



ComEd UIC-ERC Income Eligible Kits Program Impact Evaluation Report

Energy Efficiency / Demand Response Plan:
Program Year 2019 (CY2019)
(1/1/2019-12/31/2019)

Presented to
ComEd

FINAL

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ComEd UIC-ERC Income Eligible Kits Program Impact Evaluation Report

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1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd's CY2019 UIC-ERC Income Eligible Kits (IE Kits) Program. It includes a summary of the energy and demand impacts for the total program broken out by relevant measure and program structure details. The appendix provides the impact analysis methodology and details of the Total Resource Cost inputs. CY2019 covers January 1, 2019 through December 31, 2019.

2. PROGRAM DESCRIPTION

The University of Illinois at Chicago Energy Resources Center (UIC-ERC) implements the IE Kits Program and jointly delivers the program with the Illinois Association of Community Action Agencies (IACAA). The program provides qualified customers with a kit containing energy-saving devices such as seven-plug advanced power strips, LED light bulbs, LED night lights, faucet aerators, and high efficiency showerheads. The kits also include educational information on additional energy-saving actions customers can take to reduce their energy bills. The target population is eligible customers living in single family and small multi-family housing (two to four units) that are currently under served by existing energy efficiency programs. Eligibility is limited to customers whose incomes are at 80% Area Median Income (AMI) or below 250% of the federal poverty line for their household size.

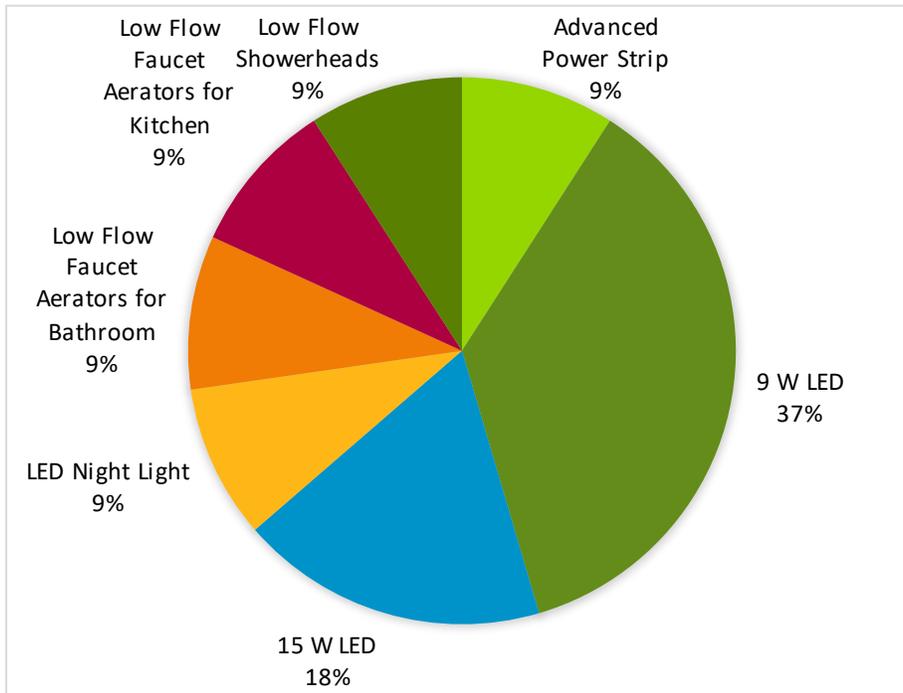
The program had 50,000 participants in CY2019 and distributed 550,000 measures in 50,000 kits as shown in the following table and graph. Each kit included the following measures: (1) 7-plug advanced power strips, (4) 9W omni directional LEDs, (2) 15W omni directional LEDs, (1) LED night light, (1) low flow bathroom faucet aerator, (1) low flow kitchen faucet aerator, and (1) low flow showerhead.

Table 2-1. CY2019 Volumetric Findings Detail

Participation	CY2019 Count
Total Energy Kits Distributed	50,000
Measure Per Kit	11
Total Number of Measures Distributed	550,000

Source: ComEd tracking data and evaluation team analysis

Figure 2-1. Number of Measures Installed by Type



Source: ComEd tracking data and evaluation team analysis

3. PROGRAM SAVINGS DETAIL

Table 3-1 summarizes the incremental energy and demand savings the IE Kits Program achieved in CY2019. The gas savings are only those that ComEd may be able to claim, which excludes savings the gas utilities claim, either via joint or non-joint programs.¹

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

Table 3-1. CY2019 Total Annual Incremental Electric Savings

Savings Category	Energy Savings (kWh)	Non-Coincident Demand Savings (kW)	Summer Peak* Demand Savings (kW)
Electricity			
Ex Ante Gross Savings	16,775,650	NR	2,126
Program Gross Realization Rate	1.17	NA	1.12
Verified Gross Savings	19,602,134	38,059	2,387
Program Net-to-Gross Ratio (NTG)	1.00	1.00	1.00
Verified Net Savings	19,602,134	38,059	2,387
Converted from Gas†			
Ex Ante Gross Savings	14,976,893	NA	NA
Program Gross Realization Rate	1.00	NA	NA
Verified Gross Savings	14,976,893	NA	NA
Program Net-to-Gross Ratio (NTG)	1.00	NA	NA
Verified Net Savings	14,976,893	NA	NA
Total Electric Plus Gas			
Ex Ante Gross Savings	31,747,484	NR	2,126
Program Gross Realization Rate	1.09	NA	1.12
Verified Gross Savings	34,579,026	38,059	2,387
Program Net-to-Gross Ratio (NTG)	1.00	1.00	1.00
Verified Net Savings	34,579,026	38,059	2,387

NR = Not reported (refers a piece of data that was not reported, i.e., non-coincident demand savings)

NA = Not applicable (refers a piece of data cannot be produced or does not apply)

* The coincident summer peak period is defined as 1:00-5:00 p.m. Central Prevailing Time on non-holiday weekdays, June through August.

† Gas savings converted to kWh by multiplying therms * 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh). The evaluation will determine which gas savings will be converted to kWh and counted toward ComEd's electric savings goal while producing the portfolio-wide Summary Report. According to Section 8-103B(b-25) of the Illinois Public Utilities Act, "In no event shall more than 10% of each year's applicable annual incremental goal as defined in paragraph (7) of subsection (g) of this Section be met through savings of fuels other than electricity."

Source: ComEd tracking data and evaluation team analysis

4. CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 4-1 to Table 4-3 and Figure 4-1 show the measure-specific and total verified gross savings for the IE Kits Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2019. The electric CPAS across all measures installed in 2019 is 19,602,134 kWh (Table 4-1). The CY2019 gas contribution to CPAS (converted to equivalent electricity) is 14,976,893 kWh (Table 4-2). Adding the gas and electric contributions produces 34,579,026 kWh of total CY2019 contribution to CPAS (Table 4-3). The "historic" rows in each table are the CPAS contribution back to CY2018. The "Program Total Electric CPAS" and the "Program Total Gas CPAS" are the sum of the CY2019 contribution and the historic contribution.



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

End Use Type	Research Category	EUL	CY2019 Verified Gross Savings (kWh)	NTG*	Lifetime Net Savings (kWh)†	Verified Net kWh Savings										
						2018	2019	2020	2021	2022	2023	2024	2025	2026		
Lighting	9 WLED	10.0	5,466,800	1.00	25,083,154		5,466,800	5,466,800	1,768,694	1,768,694	1,768,694	1,768,694	1,768,694	1,768,694	1,768,694	
Lighting	15 WLED	10.0	4,582,500	1.00	28,717,111		4,582,500	4,582,500	2,444,014	2,444,014	2,444,014	2,444,014	2,444,014	2,444,014	2,444,014	
Consumer Electronics	Advanced Power Strip	7.0	3,553,500	1.00	24,874,500		3,553,500	3,553,500	3,553,500	3,553,500	3,553,500	3,553,500	3,553,500	3,553,500	3,553,500	
Hot Water	Low Flow Showerheads	10.0	1,483,322	1.00	14,833,224		1,483,322	1,483,322	1,483,322	1,483,322	1,483,322	1,483,322	1,483,322	1,483,322	1,483,322	
Hot Water	Low Flow Faucet Aerators for Kitchen	10.0	1,140,244	1.00	11,402,441		1,140,244	1,140,244	1,140,244	1,140,244	1,140,244	1,140,244	1,140,244	1,140,244	1,140,244	
Lighting	LED Night Light	8.0	900,200	1.00	7,201,600		900,200	900,200	900,200	900,200	900,200	900,200	900,200	900,200	900,200	
Hot Water	Low Flow Faucet Aerators for Bathroom	10.0	132,055	1.00	1,320,548		132,055	132,055	132,055	132,055	132,055	132,055	132,055	132,055	132,055	
Lighting	Carryover	9.8	2,343,512	1.00	11,709,115		2,343,512	2,343,512	877,761	877,761	877,761	877,761	877,761	877,761	877,761	
CY2019 Program Total Electric Contribution to CPAS			19,602,134		125,141,693		19,602,134	19,602,134	12,299,791	12,299,791	12,299,791	12,299,791	12,299,791	12,299,791	8,746,291	
Historic Program Total Electric Contribution to CPAS‡						10,538,650	10,538,650	10,538,650	6,885,587	6,885,587	6,885,587	6,885,587	4,405,315	3,773,402		
Program Total Electric CPAS						10,538,650	30,140,784	30,140,784	19,185,378	19,185,378	19,185,378	19,185,378	16,705,106	12,519,693		
CY2019 Program Incremental Expiring Electric Savings§									7,302,343	-	-	-	-	3,553,500		
Historic Program Incremental Expiring Electric Savings‡§									3,653,063	-	-	-	2,480,272	631,913		
Program Total Incremental Expiring Electric Savings§									10,955,406	-	-	-	2,480,272	4,185,413		

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	9 WLED	1,768,694	1,768,694										
Lighting	15 WLED	2,444,014	2,444,014										
Consumer Electronics	Advanced Power Strip												
Hot Water	Low Flow Showerheads	1,483,322	1,483,322										
Hot Water	Low Flow Faucet Aerators for Kitchen	1,140,244	1,140,244										
Lighting	LED Night Light												
Hot Water	Low Flow Faucet Aerators for Bathroom	132,055	132,055										
Lighting	Carryover	877,761	877,761										
CY2019 Program Total Electric Contribution to CPAS		7,846,091	7,846,091	-	-	-	-	-	-	-	-	-	-
Historic Program Total Electric Contribution to CPAS‡		3,228,790											
Program Total Electric CPAS		11,074,881	7,846,091	-	-	-	-	-	-	-	-	-	-
CY2019 Program Incremental Expiring Electric Savings§		900,200	-	7,846,091	-	-	-	-	-	-	-	-	-
Historic Program Incremental Expiring Electric Savings‡§		544,612	3,228,790	-	-	-	-	-	-	-	-	-	-
Program Total Incremental Expiring Electric Savings§		1,444,812	3,228,790	7,846,091	-	-	-	-	-	-	-	-	-

Note: The green highlighted cell shows program total first year electric savings. The gray cells are blank, indicating values irrelevant to the CY2019 contribution to CPAS.

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

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

‡ Historical savings go back to CY2018

§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n

Source: Evaluation team analysis



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

End Use Type	Research Category	EUL	CY2019 Verified Gross Savings (Therms)	NTG*	Lifetime Net Savings (Therms)†	Verified Net Therms Savings										
						2018	2019	2020	2021	2022	2023	2024	2025	2026		
Lighting	9 WLED	10.0	-	1.00	-											
Lighting	15 WLED	10.0	-	1.00	-											
Consumer Electronics	Advanced Power Strip	7.0	-	1.00	-											
Hot Water	Low Flow Showerheads	10.0	279,708	1.00	2,797,082		279,708	279,708	279,708	279,708	279,708	279,708	279,708	279,708	279,708	
Hot Water	Low Flow Faucet Aerators for Kitchen	10.0	208,091	1.00	2,080,913		208,091	208,091	208,091	208,091	208,091	208,091	208,091	208,091	208,091	
Lighting	LED Night Light	8.0	-	1.00	-											
Hot Water	Low Flow Faucet Aerators for Bathroom	10.0	23,183	1.00	231,829		23,183	23,183	23,183	23,183	23,183	23,183	23,183	23,183	23,183	
Lighting	Carryover	9.8	-	1.00	-											
CY2019 Program Total Gas Contribution to CPAS (Therms)			510,982		5,109,823		510,982	510,982	510,982	510,982	510,982	510,982	510,982	510,982	510,982	
CY2019 Program Total Gas Contribution to CPAS (kWh Equivalent)‡							14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)‡§							-	-	-	-	-	-	-	-	-	
Program Total Gas CPAS (kWh Equivalent)‡							-	14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	14,976,893	
CY2019 Program Incremental Expiring Gas Savings (Therms)																
CY2019 Program Incremental Expiring Gas Savings (kWh Equivalent)‡																
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)‡§																
Program Total Incremental Expiring Gas Savings (kWh Equivalent)‡																

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	9 WLED												
Lighting	15 WLED												
Consumer Electronics	Advanced Power Strip												
Hot Water	Low Flow Showerheads	279,708	279,708										
Hot Water	Low Flow Faucet Aerators for Kitchen	208,091	208,091										
Lighting	LED Night Light												
Hot Water	Low Flow Faucet Aerators for Bathroom	23,183	23,183										
Lighting	Carryover												
CY2019 Program Total Gas Contribution to CPAS (Therms)		510,982	510,982	-	-	-	-	-	-	-	-	-	-
CY2019 Program Total Gas Contribution to CPAS (kWh Equivalent)‡		14,976,893	14,976,893	-	-	-	-	-	-	-	-	-	-
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)‡§		-	-	-	-	-	-	-	-	-	-	-	-
Program Total Gas CPAS (kWh Equivalent)‡		14,976,893	14,976,893	-	-	-	-	-	-	-	-	-	-
CY2019 Program Incremental Expiring Gas Savings (Therms)		-	-	510,982	-	-	-	-	-	-	-	-	-
CY2019 Program Incremental Expiring Gas Savings (kWh Equivalent)‡		-	-	14,976,893	-	-	-	-	-	-	-	-	-
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)‡§		-	-	-	-	-	-	-	-	-	-	-	-
Program Total Incremental Expiring Gas Savings (kWh Equivalent)‡		-	-	14,976,893	-	-	-	-	-	-	-	-	-

Note: The green highlighted cell shows program total first year gas savings in kWh equivalents. The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2019.
 * A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.
 † Lifetime savings are the sum of CPAS savings through the EUL.
 ‡ kWh equivalent savings are calculated by multiplying therm savings by 29.31.



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§ Historic savings go back to CY2018.

|| Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n.

Source: Evaluation team analysis

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

End Use Type	Research Category	CY2019 Verified Gross Savings			Lifetime Net Savings (kWh)†	Verified Net kWh Savings (Including Those Converted from Gas Savings)										
		EUL	(kWh)	NTG*		2018	2019	2020	2021	2022	2023	2024	2025	2026		
Lighting	9 WLED	10.0	5,466,800	1.00	19,777,071		5,466,800	5,466,800	1,768,694	1,768,694	1,768,694	1,768,694	1,768,694	1,768,694		
Lighting	15 WLED	10.0	4,582,500	1.00	28,717,111		4,582,500	4,582,500	2,444,014	2,444,014	2,444,014	2,444,014	2,444,014	2,444,014	2,444,014	
Consumer Electronics	Advanced Power Strip	7.0	3,553,500	1.00	24,874,500		3,553,500	3,553,500	3,553,500	3,553,500	3,553,500	3,553,500	3,553,500	3,553,500		
Hot Water	Low Flow Showerheads	10.0	9,681,570	1.00	77,452,562		9,681,570	9,681,570	9,681,570	9,681,570	9,681,570	9,681,570	9,681,570	9,681,570	9,681,570	
Hot Water	Low Flow Faucet Aerators for Kitchen	10.0	7,239,399	1.00	72,393,989		7,239,399	7,239,399	7,239,399	7,239,399	7,239,399	7,239,399	7,239,399	7,239,399	7,239,399	
Lighting	LED Night Light	8.0	900,200	1.00	7,201,600		900,200	900,200	900,200	900,200	900,200	900,200	900,200	900,200	900,200	
Hot Water	Low Flow Faucet Aerators for Bathroom	10.0	811,545	1.00	8,115,447		811,545	811,545	811,545	811,545	811,545	811,545	811,545	811,545	811,545	
Lighting	Carryover	9.8	2,343,512	1.00	97,165,949		2,343,512	2,343,512	877,761	877,761	877,761	877,761	877,761	877,761	877,761	
CY2019 Program Total Contribution to CPAS			34,579,026		250,241,396		34,579,026	34,579,026	27,276,683	27,276,683	27,276,683	27,276,683	27,276,683	27,276,683	21,954,489	
Historic Program Total Contribution to CPAS‡						10,538,650	10,538,650	10,538,650	6,885,587	6,885,587	6,885,587	6,885,587	6,885,587	4,405,315	3,773,402	
Program Total CPAS						10,538,650	45,117,676	45,117,676	34,162,270	34,162,270	34,162,270	34,162,270	34,162,270	31,681,998	25,727,891	
CY2019 Program Incremental Expiring Savings§									7,302,343	-	-	-	-	-	5,322,194	
Historic Program Incremental Expiring Savings‡§									3,653,063	-	-	-	-	2,480,272	631,913	
Program Total Incremental Expiring Savings§									10,955,406	-	-	-	-	2,480,272	5,954,107	

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	9 WLED												
Lighting	15 WLED	2,444,014	2,444,014										
Consumer Electronics	Advanced Power Strip												
Hot Water	Low Flow Showerheads												
Hot Water	Low Flow Faucet Aerators for Kitchen	7,239,399	7,239,399										
Lighting	LED Night Light												
Hot Water	Low Flow Faucet Aerators for Bathroom	811,545	811,545										
Lighting	Carryover	877,761	877,761										
CY2019 Program Total Contribution to CPAS		11,372,719	11,372,719	-	-	-	-	-	-	-	-	-	-
Historic Program Total Contribution to CPAS‡		3,228,790	-	-	-	-	-	-	-	-	-	-	-
Program Total CPAS		14,601,509	11,372,719	-	-	-	-	-	-	-	-	-	-
CY2019 Program Incremental Expiring Savings§		10,581,770	-	11,372,719	-	-	-	-	-	-	-	-	-
Historic Program Incremental Expiring Savings‡§		544,612	3,228,790	-	-	-	-	-	-	-	-	-	-
Program Total Incremental Expiring Savings§		11,126,382	3,228,790	11,372,719	-	-	-	-	-	-	-	-	-

Note: The green highlighted cell shows program total first year electric savings (including direct electric savings and those converted from gas). The gray cells are blank, indicating no values or do not contribute to calculating CPAS in CY2019.

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

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

‡ Historic savings go back to CY2018.

§ Incremental expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n

Source: Evaluation team analysis

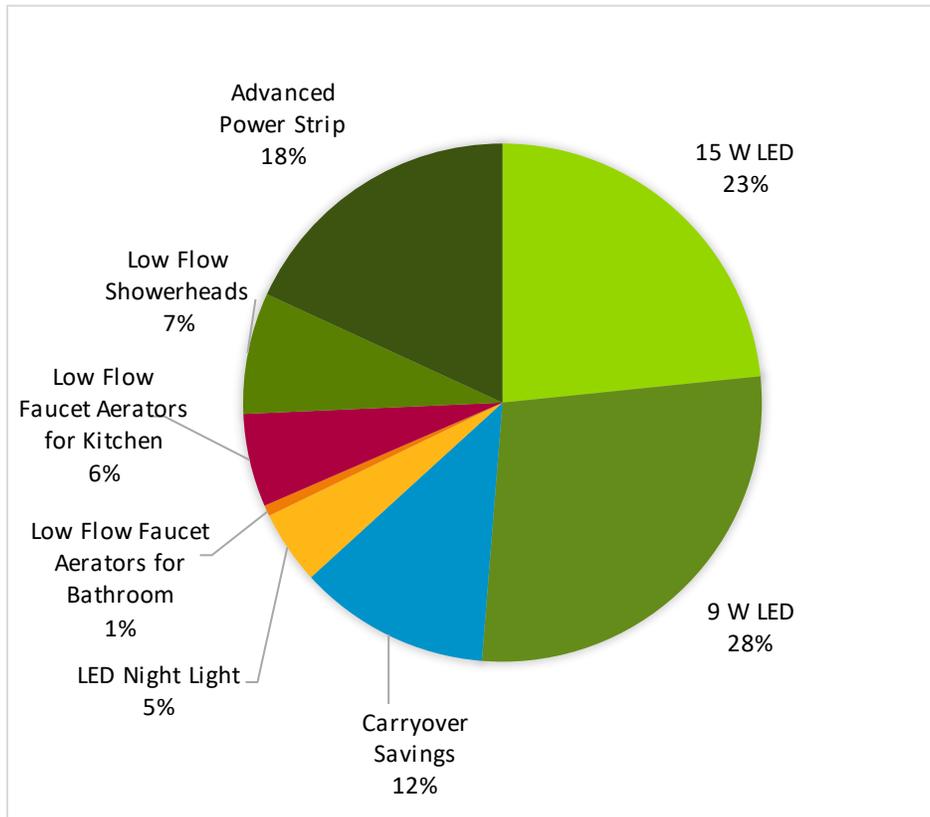
Figure 4-1. Cumulative Persisting Annual Savings


* Expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n

Source: Evaluation team analysis

5. PROGRAM SAVINGS BY MEASURE

The program includes seven measures as shown in the following tables. The 9W and 15W LED measures contributed the most savings (see Figure 5-1). Carryover savings accounted for 12% of total net verified electric savings for the program. The ex ante electric savings did not include any carryover savings.

Figure 5-1. Verified Net Savings by Measure – Electric


Source: ComEd tracking data and evaluation team analysis

Table 5-1. CY2019 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)	EUL (years)
Lighting	9 W LED	5,466,800	1.00	5,466,800	1.00	5,466,800	10.0
Lighting	15 W LED	4,582,500	1.00	4,582,500	1.00	4,582,500	10.0
Consumer Electronics	Advanced Power Strip	3,553,500	1.00	3,553,500	1.00	3,553,500	7.0
Hot Water	Low Flow Showerheads	1,244,200	1.19	1,483,322	1.00	1,483,322	10.0
Hot Water	Low Flow Faucet Aerators for Kitchen	925,500	1.23	1,140,244	1.00	1,140,244	10.0
Lighting	LED Night Light	900,200	1.00	900,200	1.00	900,200	8.0
Hot Water	Low Flow Faucet Aerators for Bathroom	102,950	1.28	132,055	1.00	132,055	10.0
Lighting	Carryover Savings	NR	NA	2,343,512	1.00	2,343,512	9.8
	Total	16,775,650	1.17	19,602,134	1.00	19,602,134	9.3

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

Note: The savings in this table includes secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd.

Source: ComEd tracking data and evaluation team analysis

Table 5-2. CY2019 Non-Coincident Demand Savings by Measure

End Use Type	Research Category	Ex Ante Gross Non-Coincident Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Non-Coincident Demand Reduction (kW)	NTG* Coincident Demand	Verified Net Non-Coincident Demand Reduction (kW)
Lighting	9 W LED	NR	NA	4,906.00	1.00	4,906.00
Lighting	15 W LED	NR	NA	4,112.00	1.00	4,112.00
Consumer Electronics	Advanced Power Strip	NR	NA	498.50	1.00	498.50
Hot Water	Low Flow Showerheads	NR	NA	5,555.47	1.00	5,555.47
Hot Water	Low Flow Faucet Aerators for Kitchen	NR	NA	11,178.79	1.00	11,178.79
Lighting	LED Night Light	NR	NA	214.00	1.00	214.00
Hot Water	Low Flow Faucet Aerators for Bathroom	NR	NA	9,432.49	1.00	9,432.49
Lighting	Carryover Savings	NR	NA	2,162.01	1.00	2,162.01
Total		NR	NA	38,059.26	1.00	38,059.26

NA = Not applicable

NR = Not reported

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

Source: ComEd tracking data and evaluation team analysis

Table 5-3. CY2019 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 W LED	672.53	0.98	662.00	1.00	662.00
Lighting	15 W LED	563.74	0.98	555.00	1.00	555.00
Consumer Electronics	Advanced Power Strip	398.77	1.00	399.00	1.00	399.00
Hot Water	Low Flow Showerheads	129.50	1.00	129.50	1.00	129.50
Hot Water	Low Flow Faucet Aerators for Kitchen	199.50	1.00	199.50	1.00	199.50
Lighting	LED Night Light	0.00	NA	0.00	1.00	0.00
Hot Water	Low Flow Faucet Aerators for Bathroom	162.00	1.00	161.66	1.00	161.66
Lighting	Carryover Savings	NR	NA	280.22	1.00	280.22
Total		2,126.00	1.12	2,386.87	1.00	2,386.87

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

Source: ComEd tracking data and evaluation team analysis

Table 5-4. CY2019 Energy Savings by Measure – Gas

End Use Type	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)	EUL (years)
Lighting	9 W LED	0	NA	0	1.00	0	10.0
Lighting	15 W LED	0	NA	0	1.00	0	10.0
Consumer Electronics	Advanced Power Strip	0	NA	0	1.00	0	7.0
Hot Water	Low Flow Showerheads	279,708	1.00	279,708	1.00	279,708	10.0
Hot Water	Low Flow Faucet Aerators for Kitchen	208,091	1.00	208,091	1.00	208,091	10.0
Lighting	LED Night Light	0	NA	0	1.00	0	8.0
Hot Water	Low Flow Faucet Aerators for Bathroom	23,183	1.00	23,183	1.00	23,183	10.0
Lighting	Carryover Savings	NA	NA	NA	1.00	NA	9.7
Total Therms		510,982	1.00	510,982	1.00	510,982	NA
Total kWh Converted From Therms†		14,976,893	1.00	14,976,893	1.00	14,976,893	NA

NA = Not applicable

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

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

Source: ComEd tracking data and evaluation team analysis

Table 5-5. CY2019 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 W LED	5,466,800	1.00	5,466,800	1.00	5,466,800
Lighting	15 W LED	4,582,500	1.00	4,582,500	1.00	4,582,500
Consumer Electronics	Advanced Power Strip	3,553,500	1.00	3,553,500	1.00	3,553,500
Hot Water	Low Flow Showerheads	9,439,679	1.03	9,681,570	1.00	9,681,570
Hot Water	Low Flow Faucet Aerators for Kitchen	7,022,595	1.03	7,239,399	1.00	7,239,399
Lighting	LED Night Light	900,200	1.00	900,200	1.00	900,200
Hot Water	Low Flow Faucet Aerators for Bathroom	782,210	1.04	811,545	1.00	811,545
Lighting	Carryover Savings	NR	NA	2,343,512	1.00	2,343,512
	Total†	31,747,484	1.09	34,579,026	1.00	34,579,026

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

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

Source: ComEd tracking data and evaluation team analysis

The IE Kits Program includes measures that save water. That reduction in water use produces secondary kWh savings from water supply and wastewater treatment. Table 5-6 shows the secondary measure level savings. The savings in this table are included within the electricity savings in the previous tables in this section.

Table 5-6. Secondary Energy Savings from Water Reduction by Measure – Electric

End Use Type	Research Category	Ex Ante Annual Water Savings (gallons)	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate (RR _{water})	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Lighting	9 W LED	0	NR	NA	0	1.00	0
Lighting	15 W LED	0	NR	NA	0	1.00	0
Consumer Electronics	Advanced Power Strip	0	NR	NA	0	1.00	0
Hot Water	Low Flow Showerheads	66,464,266	NR	NA	239,122	1.00	239,122
Hot Water	Low Flow Faucet Aerators for Kitchen	59,693,419	NR	NA	214,762	1.00	214,762
Lighting	LED Night Light	0	NR	NA	0	1.00	0
Hot Water	Low Flow Faucet Aerators for Bathroom	8,093,446	NR	NA	29,118	1.00	29,118
Lighting	Carryover Savings	NA	NA	NA	NA	1.00	NA
	Total	134,251,132	NR	NA	483,002	1.00	483,002

NR = Not reported

NA – Not applicable

Note: The savings in this table reflects only secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd, not those claimed by gas utilities.

* A deemed value. Source: is to be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

Source: ComEd tracking data and evaluation team analysis

6. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

6.1 Impact Parameter Estimates

The evaluation team verified unit savings for each program measure using the impact algorithm sources found in version 7 of the Illinois TRM. Table 6-1 presents the key parameters and the references used in the verified gross and net savings calculations.

The lifetime energy and demand savings are estimated by multiplying the verified savings by the effective useful life for each measure.

Table 6-1. Savings Parameters

Gross Savings Input Parameters	Value	Units	Deemed or Evaluated?	Source *
Quantity	Varies	# measures	Evaluated	Program Tracking Data
NTG	Varies	%	Deemed	SAG Consensus
Advanced Power Strip Measures	71.07	kWh	Deemed	TRM v7.0 – Section 5.2.1
LED Bulb Measures	Varies	kWh	Deemed	TRM v7.0 – Section 5.5.8
LED Night Light Measures	18.00	kWh	Deemed	TRM v7.0 – Section 5.5.11
Faucet Aerator Measures	Varies	kWh	Deemed	TRM v7.0 Errata – Section 5.4.4
Low Flow Showerhead Measures	Varies	kWh	Deemed	TRM v7.0 Errata – Section 5.4.5
Effective Useful Life (EUL)	Varies	Years	Mixture	TRM v7.0

* TRM is the State of Illinois Technical Reference Manual version 7.0 from <http://www.ilsag.info/technical-reference-manual.html>. The NTG values can be found on the Illinois SAG web site here: https://www.ilsag.info/ntg_2019.

6.2 Other Impact Findings and Recommendations

The evaluation team developed several recommendations based on findings from the CY2019 evaluation.

Finding 1. Carryover savings are not included in ex ante estimates.

Recommendation 1. The evaluation team recommends that ComEd and the implementer account for carryover in their ex ante estimates. See Section 7.2 for CY2020 carryover estimates.

Finding 2. The ex ante peak demand savings for both the 9W and 15W LED measures were calculated using a value of 1.11 as the waste heat factor for demand (WHF_d), which represents an interior single family bulb location.

Recommendation 2. The evaluation team recommends updating the WHF_d to the TRM v7.0 deemed value of 1.093 for bulbs installed in unknown locations. Since the program delivery type doesn't allow for tracking the location where the bulbs were installed, the most appropriate bulb location for a kit program is unknown, which has a WHF_d of 1.093 in TRM (v7.0).

Finding 3. The TRM allows for secondary kWh savings derived from water supply and wastewater treatment savings to be included in total savings for these measures. The implementer did not include these savings in the ex ante estimates. An Errata (v7.0) was published² to differentiate the total water energy factor (kWh/Million Gallons) used to calculate the secondary kWh between Cook County and the rest of Illinois.

Recommendation 3. The evaluation team recommends that secondary kWh savings from water be claimed in ex ante calculations. The secondary savings should not be included in TRC tests to avoid double counting the economic benefit of water savings. Table 6-2 shows the secondary kWh savings for the aerator and showerhead measures. As the secondary kWh savings vary by location, both the aerator and showerhead measures should be broken down into two measures: Cook County and outside of Cook County.

² Memorandum subject "v7.0 Errata Measures effective 01/01/2019", published 7/31/2019

Table 6-2. Secondary kWh Savings for Aerator and Showerhead Measures

End Use Type	Research Category	Unit	Water Savings gal/unit	Secondary Savings kWh/unit	Source
Hot Water	Low Flow Faucet Aerators for Bathroom	Each	162	0.8110	TRM v7.0 errata (7/31/2019), section 5.4.4
Hot Water	Low Flow Faucet Aerators for Bathroom (Cook County)	Each	162	0.4754	TRM v7.0 errata (7/31/2019), section 5.4.4
Hot Water	Low Flow Faucet Aerators for Kitchen	Each	1,194	5.9813	TRM v7.0 errata (7/31/2019), section 5.4.4
Hot Water	Low Flow Faucet Aerators for Kitchen (Cook County)	Each	1,194	3.5064	TRM v7.0 errata (7/31/2019), section 5.4.4
Hot Water	Low Flow Showerheads	Each	1,329	6.6597	TRM v7.0 errata (7/31/2019), section 5.4.5
Hot Water	Low Flow Showerheads (Cook County)	Each	1,329	3.9041	TRM v7.0 errata (7/31/2019), section 5.4.5

Source: Guidehouse Analysis of CY2019 ComEd Tracking Data

7. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

7.1 Verified Program Savings Analysis Approach

The evaluation team determined verified gross savings for each program measure by:

1. Reviewing savings algorithm inputs in the measure workbook for agreement with the TRM v7.0 and Errata.
2. Validating savings algorithms were applied correctly.
3. Cross-checking per-unit savings values in the tracking data with the verified values in the measure workbook or in Guidehouse's calculations if the workbook did not agree with the TRM.
4. Multiplying the verified per-unit savings value by the quantity reported in the tracking data.

Guidehouse calculated verified net energy and demand (coincident peak and overall) savings by multiplying the verified gross savings estimates by a net-to-gross (NTG) of 1.0. In CY2019, the IE Kits Program's NTG estimate was defined by a consensus process through the Illinois Stakeholder Advisory Group (SAG).

7.2 CY2020 Carryover Savings Estimates

The evaluation team calculated the CY2020 carryover savings estimates using the RM (v6, v7, and v8) and the CY2018 and CY2019 Impact Evaluation reports. The energy and demand savings from the second and third year installations are calculated based on the following parameters:

- Delta Watts – Verified savings estimate from the year of installation (source: TRM v8)
- Quantity – Number of bulbs from the year of distribution (source: Impact Evaluation Reports)
- HOU and Peak CF – Verified savings estimate from the year of installation (source: TRM v8)
- Energy and Demand IE – Verified savings estimate from the year of installation (source: TRM v8)
- Installation Rate – Verified savings estimate from the year of distribution (source: TRM v6 and v7)
- NTG – Evaluation research from the year of distribution (source: Impact Evaluation Reports)

Table 7-1 shows that in CY2020 a total of 67,127 bulbs distributed during CY2018 and CY2019 are expected to be installed within ComEd's service territory. The table below provides the gross and net energy and demand savings from these carryover bulbs attributable to CY2020. Total CY2020 net carryover savings are estimated to be 3,407,014 kWh, 3,057 demand kW, and 413 peak demand kW.

Table 7-1. CY2020 Carryover Savings

Parameter	Third Year Installs from CY2018		Second Year Installs from CY2019		Total Carryover from CY18
	9W LED	15W LED	9W LED	15W LED	
Bulbs Delivered	16,752	8,376	28,000	14,000	67,127
Delta Watts	0.034	0.057	0.034	0.057	0.042
Daily Hours of Use	1159	1159	1159	1159	1159
Installation Rate	0.12	0.12	0.14	0.14	0.13
Energy Interactive Effects	1.051	1.051	1.051	1.051	1.051
Demand Interactive Effects	1.093	1.093	1.093	1.093	1.093
Coincidence Factor	0.135	0.135	0.135	0.135	0.135
Carryover Gross Energy Savings (kWh)	693,776	581,548	1,159,640	972,051	3,407,014
Carryover Gross Demand Savings (kW)	622.52	521.82	1,040.54	872.21	3,057.09
Carryover Gross Peak Demand Savings (kW)	84.04	70.45	140.47	117.75	412.71
NTG	1.00	1.00	1.00	1.00	1.00
Carryover Net Energy Savings (kWh)	693,776	581,548	1,159,640	972,051	3,407,014
Carryover Net Demand Savings (kW)	622.52	521.82	1,040.54	872.21	3,057.09
Carryover Net Peak Demand Savings (kW)	84.04	70.45	140.47	117.75	412.71
EUL	6	6	6	6	6



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8. APPENDIX 3. TOTAL RESOURCE COST DETAIL

Table 8-1 shows the Total Resource Cost (TRC) 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 the evaluation team later.

Table 8-1. Total Resource Cost Savings Summary

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Verified Gross Electric Energy Savings (kWh)	Verified Gross Peak Demand Reduction (kW)	Verified Gross Gas Savings (Therms)	Gross Heating Penalty (kWh)	Gross Heating Penalty (Therms)	NTG (kWh)	NTG (Therms)	NTG (Therms)	Verified Net Electric Energy Savings (kWh)	Verified Net Peak Demand Reduction (kW)	Verified Net Gas Savings (Therms)	Net Heating Penalty (kWh)	Net Heating Penalty (Therms)
Lighting	9 W LED	Lamp	200,000	10.0	No	5,466,800	662.00	0	0	-106,487	1.00	1.00	1.00	5,466,800	662	0	0	-106,487
Lighting	15 W LED	Lamp	100,000	10.0	No	4,582,500	555.00	0	0	-89,261	1.00	1.00	1.00	4,582,500	555.00	0	0	-89,261
Consumer Electronics	Advanced Power Strip	Each	50,000	7.0	No	3,553,500	399.00	0	0	0	1.00	1.00	1.00	3,553,500	399.00	0	0	0
Hot Water	Low Flow Showerheads	Each	50,000	10.0	No	1,244,201	129.50	279,708	0	0	1.00	1.00	1.00	1,244,201	129.50	279,708	0	0
Hot Water	Low Flow Faucet Aerators for Kitchen	Each	50,000	10.0	No	925,482	199.50	208,091	0	0	1.00	1.00	1.00	925,482	199.50	208,091	0	0
Lighting	LED Night Light	Lamp	50,000	8.0	No	900,200	0.00	0	0	-17,485	1.00	1.00	1.00	900,200	0.00	0	0	-17,485
Hot Water	Low Flow Faucet Aerators for Bathroom	Each	50,000	10.0	No	102,937	161.66	23,183	0	0	1.00	1.00	1.00	102,937	161.66	23,183	0	0
Lighting	Carryover Savings	Lamp	44,498	9.8	No	2,343,512	280.22	0	0	-40,804	1.00	1.00	1.00	2,343,512	280.22	0	0	-40,804
Total				9.3		19,119,132	2,387	510,982	0	-254,037	1.00	1.00	1.00	19,119,132	2,387	510,982	0	-254,037

Note: To avoid double counting, the verified gross kWh and net kWh used in the TRC analysis excludes secondary energy savings from water reduction measures. Table 9-1 represents the kWh savings from Table 5-1 minus those shown in Table 5-6)

* The total of the EUL column is the weighted average measure life (WAML), and is calculated as the sum product of EUL and measure savings divided by total program savings.

† Early Replacement (ER) measures are flagged as YES, otherwise a NO is indicated in the column.

‡ The EUL for this measure varies over time. See the CPAS tables (Table 4-1 to Table 4-3).

Source: ComEd tracking data and evaluation team analysis