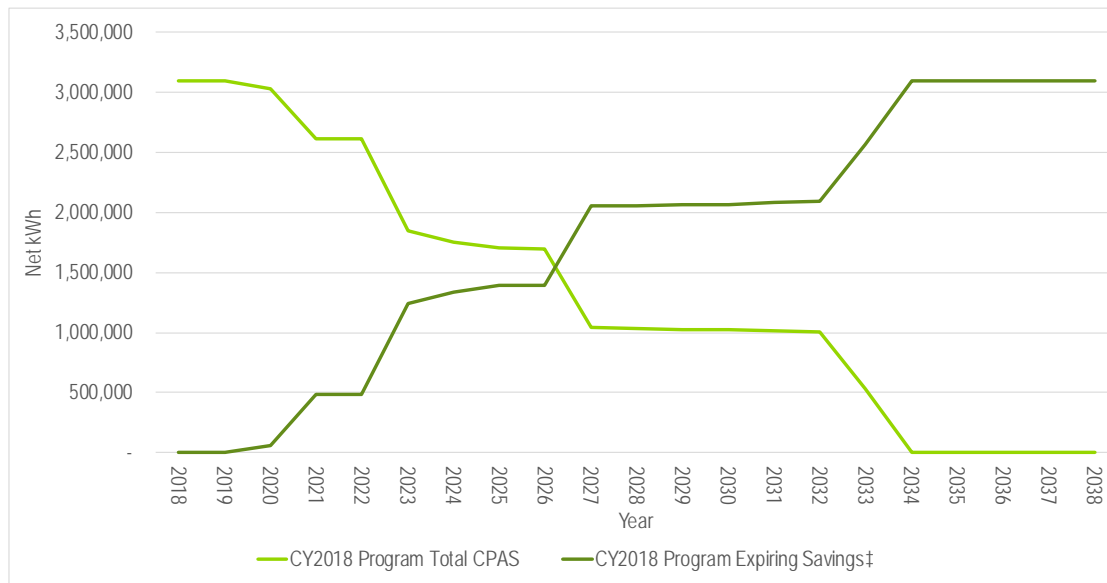
†Lifetime savings are the sum of CPAS savings through the EUL.

‡ Expiring savings are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.

§ This is the weighted average EUL for all the lamps included in the carryover calculations from PY9. The PY9 carryover savings do not expire until 2031

Source: Navigant analysis

Figure 4-1. Cumulative Persisting Annual Savings



‡ Expiring savings are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.
Source: Navigant analysis

5. PROGRAM SAVINGS BY MEASURE

The Navigant team’s analysis of the ComEd CY2018 Rural SBEEK Program resulted in a verified gross energy and peak demand savings of 2,277,336 kWh and 400 kW, respectively (not including kWh converted from gas savings). The verified gross realization rates for energy and peak demand savings taking into account the PY9 carryover were 86% and 106%, respectively. The Realization rates reported in Table 3-1 don’t include the carryover, this was done to give a better picture of the discrepancies between the ex ante and verified calculations. Verified net energy and peak demand savings were 2,049,602 kWh and 360 kW, respectively. The verified savings detailed in this section include PY9 Carryover savings.

The program includes seven types of measures as shown in the following tables. LED lamps contribute the most towards verified gross savings (41%), followed by all LED exit signs (25%) when considering electric savings only. LED bulbs and pre-rinse spray valves contributed the most to the verified gross savings (27% and 25%, respectively) after gas savings were converted to electric energy savings.

The evaluation team calculated custom ISRs and domestic hot water fuel splits using the participant telephone survey data provided by ComEd. All the other input parameters for the savings algorithms were from the appropriate C&I section of the IL TRM v6.0. The telephone survey was conducted by the program implementation contractor on a sample of program participants and the evaluation team reviewed the final summary results along with the survey questions

The custom ISR values the evaluation calculated from the survey responses are less than the values used in the ex ante calculations (where the ex ante calculations used deemed ISR values in the IL TRM), and the comparison of these values is detailed in Section 8 (Appendix 2) The discrepancies between the verified and ex ante observations in the tables below are due in large part to the use of custom ISR values and in part to using different building specific input variables.

Table 5-1. CY2018 Energy Savings by Measure – Electric

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG *	Verified Net Savings (kWh)	Effective Useful Life
Lighting	9.0-watt LED - Small Office	91,124	0.81	73,674	0.90	66,307	15.0
Lighting	9.0-watt LED - Restaurant	110,826	0.92	102,068	0.90	91,861	10.5
Lighting	9.0-watt LED - Other General	255,914	1.09	280,104	0.90	252,094	15.0
Lighting	BR30 LED - Other General	537,419	0.89	476,409	0.90	428,768	15.0
Lighting	Exit Sign LED - Small Office	320,550	0.30	94,831	0.90	85,348	16.0
Lighting	Exit Sign LED - Restaurant	159,161	0.35	56,330	0.90	50,697	16.0
Lighting	Exit Sign LED - Other General	797,395	0.55	436,690	0.90	393,021	16.0
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	13,062	0.99	12,963	0.90	11,666	9.0
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	32,882	1.58	51,799	0.90	46,619	9.0
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	32,494	1.42	46,243	0.90	41,618	9.0
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	7,582	1.04	7,900	0.90	7,110	9.0
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	38,170	1.63	62,165	0.90	55,949	9.0
Hot Water	Pre-rinse Spray Valve- Restaurant	174,090	1.37	238,731	0.90	214,858	5.0
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	77,855	0.80	62,580	0.90	56,322	7.0
Carryover	PY9 Carryover	NR	NA	274,849	0.90	247,364	9.6
Total		2,648,524	0.86	2,277,336	0.90	2,049,602	

* A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

NR = Not reported

NA = Not applicable

Source: ComEd tracking data and Navigant team analysis.

Table 5-2. CY2018 Demand Savings by Measure

End Use Type	Research Category	Ex Ante Gross Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Demand Reduction (kW)	NTG *	Verified Net Demand Reduction (kW)
Lighting	9.0-watt LED - Small Office	NR	NA	28	0.90	25
Lighting	9.0-watt LED - Restaurant	NR	NA	24	0.90	21
Lighting	9.0-watt LED - Other General	NR	NA	111	0.90	100
Lighting	BR30 LED - Other General	NR	NA	188	0.90	170
Lighting	Exit Sign LED - Small Office	NR	NA	13	0.90	11
Lighting	Exit Sign LED - Restaurant	NR	NA	7	0.90	6
Lighting	Exit Sign LED - Other General	NR	NA	58	0.90	52
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	NR	NA	540	0.90	486
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	NR	NA	421	0.90	379
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	NR	NA	944	0.90	849
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	NR	NA	329	0.90	296
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	NR	NA	505	0.90	455
Hot Water	Pre-rinse Spray Valve- Restaurant	NR	NA	0	0.90	0
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	NR	NA	0	0.90	0
Carryover	PY9 Carryover	NR	NA	105	0.90	95
Total				3,274	0.90	2,946

* A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

NR = Not reported

NA = Not applicable

Source: ComEd tracking data and Navigant team analysis.

Table 5-3. CY2018 Summer 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)	NTG*	Verified Net Peak Demand Reduction (kW)
Lighting	9.0-watt LED - Small Office	18	0.81	15	0.90	13
Lighting	9.0-watt LED - Restaurant	18	0.92	16	0.90	15
Lighting	9.0-watt LED - Other General	67	1.09	73	0.90	66
Lighting	BR30 LED - Other General	140	0.89	124	0.90	112
Lighting	Exit Sign LED - Small Office	28	0.45	13	0.90	11
Lighting	Exit Sign LED - Restaurant	14	0.51	7	0.90	6
Lighting	Exit Sign LED - Other General	70	0.83	58	0.90	52
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	3	0.99	3	0.90	3
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	4	1.58	6	0.90	5
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	8	1.42	12	0.90	11
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	2	1.04	2	0.90	2
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	4	1.63	7	0.90	6
Hot Water	Pre-rinse Spray Valve- Restaurant	0	NA	0	0.90	0
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	0	NA	0	0.90	0
Carryover	PY9 Carryover	NR	NA	64	0.90	57
	Total	377	1.06	400	0.90	360

* A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

NR = Not reported

NA = Not applicable

Source: ComEd tracking data and Navigant team analysis.

Table 5-4. CY2018 Energy Savings by Measure – Gas

End Use Type	Research Category	Ex Ante Gross Savings	Verified Gross Realization Rate	Verified Gross Savings	NTG *	Verified Net Savings	Effective Useful Life
Lighting	9.0-watt LED - Small Office	NA	NA	NA	0.90	NA	15.0
Lighting	9.0-watt LED - Restaurant	NA	NA	NA	0.90	NA	10.5
Lighting	9.0-watt LED - Other General	NA	NA	NA	0.90	NA	15.0
Lighting	BR30 LED - Other General	NA	NA	NA	0.90	NA	15.0
Lighting	Exit Sign LED - Small Office	NA	NA	NA	0.90	NA	16.0
Lighting	Exit Sign LED - Restaurant	NA	NA	NA	0.90	NA	16.0
Lighting	Exit Sign LED - Other General	NA	NA	NA	0.90	NA	16.0
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	3,536	0.40	1,419	0.90	1,277	9.0
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	8,628	0.63	5,439	0.90	4,895	9.0
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	15,180	0.30	4,499	0.90	4,049	9.0
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	2,566	0.34	865	0.90	778	9.0
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	10,518	0.62	6,528	0.90	5,876	9.0
Hot Water	Pre-rinse Spray Valve- Restaurant	57,354	0.36	20,771	0.90	18,694	5.0
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	0	NA	0	0.90	0	7.0
Carryover	PY9 Carryover	NR	NA	0	0.90	0	9.6
Total Therms		97,783	0.40	39,521	0.90	35,569	
Total kWh Converted From Therms†		2,866,012		1,158,363		1,042,527	

* A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† Gas savings converted to kWh by multiplying therms * 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh).

NR = Not reported

NA = Not applicable

Source: ComEd tracking data and Navigant team analysis.

Table 5-5. CY2018 Energy Savings by Measure – Total Combining Electricity and Gas

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG *	Verified Net Savings (kWh)
Lighting	9.0-watt LED - Small Office	91,124	0.81	73,674	0.90	66,307
Lighting	9.0-watt LED - Restaurant	110,826	0.92	102,068	0.90	91,861
Lighting	9.0-watt LED - Other General	255,914	1.09	280,104	0.90	252,094
Lighting	BR30 LED - Other General	537,419	0.89	476,409	0.90	428,768
Lighting	Exit Sign LED - Small Office	320,550	0.30	94,831	0.90	85,348
Lighting	Exit Sign LED - Restaurant	159,161	0.35	56,330	0.90	50,697
Lighting	Exit Sign LED - Other General	797,395	0.55	436,690	0.90	393,021
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	116,710	0.47	54,541	0.90	49,087
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	285,759	0.74	211,201	0.90	190,081
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	477,429	0.37	178,120	0.90	160,308
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	82,796	0.40	33,245	0.90	29,920
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	346,464	0.73	253,513	0.90	228,162
Hot Water	Pre-rinse Spray Valve- Restaurant	1,855,134	0.46	847,543	0.90	762,788
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	77,855	0.80	62,580	0.90	56,322
Carryover	PY9 Carryover	NR	NA	274,849	0.90	247,364
Total†		5,514,536	0.62	3,435,699	0.90	3,092,129

* A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† The total includes the electric equivalent of the total therms.

NR = Not reported

NA = Not applicable

Source: ComEd tracking data and Navigant team analysis.

6. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

6.1 Impact Parameter Estimates

Table 6-1 details all the custom and deemed inputs used for calculating the energy and demand savings for each measure, as well as their source. The evaluation team calculated savings for each measure based on the savings algorithms noted in the IL TRM v6.0 or each respective measure. The custom inputs were calculated using the telephone participant survey data supplied by the implementer.

Table 6-1. Savings Parameters

Measure	Custom Input Parameters	Deemed Input Parameters	Deemed* Input Data Source
9W LEDs	WattsEE, ISR	Wattbase, Hours, WHFe, WHFd, CF, NTG [†]	IL TRM v6.0 – Section 4.5.4
BR30 8W LEDs	WattsEE, ISR	Wattbase, Hours, WHFe, WHFd, CF, NTG [†]	IL TRM v6.0 – Section 4.5.4
Exit Signs	WattsEE, ISR	Wattbase, Hours, WHFe, WHFd, CF, NTG [†]	IL TRM v6.0 – Section 4.5.5
Bathroom Aerators	ISR, Usage, %Electric DHW, %FossilDHW	GPM_base, GPM_low, EPG_electric, CF, Hours, NTG [†]	IL TRM v6.0 – Section 4.3.2
Kitchen Aerators	ISR, Usage, %Electric DHW, %FossilDHW	GPM_base, GPM_low, EPG_electric, CF, Hours, NTG [†]	IL TRM v6.0 – Section 4.3.3
Pre-Rinse Spray Valves	ISR, FLOee, %Electric DHW, %FossilDHW	Tout, Tin, EEF_Elec, FLObase, HOURSday, DAYSyear, NTG [†]	IL TRM v6.0 – Section 4.2.11
Advanced Power Strips	ISR	Verified Gross kWh, Hours, CF, NTG [†]	IL TRM v6.0 – Section 4.8.7

* State of Illinois Technical Reference Manual version 6.0 from <http://www.ilsag.info/technical-reference-manual.html>.

† A deemed value. Source: ComEd_NTG_History_and_PY10_Recommendations_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

6.2 CY2019 Carryover Savings Estimate

Calculation of the CY2019 carryover estimate relies upon the IL TRM v7.0 and the PY9 and CY2018 reports. At this time, all of these data sources are available and thus it is possible to estimate the gross and net carryover energy savings that the evaluation team recommends for CY2019. The energy and demand savings from these PY9 and CY2018 late installed bulbs are calculated based on the following parameters:

- Delta Watts – Verified savings estimate from the year of installation (source: IL TRM v7.0, CY2018 program data).
- HOU and Peak CF – Verified savings estimate from the year of installation (source: IL TRM v7.0).
- Energy and Demand IE – Verified savings estimate from the year of installation (source: IL TRM v7.0.)
- Installation Rate - Verified savings estimate from the year of purchase (CY2018 program survey data). The Navigant team subtracted the CY2018 custom ISR from the lifetime ISR found in the IL TRM v6.0, and split the remaining installs between the second and third years using the same ratio found in the IL TRM v6.0.
- NTG – Evaluation research from the year of purchase (source: PY9 and CY2018 Reports).

Table 6-2 shows that 4,662 bulbs were purchased during either PY9 or CY2018 and are expected to be installed within ComEd service territory. The table provides both the gross and net energy and demand savings from these bulbs. The total net energy and summer peak demand savings are estimated to be 461,067 kWh and 109.61 kW, which will be counted in CY2019 Rural SBEEK program carryover savings.

Table 6-2. CY2019 Verified Savings Carryover Estimate

CY2019 Verified Savings Carryover Estimate	PY9 Bulbs	CY2018 Bulbs	CY2019 Carryover
Carryover Bulbs Installed During CY2019	2,265	2,397	4,662
Average Delta Watts	30.6	28.1	29.3
Average Installation Rate	1.00	1.00	1.00
Average Annual Hours of Use	3,086	3,177	3,133
Energy Interactive Effects	1.12	1.26	1.19
Demand Interactive Effects	1.30	1.47	1.39
Summer Peak Load Coincidence Factor	0.59	0.64	0.62
Carryover Gross Energy Savings (kWh)	235,585	276,712	512,297
Carryover Gross Demand Savings (kW)	90.02	103.76	193.78
Carryover Gross Summer Peak Demand Savings (kW)	54.74	67.04	121.79
Net-to-Gross Ratio	0.90	0.90	0.90
Carryover Net Energy Savings (kWh)	212,026	249,041	461,067
Carryover Net Demand Savings (kW)	81.02	93.39	174.40
Carryover Net Summer Peak Demand Savings (kW)	49.27	60.34	109.61
Effective Useful Life	7.8	14.9	11.5

Source: ComEd Tracking Data and Navigant team analysis

6.3 Other Impact Findings and Recommendations

The evaluation team developed several recommendations based on findings from the CY2018 evaluation. Findings and recommendations for each measure included in the kits are listed below.

6.3.1 Program Level

Finding 1. The ex ante savings claimed for the Rural SBEEK Program did not include carryover savings from PY9.

Recommendation 1. The evaluation team recommends tracking carryover savings on an ongoing basis and including carryover savings estimates in the ex ante energy and demand savings.

Finding 2. The evaluation team found that CY2018 telephone survey respondents indicated lower installation rates compared to PY9 telephone survey respondents. The Navigant team calculated the ISR based on the full year survey data provided by Franklin. The ISR for each measure is based on the total number of units distributed in the kits. The number of survey responses indicating installation rates are weighted based on the percent of units installed. For example, customers who indicate they installed both of the LEDs for office kits, receive a 1.0 weighting. Customers who indicate they only installed one LED receive a 0.5 weighting, and those who didn't install any, a 0 weighting. The evaluation team used similar weighting for three unit measures, such as restaurant LEDs, except that the weights are 1.0 for installing three, 0.67 for installing two, 0.33 for installing one, and 0 for installing none. Navigant used the total weighted ISR to calculate the CY2018 verified savings. Table 6-3 shows a comparison of the installation rates determined from the participant survey data in PY9 and CY2018. Most measures show notable decreases in the reported ISRs across all three kit types.

Table 6-3. ISR Comparison from PY9 to CY2018

Measure	PY9 ISR			CY2018 ISR			Change (CY2018-PY9)		
	Small Office	Restaurant	Other / General	Small Office	Restaurant	Other / General	Small Office	Restaurant	Other / General
LED 9W	75%	86%	87%	53%	61%	72%	-22%	-25%	-15%
BR30 LED 8 W	NA	NA	49%	NA	NA	59%	NA	NA	10%
Exit Sign*	NA	NA	NA	23%	26%	36%	NA	NA	NA
Bath Aerator - Low Flow	41%	82%	69%	32%	49%	43%	-9%	-32%	-26%
Kitchen Aerator - Low Flow	39%	82%	NA	32%	49%	NA	-7%	-33%	NA
Pre-rinse Spray Valve	0%	83%	NA	NA	45%	NA	NA	-38%	NA
Advanced Power Strip - Tier 1	77%	NA	NA	55%	NA	NA	-22%	NA	NA

Note that PY9 kits did not include exit signs

NA = Not Applicable

Source: ComEd program data and Navigant team analysis

The Navigant team conducted a comparison between the PY9 and CY2018 participant lists to determine if customers were receiving kits in back-to-back years. Customers who received a kit in PY9 may be less likely to install measures they received in the CY2018 kit. The Navigant team’s analysis showed that 18 percent of customers who received a kit in CY2018 were likely to have received a kit during PY9.

Table 6-4. PY9 and CY2018 Repeat Customer Summary

Kit Type	PY9 Quantity	CY2018 Quantity	Repeat Customers	Repeat Customers (percent of CY2018)*
General Kit†	1,162	2,505	423	17%
Office Kit	4,181	1,007	202	20%
Restaurant Kit‡	665	500	86	17%
Total	6,008	4,012	711	18%

*Repeat customers were those where the telephone number, service address, full company name, or any combination of those three fields was the same in both program years

† In CY2018 the general kit replaced the retail kit

‡ CY2018 restaurant kit includes sit-down and fast-food kits from PY9

Source: ComEd program data and Navigant team analysis

Recommendation 2. The evaluation team recommends screening out previous program participants. Removing customers who already received kits from previous years may increase the ISR for kit measures.

Finding 3. The ex ante gas calculations used 0.16 for %Electric DHW and 0.84 for %FossilDHW consistent with IL TRM v6.0. The verified savings used the survey responses to determine the split between electric and natural gas water heaters. Customers who responded “unknown” or “don’t know” were allocated to electric or natural gas following the fuel split found in the ILTRM v6.0 (0.16 electric and 0.84 natural gas).

Recommendation 3. The evaluation team recommends calculating the DHW fuel split using the survey responses. Customers who respond “don’t know” or “unknown” should be split using the values found in the IL TRM. Customers who indicate propane, solar, or none do not achieve savings for hot water measures.

6.3.2 9W LEDs and 8W BR30 LEDs

Finding 4. The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the LED lamp measures where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.66 while the verified calculation used custom ISR values for each kit type (0.53 for office LEDs, 0.61 for restaurant LEDs, 0.72 for other/general LEDs, and 0.59 for other/general BR30LEDs) causing the verified savings for these measures to be less than the ex ante savings.

Recommendation 43. The evaluation team recommends calculating custom ISR values for measures if possible, when sufficient participant survey response data is available.

6.3.3 LED Exit Signs

Finding 5. The ex ante calculations use CF, WHFe, and WHFd factors for a Low-Use Small Business building type to calculate the energy and demand savings for the LED exit signs in the office and restaurant kits. The verified analysis used values for CF, WHFe, and WHFd specific to small office and restaurant building types to calculate the respective energy and demand savings. This finding reduced the ex ante savings for the LED exit signs installed in small offices and restaurants.

Recommendation 5. The evaluation team recommends using input variables that correspond to the applicable TRM building type when calculating energy and demand savings.

Finding 6. The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the LED exit sign measures where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.66 while the verified calculation used custom ISR values for each kit type (0.26 for restaurant exit signs, 0.23 for small office exit signs, 0.36 for other/general LED exit signs). This finding caused the verified savings for this measure to be less than the ex ante savings.

Recommendation 6. The evaluation team recommends calculating custom ISR values for measures if possible, when sufficient participant survey response data is available.

6.3.4 Bathroom and Kitchen Low Flow Faucet Aerators

Finding 7. The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the bathroom and kitchen faucet aerator measures where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.63 for the bathroom faucet aerators and an ISR value of 0.60 for the kitchen faucet aerators while the verified calculation used custom ISR values for each kit type. This finding caused the verified savings for this measure to be less than the ex ante savings.

Recommendation 7. The evaluation team recommends calculating custom ISR values for measures if possible, when sufficient participant survey response data is available.

Finding 8. The ex ante gas calculations used different inputs than the ex ante calculations for energy and demand savings. The bathroom aerator savings for other/general kits used an ISR of 0.95 and 100 percent electric water heaters, from measure 4.3.2 in the IL TRM v6.0.

Recommendation 8. The evaluation team recommends calculating natural gas savings using the same ISR and DHW fuel split (from participant survey data) as other aerator savings calculations.

6.3.5 High Efficiency Pre-Rinse Spray Valves

Finding 9. The ex ante gas savings are calculated using a gas water heater efficiency of 75 percent but did not provide a reference for this value in the calculations. The evaluation team used the value stipulated in the IL TRM v6.0 (80 percent) when a custom efficiency value is not known.

Recommendation 9. The evaluation team encourages the implementer to use custom values when permitted in the IL TRM to calculate savings and requests the implementer supply supporting documentation so the assumptions and can be independently reviewed. The implementer did not provide documentation to support the use of a 75% gas water heater efficiency, therefore, the evaluation team used the deemed 80% gas water heater efficiency noted in the IL TRM v6.0.

Finding 10. The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the pre-rinse spray valve measure where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.66 while the verified calculation used custom ISR value of 0.45. This finding caused the verified savings for this measure to be less than the ex ante savings.

Recommendation 10. The evaluation team recommends calculating custom ISR values for measures if possible, when sufficient participant survey response data is available.

Finding 11. The ex ante gas calculations used different inputs than the ex ante calculations for energy and demand savings. The ex ante gas calculations used an ISR of 1.0.

Recommendation 11. The evaluation team recommends calculating the gas savings using the same ISR as the energy and demand savings.

6.3.6 Advanced Power Strip – Tier 1

Finding 12. The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the advanced power strip measure where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.69 while the verified calculation used custom ISR value of 0.56. This finding caused the verified savings for this measure to be less than the ex ante savings.

Recommendation 12. The evaluation team recommends calculating custom ISR values for measures when sufficient participant survey response data is available.

7. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

The evaluation team utilized the appropriate input parameters and equations found in the IL TRM v6.0. The evaluation team used the deemed input parameters from all measures except for specifications of the items included in the kit, and ISRs or usage parameters taken from survey data. A detailed summary of the input parameters used is found in Section 8 (Appendix 2).

8. APPENDIX 2. IMPACT ANALYSIS DETAIL

The tables below show the comparison between the inputs assumptions that were used by the evaluation team and the implementation contractor in the ex ante and verified calculations for each measure.

Table 8-1. LED Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
9W LED Office					
29	29	Wattsbase	IL TRM 4.5.4	Deemed	
9	9	WattsEE	Specifications	Actual	
0.53	0.66	ISR	Survey	Custom	Yes
3,088	3,088	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	
0.016	0.016	IFTherms	IL TRM 4.5.4	Deemed	
9W LED Restaurant					
29	29	Wattsbase	IL TRM 4.5.4	Deemed	
9	9	WattsEE	Specifications	Actual	
0.61	0.66	ISR	Survey	Custom	Yes
4,784	4,784	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	
0.021	0.021	IFTherms	IL TRM 4.5.4	Deemed	
9W LED Low-Use Small Business					
29	29	Wattsbase	IL TRM 4.5.4	Deemed	
9	9	WattsEE	Specifications	Actual	
0.72	0.66	ISR	Survey	Custom	Yes
2,954	2,954	Hours	IL TRM 4.5.4	Deemed	
1.31	1.31	WHFe	IL TRM 4.5.4	Deemed	
1.53	1.53	WHFd	IL TRM 4.5.4	Deemed	
0.66	0.66	CF	IL TRM 4.5.4	Deemed	
0.023	0.023	IFTherms	IL TRM 4.5.4	Deemed	
8W BR30 LEDs Low-Use Small Business					
50	50	Wattsbase	IL TRM 4.5.4	Deemed	
8	8	WattsEE	Specifications	Actual	
0.59	0.66	ISR	Survey	Custom	Yes
2,954	2,954	Hours	IL TRM 4.5.4	Deemed	
1.31	1.31	WHFe	IL TRM 4.5.4	Deemed	
1.53	1.53	WHFd	IL TRM 4.5.4	Deemed	
0.66	0.66	CF	IL TRM 4.5.4	Deemed	
0.023	0.023	IFTherms	IL TRM 4.5.4	Deemed	

Source: ComEd tracking data and Navigant team analysis.

Table 8-2. Exit Sign Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
Office					
23	23	Wattsbase	IL TRM 4.5.5	Deemed	
2	2	WattsEE	Specifications	Actual	
0.23	0.66	ISR	Survey	Custom	Yes
8766	8766	Hours	IL TRM 4.5.5	Deemed	
1.11	1.31	WHF _e	IL TRM 4.5.5	Deemed	Yes
1.31	1.53	WHF _d	IL TRM 4.5.5	Deemed	Yes
1.00	0.66	CF	IL TRM 4.5.5	Deemed	Yes
Restaurant					
23	23	Wattsbase	IL TRM 4.5.5	Deemed	
2	2	WattsEE	Specifications	Actual	
0.26	0.66	ISR	Survey	Custom	Yes
8766	8766	Hours	IL TRM 4.5.5	Deemed	
1.17	1.31	WHF _e	IL TRM 4.5.5	Deemed	Yes
1.31	1.53	WHF _d	IL TRM 4.5.5	Deemed	Yes
1.00	0.66	CF	IL TRM 4.5.5	Deemed	Yes
Low-Use Small Business					
23	23	Wattsbase	IL TRM 4.5.5	Deemed	
2	2	WattsEE	Specifications	Actual	
0.36	0.66	ISR	Survey	Custom	Yes
8766	8766	Hours	IL TRM 4.5.5	Deemed	
1.31	1.31	WHF _e	IL TRM 4.5.5	Deemed	
1.53	1.53	WHF _d	IL TRM 4.5.5	Deemed	
1.0	0.66	CF	IL TRM 4.5.5	Deemed	Yes

Source: ComEd tracking data and Navigant team analysis.

Table 8-3. Bathroom Faucet Aerator Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
Bathroom Faucet Aerator Office					
0.31	0.16	%Electric DHW	IL TRM 4.3.1	Custom	Yes
0.68	0.84	%FossilDHW	IL TRM 4.3.1	Custom	Yes
1.39	1.39	GPM_base	IL TRM 4.3.1	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.1	Deemed	
2,500	2,500	Usage	IL TRM 4.3.1	Deemed	
0.0795	0.0795	EPG_electric	IL TRM 4.3.1	Deemed	
0.00397	0.00397	EPG_gas	IL TRM 4.3.1	Deemed	
0.32	0.63	ISR	Survey	Custom	Yes
0.0064	0.0064	CF	IL TRM 4.3.1	Deemed	
24	24	Hours	IL TRM 4.3.1	Deemed	
Bathroom Faucet Aerator Restaurant					
0.32	0.16	%Electric DHW	IL TRM 4.3.1	Custom	Yes
0.68	0.84	%FossilDHW	IL TRM 4.3.1	Custom	Yes
1.39	1.39	GPM_base	IL TRM 4.3.1	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.1	Deemed	
12,675	12,675	Usage	IL TRM 4.3.1	Deemed	
0.0795	0.0795	EPG_electric	IL TRM 4.3.1	Deemed	
0.00397	0.00397	EPG_gas	IL TRM 4.3.1	Deemed	
0.49	0.63	ISR	Survey	Custom	Yes
0.0134	0.0134	CF	IL TRM 4.3.1	Deemed	
123	123	Hours	IL TRM 4.3.1	Deemed	
Bathroom Faucet Aerator Low-use Small Business					
0.33	0.16	%Electric DHW	IL TRM 4.3.2	Custom	Yes
0.65	0.84	%FossilDHW	IL TRM 4.3.2	Custom	Yes
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	
5,000	5,000	Usage	IL TRM 4.3.2	Deemed	
0.0795	0.0795	EPG_electric	IL TRM 4.3.2	Deemed	
0.00397	0.00397	EPG_gas	IL TRM 4.3.2	Deemed	
0.43	0.63	ISR	Survey	Custom	Yes
0.0128	0.0128	CF	IL TRM 4.3.2	Deemed	
49	49	Hours	IL TRM 4.3.2	Deemed	

Source: ComEd tracking data and Navigant team analysis.

Table 8-4. Kitchen Faucet Aerator Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
Kitchen Faucet Aerator Office					
0.31	0.16	%Electric DHW	IL TRM 4.3.2	Custom	Yes
0.68	0.84	%FossilDHW	IL TRM 4.3.2	Custom	Yes
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	
2,500	2,500	Usage	IL TRM 4.3.2	Deemed	
0.0969	0.0969	EPG_electric	IL TRM 4.3.2	Deemed	
0.00484	0.00484	EPG_gas	IL TRM 4.3.2	Deemed	
0.32	0.60	ISR	Survey	Custom	Yes
0.0064	0.0064	CF	IL TRM 4.3.2	Deemed	
24	24	Hours	IL TRM 4.3.2	Deemed	
Kitchen Faucet Aerator Restaurant					
0.32	0.16	%Electric DHW	IL TRM 4.3.2	Deemed	
0.68	0.84	%FossilDHW	IL TRM 4.3.2	Deemed	
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	
12,675	12,675	Usage	IL TRM 4.3.2	Deemed	
0.0969	0.0969	EPG_electric	IL TRM 4.3.2	Deemed	
0.00484	0.00484	EPG_gas	IL TRM 4.3.2	Deemed	
0.49	0.60	ISR	Survey	Custom	Yes
0.0134	0.0134	CF	IL TRM 4.3.2	Deemed	
123	123	Hours	IL TRM 4.3.2	Deemed	

Source: ComEd tracking data and Navigant team analysis.

Table 8-5. High-efficiency Pre-Rinse Spray Valves Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
0.32	0.16	%Electric DHW	IL TRM 4.2.11	Custom	Yes
0.68	0.84	%FossilDHW	IL TRM 4.2.11	Custom	Yes
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	
0.8	0.8	EFF_Gas	IL TRM 4.2.11	Deemed	
1.9	1.9	FLObase	IL TRM 4.2.11	Deemed	
1.1	1.1	FLOee	Specifications	Actual	
1.25	1.25	HOURSday	IL TRM 4.2.11	Deemed	
312	312	DAYSyear	IL TRM 4.2.11	Deemed	
1	1	FLAG	IL TRM 4.2.11	Deemed	
0.45	0.66	ISR	Survey	Custom	Yes

Source: ComEd tracking data and Navigant team analysis.

Table 8-6. Advanced Power Strip – Tier 1 Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
0.0315	0.0315	K_wkday	IL TRM 4.8.7	Deemed	
0.00617	0.00617	KW_wkend	IL TRM 4.8.7	Deemed	
106	106	Hrs_wkay	IL TRM 4.8.7	Deemed	
62	62	Hrs_wkend	IL TRM 4.8.7	Deemed	
50	50	Hrs_wkday-open	IL TRM 4.8.7	Deemed	
0	0	Hrs_wkend-open	IL TRM 4.8.7	Deemed	
52.2	52.2	Weeks per year	IL TRM 4.8.7	Deemed	
0.56	0.69	ISR	Survey	Custom	Yes

Source: ComEd tracking data and Navigant team analysis.

9. APPENDIX 3. TOTAL RESOURCE COST DETAIL

Table 9-1 below, shows the Total Resource Cost (TRC) table. It includes only the cost-effectiveness analysis inputs available at the time of finalizing this 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.

Table 9-1. Total Resource Cost Savings Summary

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Verified Gross Savings (kWh)	Verified Gross Peak Demand Reduction (kW)	Verified Gross Savings Therms	Gross Heating Penalty (Therms)	NTG Ratio (kWh)	Verified Net Savings (kWh)	Verified Net Peak Demand Reduction (kW)	Verified Net Savings Therms	Net Heating Penalty (Therms)
Lighting	9.0-watt LED - Small Office	Lamp	2,014	15.0*	73,674	15	NA	-1,062	0.9	66,307	13	NA	-956
Lighting	9.0-watt LED - Restaurant	Lamp	1,500	10.5*	102,068	16	NA	-1,832	0.9	91,861	15	NA	-1,649
Lighting	9.0-watt LED - Other General	Lamp	5,010	15.0*	280,104	73	NA	-4,918	0.9	252,094	66	NA	-4,426
Lighting	BR30 LED - Other General	Lamp	5,010	15.0*	476,409	124	NA	-8,364	0.9	428,768	112	NA	-7,528
Lighting	Exit Sign LED - Small Office	Each	2,014	16.0*	94,831	13	NA	-1,367	0.9	85,348	11	NA	-1,230
Lighting	Exit Sign LED - Restaurant	Each	1,000	16.0*	56,330	7	NA	-1,011	0.9	50,697	6	NA	-910
Lighting	Exit Sign LED - Other General	Each	5,010	16.0*	436,690	58	NA	-7,667	0.9	393,021	52	NA	-6,900
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	Each	2,014	9.0	12,963	3	1,419	0	0.9	11,666	3	1,277	0
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	Each	1,000	9.0	51,799	6	5,439	0	0.9	46,619	5	4,895	0
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	Each	2,505	9.0	46,243	12	4,499	0	0.9	41,618	11	4,049	0
Hot Water	Kitchen Aerator (1.5 GPM) - Small Office	Each	1,007	9.0	7,900	2	865	0	0.9	7,110	2	778	0
Hot Water	Kitchen Aerator (1.5 GPM) - Restaurant	Each	1,000	9.0	62,165	7	6,528	0	0.9	55,949	6	5,876	0
Hot Water	Pre-rinse Spray Valve- Restaurant	Each	500	5.0	238,731	0	20,771	0	0.9	214,858	0	18,694	0
Consumer Electronics	Advanced Power Strip- Tier 1 - Small Office	Each	1,007	7.0	62,580	0	0	0	0.9	56,322	0	0	0
Carryover	PY9 Carryover			9.6	274,849	64	0	-3,940	0.9	247,364	57	0	-3,546

* The CY2018 contribution to CPAS for these measures varies over time. See the CPAS tables in Section 4.
Source: ComEd tracking data and Navigant team analysis.