



ComEd UIC-ERC Income Eligible Kits Program Impact Evaluation Report

Energy Efficiency / Demand Response Plan:
Program Year 2020 (CY2020)
(1/1/2020-12/31/2020)

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Table of Contents

1. Introduction	1
2. Program Description.....	1
3. Program Savings Detail	3
4. Cumulative Persisting Annual Savings.....	4
5. Program Savings by Measure	10
6. Impact Analysis Findings and Recommendations.....	14
6.1 Impact Parameter Estimates	14
6.2 CY2021 Carryover Savings Estimates.....	14
6.3 Other Impact Findings and Recommendations.....	15
Appendix A. Impact Analysis Methodology.....	A-1
Appendix B. Total Resource Cost Detail.....	B-1

List of Tables and Figures

Figure 2-1. Share of Measures Installed by Type	2
Figure 4-1. Cumulative Persisting Annual Savings.....	10
Figure 5-1. Verified Net Savings by Measure – Electric.....	11
Table 2-1. CY2020 Volumetric Findings Detail	2
Table 3-1. CY2020 Total Annual Incremental Electric Savings.....	3
Table 4-1. Cumulative Persisting Annual Savings (CPAS) – Electric.....	5
Table 4-2. Cumulative Persisting Annual Savings (CPAS) – Gas.....	7
Table 4-3. Cumulative Persisting Annual Savings (CPAS) – Total	9
Table 5-1. CY2020 Energy Savings by Measure – Electric	11
Table 5-2. CY2020 Summer Peak Demand Savings by Measure	12
Table 5-3. CY2020 Energy Savings by Measure – Gas	12
Table 5-4. CY2020 Energy Savings by Measure – Total Combining Electricity and Gas.....	13
Table 5-5. Secondary Energy Savings from Water Reduction by Measure – Electric.....	13
Table 6-1. Savings Parameters.....	14
Table 6-2. CY2021 Carryover Savings.....	15
Table 6-3. Measure-Level Savings and Realization Rates	16
Table 6-4. Secondary kWh Savings for Aerator and Showerhead Measures	17
Table B-1. Total Resource Cost Savings Summary	B-1

1. Introduction

This report presents results from the CY2020 impact evaluation of ComEd's UIC-ERC Income Eligible Kits Program. It summarizes the total energy and demand impacts for the program broken out by relevant measure and program structure details. The appendices provide the impact analysis methodology and details of the total resource cost (TRC) inputs. CY2020 covers January 1, 2020 through December 31, 2020.

2. Program Description

The University of Illinois at Chicago Energy Resources Center (UIC-ERC) implements the UIC-ERC Income Eligible Kits Program and jointly delivers the program with the Illinois Association of Community Action Agencies (IACAA). The program provides eligible customers with a kit containing energy-saving devices and educational information on additional energy-saving actions customers can take to reduce their energy bills. The program's target population is eligible customers living in single-family and small multifamily housing (2-4 units) currently underserved by existing energy efficiency programs. Eligibility is limited to customers whose incomes are at or below 80% area median income or below 250% of the federal poverty line for their household size.

The program had 60,000 participants in CY2020, and distributed 720,000 measures in 60,000 kits, as Table 2-1 and Figure 2-1 show. Each kit included the following measures:

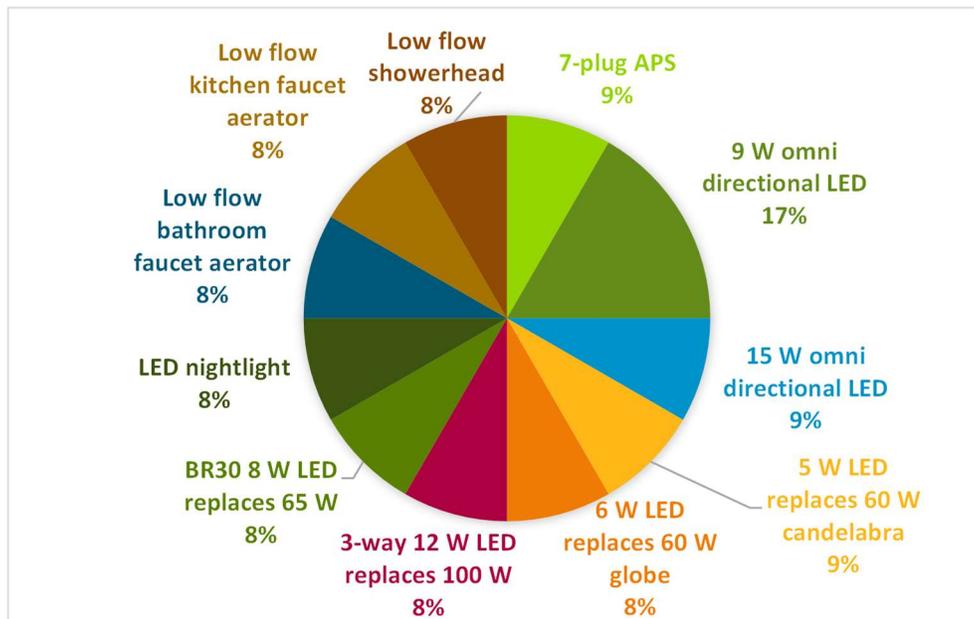
- 7-plug advanced power strip (APS) (1)
- 9 W omni directional LED (2)
- 15 W omni directional LED (1)
- 5 W LED replaces 60 W candelabra (1)
- 6 W LED replaces 60 W globe (1)
- 3-way 12 W LED replaces 100 W (1)
- BR30 8 W LED replaces 65 W (1)
- LED nightlight (1)
- Low flow bathroom faucet aerator (1)
- Low flow kitchen faucet aerator (1)
- Low flow showerhead (1)

Table 2-1. CY2020 Volumetric Findings Detail

Participation	CY2020 Count
Total Energy Kits Distributed	60,000
Measures Per Kit	12
Number of 7-plug APS Distributed	60,000
Number of 9 W omni directional LEDs Distributed	120,000
Number of 15 W omni directional LEDs Distributed	60,000
Number of 5 W LED replaces 60 W candelabras Distributed	60,000
Number of 6 W LED replaces 60 W globes Distributed	60,000
Number of 3-way 12 W LED replaces 100 W Distributed	60,000
Number of BR30 8 W LED replaces 65 W Distributed	60,000
Number of LED nightlights Distributed	60,000
Number of low flow bathroom faucet aerators Distributed	60,000
Number of low flow kitchen faucet aerators Distributed	60,000
Number of low flow showerheads Distributed	60,000
Total Number of Measures Distributed	720,000

Source: ComEd tracking data and evaluation team analysis

Figure 2-1. Share 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 UIC-ERC Income Eligible Kits Program achieved in CY2020. 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.

Table 3-1. CY2020 Total Annual Incremental Electric Savings

Savings Category	Energy Savings (kWh)	Summer Peak* Demand Savings (kW)
Electricity		
Ex Ante Gross Savings‡	25,153,800	3,209
Program Gross Realization Rate	1.14	1.06
Verified Gross Savings	28,604,291	3,404
Program Net-to-Gross Ratio (NTG)	1.00	1.00
CY2018 and CY2019 Net Carryover Saving	3,617,066	413
Verified Net Savings§	32,221,357	3,817
Converted from Gas†		
Ex Ante Gross Savings	16,835,078	NA
Program Gross Realization Rate	1.01	NA
Verified Gross Savings	16,938,095	NA
Program Net-to-Gross Ratio (NTG)	1.00	NA
Verified Net Savings	16,938,095	NA
Total Electric Plus Gas		
Ex Ante Gross Savings‡	41,988,878	3,209
Program Gross Realization Rate	1.08	1.06
Verified Gross Savings	45,542,386	3,404
Program Net-to-Gross Ratio (NTG)	1.00	1.00
CY2018 and CY2019 Net Carryover Saving	3,617,066	412.71
Verified Net Savings§	49,159,452	3,817

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

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

† Gas savings converted to kilowatt-hours (kWh) by multiplying therms by 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh). The evaluation determines which gas savings are 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."

‡ Ex ante and verified gross savings exclude gross carryover savings from CY2018 and CY2019 bulb sales.

§ Verified net savings includes net carryover savings from CY2018 and CY2019.

|| The program ex ante gross savings shown in this table matches the program's scorecard value, which is calculated from kit-level savings. Guidehouse calculates verified savings at the measure level. Due to rounding issues, the total ex ante savings from measure level data is 25,153,813 kWh, which is the value that will appear in the CY2020 Summary Report.

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 UIC-ERC Income Eligible Kits Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2020. The electric CPAS across all measures installed in 2020 is 32,221,357 kWh (Table 4-1). The CY2020 gas contribution to CPAS (converted to equivalent electricity) is 16,938,095 kWh (Table 4-2). Adding the gas and electric contributions produces 49,159,452 kWh of total CY2020 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 Program Total Gas CPAS rows are the sum of the CY2020 contribution and the historic contribution. Figure 4-1 represents the program total contributions to CPAS over the lifetimes of the measures, and the incremental expiring savings over time.

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

End Use Type	Research Category	EUL	CY2020 Verified Gross Savings (kWh)	NTG*	Lifetime Net Savings (kWh)†	Verified Net kWh Savings									
						2018	2019	2020	2021	2022	2023	2024	2025	2026	
Consumer Electronics	7-plug APS	7.0	5,623,800	1.00	39,366,600			5,623,800	5,623,800	5,623,800	5,623,800	5,623,800	5,623,800	5,623,800	
Lighting	9 W LED	10.0	4,373,499	1.00	38,093,172			4,373,499	4,373,499	4,373,499	4,373,499	4,373,499	4,373,499	4,373,499	
Lighting	3-Way 12 W LED replaces 100 W	10.0	3,811,892	1.00	32,744,150			3,811,892	3,811,892	3,811,892	3,811,892	3,811,892	3,811,892	3,811,892	
Lighting	15 W LED	10.0	3,666,021	1.00	31,931,042			3,666,021	3,666,021	3,666,021	3,666,021	3,666,021	3,666,021	3,666,021	
Lighting	BR30 8 W LED replaces 65 W	10.0	3,211,002	1.00	28,931,132			3,211,002	3,211,002	3,211,002	3,211,002	3,211,002	3,211,002	3,211,002	
Lighting	5 W LED replaces 60 W candelabra	10.0	1,971,668	1.00	16,936,629			1,971,668	1,971,668	1,971,668	1,971,668	1,971,668	1,971,668	1,971,668	
Lighting	6 W LED replaces 60 W globe	10.0	1,915,335	1.00	16,452,726			1,915,335	1,915,335	1,915,335	1,915,335	1,915,335	1,915,335	1,915,335	
Hot Water	Low flow showerheads	10.0	1,764,655	1.00	17,646,550			1,764,655	1,764,655	1,764,655	1,764,655	1,764,655	1,764,655	1,764,655	
Lighting	LED nightlight	8.0	1,080,266	1.00	8,642,125			1,080,266	1,080,266	1,080,266	1,080,266	1,080,266	1,080,266	1,080,266	
Hot Water	Low flow faucet aerators for kitchen	10.0	1,050,919	1.00	10,509,185			1,050,919	1,050,919	1,050,919	1,050,919	1,050,919	1,050,919	1,050,919	
Hot Water	Low flow faucet aerators for bathroom	10.0	135,236	1.00	1,352,355			135,236	135,236	135,236	135,236	135,236	135,236	135,236	
Lighting	CY2018 and CY2019 Carryover	8.7	3,617,066	1.00	31,355,508			3,617,066	3,617,066	3,617,066	3,617,066	3,617,066	3,617,066	3,617,066	
CY2020 Program Total Electric Contribution to CPAS			32,221,357		273,961,175			32,221,357							
Historic Program Total Electric Contribution to CPAS‡						10,538,650	30,140,784	34,784,182	23,828,776	23,828,776	23,828,776	23,828,776	21,348,504	17,163,091	
Program Total Electric CPAS						10,538,650	30,140,784	67,005,539	56,050,133	56,050,133	56,050,133	56,050,133	53,569,861	49,384,448	
CY2020 Program Incremental Expiring Electric Savings§									-	-	-	-	-	-	
Historic Program Incremental Expiring Electric Savings‡§								(4,643,398)	10,955,406	-	-	-	2,480,272	4,185,413	
Program Total Incremental Expiring Electric Savings§								(4,643,398)	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
Consumer Electronics	7-plug APS												
Lighting	9 WLED	2,492,894	2,492,894	2,492,894									
Lighting	3-Way 12 WLED replaces 100 W	2,020,303	2,020,303	2,020,303									
Lighting	15 WLED	2,089,632	2,089,632	2,089,632									
Lighting	BR30 8 WLED replaces 65 W	2,151,372	2,151,372	2,151,372									
Lighting	5 WLED replaces 60 W candelabra	1,044,984	1,044,984	1,044,984									
Lighting	6 WLED replaces 60 W globe	1,015,127	1,015,127	1,015,127									
Hot Water	Low flow showerheads	1,764,655	1,764,655	1,764,655									
Lighting	LED nightlight	1,080,266											
Hot Water	Low flow faucet aerators for kitchen	1,050,919	1,050,919	1,050,919									
Hot Water	Low flow faucet aerators for bathroom	135,236	135,236	135,236									
Lighting	CY2018 and CY2019 Carryover	2,152,050	1,941,998	1,941,998									
CY2020 Program Total Electric Contribution to CPAS		16,997,436	15,707,119	15,707,119	-	-	-	-	-	-	-	-	-
Historic Program Total Electric Contribution to CPAS†		13,460,072	10,035,934	2,189,843									
Program Total Electric CPAS		30,457,508	25,743,053	17,896,962	-	-	-	-	-	-	-	-	-
CY2020 Program Incremental Expiring Electric Savings§		15,223,921	1,290,317	-	15,707,119	-	-	-	-	-	-	-	-
Historic Program Incremental Expiring Electric Savings‡§		3,703,019	3,424,138	7,846,091	2,189,843	-	-	-	-	-	-	-	-
Program Total Incremental Expiring Electric Savings§		18,926,940	4,714,455	7,846,091	17,896,962	-	-	-	-	-	-	-	-

Note: The green highlighted cell shows program total first-year electric savings. The gray cells are blank, indicating no values or no contribution to calculating CPAS in CY2020.

*A deemed value. Source found on the Illinois Stakeholder Advisory Group (SAG) website: https://www.ilsag.info/ntg_2020.

† Lifetime savings are the sum of CPAS savings through the effective useful life (EUL).

‡ Historic savings go back to CY2018.

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

Source: Evaluation team analysis

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

End Use Type	Research Category	EUL	CY2020 Verified Gross Savings (Therms)	NTG*	Lifetime Net Savings (Therms)†	Verified Net Therms Savings											
						2018	2019	2020	2021	2022	2023	2024	2025	2026			
Consumer Electronics	7-plug APS	7.0	-	1.00	-												
Lighting	9 WLED	10.0	-	1.00	-												
Lighting	3-Way 12 WLED replaces 100 W	10.0	-	1.00	-												
Lighting	15 WLED	10.0	-	1.00	-												
Lighting	BR30 8 WLED replaces 65 W	10.0	-	1.00	-												
Lighting	5 WLED replaces 60 W candelabra	10.0	-	1.00	-												
Lighting	6 WLED replaces 60 W globe	10.0	-	1.00	-												
Hot Water	Low flow showerheads	10.0	352,399	1.00	3,523,989			352,399	352,399	352,399	352,399	352,399	352,399	352,399	352,399	352,399	352,399
Lighting	LED nightlight	8.0	-	1.00	-												
Hot Water	Low flow faucet aerators for kitchen	10.0	200,276	1.00	2,002,760			200,276	200,276	200,276	200,276	200,276	200,276	200,276	200,276	200,276	200,276
Hot Water	Low flow faucet aerators for bathroom	10.0	25,220	1.00	252,199			25,220	25,220	25,220	25,220	25,220	25,220	25,220	25,220	25,220	25,220
Lighting	CY2018 and CY2019 Carryover	8.7	-	1.00	-												
CY2020 Program Total Gas Contribution to CPAS (Therms)			577,895		5,778,947			577,895	577,895	577,895	577,895	577,895	577,895	577,895	577,895	577,895	577,895
CY2020 Program Total Gas Contribution to CPAS (kWh Equivalent)‡								16,938,095	16,938,095	16,938,095	16,938,095	16,938,095	16,938,095	16,938,095	16,938,095	16,938,095	16,938,095
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)‡§							-	14,976,893	18,020,391	18,020,391	18,020,391	18,020,391	18,020,391	18,020,391	18,020,391	18,020,391	18,020,391
Program Total Gas CPAS (kWh Equivalent)‡							-	14,976,893	34,958,486	34,958,486	34,958,486	34,958,486	34,958,486	34,958,486	34,958,486	34,958,486	34,958,486
CY2020 Program Incremental Expiring Gas Savings (Therms) 																	
CY2020 Program Incremental Expiring Gas Savings (kWh Equivalent)‡ 																	
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)‡§ 																	
Program Total Incremental Expiring Gas Savings (kWh Equivalent)‡ 									(3,043,498)								

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Consumer Electronics	7-plug APS												
Lighting	9 WLED												
Lighting	3-Way 12 WLED replaces 100 W												
Lighting	15 WLED												
Lighting	BR30 8 WLED replaces 65 W												
Lighting	5 WLED replaces 60 W candelabra												
Lighting	6 WLED replaces 60 W globe												
Hot Water	Low flow showerheads	352,399	352,399	352,399									
Lighting	LED nightlight												
Hot Water	Low flow faucet aerators for kitchen	200,276	200,276	200,276									
Hot Water	Low flow faucet aerators for bathroom	25,220	25,220	25,220									
Lighting	CY2018 and CY2019 Carryover												
CY2020 Program Total Gas Contribution to CPAS (Therms)		577,895	577,895	577,895	-	-	-	-	-	-	-	-	-
CY2020 Program Total Gas Contribution to CPAS (kWh Equivalent)†		16,938,095	16,938,095	16,938,095	-	-	-	-	-	-	-	-	-
Historic Program Total Gas Contribution to CPAS (kWh Equivalent)‡§		18,020,391	18,020,391	3,043,498									
Program Total Gas CPAS (kWh Equivalent)‡		34,958,486	34,958,486	19,981,593	-	-	-	-	-	-	-	-	-
CY2020 Program Incremental Expiring Gas Savings (Therms) 		-	-	-	577,895	-							
CY2020 Program Incremental Expiring Gas Savings (kWh Equivalent)‡ 		-	-	-	16,938,095	-							
Historic Program Incremental Expiring Gas Savings (kWh Equivalent)‡§ 		-	-	14,976,893	3,043,498	-							
Program Total Incremental Expiring Gas Savings (kWh Equivalent)‡ 		-	-	14,976,893	19,981,593	-							

Note: The green highlighted cell shows program total first-year gas savings in kWh equivalents. The gray cells are blank, indicating no values or no contribution to calculating CPAS in CY2020.

*A deemed value. Source found on the Illinois SAG website: https://www.ilsag.info/ntg_2020.

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

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

§ 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	EUL	CY2020 Verified Gross Savings (kWh)	NTG*	Lifetime Net Savings (kWh)†	Verified Net kWh Savings (Including Those Converted from Gas Savings)									
						2018	2019	2020	2021	2022	2023	2024	2025	2026	
Consumer Electronics	7-plug APS	7.0	5,623,800	1.00	39,366,600			5,623,800	5,623,800	5,623,800	5,623,800	5,623,800	5,623,800	5,623,800	5,623,800
Lighting	9 WLED	10.0	4,373,499	1.00	38,093,172			4,373,499	4,373,499	4,373,499	4,373,499	4,373,499	4,373,499	4,373,499	4,373,499
Lighting	3-Way 12 WLED replaces 100 W	10.0	3,811,892	1.00	32,744,150			3,811,892	3,811,892	3,811,892	3,811,892	3,811,892	3,811,892	3,811,892	3,811,892
Lighting	15 WLED	10.0	3,666,021	1.00	31,931,042			3,666,021	3,666,021	3,666,021	3,666,021	3,666,021	3,666,021	3,666,021	3,666,021
Lighting	BR30 8 WLED replaces 65 W	10.0	3,211,002	1.00	28,931,132			3,211,002	3,211,002	3,211,002	3,211,002	3,211,002	3,211,002	3,211,002	3,211,002
Lighting	5 WLED replaces 60 W candelabra	10.0	1,971,668	1.00	16,936,629			1,971,668	1,971,668	1,971,668	1,971,668	1,971,668	1,971,668	1,971,668	1,971,668
Lighting	6 WLED replaces 60 W globe	10.0	1,915,335	1.00	16,452,726			1,915,335	1,915,335	1,915,335	1,915,335	1,915,335	1,915,335	1,915,335	1,915,335
Hot Water	Low flow showerheads	10.0	12,093,465	1.00	120,934,655			12,093,465	12,093,465	12,093,465	12,093,465	12,093,465	12,093,465	12,093,465	12,093,465
Lighting	LED nightlight	8.0	1,080,266	1.00	8,642,125			1,080,266	1,080,266	1,080,266	1,080,266	1,080,266	1,080,266	1,080,266	1,080,266
Hot Water	Low flow faucet aerators for kitchen	10.0	6,921,007	1.00	69,210,066			6,921,007	6,921,007	6,921,007	6,921,007	6,921,007	6,921,007	6,921,007	6,921,007
Hot Water	Low flow faucet aerators for bathroom	10.0	874,431	1.00	8,744,315			874,431	874,431	874,431	874,431	874,431	874,431	874,431	874,431
Lighting	CY2018 and CY2019 Carryover	8.7	3,617,066	1.00	31,355,508			3,617,066	3,617,066	3,617,066	3,617,066	3,617,066	3,617,066	3,617,066	3,617,066
CY2020 Program Total Contribution to CPAS			49,159,452		443,342,121			49,159,452	49,159,452	49,159,452	49,159,452	49,159,452	49,159,452	49,159,452	49,159,452
Historic Program Total Contribution to CPAS‡								10,538,650	45,117,677	52,804,573	41,849,167	41,849,167	41,849,167	39,368,895	35,183,482
Program Total CPAS								10,538,650	45,117,677	101,964,025	91,008,619	91,008,619	91,008,619	88,528,347	84,342,934
CY2020 Program Incremental Expiring Savings§															
Historic Program Incremental Expiring Savings‡§														2,480,272	4,185,413
Program Total Incremental Expiring Savings§														2,480,272	4,185,413

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Consumer Electronics	7-plug APS	-	-	-	-	-	-	-	-	-	-	-	-
Lighting	9 WLED	2,492,894	2,492,894	2,492,894	-	-	-	-	-	-	-	-	-
Lighting	3-Way 12 WLED replaces 100 W	2,020,303	2,020,303	2,020,303	-	-	-	-	-	-	-	-	-
Lighting	15 WLED	2,089,632	2,089,632	2,089,632	-	-	-	-	-	-	-	-	-
Lighting	BR30 8 WLED replaces 65 W	2,151,372	2,151,372	2,151,372	-	-	-	-	-	-	-	-	-
Lighting	5 WLED replaces 60 W candelabra	1,044,984	1,044,984	1,044,984	-	-	-	-	-	-	-	-	-
Lighting	6 WLED replaces 60 W globe	1,015,127	1,015,127	1,015,127	-	-	-	-	-	-	-	-	-
Hot Water	Low flow showerheads	12,093,465	12,093,465	12,093,465	-	-	-	-	-	-	-	-	-
Lighting	LED nightlight	1,080,266	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Low flow faucet aerators for kitchen	6,921,007	6,921,007	6,921,007	-	-	-	-	-	-	-	-	-
Hot Water	Low flow faucet aerators for bathroom	874,431	874,431	874,431	-	-	-	-	-	-	-	-	-
Lighting	CY2018 and CY2019 Carryover	2,152,050	1,941,998	1,941,998	-	-	-	-	-	-	-	-	-
CY2020 Program Total Contribution to CPAS		33,935,531	32,645,214	32,645,214	-	-	-	-	-	-	-	-	-
Historic Program Total Contribution to CPAS‡		31,480,463	28,056,325	5,233,341	-	-	-	-	-	-	-	-	-
Program Total CPAS		65,415,994	60,701,539	37,878,555	-	-	-	-	-	-	-	-	-
CY2020 Program Incremental Expiring Savings§		15,223,921	1,290,317	-	32,645,214	-	-	-	-	-	-	-	-
Historic Program Incremental Expiring Savings‡§		3,703,019	3,424,138	22,822,984	5,233,341	-	-	-	-	-	-	-	-
Program Total Incremental Expiring Savings§		18,926,940	4,714,455	22,822,984	37,878,555	-	-	-	-	-	-	-	-

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 no contribution to calculating CPAS in CY2020.

*A deemed value. Source found on the Illinois SAG website: https://www.ilsag.info/ntg_2020.

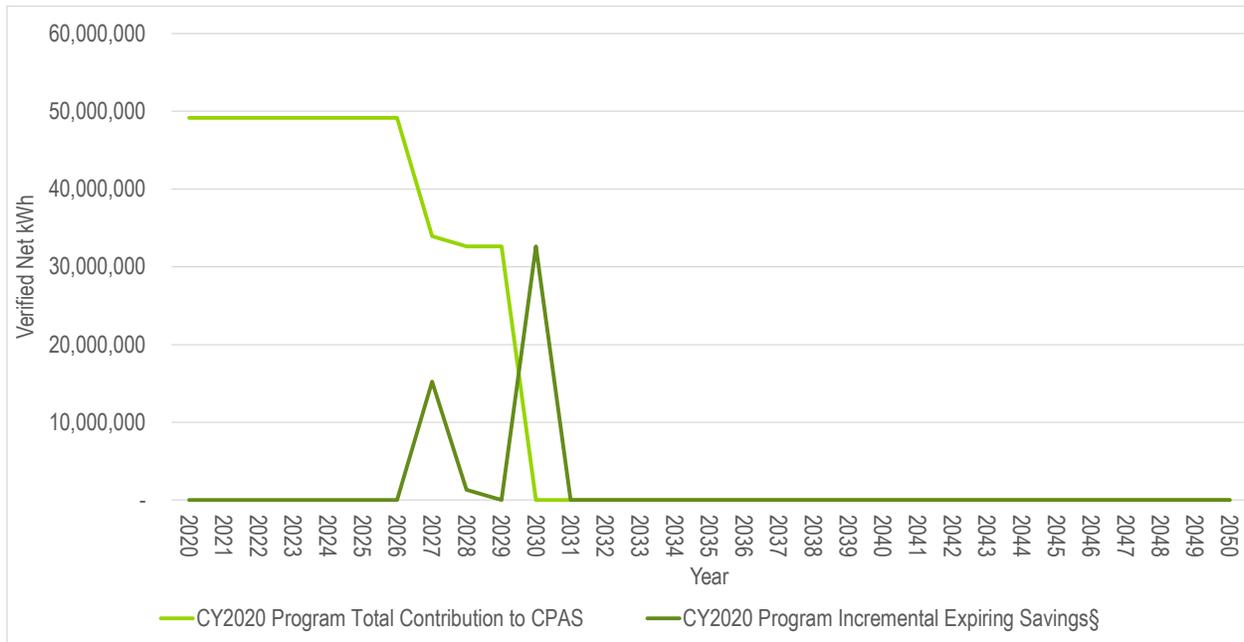
† Lifetime savings are the sum of CPAS savings through the EUL.

‡ 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



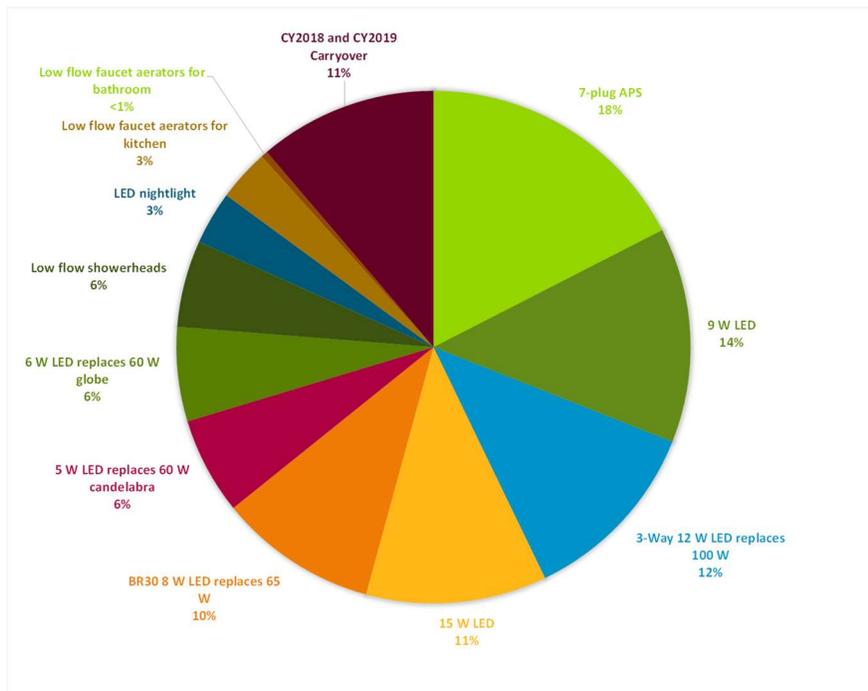
§ Expiring savings are equal to CPAS Y_{n-1} - CPAS Y_n .

Source: Evaluation team analysis

5. Program Savings by Measure

The program includes 12 measures, as the following tables show. The APS and 9 W LED measures contributed the most savings (see Figure 5-1). Carryover savings from CY2018 and CY2019 accounted for 11% 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. CY2020 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)
Consumer Electronics	7-plug APS	5,623,800	1.00	5,623,800	1.00	5,623,800	7.0
Lighting	9 W LED	4,373,499	1.00	4,373,499	1.00	4,373,499	10.0
Lighting	3-Way 12 W LED replaces 100 W	2,654,793	1.44	3,811,892	1.00	3,811,892	10.0
Lighting	15 W LED	3,666,021	1.00	3,666,021	1.00	3,666,021	10.0
Lighting	BR30 8 W LED replaces 65 W	2,401,956	1.34	3,211,002	1.00	3,211,002	10.0
Lighting	5 W LED replaces 60 W candelabra	1,474,885	1.34	1,971,668	1.00	1,971,668	10.0
Lighting	6 W LED replaces 60 W globe	1,432,746	1.34	1,915,335	1.00	1,915,335	10.0
Hot Water	Low flow showerheads	1,493,053	1.18	1,764,655	1.00	1,764,655	10.0
Lighting	LED nightlight	1,080,266	1.00	1,080,266	1.00	1,080,266	8.0
Hot Water	Low flow faucet aerators for kitchen	861,660	1.22	1,050,919	1.00	1,050,919	10.0
Hot Water	Low flow faucet aerators for bathroom	91,135	1.48	135,236	1.00	135,236	10.0
Lighting	CY2018 and CY2019 Carryover	NR	NA	3,617,066	1.00	3,617,066	8.7
Total†		25,153,800	1.28§	32,221,357	NA	32,221,357	NA

NR = not reported (refers to a piece of data that was not reported)

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

Note: The savings in this table include secondary electric energy (kWh) savings from water supply and wastewater treatment plants for measures claimed by ComEd. The savings account for electric heating penalties, where applicable.

*A deemed value. Source found on the Illinois SAG website: https://www.ilsag.info/ntg_2020.

† The program ex ante gross savings shown in this table matches the program’s scorecard value, which is calculated from kit-level savings. Guidehouse calculates verified savings at the measure level. Due to rounding issues, the total ex ante savings from measure level data is 25,153,813 kWh, which is the value that will appear in the CY2020 Summary Report.

§ The overall program realization rate includes verified gross carryover savings in the program savings totals. The overall program realization rate excluding verified carryover savings is 1.14.

Source: ComEd tracking data and evaluation team analysis

Table 5-2. CY2020 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)
Consumer Electronics	7-plug APS	574.29	1.10	631.09	1.00	631.09
Lighting	9 WLED	529.78	1.00	529.78	1.00	529.78
Lighting	3-Way 12 WLED replaces 100 W	392.67	1.15	452.71	1.00	452.71
Lighting	15 WLED	444.08	1.00	444.08	1.00	444.08
Lighting	BR30 8 WLED replaces 65 W	355.27	1.07	381.35	1.00	381.35
Lighting	5 WLED replaces 60 W candelabra	218.15	1.07	234.16	1.00	234.16
Lighting	6 WLED replaces 60 W globe	211.92	1.07	227.47	1.00	227.47
Hot Water	Low flow showerheads	164.63	1.00	164.63	1.00	164.63
Lighting	LED nightlight	0.00	NA	0.00	1.00	0.00
Hot Water	Low flow faucet aerators for kitchen	196.60	1.00	196.60	1.00	196.60
Hot Water	Low flow faucet aerators for bathroom	121.66	1.17	142.41	1.00	142.41
Lighting	CY2018 and CY2019 Carryover	NR	NA	412.71	1.00	412.71
	Total	3,209.07	1.19§	3,817.00	1.00	3,817.00

NR = not reported (refers to a piece of data that was not reported)

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

*A deemed value. Source found on the Illinois SAG website: https://www.ilsag.info/ntg_2020.

§ The overall program realization rate includes verified gross carryover savings in the program savings totals. The overall program realization rate excluding verified carryover savings is 1.06.

Source: ComEd tracking data and evaluation team analysis

Table 5-3. CY2020 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)
Consumer Electronics	7-plug APS	0	NA	0	1.00	0	7.0
Lighting	9 WLED	0	NA	0	1.00	0	10.0
Lighting	3-Way 12 WLED replaces 100 W	0	NA	0	1.00	0	10.0
Lighting	15 WLED	0	NA	0	1.00	0	10.0
Lighting	BR30 8 WLED replaces 65 W	0	NA	0	1.00	0	10.0
Lighting	5 WLED replaces 60 W candelabra	0	NA	0	1.00	0	10.0
Lighting	6 WLED replaces 60 W globe	0	NA	0	1.00	0	10.0
Hot Water	Low flow showerheads	352,680	1.00	352,399	1.00	352,399	10.0
Lighting	LED nightlight	0	NA	0	1.00	0	8.0
Hot Water	Low flow faucet aerators for kitchen	200,108	1.00	200,276	1.00	200,276	10.0
Hot Water	Low flow faucet aerators for bathroom	21,567	1.17	25,220	1.00	25,220	10.0
Lighting	CY2018 and CY2019 Carryover	NR	NA	0	1.00	0	8.7
	Total Therms	574,380	1.01	577,895	1.00	577,895	NA
	Total kWh Converted From Therms†	16,835,078	1.01	16,938,095	1.00	16,938,095	NA

NR = not reported (refers to a piece of data that was not reported)

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

*A deemed value. Source found on the Illinois SAG website: https://www.ilsag.info/ntg_2020.

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

Source: ComEd tracking data and evaluation team analysis

Table 5-4. CY2020 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)
Consumer Electronics	7-plug APS	5,623,800	1.00	5,623,800	1.00	5,623,800
Lighting	9 WLED	4,373,499	1.00	4,373,499	1.00	4,373,499
Lighting	3-Way 12 WLED replaces 100 W	2,654,793	1.44	3,811,892	1.00	3,811,892
Lighting	15 WLED	3,666,021	1.00	3,666,021	1.00	3,666,021
Lighting	BR30 8 WLED replaces 65 W	2,401,956	1.34	3,211,002	1.00	3,211,002
Lighting	5 WLED replaces 60 W candelabra	1,474,885	1.34	1,971,668	1.00	1,971,668
Lighting	6 WLED replaces 60 W globe	1,432,746	1.34	1,915,335	1.00	1,915,335
Hot Water	Low flow showerheads	11,830,111	1.02	12,093,465	1.00	12,093,465
Lighting	LED nightlight	1,080,266	1.00	1,080,266	1.00	1,080,266
Hot Water	Low flow faucet aerators for kitchen	6,726,822	1.03	6,921,007	1.00	6,921,007
Hot Water	Low flow faucet aerators for bathroom	723,273	1.21	874,431	1.00	874,431
Lighting	CY2018 and CY2019 Carryover	NA	NA	3,617,066	1.00	3,617,066
Total†		41,988,878	1.17§	49,159,452	1.00	49,159,452

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

*A deemed value. Source found on the Illinois SAG website: https://www.ilsag.info/ntg_2020.

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

§ The overall program realization rate includes verified gross carryover savings in the program savings totals. The overall program realization rate excluding verified carryover savings is 1.08.

Source: ComEd tracking data and evaluation team analysis

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

Table 5-5. 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)
Consumer Electronics	7-plug APS	0	NR	NA	0	1.00	0
Lighting	9 WLED	0	NR	NA	0	1.00	0
Lighting	3-Way 12 WLED replaces 100 W	0	NR	NA	0	1.00	0
Lighting	15 WLED	0	NR	NA	0	1.00	0
Lighting	BR30 8 WLED replaces 65 W	0	NR	NA	0	1.00	0
Lighting	5 WLED replaces 60 W candelabra	0	NR	NA	0	1.00	0
Lighting	6 WLED replaces 60 W globe	0	NR	NA	0	1.00	0
Hot Water	Low flow showerheads	79,757,120	NR	NA	271,602	1.00	271,602
Lighting	LED nightlight	0	NR	NA	0	1.00	0
Hot Water	Low flow faucet aerators for kitchen	55,576,632	NR	NA	189,258	1.00	189,258
Hot Water	Low flow faucet aerators for bathroom	7,164,690	NR	NA	28,559	1.00	28,559
Lighting	CY2018 and CY2019 Carryover	NA	NR	NA	NA	1.00	NA
Total		142,496,640	NR	NA	489,419	1.00	489,419

NR = not reported (refers to a piece of data that was not reported)

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

Note: The savings in this table reflect 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 found on the Illinois SAG website: https://www.ilsag.info/ntg_2020.

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 the Illinois Statewide Technical Reference Manual (TRM) v8.0. Table 6-1 presents the key parameters and the references used in the verified gross and net savings calculations.

The team estimated the lifetime energy and demand savings by multiplying the verified savings by the EUL for each measure. The evaluation team also applied midlife baseline adjustments to the lifetime savings calculations for lighting measures following TRM v8.0 methodology.

Table 6-1. Savings Parameters

Gross Savings Input Parameters	Value	Units	Deemed or Evaluated?	Source*
Quantity	Varies	No. of measures	Evaluated	Program Tracking Data
NTG	1.0	%	Deemed	SAG Consensus
APS Measures	93.73	kWh	Deemed	TRM v8.0 – Section 5.2.1
LED Bulb Measures	Varies	kWh	Deemed	TRM v8.0 – Errata Sept. 25, 2020 – Section 5.5.8
Specialty LED Measures	Varies	kWh	Deemed	TRM v8.0 – Errata Sept. 25, 2020 – Section 5.5.6
LED Nightlight Measures	18.00	kWh	Deemed	TRM v8.0 – Section 5.5.11
Faucet Aerator Measures	Varies	kWh	Deemed	TRM v8.0 – Section 5.4.4
Low Flow Showerhead Measures	Varies	kWh	Deemed	TRM v8.0 – Section 5.4.5
EUL	Varies	Years	Mixture	TRM v8.0

*TRM is the Illinois Statewide Technical Reference Manual version 8.0 from <http://www.ilsag.info/technical-reference-manual.html>. The NTG values can be found on the Illinois SAG website: https://www.ilsag.info/ntg_2020.

Source: Evaluation team analysis

6.2 CY2021 Carryover Savings Estimates

The CY2021 carryover estimate calculation relies on the TRM v9.0 and the CY2019 and CY2020 reports. All of these data sources are available, so it is possible to estimate the gross and net carryover energy savings that the evaluation team recommends for CY2021. The energy and demand savings from these CY2019 and CY2020 deferred installs are calculated based on the following parameters:

- **Delta watts:** Verified savings estimate from the installation year (source: TRM v9.0, CY2020 program data)
- **Quantity:** Number of bulbs from the distribution year (source: impact evaluation reports)
- **Hours of Use (HOU) and Peak Coincidence Factor (CF):** Verified savings estimate from the installation year (source: TRM v9.0)

- **Energy and Demand Interactive Effects:** Verified savings estimate from the installation year (source: TRM v9.0)
- **Installation Rate:** Verified savings estimate from the distribution year (source: TRM v8.0, TRM v9.0)
- **NTG:** Deemed through the SAG consensus process

Table 6-2 shows that 61,200 bulbs distributed during CY2019 and CY2020 are expected to be installed in CY2021 within ComEd's service territory. The table provides the gross and net energy and demand savings from these carryover bulbs attributable to CY2021. Total CY2021 net carryover savings are estimated to be 2,976,571 kWh and 324 peak demand kW.

Table 6-2. CY2021 Carryover Savings

CY2021 Verified Savings Carryover Estimate	CY2019 Bulbs	CY2020 Bulbs	Carryover in CY2021
Carryover Bulbs Installed During CY2021	42,000	19,200	61,200
Average Delta Watts	36.6	40.6	37.9
Average Annual Hours of Use	1,619	1,492	1,579
Energy Interactive Effects	1.051	1.049	1.051
Demand Interactive Effects	1.094	1.089	1.092
Summer Peak Load Coincidence Factor	0.116	0.109	0.114
Carryover Gross Energy Savings (kWh)	2,043,217	933,355	2,976,571
Carryover Gross Demand Savings (kW)	1,682	848	2,531
Carryover Gross Summer Peak Demand Savings (kW)	221.33	103.16	324.49
Net-to-Gross Ratio	1.00	1.00	1.00
Carryover Net Energy Savings (kWh)	2,043,217	933,355	2,976,571
Carryover Net Demand Savings (kW)	1,682	848	2,531
Carryover Net Summer Peak Demand Savings (kW)	221.33	103.16	324.49
Effective Useful Life	9.7	9.8	9.7

Source: ComEd tracking data and evaluation team analysis

6.3 Other Impact Findings and Recommendations

The evaluation team developed several recommendations based on findings from the CY2020 evaluation. These findings suggest ways to improve the measure-level realization rates. The measure-level realization rates and program savings percentages presented in Table 6-3 give context to the team's recommendations.

Table 6-3. Measure-Level Savings and Realization Rates

End Use	Realization Rate	Percentage of Verified Net Savings
7-plug Advanced Power Strip	1.00	17%
9 W LED	1.00	14%
3-Way 12 W LED Replaces 100 W	1.44	12%
15 W LED	1.00	11%
BR30 8 W LED 65 W Replacement	1.34	10%
5 W LED 60 W Replacement Candelabra	1.34	6%
6 W LED 60 W Replacement Globe	1.34	6%
Low Flow Showerheads	1.18	5%
LED Night Light	1.00	3%
Low Flow Faucet Aerators for Kitchen	1.22	3%
Low Flow Faucet Aerators for Bathroom	1.48	<1%
CY2018 and CY2019 Carryover	NA	11%

Source: Evaluation team analysis

Finding 1. The ex ante calculations for the specialty LED lamps (candelabra, globe, 3-way, BR30) used the HOU and CF for an interior location. Together, these lamps represent 22% of the program's CY2020 net energy savings with a verified gross realization rate of 137%.

Recommendation 1. Guidehouse recommends using the HOU and CF for an unknown location from TRM v8.0 – Section 5.5.6, which is consistent with assumptions made while determining the Waste Heat Factor for Cooling Energy (WHFe), Waste Heat Factor for Cooling Demand (WHFd), and Heating Factor (HF) values.

Finding 2. The ex ante calculations for the 3-way LED measure used Watts_Base of 75 W and Watts_EE of 12 W. This measure accounted for 12% of the program's savings, and the realization rate was 1.44.

Recommendation 2. Guidehouse recommends using the average of the three wattage levels for Watts_Base and Watts_EE. The average equals 80 W for Watts_Base and 12.33 for Watts_EE.

Finding 3. The TRM v8.0 allows for secondary kWh savings derived from water supply and wastewater treatment savings to be included in total savings for aerator and low flow showerhead measures. The implementer did not include these savings in the ex ante calculations. Secondary kWh savings differ between measures installed in Cook County and measures installed outside of Cook County. The program achieved 489,419 total net secondary kWh savings from the aerator and showerhead measures distributed in CY2020. Without including secondary kWh savings in the ex post totals, the gross realization rate would be 100% for the kitchen aerator and showerhead measures and 117% for the bathroom aerator measure.

Recommendation 3. Guidehouse 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 6-4 shows the secondary

kWh savings for the aerator and showerhead measures. As the secondary kWh savings vary by location, the aerator and showerhead measures should be broken down into two measures: Cook County and outside of Cook County.

Table 6-4. Secondary kWh Savings for Aerator and Showerhead Measures

Research Category	Unit	Water Savings gal/unit	Secondary Savings kWh/unit	Source
Low flow faucet aerators for bathroom	Each	140	0.7003	TRM v8.0 – Section 5.4.4
Low flow faucet aerators for bathroom (Cook County)	Each	140	0.4105	TRM v8.0 – Section 5.4.4
Low flow faucet aerators for kitchen	Each	926	4.6406	TRM v8.0 – Section 5.4.4
Low flow faucet aerators for kitchen (Cook County)	Each	926	2.7205	TRM v8.0 – Section 5.4.4
Low flow showerheads	Each	1,329	6.6597	TRM v8.0 – Section 5.4.5
Low flow showerheads (Cook County)	Each	1,329	3.9041	TRM v8.0 – Section 5.4.5

Source: Guidehouse Analysis of CY2020 ComEd Tracking Data

Finding 4. The ex ante savings calculations for the bathroom aerator measures used the faucets per household (FPH) for bathroom faucets in a single-family home, however, the population of participants live in a variety of home types. Bathroom faucet aerators have a realization rate of 1.48 and represent less than 1% of program savings.

Recommendation 4. Guidehouse recommends using a weighted average of FPH for bathroom aerators in single-family homes (2.83) and multifamily and mobile homes (1.5). Section 5.4.4 of TRM v8.0 uses a statewide weighted average of 69% single-family and 31% multifamily homes to calculate the unknown location FPH. Applying this weighted average to the FPH for bathroom aerators in single-family homes and multifamily and mobile homes results in an FPH of 2.418.

Finding 5. The in-service rate (ISR) for the APS measure was applied twice to the peak demand ex ante calculations, once in the delta kWh and once in the kW calculation. APS measures represent 18% of program savings, and the measure has a peak demand realization rate of 1.10.

Recommendation 5. Guidehouse recommends that the ISR only be applied once to peak demand. The unit peak demand savings for the APS measure should be 0.0105 kW.

Appendix A. Impact Analysis Methodology

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

- Reviewing the savings algorithm inputs in the measure workbook for agreement with the TRM v8.0 and Errata.
- Validating savings algorithms were applied correctly.
- Cross-checking per-unit savings values in the tracking data with the verified values in the measure workbook or in the team's calculations if the workbook did not agree with the TRM v8.0.
- Multiplying the verified per-unit savings value by the quantity reported in the tracking data.

The team calculated verified net energy and demand (coincident peak and overall) savings by multiplying the verified gross savings estimates by a net-to-gross (NTG) ratio of 1.0. For CY2020, the UIC-ERC Income Eligible Kits Program's NTG estimate was defined by a consensus process through the Illinois SAG.

Appendix B. Total Resource Cost Detail

Table B-1 shows the 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) is not included in this table and will be provided to the evaluation team later.

Table B-1. Total Resource Cost Savings Summary

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag †	Gross Electric Savings (kWh)	Gross Peak Demand Reduction (kW)	Gross Gas Savings (Therms)	Gross Secondary Savings due to Water Reduction (kWh)	Gross Heating Penalty (kWh)	Gross Heating Penalty (Therms)	NTG (kWh)	NTG (Therms)	Net Electric Savings (kWh)	Net Peak Demand Reduction (kW)	Net Gas Savings (Therms)	Net Secondary Savings due to Water Reduction (kWh)	Net Heating Penalty (kWh)	Net Heating Penalty (Therms)	
Consumer Electronics	7-plug APS	Each	60,000	7.0	No	5,623,800	631.09	0	0	0	0	1.00	1.00	1.00	5,623,800	631.09	0	0	0	
Lighting	9 WLED	Lamp	120,000	10.0	No	4,373,499	529.78	0	0	-85,190	1.00	1.00	1.00	4,373,499	529.78	0	0	0	-85,190	
Lighting	3-Way 12 WLED replaces 100 W	Lamp	60,000	10.0	No	3,811,892	452.71	0	0	-74,605	1.00	1.00	1.00	3,811,892	452.71	0	0	0	-74,605	
Lighting	15 WLED	Lamp	60,000	10.0	No	3,666,021	444.08	0	0	-71,409	1.00	1.00	1.00	3,666,021	444.08	0	0	0	-71,409	
Lighting	BR30 8 WLED replaces 65 W	Lamp	60,000	10.0	No	3,211,002	381.35	0	0	-62,845	1.00	1.00	1.00	3,211,002	381.35	0	0	0	-62,845	
Lighting	5 WLED replaces 60 W candelabra	Lamp	60,000	10.0	No	1,971,668	234.16	0	0	-38,589	1.00	1.00	1.00	1,971,668	234.16	0	0	0	-38,589	
Lighting	6 WLED replaces 60 W globe	Lamp	60,000	10.0	No	1,915,335	227.47	0	0	-37,486	1.00	1.00	1.00	1,915,335	227.47	0	0	0	-37,486	
Hot Water	Low flow showerheads	Each	60,000	10.0	No	1,493,053	164.63	352,399	271,602	0	0	1.00	1.00	1.00	1,493,053	164.63	352,399	271,602	0	0
Lighting	LED nightlight	Lamp	60,000	8.0	No	1,080,266	0.00	0	0	-24,479	1.00	1.00	1.00	1,080,266	0.00	0	0	0	-24,479	
Hot Water	Low flow faucet aerators for kitchen	Each	60,000	10.0	No	861,660	196.60	200,276	189,258	0	0	1.00	1.00	1.00	861,660	196.60	200,276	189,258	0	0
Hot Water	Low flow faucet aerators for bathroom	Each	60,000	10.0	No	106,676	142.41	25,220	28,559	0	0	1.00	1.00	1.00	106,676	142.41	25,220	28,559	0	0
Lighting	CY2018 and CY2019 Carryover	Lamp	74,127	8.7	No	3,617,066	412.71	0	0	-64,869	1.00	1.00	1.00	3,617,066	412.71	0	0	0	-64,869	
Total			794,127	9.3		31,731,938	3,817	577,895	489,419	0	-459,472	1.00	1.00	1.00	31,731,938	3,817	577,895	489,419	0	-459,472

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

*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