

# ComEd Incentives – Standard Impact Evaluation Report

Energy Efficiency/Demand Response Plan:  
Program Year 2021 (CY2021)  
(1/1/2021-12/31/2021)

Prepared for:

ComEd

**FINAL**

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## 1. Introduction

This report presents the results of the impact evaluation of the CY2021 Incentives – Standard Program (Standard 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) analysis inputs. CY2021 covers January 1, 2021 through December 31, 2021.

## 2. Program Description

As part of the Business Incentives Program,<sup>1</sup> the Standard Program offers prescriptive financial incentives and a streamlined application to facilitate the implementation of energy efficiency improvements for nonresidential (commercial, industrial, and public) customers and market segments through a program network of trade allies and service providers. Eligible measures include energy efficient indoor and outdoor lighting; heating, ventilation, and air conditioning (HVAC) equipment; refrigeration; energy management systems (EMSs); commercial kitchen equipment; variable speed drives (VSDs); compressed air equipment; and other qualifying products. The program also targets new system installation opportunities (e.g., networked lighting controls) by offering incentives that bundle equipment and controls technologies. ICF International is the program implementation contractor; ICF collaborates with DNV for the program’s day-to-day operations.

The program had 2,779 participants and distributed 10,839 measure installations in CY2021 (see Table 2-1).

**Table 2-1. Number of Participants and Projects**

Participation	Private†	Public†	Total
Participants	2,289	521	2,810
Total Projects	2,594	638	3,232
Total Measure Installations*	8,926	1,913	10,839

\*Measure installations refers to the number of line items in the tracking data.

†Three projects were entered into the database with measures assigned to both private and public sectors. Guidehouse reviewed each instance individually and has assigned each site to only a single sector.

Source: ComEd tracking data and evaluation team analysis

The program included the measures shown in Table 2-2 and Figure 2-1.

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<sup>1</sup> The Business Incentives Program consists of the nonresidential Standard and Custom Programs. The incentive structure is either on a standard, per-unit basis as with most lighting measures or is custom with the incentive based on the calculated annual energy savings for the customer.

**Table 2-2. Number of Measures by Type**

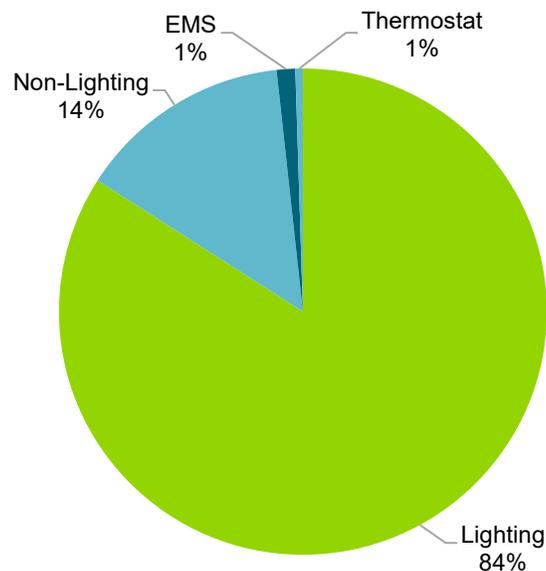
End Use Type	Research Category	Quantity
Lighting	Lighting	9,113
Non-Lighting	HVAC	550
Non-Lighting	Refrigeration	405
EMS	EMS	133
Non-Lighting	VSD	199
Non-Lighting	Compressed Air	132
Non-Lighting	Industrial Systems	43
Non-Lighting	Laboratory	17
Non-Lighting	Food Service Equipment	184
Thermostat	Thermostat	54
Non-Lighting	Commercial Laundry	9
<b>Total</b>		<b>10,839</b>

Note: Quantity of measures refers to the number of line items in the tracking data. Data is sorted by verified gross.

Source: ComEd tracking data and evaluation team analysis

In CY2021, lighting measure installations accounted for 84% of the measure mix. Non-lighting measure installations accounted for 16% of the measure mix. Figure 2-1 shows the distribution of all measures installed by end use type.

**Figure 2-1. Share of Measures Installed by End Use Type**



Source: ComEd tracking data and evaluation team analysis

### 3. Program Savings Detail

Table 3-1 summarizes the incremental energy and demand savings the Standard Program achieved in CY2021. 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.<sup>2</sup>

**Table 3-1. Total Annual Incremental Electric Savings**

Savings Category	Units	Ex Ante Gross Savings	Program Gross Realization Rate	Verified Gross Savings	Program Net-to-Gross Ratio (NTG)*	CY2019 Net Carryover Savings†	CY2020 Net Carryover Savings†	Verified Net Savings
Electric Energy Savings - Direct	kWh	262,202,631	1.02	266,168,127	Varies	N/A	N/A	205,086,296
Electric Energy Savings - Converted from Gas‡	kWh	87,914,965	1.00	87,914,965	Varies	N/A	N/A	61,540,478
Total Electric Energy Savings	kWh	350,117,596	1.01	354,083,092	Varies	N/A	N/A	266,626,774
Summer Peak§ Demand Savings	kW	44,097	1.02	44,937	Varies	N/A	N/A	35,173

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).

\*A deemed value that varies by measure. Source: Illinois Stakeholder Advisory Group (SAG) website:

<https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>. Lighting: 0.80, non-lighting: 0.70, and thermostat: 0.86

† The Standard Program does not generate carryover savings.

‡ Gas savings are 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 team 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."

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

The "Verified Net Savings" in row one (Electric Energy Savings – Direct) includes primary kWh savings as a result of measure implementation and secondary kWh savings from wastewater treatment. It does not include carryover savings and electric heating penalties as they don't apply to this program.

Source: ComEd tracking data and evaluation team analysis

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

## 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 Standard Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2021. The electric CPAS across all measures installed in 2021 is shown in Table 4-1. The CY2021 gas contribution to CPAS (converted to equivalent electricity) is shown in Table 4-2. The combined savings are shown in 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 CY2021 contribution and the historic contribution. Figure 4-1 shows the savings across the effective useful life (EUL) of the measures.

Due to the large number of Standard Program measures, the CPAS values presented in the tables of this section are aggregated by research category. The net savings reflect a year-over-year sum of all measures in a research category. The EUL values reflect averages, weighted by energy savings, of all measures in a research category.

Table 4-1 accounts for midlife adjustments to lighting measures with T12 baselines, as required by the Illinois Technical Reference Manual v9.0 (IL-TRM).<sup>3</sup> This process identifies measures with T12 baselines and calculates a remaining useful life (RUL) that is calibrated for each site based on the building type average annual hours of use (HOU). After the T12 fixture has reached the end of its RUL, the savings are derated using a coefficient of 0.57 as specified in the IL-TRM. Savings in the year this baseline shift occurs is a weighted average based on the portion of the year in the T12's RUL and the remainder of the year with the adjusted savings. Overall, 7% of the savings from affected light-emitting diode (LED) measures involved T12 baselines.

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<sup>3</sup> In this report, unless stated otherwise, IL-TRM and IL-TRM Errata refers to version 9.0 (v9.0).

**Table 4-1. Cumulative Persisting Annual Savings – Electric**

End Use Type	Research Category	EUL	CY2021 Verified Gross Savings		Lifetime Net Savings (kWh)†	Verified Net kWh Savings									
			(kWh)	NTG*		2018	2019	2020	2021	2022	2023	2024	2025	2026	
Lighting	Lighting	12.3	187,562,475	0.80	1,810,347,744				150,049,980	149,987,602	149,642,294	147,068,182	145,630,108	144,815,596	
Non-Lighting	HVAC	19.6	22,956,543	0.70	315,030,478				16,069,580	16,069,580	16,069,580	16,044,158	16,044,158	16,034,451	
Non-Lighting	Refrigeration	11.7	16,880,111	0.70	138,190,114				11,816,078	11,816,078	11,816,078	11,816,078	11,795,404	11,549,587	
EMS	EMS	15.0	13,166,533	0.70	138,248,601				9,216,573	9,216,573	9,216,573	9,216,573	9,216,573	9,216,573	
Non-Lighting	VSD	15.0	12,095,366	0.70	127,001,348				8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	
Non-Lighting	Compressed Air	12.9	6,846,490	0.70	61,692,216				4,792,543	4,792,543	4,792,543	4,792,543	4,792,543	4,792,543	
Non-Lighting	Industrial Systems	19.1	5,213,959	0.70	69,859,540				3,649,771	3,649,771	3,649,771	3,649,771	3,649,771	3,459,556	
Non-Lighting	Laboratory	2.0	800,610	0.70	1,120,853				560,427	560,427					
Non-Lighting	Food Service Equipment	16.9	567,329	0.70	6,699,092				397,131	397,131	397,131	397,131	397,131	387,098	
Thermostat	Thermostat	10.9	77,247	0.86	727,064				66,432	66,432	66,432	66,432	66,432	66,432	
Non-Lighting	Commercial Laundry	11.0	1,463	0.70	11,263				1,024	1,024	1,024	1,024	1,024	1,024	
<b>CY2021 Program Total Electric Contribution to CPAS</b>									<b>205,086,296</b>	<b>205,023,917</b>	<b>204,118,183</b>	<b>201,518,649</b>	<b>200,059,901</b>	<b>198,789,619</b>	
<b>Historic Program Total Electric Contribution to CPAS‡</b>						<b>193,038,555</b>	<b>393,456,792</b>	<b>629,349,232</b>	<b>629,136,651</b>	<b>628,284,758</b>	<b>625,216,385</b>	<b>618,322,106</b>	<b>611,599,508</b>	<b>596,795,436</b>	
<b>Program Total Electric CPAS</b>						<b>193,038,555</b>	<b>393,456,792</b>	<b>629,349,232</b>	<b>834,222,947</b>	<b>833,308,675</b>	<b>829,334,569</b>	<b>819,840,755</b>	<b>811,659,409</b>	<b>795,585,055</b>	
<b>CY2021 Program Incremental Expiring Electric Savings§</b>										<b>62,379</b>	<b>905,734</b>	<b>2,599,535</b>	<b>1,458,748</b>	<b>1,270,283</b>	
<b>Historic Program Incremental Expiring Electric Savings</b>									<b>212,581</b>	<b>851,893</b>	<b>3,068,373</b>	<b>6,894,279</b>	<b>6,722,599</b>	<b>14,804,071</b>	
<b>Program Total Incremental Expiring Electric Savings</b>									<b>212,581</b>	<b>914,272</b>	<b>3,974,107</b>	<b>9,493,814</b>	<b>8,181,346</b>	<b>16,074,354</b>	
End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038		
Lighting	Lighting	141,391,611	138,544,918	138,479,267	138,063,452	131,107,892	93,644,254	49,841,581	47,712,532	44,368,475					
Non-Lighting	HVAC	16,034,451	16,034,451	16,014,156	15,919,771	15,435,111	15,435,111	15,435,111	15,435,111	15,435,111	14,020,433	14,020,433	14,020,433		
Non-Lighting	Refrigeration	11,549,587	11,549,587	9,492,734	6,169,127	5,892,219	5,748,777	5,748,777	5,695,427	5,695,427	39,149				
EMS	EMS	9,216,573	9,216,573	9,216,573	9,216,573	9,216,573	9,216,573	9,216,573	9,216,573	9,216,573					
Non-Lighting	VSD	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757					
Non-Lighting	Compressed Air	4,792,543	4,792,543	4,792,543	4,792,543	4,570,486	4,570,486	4,570,486	27,662	27,662					
Non-Lighting	Industrial Systems	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	2,813,138	2,813,138	2,813,138		
Non-Lighting	Laboratory														
Non-Lighting	Food Service Equipment	387,098	387,098	387,098	383,112	383,112	383,112	251,964	251,964	251,964	251,964	251,964	251,964		
Thermostat	Thermostat	66,432	66,432	66,432	66,432	62,740									
Non-Lighting	Commercial Laundry	1,024	1,024	1,024	1,024	1,024									
<b>CY2021 Program Total Electric Contribution to CPAS</b>		<b>195,365,633</b>	<b>192,518,940</b>	<b>190,376,142</b>	<b>186,538,348</b>	<b>178,595,471</b>	<b>140,924,627</b>	<b>96,990,805</b>	<b>90,265,582</b>	<b>86,921,525</b>	<b>17,124,684</b>	<b>17,085,535</b>	<b>17,085,535</b>		
<b>Historic Program Total Electric Contribution to CPAS‡</b>		<b>555,352,525</b>	<b>472,602,245</b>	<b>434,619,678</b>	<b>359,935,437</b>	<b>268,229,312</b>	<b>197,952,831</b>	<b>142,416,976</b>	<b>96,475,602</b>	<b>22,817,924</b>	<b>22,770,627</b>	<b>22,770,627</b>	<b>17,346,899</b>		
<b>Program Total Electric CPAS</b>		<b>750,718,158</b>	<b>665,121,186</b>	<b>624,995,820</b>	<b>546,473,786</b>	<b>446,824,783</b>	<b>338,877,458</b>	<b>239,407,781</b>	<b>186,741,183</b>	<b>109,739,449</b>	<b>39,895,311</b>	<b>39,856,162</b>	<b>34,432,434</b>		
<b>CY2021 Program Incremental Expiring Electric Savings§</b>		<b>3,423,986</b>	<b>2,846,693</b>	<b>2,142,799</b>	<b>3,837,793</b>	<b>7,942,877</b>	<b>37,670,845</b>	<b>43,933,821</b>	<b>6,725,223</b>	<b>3,344,056</b>	<b>69,796,841</b>	<b>39,149</b>	<b>-</b>		
<b>Historic Program Incremental Expiring Electric Savings</b>		<b>41,442,912</b>	<b>82,750,279</b>	<b>37,982,567</b>	<b>74,684,241</b>	<b>91,706,125</b>	<b>70,276,481</b>	<b>55,535,856</b>	<b>45,941,374</b>	<b>73,657,678</b>	<b>47,297</b>	<b>-</b>	<b>5,423,728</b>		
<b>Program Total Incremental Expiring Electric Savings</b>		<b>44,866,897</b>	<b>85,596,972</b>	<b>40,125,366</b>	<b>78,522,035</b>	<b>99,649,003</b>	<b>107,947,325</b>	<b>99,469,677</b>	<b>52,666,597</b>	<b>77,001,734</b>	<b>69,844,138</b>	<b>39,149</b>	<b>5,423,728</b>		

End Use Type	Research Category	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Lighting	Lighting												
Non-Lighting	HVAC	14,020,433	14,020,433	2,335,043	2,335,043	2,335,043	206,645	206,645					
Non-Lighting	Refrigeration												
EMS	EMS												
Non-Lighting	VSD												
Non-Lighting	Compressed Air												
Non-Lighting	Industrial Systems	2,813,138	2,813,138	589,886	589,886	589,886	589,886	589,886					
Non-Lighting	Laboratory												
Non-Lighting	Food Service Equipment	251,964	251,964										
Thermostat	Thermostat												
Non-Lighting	Commercial Laundry												
<b>CY2021 Program Total Electric Contribution to CPAS</b>		<b>17,085,535</b>	<b>17,085,535</b>	<b>2,924,929</b>	<b>2,924,929</b>	<b>2,924,929</b>	<b>796,531</b>	<b>796,531</b>	-	-	-	-	-
<b>Historic Program Total Electric Contribution to CPAS†</b>		<b>16,304,243</b>	<b>14,379,087</b>	<b>14,379,087</b>	<b>7,142,141</b>	<b>515,454</b>	<b>456,303</b>	-	-	-	-	-	-
<b>Program Total Electric CPAS</b>		<b>33,389,779</b>	<b>31,464,622</b>	<b>17,304,016</b>	<b>10,067,070</b>	<b>3,440,382</b>	<b>1,252,834</b>	<b>796,531</b>	-	-	-	-	-
<b>CY2021 Program Incremental Expiring Electric Savings‡</b>		-	-	<b>14,160,606</b>	-	-	<b>2,128,398</b>	-	<b>796,531</b>	-	-	-	-
<b>Historic Program Incremental Expiring Electric Savings</b>		<b>1,042,655</b>	<b>1,925,156</b>	-	<b>7,236,946</b>	<b>6,626,688</b>	<b>59,150</b>	<b>456,303</b>	-	-	-	-	-
<b>Program Total Incremental Expiring Electric Savings</b>		<b>1,042,655</b>	<b>1,925,156</b>	<b>14,160,606</b>	<b>7,236,946</b>	<b>6,626,688</b>	<b>2,187,548</b>	<b>456,303</b>	<b>796,531</b>	-	-	-	-

Note: The green highlighted cell shows program total first-year electric savings. The gray cells are blank, indicating values irrelevant to the CY2021 contribution to CPAS.

\* A deemed value. Source: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

† 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

**Table 4-2. Cumulative Persisting Annual Savings – Gas**

End Use Type	Research Category	CY2021 Verified Gross Savings			Lifetime Net Savings (Therms)†	Verified Net Therms Savings								
		EUL	(Therms)	NTG*		2018	2019	2020	2021	2022	2023	2024	2025	2026
Lighting	Lighting	12.3	-	0.80	-									
Non-Lighting	HVAC	12.2	30,044	0.70	257,088				21,031	21,031	21,031	21,031	21,031	21,026
Non-Lighting	Refrigeration	11.7	-	0.70	-									
EMS	EMS	15.0	2,912,740	0.70	30,583,775				2,038,918	2,038,918	2,038,918	2,038,918	2,038,918	2,038,918
Non-Lighting	VSD	15.0	-	0.70	-									
Non-Lighting	Compressed Air	12.9	-	0.70	-									
Non-Lighting	Industrial Systems	19.1	-	0.70	-									
Non-Lighting	Laboratory	2.0	-	0.70	-									
Non-Lighting	Food Service Equipment	20.0	56,702	0.70	793,822				39,691	39,691	39,691	39,691	39,691	39,691
Thermostat	Thermostat	11.0	1	0.86	5				0.5	0.5	0.5	0.5	0.5	0.5
Non-Lighting	Commercial Laundry	11.0	-	0.70	-									
<b>CY2021 Program Total Gas Contribution to CPAS (Therms)</b>			<b>2,999,487</b>		<b>31,634,690</b>				<b>2,099,641</b>	<b>2,099,641</b>	<b>2,099,641</b>	<b>2,099,641</b>	<b>2,099,641</b>	<b>2,099,636</b>
<b>CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)‡</b>									<b>61,540,478</b>	<b>61,540,478</b>	<b>61,540,478</b>	<b>61,540,478</b>	<b>61,540,478</b>	<b>61,540,331</b>
<b>Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§</b>									<b>52,270,178</b>	<b>69,103,090</b>	<b>183,786,174</b>	<b>183,786,174</b>	<b>183,786,174</b>	<b>183,617,931</b>
<b>Program Total Gas CPAS (kWh Equivalent)</b>									<b>52,270,178</b>	<b>69,103,090</b>	<b>183,786,174</b>	<b>245,326,652</b>	<b>245,326,652</b>	<b>245,158,262</b>
<b>CY2021 Program Incremental Expiring Gas Savings (Therms)</b>														<b>5</b>
<b>CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)  </b>														<b>147</b>
<b>Historic Program Incremental Expiring Gas Savings (kWh Equivalent)</b>													<b>168,243</b>	<b>-</b>
<b>Program Total Incremental Expiring Gas Savings (kWh Equivalent)</b>													<b>168,243</b>	<b>147</b>
End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	
Lighting	Lighting													
Non-Lighting	HVAC	21,026	21,026	21,026	21,026	9,360	9,360	9,360	9,360	9,360				
Non-Lighting	Refrigeration													
EMS	EMS	2,038,918	2,038,918	2,038,918	2,038,918	2,038,918	2,038,918	2,038,918	2,038,918	2,038,918				
Non-Lighting	VSD													
Non-Lighting	Compressed Air													
Non-Lighting	Industrial Systems													
Non-Lighting	Laboratory													
Non-Lighting	Food Service Equipment	39,691	39,691	39,691	39,691	39,691	39,691	39,691	39,691	39,691	39,691	39,691	39,691	
Thermostat	Thermostat	0.5	0.5	0.5	0.5	0.5								
Non-Lighting	Commercial Laundry													
<b>CY2021 Program Total Gas Contribution to CPAS (Therms)</b>		<b>2,099,636</b>	<b>2,099,636</b>	<b>2,099,636</b>	<b>2,099,636</b>	<b>2,087,970</b>	<b>2,087,970</b>	<b>2,087,970</b>	<b>2,087,970</b>	<b>2,087,970</b>	<b>39,691</b>	<b>39,691</b>	<b>39,691</b>	
<b>CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)‡</b>		<b>61,540,331</b>	<b>61,540,331</b>	<b>61,540,331</b>	<b>61,540,331</b>	<b>61,198,410</b>	<b>61,198,396</b>	<b>61,198,396</b>	<b>61,198,396</b>	<b>61,198,396</b>	<b>1,163,347</b>	<b>1,163,347</b>	<b>1,163,347</b>	
<b>Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§</b>		<b>183,617,931</b>	<b>182,148,190</b>	<b>181,341,357</b>	<b>180,720,574</b>	<b>180,363,725</b>	<b>180,363,725</b>	<b>129,563,288</b>	<b>113,537,210</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	
<b>Program Total Gas CPAS (kWh Equivalent)</b>		<b>245,158,262</b>	<b>243,688,521</b>	<b>242,881,688</b>	<b>242,260,905</b>	<b>241,562,136</b>	<b>241,562,122</b>	<b>190,761,684</b>	<b>174,735,606</b>	<b>61,198,396</b>	<b>1,163,347</b>	<b>1,163,347</b>	<b>1,163,347</b>	
<b>CY2021 Program Incremental Expiring Gas Savings (Therms)</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>11,666</b>	<b>0</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2,048,279</b>	<b>-</b>	<b>-</b>	
<b>CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)  </b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>341,920</b>	<b>14</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>60,035,050</b>	<b>-</b>	<b>-</b>	
<b>Historic Program Incremental Expiring Gas Savings (kWh Equivalent)</b>		<b>-</b>	<b>1,469,741</b>	<b>806,834</b>	<b>620,783</b>	<b>356,849</b>	<b>-</b>	<b>50,800,438</b>	<b>16,026,078</b>	<b>113,537,210</b>	<b>-</b>	<b>-</b>	<b>-</b>	
<b>Program Total Incremental Expiring Gas Savings (kWh Equivalent)</b>		<b>-</b>	<b>1,469,741</b>	<b>806,834</b>	<b>620,783</b>	<b>698,769</b>	<b>14</b>	<b>50,800,438</b>	<b>16,026,078</b>	<b>113,537,210</b>	<b>60,035,050</b>	<b>-</b>	<b>-</b>	

End Use Type	Research Category	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Lighting	Lighting												
Non-Lighting	HVAC												
Non-Lighting	Refrigeration												
EMS	EMS												
Non-Lighting	VSD												
Non-Lighting	Compressed Air												
Non-Lighting	Industrial Systems												
Non-Lighting	Laboratory												
Non-Lighting	Food Service Equipment	39,691	39,691										
Thermostat	Thermostat												
Non-Lighting	Commercial Laundry												
<b>CY2021 Program Total Gas Contribution to CPAS (Therms)</b>		<b>39,691</b>	<b>39,691</b>	-	-	-	-	-	-	-	-	-	-
<b>CY2021 Program Total Gas Contribution to CPAS (kWh Equivalent)†</b>		<b>1,163,347</b>	<b>1,163,347</b>	-	-	-	-	-	-	-	-	-	-
<b>Historic Program Total Gas Contribution to CPAS (kWh Equivalent)§</b>		-	-	-	-	-	-	-	-	-	-	-	-
<b>Program Total Gas CPAS (kWh Equivalent)</b>		<b>1,163,347</b>	<b>1,163,347</b>	-	-	-	-	-	-	-	-	-	-
<b>CY2021 Program Incremental Expiring Gas Savings (Therms)</b>		-	-	39,691	-	-	-	-	-	-	-	-	-
<b>CY2021 Program Incremental Expiring Gas Savings (kWh Equivalent)  </b>		-	-	1,163,347	-	-	-	-	-	-	-	-	-
<b>Historic Program Incremental Expiring Gas Savings (kWh Equivalent)</b>		-	-	-	-	-	-	-	-	-	-	-	-
<b>Program Total Incremental Expiring Gas Savings (kWh Equivalent)</b>		-	-	1,163,347	-	-	-	-	-	-	-	-	-

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 CY2021.

\* A deemed value. Source: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

† 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 – Total**

		CY2021 Verified Gross Savings				Verified Net kWh Savings (Including Those Converted from Gas Savings)										
End Use Type	Research Category	EUL	(kWh)	NTG*	Lifetime Net Savings (kWh)†	2018	2019	2020	2021	2022	2023	2024	2025	2026		
Lighting	Lighting	12.3	187,562,475	0.80	1,810,347,744				150,049,980	149,987,602	149,642,294	147,068,182	145,630,108	144,815,596		
Non-Lighting	HVAC	19.6	23,837,144	0.70	322,565,717				16,686,001	16,686,001	16,686,001	16,660,578	16,660,578	16,650,725		
Non-Lighting	Refrigeration	11.7	16,880,111	0.70	138,190,114				11,816,078	11,816,078	11,816,078	11,816,078	11,795,404	11,549,587		
EMS	EMS	15.0	98,538,957	0.70	1,034,659,051				68,977,270	68,977,270	68,977,270	68,977,270	68,977,270	68,977,270		
Non-Lighting	VSD	15.0	12,095,366	0.70	127,001,348				8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757		
Non-Lighting	Compressed Air	12.9	6,846,490	0.70	61,692,216				4,792,543	4,792,543	4,792,543	4,792,543	4,792,543	4,792,543		
Non-Lighting	Industrial Systems	19.1	5,213,959	0.70	69,859,540				3,649,771	3,649,771	3,649,771	3,649,771	3,649,771	3,459,556		
Non-Lighting	Laboratory	2.0	800,610	0.70	1,120,853				560,427	560,427						
Non-Lighting	Food Service Equipment	16.9	2,229,253	0.70	29,966,024				1,560,477	1,560,477	1,560,477	1,560,477	1,560,477	1,550,445		
Thermostat	Thermostat	10.9	77,263	0.86	727,216				66,446	66,446	66,446	66,446	66,446	66,446		
Non-Lighting	Commercial Laundry	11.0	1,463	0.70	11,263				1,024	1,024	1,024	1,024	1,024	1,024		
<b>CY2021 Program Total Contribution to CPAS</b>			<b>354,083,092</b>		<b>3,596,141,086</b>				<b>266,626,774</b>	<b>266,564,395</b>	<b>265,658,661</b>	<b>263,059,127</b>	<b>261,600,379</b>	<b>260,329,950</b>		
<b>Historic Program Total Contribution to CPAS‡</b>						<b>245,308,733</b>	<b>462,559,882</b>	<b>813,135,405</b>	<b>812,922,825</b>	<b>812,070,932</b>	<b>809,002,559</b>	<b>802,108,280</b>	<b>795,217,439</b>	<b>780,413,367</b>		
<b>Program Total CPAS</b>						<b>245,308,733</b>	<b>462,559,882</b>	<b>813,135,405</b>	<b>1,079,549,599</b>	<b>1,078,635,327</b>	<b>1,074,661,221</b>	<b>1,065,167,407</b>	<b>1,056,817,818</b>	<b>1,040,743,317</b>		
<b>CY2021 Program Incremental Expiring Savings§</b>									<b>62,379</b>	<b>905,734</b>	<b>2,599,535</b>	<b>1,458,748</b>	<b>1,270,430</b>			
<b>Historic Program Incremental Expiring Savings</b>									<b>212,581</b>	<b>851,893</b>	<b>3,068,373</b>	<b>6,894,279</b>	<b>6,890,842</b>	<b>14,804,071</b>		
<b>Program Total Incremental Expiring Savings</b>									<b>212,581</b>	<b>914,272</b>	<b>3,974,107</b>	<b>9,493,814</b>	<b>8,349,589</b>	<b>16,074,501</b>		
End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038			
Lighting	Lighting	141,391,611	138,544,918	138,479,267	138,063,452	131,107,892	93,644,254	49,841,581	47,712,532	44,368,475						
Non-Lighting	HVAC	16,650,725	16,650,725	16,630,430	16,536,045	15,709,464	15,709,464	15,709,464	15,709,464	15,709,464	14,020,433	14,020,433	14,020,433			
Non-Lighting	Refrigeration	11,549,587	11,549,587	9,492,734	6,169,127	5,892,219	5,748,777	5,748,777	5,695,427	5,695,427	39,149					
EMS	EMS	68,977,270	68,977,270	68,977,270	68,977,270	68,977,270	68,977,270	68,977,270	68,977,270	68,977,270						
Non-Lighting	VSD	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757	8,466,757						
Non-Lighting	Compressed Air	4,792,543	4,792,543	4,792,543	4,792,543	4,570,486	4,570,486	4,570,486	27,662	27,662						
Non-Lighting	Industrial Systems	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	3,459,556	2,813,138	2,813,138	2,813,138			
Non-Lighting	Laboratory															
Non-Lighting	Food Service Equipment	1,550,445	1,550,445	1,550,445	1,546,459	1,546,459	1,546,459	1,415,310	1,415,310	1,415,310	1,415,310	1,415,310	1,415,310			
Thermostat	Thermostat	66,446	66,446	66,446	66,446	62,754										
Non-Lighting	Commercial Laundry	1,024	1,024	1,024	1,024	1,024										
<b>CY2021 Program Total Contribution to CPAS</b>		<b>256,905,964</b>	<b>254,059,271</b>	<b>251,916,473</b>	<b>248,078,679</b>	<b>239,793,881</b>	<b>202,123,023</b>	<b>158,189,202</b>	<b>151,463,978</b>	<b>148,119,922</b>	<b>18,288,031</b>	<b>18,248,882</b>	<b>18,248,882</b>			
<b>Historic Program Total Contribution to CPAS‡</b>		<b>738,970,456</b>	<b>654,750,436</b>	<b>615,961,035</b>	<b>540,656,011</b>	<b>448,593,037</b>	<b>378,316,556</b>	<b>271,980,263</b>	<b>210,012,811</b>	<b>22,817,924</b>	<b>22,770,627</b>	<b>22,770,627</b>	<b>17,346,899</b>			
<b>Program Total CPAS</b>		<b>995,876,420</b>	<b>908,809,707</b>	<b>867,877,508</b>	<b>788,734,690</b>	<b>688,386,919</b>	<b>580,439,579</b>	<b>430,169,465</b>	<b>361,476,789</b>	<b>170,937,846</b>	<b>41,058,658</b>	<b>41,019,509</b>	<b>35,595,780</b>			
<b>CY2021 Program Incremental Expiring Savings§</b>		<b>3,423,986</b>	<b>2,846,693</b>	<b>2,142,799</b>	<b>3,837,793</b>	<b>8,284,798</b>	<b>37,670,858</b>	<b>43,933,821</b>	<b>6,725,223</b>	<b>3,344,056</b>	<b>129,831,891</b>	<b>39,149</b>	<b>-</b>			
<b>Historic Program Incremental Expiring Savings</b>		<b>41,442,912</b>	<b>84,220,020</b>	<b>38,789,401</b>	<b>75,305,024</b>	<b>92,062,974</b>	<b>70,276,481</b>	<b>106,336,293</b>	<b>61,967,452</b>	<b>187,194,888</b>	<b>47,297</b>	<b>-</b>	<b>5,423,728</b>			
<b>Program Total Incremental Expiring Savings</b>		<b>44,866,897</b>	<b>87,066,713</b>	<b>40,932,199</b>	<b>79,142,817</b>	<b>100,347,772</b>	<b>107,947,339</b>	<b>150,270,115</b>	<b>68,692,675</b>	<b>190,538,944</b>	<b>129,879,188</b>	<b>39,149</b>	<b>5,423,728</b>			

End Use Type	Research Category	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Lighting	Lighting												
Non-Lighting	HVAC	14,020,433	14,020,433	2,335,043	2,335,043	2,335,043	206,645	206,645					
Non-Lighting	Refrigeration												
EMS	EMS												
Non-Lighting	VSD												
Non-Lighting	Compressed Air												
Non-Lighting	Industrial Systems	2,813,138	2,813,138	589,886	589,886	589,886	589,886	589,886					
Non-Lighting	Laboratory												
Non-Lighting	Food Service Equipment	1,415,310	1,415,310										
Thermostat	Thermostat												
Non-Lighting	Commercial Laundry												
<b>CY2021 Program Total Contribution to CPAS</b>		<b>18,248,882</b>	<b>18,248,882</b>	<b>2,924,929</b>	<b>2,924,929</b>	<b>2,924,929</b>	<b>796,531</b>	<b>796,531</b>	-	-	-	-	-
<b>Historic Program Total Contribution to CPAS†</b>		<b>16,304,243</b>	<b>14,379,087</b>	<b>14,379,087</b>	<b>7,142,141</b>	<b>515,454</b>	<b>456,303</b>	-	-	-	-	-	-
<b>Program Total CPAS</b>		<b>34,553,125</b>	<b>32,627,969</b>	<b>17,304,016</b>	<b>10,067,070</b>	<b>3,440,382</b>	<b>1,252,834</b>	<b>796,531</b>	-	-	-	-	-
<b>CY2021 Program Incremental Expiring Savings§</b>		-	-	<b>15,323,953</b>	-	-	<b>2,128,398</b>	-	<b>796,531</b>	-	-	-	-
<b>Historic Program Incremental Expiring Savings</b>		<b>1,042,655</b>	<b>1,925,156</b>	-	<b>7,236,946</b>	<b>6,626,688</b>	<b>59,150</b>	<b>456,303</b>	-	-	-	-	-
<b>Program Total Incremental Expiring Savings</b>		<b>1,042,655</b>	<b>1,925,156</b>	<b>15,323,953</b>	<b>7,236,946</b>	<b>6,626,688</b>	<b>2,187,548</b>	<b>456,303</b>	<b>796,531</b>	-	-	-	-

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 CY2021.

\* A deemed value. Source: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

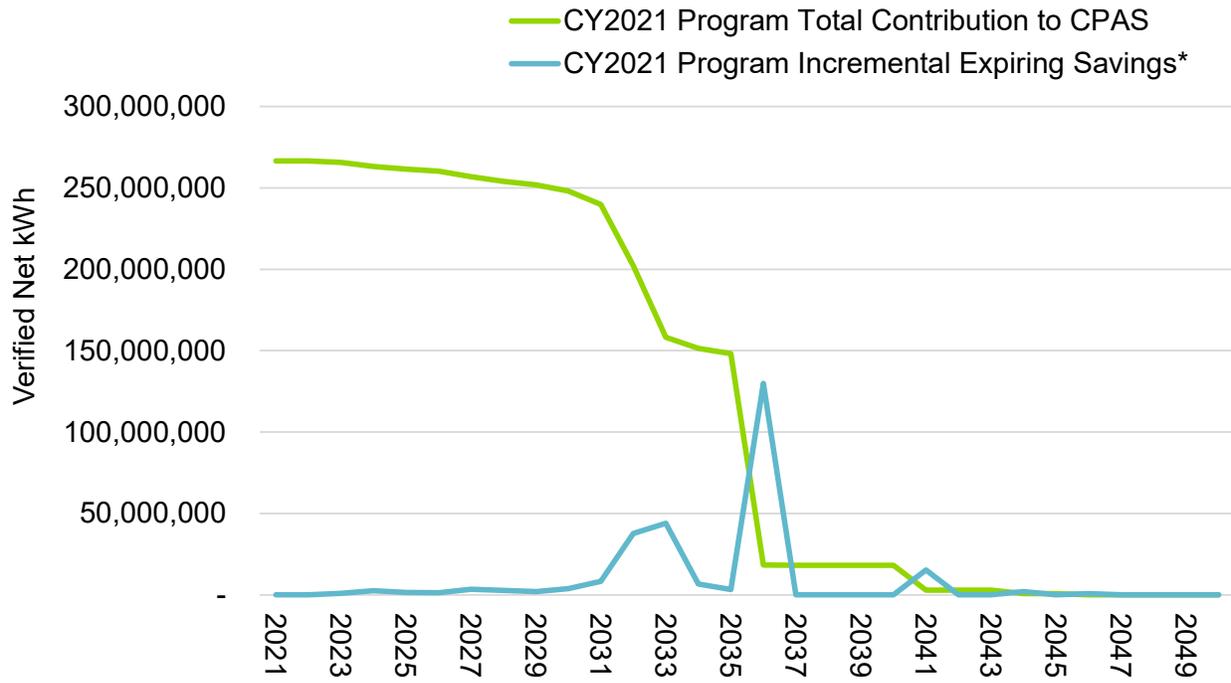
† Lifetime savings are the sum of CPAS savings through the EUL.

‡ 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 measures across 11 measure categories, as Table 5-1 and Figure 5-1 show. Lighting measures contributed the most savings.

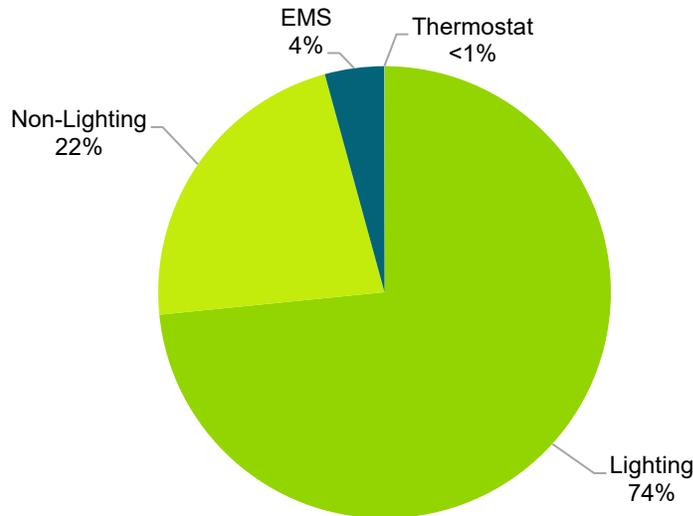
**Table 5-1. Number of Measures by Type**

End Use Type	Research Category	Quantity
Lighting	Lighting	9,113
Non-Lighting	HVAC	550
Non-Lighting	Refrigeration	405
EMS	EMS	133
Non-Lighting	VSD	199
Non-Lighting	Compressed Air	132
Non-Lighting	Industrial Systems	43
Non-Lighting	Laboratory	17
Non-Lighting	Food Service Equipment	184
Thermostat	Thermostat	54
Non-Lighting	Commercial Laundry	9
<b>Total</b>		<b>10,839</b>

Note: This is the same table as Table 2-2.

Source: ComEd tracking data and evaluation team analysis

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



Source: ComEd tracking data and evaluation team analysis

Measure-level energy and demand savings are provided in the following tables.

**Table 5-2. 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	Lighting	186,957,729	1.00	187,562,475	0.80	150,049,980	12.3
Non-Lighting	HVAC	22,247,856	1.03	22,956,543	0.70	16,069,580	19.6
Non-Lighting	Refrigeration	16,046,827	1.05	16,880,111	0.70	11,816,078	11.7
EMS	EMS	13,132,426	1.00	13,166,533	0.70	9,216,573	15.0
Non-Lighting	VSD	11,400,190	1.06	12,095,366	0.70	8,466,757	15.0
Non-Lighting	Compressed Air	6,271,265	1.09	6,846,490	0.70	4,792,543	12.9
Non-Lighting	Industrial Systems	4,761,865	1.09	5,213,959	0.70	3,649,771	19.1
Non-Lighting	Laboratory	753,739	1.06	800,610	0.70	560,427	2.0
Non-Lighting	Food Service Equipment	553,851	1.02	567,329	0.70	397,131	16.9
Thermostat	Thermostat	75,454	1.02	77,247	0.86	66,432	10.9
Non-Lighting	Commercial Laundry	1,429	1.02	1,463	0.70	1,024	15.0
<b>Total</b>		<b>262,202,631</b>	<b>1.02</b>	<b>266,168,127</b>		<b>205,086,296</b>	

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: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

Source: ComEd tracking data and evaluation team analysis

**Table 5-3. 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	Lighting	35,534	1.05	37,162	0.80	29,730
Non-Lighting	HVAC	3,024	0.91	2,754	0.70	1,928
Non-Lighting	Refrigeration	2,482	0.95	2,362	0.70	1,653
EMS	EMS	0	N/A	0	0.70	0
Non-Lighting	VSD	758	0.84	638	0.70	447
Non-Lighting	Compressed Air	1,035	0.88	909	0.70	636
Non-Lighting	Industrial Systems	1,100	0.87	955	0.70	669
Non-Lighting	Laboratory	86	0.92	80	0.70	56
Non-Lighting	Food Service Equipment	70	0.99	69	0.70	49
Thermostat	Thermostat	7	0.99	7	0.86	6
Non-Lighting	Commercial Laundry	0	N/A	0	0.70	0
<b>Total</b>		<b>44,097</b>	<b>1.02</b>	<b>44,937</b>		<b>35,173</b>

\* A deemed value. Source: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

N/A is not applicable.

Source: ComEd tracking data and evaluation team analysis

The Standard Program offers two measures that save water,<sup>4</sup> each of which had a single instance reported in CY2021. The water savings from these two measures produce secondary kWh savings from water supply and wastewater treatment. The IL-TRM provides the necessary conversion factor to assess these secondary energy savings; both of the CY2021 projects with these water savings measures are located in Cook County. Table 5-4 shows the secondary measure-level savings. The savings in this table are included in the verified electricity savings as reported in the previous tables in this section.

<sup>4</sup> Pre-rinse spray valves and ENERGY STAR steam cookers.

**Table 5-4. 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 <sub>water</sub> )	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Lighting	Lighting	NR	NR	N/A	0	0.80	0
Non-Lighting	HVAC	NR	NR	N/A	0	0.70	0
Non-Lighting	Refrigeration	NR	NR	N/A	0	0.70	0
EMS	EMS	NR	NR	N/A	0	0.70	0
Non-Lighting	VSD	NR	NR	N/A	0	0.70	0
Non-Lighting	Compressed Air	NR	NR	N/A	0	0.70	0
Non-Lighting	Industrial Systems	NR	NR	N/A	0	0.70	0
Non-Lighting	Laboratory	NR	NR	N/A	0	0.70	0
Non-Lighting	Food Service Equipment	NR	NR	N/A	282	0.70	198
Thermostat	Thermostat	NR	NR	N/A	0	0.86	0
Non-Lighting	Commercial Laundry	NR	NR	N/A	0	0.70	0
<b>Total</b>		<b>NR</b>	<b>NR</b>	<b>N/A</b>	<b>282</b>		<b>198</b>

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.

NR = Not reported (refers a piece of data that was not reported in the data).

\* A deemed value. Source: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

N/A is not applicable.

Source: ComEd tracking data and evaluation team analysis

**Table 5-5. 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	Lighting	0	N/A	0	0.80	0	12.3
Non-Lighting	HVAC	30,044	1.00	30,044	0.70	21,031	19.6
Non-Lighting	Refrigeration	0	N/A	0	0.70	0	11.7
EMS	EMS	2,912,740	1.00	2,912,740	0.70	2,038,918	15.0
Non-Lighting	VSD	0	N/A	0	0.70	0	15.0
Non-Lighting	Compressed Air	0	N/A	0	0.70	0	12.9
Non-Lighting	Industrial Systems	0	N/A	0	0.70	0	19.1
Non-Lighting	Laboratory	0	N/A	0	0.70	0	2.0
Non-Lighting	Food Service Equipment	56,702	1.00	56,702	0.70	39,691	16.9
Thermostat	Thermostat	1	N/A	1	0.86	0	10.9
Non-Lighting	Commercial Laundry	0	N/A	0	0.70	0	15.0
<b>Total Therms</b>		<b>2,999,487</b>	<b>1.00</b>	<b>2,999,487</b>		<b>2,099,641</b>	
<b>Total kWh Converted From Therms†</b>		<b>87,914,965</b>	<b>1.00</b>	<b>87,914,965</b>		<b>61,540,478</b>	

\* A deemed value. Source: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

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

N/A is not applicable

Source: ComEd tracking data and evaluation team analysis

**Table 5-6. Energy Savings by Measure – Total**

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Lighting	Lighting	186,957,729	1.00	187,562,475	0.80	150,049,980
Non-Lighting	HVAC	23,128,458	1.03	23,837,144	0.70	16,686,001
Non-Lighting	Refrigeration	16,046,827	1.05	16,880,111	0.70	11,816,078
EMS	EMS	98,504,850	1.00	98,538,957	0.70	68,977,270
Non-Lighting	VSD	11,400,190	1.06	12,095,366	0.70	8,466,757
Non-Lighting	Compressed Air	6,271,265	1.09	6,846,490	0.70	4,792,543
Non-Lighting	Industrial Systems	4,761,865	1.09	5,213,959	0.70	3,649,771
Non-Lighting	Laboratory	753,739	1.06	800,610	0.70	560,427
Non-Lighting	Food Service Equipment	2,215,775	1.01	2,229,253	0.70	1,560,477
Thermostat	Thermostat	75,470	1.02	77,263	0.86	66,446
Non-Lighting	Commercial Laundry	1,429	1.02	1,463	0.70	1,024
<b>Total†</b>		<b>350,117,596</b>	<b>1.01</b>	<b>354,083,092</b>		<b>266,626,774</b>

\* A deemed value. Source: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

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

Source: ComEd tracking data and evaluation team analysis

## 6. Impact Analysis Findings and Recommendations

Overall realization rate for the Incentives – Standard program in CY2021 is very strong with an overall realization rate for the program’s reported energy (kWh) savings of 1.02. Within the sample strata, projects with primarily lighting savings have a kWh realization rate (RR) of 1.0; projects with more than half of their savings from non-lighting measures have a kWh RR of 1.05; and EMS projects a RR of 0.99.

### 6.1 Impact Parameter Estimates

**Finding 1.** The IL-TRM defines multiple office types, each with unique HOU, coincidence factors (CFs), and HVAC interactive impacts. However, the program data for a few specific subsets of building types does not use those factors straight from the IL-TRM. Rather, the program uses inputs based on an average of the building types within that subset. For example, office is the second most common building type in the CY2021 data, second only to exterior. However, the ex ante savings for offices are based on an average for each of these coefficients, not the specific values in the IL-TRM but a simple average of the IL-TRM values that the implementer documents in their Standard Workpapers. Hospitals and Grocery/Convenience/Drug Store building types are both in the top 10 most common building types in the data, and both of these also use blended averages in the data. The IL-TRM specifies hospitals based on HVAC type (similar to high-rise offices), limiting use of those distinctions to persons with specific, detailed knowledge of the site’s HVAC system. The implementer also blends Grocery, Convenience, and Drug stores as sites for which the lighting savings algorithm has somewhat similar coefficients. But these three sites do have distinctions worth noting and therefore, when sampled, the evaluation team corrects the inputs for these sites to follow the IL-TRM.

**Recommendation 1.** Ensure the most common building types are offered in as much detail as possible on the application. Subdivide office in to low-rise, mid-rise, and high-rise based on the number of floors. The IL-TRM offers additional subtypes in the office high-rise category that are based on HVAC system types. If the full list of high-rise options cannot be reliably accommodated, at minimum distinguish by number of floors.

**Finding 2.** The evaluation team corrected the building type assignment for specific projects. For instance, one batch of similar projects (e.g., STND-71647) were submitted using the retail - strip-mall building type, but the total site floor area is greater than 30,000 square feet, so these should be treated as retail – department store. The project documentation for STND-72610 indicates it is a warehouse; however, ex ante savings are based on the miscellaneous building type. For STND-73233 the project was submitted using the exterior building type while project documentation supports re-assigning this to the garage building type.

**Recommendation 2.** Confirm that all staff processing applications have a clear quick reference guide that explains the distinction between similar building types (e.g., noting that retail – strip-mall is for smaller sites whereas retail – department store is for sites above 30,000 square feet). Require engineers and staff to double check this fundamental input as part of the program’s internal quality control (QC) process.

**Finding 3.** Some lighting projects’ ex ante savings are based on LED wattages sourced from the product specification sheets. These are a reasonable option when other data is not available. However, as this program requires all incentivized fixtures to be DLC-certified, the

DesignLights Consortium (DLC) measure database provides fixture wattages based on independent third-party testing. A screenshot of the DLC reference is already included in the project supporting documentation.

**Recommendation 3.** Use the fixture wattages as provided by the DLC-approved product database.

## 6.2 Tracking Data Findings

**Finding 4.** Of measure rows, 11% are entered into the tracking database without a building type. For some projects, the building type is reported for a portion of measures but not others. Reviewing this at the project level, 8% of projects have only partially reported building type (e.g., exterior lights are noted but no building type is assigned for interior measures) and 14% of projects have no associated building type. The evaluation can update building types for the sampled projects, so this has minimal impact on first-year verified savings. However, the building type data gap reduces the evaluation team's ability to accurately forecast lifetime savings for lighting measures that do not have an associated building type.

**Recommendation 4.** Ensure that all project building types are appropriately populated in eTrack.

## 6.3 Quality Control Findings

**Finding 5.** EMS project STND-71114 did not meet the minimum threshold of three new strategies as the EMS system for this project only has one new control strategy that was not present in the baseline building (distribution pump speed control), therefore the ex post savings for this project are zero. The evaluation team made a similar yet more limited adjustment to STND-70950 after a participant interview determined that the demand controlled ventilation control point does not have an impact on system operation.

**Recommendation 5.** Ensure the program's review of EMS projects includes confirmation that the minimum number of control strategies have been incorporated into the project design and the necessary equipment is fully installed and functional.

**Finding 6.** The ex ante energy savings reported for EMS project STND-69646 represented half of the site's typical annual usage. This is far in excess of the typical savings range of 2%-10% of site energy use.

**Recommendation 6.** Update the project review process for EMS projects to include a step that checks that total project savings estimates are a reasonable portion (less than 10%) of typical annual site use. If the savings estimate exceeds this fraction, perform additional internal quality assurance checks to confirm the calculation is correct and reasonable.

**Finding 7.** After discussion with the customer, the evaluation team revised the baseline control system for project STND-72383 from non-programmable pneumatic thermostats to non-programmable electronic thermostats.

**Recommendation 7.** Ensure measure names and types are correctly documented in the project files and align with the database.

## Appendix A. Impact Analysis Methodology

This appendix describes the sample design approach for savings verification, engineering review, and site specific parameters that the evaluation team used in the impact analysis methodology. In the savings verification process, the evaluation sought to verify eligibility, quantity, and compliance with claimed per-unit savings values defined in IL-TRM. The evaluation sought to verify that the IL-TRM was applied correctly and consistently by the program, that the measure-level inputs to the algorithm were correct, and that the quantity of measures claimed through the program were correct, in place, and operational. The evaluation adjusted the variables used in the ex ante gross savings for custom variables. For such measures, ComEd provided workpaper savings documentation, but verified savings were based on engineering reviews or billing or interval data reviews to determine eligibility and savings. The evaluation team did not conduct onsite metering due to COVID-19 pandemic concerns.

Other evaluation activities to verify gross energy savings involved the steps outlined in the following sections.

### A.1 Sample Design for Savings Verification

Guidehouse examined a sample of the Standard projects using a stratified random sampling where projects were grouped into three sample strata: lighting, non-lighting, and EMS. The evaluation team classified a project as lighting or non-lighting if more than 50% of savings are from lighting or non-lighting measures. A project was classified as an EMS project if it contained an EMS measure; otherwise, it was classified as lighting or non-lighting based on which measures produced most of the project savings.

The evaluation team selected 115 projects including 69 lighting projects, 22 non-lighting projects, and 24 EMS projects. The team designed the sample to provide a 90/10 confidence level and relative precision for gross impact realization rate results for lighting, non-lighting, and EMS measures as well as the overall program. The team defined strata by project size (separately for lighting, non-lighting, and EMS projects) based on ex ante gross energy savings boundaries that placed approximately one-third of program-level savings into each stratum (large, medium, and small) for nine total sub-strata.

Overall, the sample represented 15% (38,969,311 kWh) of the population of ex ante savings (350,117,596 kWh).

**Table A-1. Standard Program Sample Details**

Strata	Population Summary			Sample Summary		
	Number of Projects (N)	Ex Ante Gross Savings (kWh)	kWh Weights	Sampled Projects (N)	Ex Ante Gross Savings (kWh)	Sampled % of Population kWh
Lighting - Large (360,000+ kWh)	68	61,386,041	0.23	18	15,888,608	26%
Lighting - Medium (125,000 kWh - 359,999 kWh)	191	60,296,801	0.23	20	7,487,001	12%
Lighting - Small (10,000 kWh - 124,999 kWh)	2,139	67,706,697	0.26	31	1,962,413	3%
Non-Lighting - Large (500,000+ kWh)	21	23,843,893	0.09	7	7,973,637	33%
Non-Lighting - Medium (100,000 kWh - 499,999 kWh)	64	14,346,568	0.05	5	932,903	7%
Non-Lighting - Small (15,000 kWh - 99,999 kWh)	623	18,672,709	0.07	10	558,419	3%
EMS - Large (200,000+ kWh)	19	12,567,500	0.05	8	3,027,979	24%
EMS - Medium (50,000 kWh - 199,999 kWh)	22	2,205,088	0.01	8	814,706	37%
EMS - Small (6,000 kWh - 49,999 kWh)	85	1,177,334	0.00	8	323,645	27%
<b>Total</b>	<b>3,232</b>	<b>262,202,631</b>	<b>1.00</b>	<b>115</b>	<b>38,969,311</b>	<b>15%</b>

Source: ComEd tracking data and evaluation team analysis

In CY2021, Guidehouse’s initial sample design lowered the estimated coefficient of variation (CV) for the lighting stratum from 0.5 (default) to 0.3 based on the assumption that the variance in the lighting stratum is relatively small. This assumption was supported by a review of precision and CV values from the most recent three evaluations of the Standard Program. The final sample frame produced a program-level precision value of 2% (kWh), which is well within the target of 10% with 90% confidence. Table A-2 provides additional detail on realization rate and population weight by stratum.

**Table A-2. Primary Electric Energy Savings (kWh) by Strata**

Sample Strata	Sample Size	Ex ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	Verified Net Savings (kWh)	% of Claimed Savings
Lighting - Large	18	61,386,041	0.98	59,883,686	47,754,968	23%
Lighting - Medium	20	60,296,801	1.03	62,159,499	49,444,083	23%
Lighting - Small	31	67,706,697	1.00	67,833,643	54,247,498	26%
Non-Lighting - Large	7	23,843,893	1.00	23,806,246	16,736,704	9%
Non-Lighting - Medium	5	14,346,568	1.21	17,376,369	12,254,521	5%
Non-Lighting - Small	10	18,672,709	1.02	19,116,731	13,402,038	7%
EMS - Large	8	12,567,500	1.00	12,531,480	8,809,183	5%
EMS - Medium	8	2,205,088	1.08	2,390,937	1,685,599	1%
EMS - Small	8	1,177,334	0.91	1,069,537	751,701	<1%

\* Net-to-gross (NTG) is a deemed value sourced from the Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>. However, non-lighting – small row indicates varies because this stratum contains a blend of non-lighting measures with a NTG of 0.70 and thermostat measures with a NTG of 0.086.

Source: ComEd tracking data and evaluation team analysis

## A.2 Engineering Review of Project Files

For each selected project, the evaluation team performed an in-depth application review to assess the engineering methods, parameters, and assumptions used to generate all ex ante impact estimates. For each measure in the sampled project, engineers estimated ex post gross savings based on their documentation review and engineering analysis. The team completed desk file reviews on all sampled projects to support deemed and non-deemed measure savings verification and program-level research.

To support this review, ComEd provided project documentation in electronic format for each sampled project. Documentation included some or all scanned files of hardcopy application forms and supporting documentation from the applicant (invoices, measure specification sheets, and vendor proposals), pre-inspection reports and photos (when required), post-inspection reports and photos (when conducted), calculation spreadsheets, a project summary report, and important email and memoranda.

### A.3 Impact Parameter Estimates

The evaluation team calculated the verified gross and net savings (energy and coincident peak demand) resulting from the CY2021 Standard Program using algorithms defined by the IL-TRM or ComEd CY2021 workpapers. Table A-3 presents the key parameters and references used in the verified gross and net savings calculations, indicating which were examined through CY2021 evaluation research and which were deemed.

**Table A-3. Savings Parameters**

Gross Savings Input Parameters	Value	Units	Deemed or Evaluated?	Source
Quantity	Varies	Varies	Evaluated	Program Tracking Database
Net-to-Gross (NTG)	Varies	N/A	Deemed	Illinois SAG Consensus*
Deemed Lighting Measure Savings Parameters: HOU, CF, Interactive Effects	Varies	N/A	Deemed	IL-TRM†
Lighting Measure ΔWatts (deemed by IL-TRM)	Varies	Watts	Deemed	IL-TRM†
Lighting Measure ΔWatts (not deemed by IL-TRM)	Varies	Watts	Evaluated	Program Documentation and CY2021 Measurement and Verification (M&V)
Deemed HVAC, Food Service, and Refrigeration Measures, principally: Electric Chillers, HVAC Equipment VSDs, Air Compressors, Motors, and Anti-Sweat Heater Controls	Varies	kWh	Deemed	IL-TRM†
Non-Deemed Non-Lighting Measures, principally: Industrial VSD, EMS, Refrigeration Cases/Doors, Refrigerated Cycling Dryers, Demand-Controlled Ventilation, Laboratory Measures	Varies	kWh	Evaluated	Program Documentation and CY2021 M&V
Verified Realization Rate on Ex Ante Gross Savings	Varies	N/A	Evaluated	CY2021 Evaluation
EUL	Varies	Years	Deemed	IL-TRM†

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).

\*A deemed value. Source: Illinois SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

† IL-TRM is the Illinois Technical Reference Manual version 9.0 from <http://www.ilsag.info/technical-reference-manual.html>.

Source: ComEd tracking data and evaluation team analysis

## A.4 Site-Specific Impact Estimates

Due to the COVID-19 pandemic, the evaluation team was unable to complete onsite work and no onsite metering was performed. However, Guidehouse used billing data in its analysis of the EMS measure savings. In CY2021, the team was able to use site-specific billing regression models for seven of 24 EMS projects sampled. For the remainder of the EMS projects, verified savings used the workpaper-based approach due to one or more of the following constraints:

- Statistics correlation or curve fit between the predicted and actual values do not meet minimum thresholds as defined by International Performance Measurement and Verification Protocol (IPMVP).
- Impacts from the COVID-19 pandemic could not be adequately accounted for and tuned out of the predicted savings.
- The billing data indicates dramatically shifts in site usage that cannot be attributed to the EMS Project.

For ComEd demand savings, summer peak hours are defined as non-holiday weekdays between 1:00 p.m. and 5:00 p.m. Central Prevailing Time from June 1 to August 31. Winter peak hours are defined as non-holiday weekdays between 6:00 a.m. and 8:00 a.m. CPT, and between 5:00 p.m. and 7:00 p.m. CPT, from January 1 to February 28. These definitions are in accordance with the PJM Manual 18B, effective August 22, 2019.<sup>5</sup>

Peak demand savings for baseline and post-retrofit conditions are the average demand kW savings for the 1:00 p.m. to 5:00 p.m. CPT weekday time period for summer and 6:00 a.m. to 8:00 a.m. CPT and 5:00 p.m. to 7:00 p.m. CPT weekday time period for winter.<sup>6</sup>

The primary gas-saving measure in the Standard Program is EMS, accounting for 96% of the program's total ex ante gas savings. The evaluation team typically evaluates the EMS measure's electric energy savings using a billing analysis approach that uses all the available post-installation usage data. However, generally, the file reviews did not provide insight to the gas savings, with three exceptions: when the area (ft<sup>2</sup>) of the project was adjusted, when the heating fuel was adjusted, and when the building type was adjusted. Given the limited insight to gas impacts, the realization rates resulting from of the electric billing regression model were also applied the gas savings as the best available point of reference with which to calibration ex ante projections of gas impacts.

For all other gas-saving measures, rather than draw a sample, the evaluation team reviewed the program (population) tracking data for compliance with program workpapers and the IL-TRM.

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<sup>5</sup> Manual 18B, p. 39: <https://pjm.com/~media/documents/manuals/m18b.ashx>.

<sup>6</sup> The winter weather standard is the dry bulb temperature adjusted (by 0.5 °F) for wind speed above 10 mph. The measurements were for hour-ending 19:00 on regional transmission organization (RTO) peak days.

## Appendix B. Impact Analysis Detail

Table B-1 through Table B-3 present the program performance from the private and public sector participation and the overall population-level savings summary.

**Table B-1. Population-Level Savings Summary**

End Use Type	Ex Ante Gross Savings (kWh)	Verified Gross Savings (kWh)	RR <sub>kWh</sub>	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Peak Demand Reduction (kW)	Weighted RR <sub>kW</sub>	Ex Ante Gross Gas Savings (therms)	Verified Gross Gas Savings (therms)	RR <sub>therm</sub>
Private-Lighting	170,971,519	171,374,968	1.00	32,760	34,467	1.05	-	-	N/A
Public-Lighting	18,418,020	18,501,859	1.00	3,305	3,376	1.02	-	-	N/A
<b>Sub-total Lighting</b>	<b>189,389,539</b>	<b>189,876,828</b>	<b>1.00</b>	<b>36,065</b>	<b>37,843</b>	<b>1.05</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Private-Non-Lighting	47,685,610	50,807,371	1.07	6,686	5,942	0.89	31,664	31,664	1.00
Public-Non-Lighting	9,177,560	9,491,976	1.03	1,011	909	0.90	51,200	51,200	1.00
<b>Sub-total Non-Lighting</b>	<b>56,863,170</b>	<b>60,299,346</b>	<b>1.06</b>	<b>7,697</b>	<b>6,851</b>	<b>0.89</b>	<b>82,865</b>	<b>82,865</b>	<b>1.00</b>
Private-EMS	13,321,903	13,305,610	1.00	241	242	1.00	1,620,263	1,620,263	1.00
Public-EMS	2,628,019	2,686,344	1.02	93	0	0.00	1,296,359	1,296,359	1.00
<b>Sub-total EMS</b>	<b>15,949,922</b>	<b>15,991,953</b>	<b>1.00</b>	<b>334</b>	<b>243</b>	<b>0.73</b>	<b>2,916,622</b>	<b>2,916,622</b>	<b>1.00</b>
Private Sub-total	231,979,032	235,487,949	1.02	39,687	40,651	1.02	1,651,928	1,651,928	1.00
Public Sub-total	30,223,600	30,680,179	1.02	4,409	4,285	0.97	1,347,559	1,347,559	1.00
<b>Grand Total</b>	<b>262,202,631</b>	<b>266,168,127</b>	<b>1.02</b>	<b>44,097</b>	<b>44,937</b>	<b>1.02</b>	<b>2,999,487</b>	<b>2,999,487</b>	<b>1.00</b>

Note: The electric realization rates (RRs) presented in this table reflect the statistical sample RRs extrapolated to the population level.

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).

\* Ex ante gross savings (kWh) and verified gross savings (kWh) totals are off by 2 kWh from totals reported in Table 5-2 due to stratification and rounding.

Source: ComEd tracking data and evaluation team analysis

The miscellaneous building type is the second largest shown in Table B-2. In large part, this is attributed to 11% of the measure rows being reported without a building type indicated. These missing instances are subsequently reassigned as miscellaneous for reporting purposes.

**Table B-2. Gross kWh Realization Rates and Relative Precision at 90% Confidence Level**

Population	Sampling Strata	Mean kWh RR	Relative Precision at 90% Level of Confidence ± %, kWh	Mean kW RR	Relative Precision at 90% Level of Confidence ± %, kW	Standard Error, kWh
Lighting	Large	0.98	3%	1.05	6%	2%
	Medium	1.03	5%	1.12	8%	3%
	Small	1.00	1%	0.98	6%	0%
<b>Sub-total Lighting</b>		<b>1.00</b>	<b>1%</b>	<b>1.05</b>	<b>4%</b>	<b>1%</b>
Non-Lighting	Large	1.00	1%	0.94	11%	1%
	Medium	1.21	30%	0.66	79%	17%
	Small	1.02	3%	0.99	1%	2%
<b>Sub-total Non-Lighting</b>		<b>1.06</b>	<b>5%</b>	<b>0.89</b>	<b>8%</b>	<b>3%</b>
EMS	Large	1.00	21%	1.01	0%	11%
	Medium	1.08	11%	(0.71)	-620%	6%
	Small	0.91	29%	0.92	19%	14%
<b>Sub-total EMS</b>		<b>1.00</b>	<b>13%</b>	<b>0.71</b>	<b>20%</b>	<b>7%</b>
<b>Overall CY2021 Program</b>		<b>1.02</b>	<b>2%</b>	<b>1.02</b>	<b>3%</b>	<b>1%</b>

Source: ComEd tracking data and evaluation team analysis

**Table B-3. Program Savings by Building Type**

Space Type	Ex Ante Gross Savings (kWh)	Verified Gross Savings (kWh)	RR <sub>kWh</sub>	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Peak Demand Reduction (kW)	RR <sub>kW</sub>	Ex Ante Gross Gas Savings (therms)	Verified Gross Gas Savings (therms)	RR <sub>therm</sub>
Exterior	74,301,264	74,612,407	1.00	9,470	10,076	1.06	13,426	13,426	1.00
Miscellaneous	64,709,721	67,052,089	1.04	10,261	10,020	0.98	391,039	391,039	1.00
Office	25,496,439	25,902,569	1.02	2,882	2,817	0.98	399,260	399,260	1.00
Warehouse	23,753,525	23,886,037	1.01	8,511	8,837	1.04	-	-	N/A
Manufacturing	21,343,362	21,359,549	1.00	4,259	4,428	1.04	-	-	N/A
Retail/Service - Indoor Mall/Department Store	11,787,023	11,824,873	1.00	2,497	2,617	1.05	2,699	2,699	1.00
K-12 School	10,502,593	10,692,989	1.02	2,409	2,355	0.98	1,266,556	1,266,556	1.00
Hospital (24/7)	7,435,811	7,890,585	1.06	557	501	0.90	226,926	226,926	1.00
Grocery/Convenience/Drug Store	5,108,111	5,049,667	0.99	1,052	1,097	1.04	123,274	123,274	1.00
Miscellaneous (24/7)	4,863,310	4,829,859	0.99	480	500	1.04	27,986	27,986	1.00
Garage/24/7	2,517,565	2,479,909	0.99	318	332	1.04	-	-	N/A
Retail/Service - Strip Mall	2,122,587	2,087,471	0.98	431	441	1.02	3,750	3,750	1.00
MultiFamily - Common	1,544,726	1,636,217	1.06	104	103	0.99	21,065	21,065	1.00
Hotel	1,405,605	1,459,052	1.04	167	147	0.88	-	-	N/A
Hotel/Motel - Common	1,317,927	1,361,824	1.03	66	57	0.88	-	-	N/A
College / University	1,059,771	1,058,770	1.00	102	99	0.98	490,699	490,699	1.00
College	984,559	1,031,377	1.05	155	140	0.90	-	-	N/A
Healthcare Clinic/Office	920,075	924,212	1.00	160	157	0.98	-	-	N/A
Restaurant	550,312	547,043	0.99	97	94	0.98	32,189	32,189	1.00
Garage	353,614	354,277	1.00	98	96	0.98	-	-	N/A
Hotel/Motel - Guest	99,360	101,479	1.02	15	15	0.99	-	-	N/A
Grocery/Convenience Store	20,680	21,171	1.02	5	5	0.99	619	619	1.00
Emergency Services	4,692	4,701	1.00	1	1	0.98	-	-	N/A
<b>Total</b>	<b>262,202,631</b>	<b>266,168,127</b>	<b>1.02</b>	<b>44,097</b>	<b>44,937</b>	<b>1.02</b>	<b>2,999,487</b>	<b>2,999,487</b>	<b>1.00</b>

Note: The electric realization rates (RRs) presented in this table reflect the statistical sample RRs extrapolated at the population level. Ex ante gross savings (kWh) and verified gross savings (kWh) totals are off by 2 kWh from totals reported in Table 5-2 due to stratification and rounding.

N/A = not applicable (refers to a piece of data that cannot be produced or does not apply).

Source: ComEd tracking data and evaluation team analysis

## Appendix C. Total Resource Cost Detail

Table C-1 shows the TRC cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. This table does not include additional required cost data (e.g., measure costs, program-level incentive, and non-incentive costs). ComEd will provide this data to the evaluation team later.

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

End Use Type	Research Category	Units	Quantity	EUL (years)*	ER Flag†	Gross Electric Energy 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 (kW)	NTG (Therms)	Net Electric Energy 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)
Lighting‡	Lighting	Each	9,113	12.3	NO	187,562,475	37,162	0	0	0	-1,179,093	0.80	0.80	0.80	150,049,980	29,730	0	0	0	-943,274
Non-Lighting	HVAC	Each	550	19.6	NO	22,956,543	2,754	30,044	0	0	0	0.70	0.70	0.70	16,069,580	1,928	21,031	0	0	0
Non-Lighting	Refrigeration	Each	405	11.7	NO	16,880,111	2,362	0	0	0	0	0.70	0.70	0.70	11,816,078	1,653	0	0	0	0
EMS	EMS	Each	133	15.0	NO	13,166,533	0	2,912,740	0	0	0	0.70	0.70	0.70	9,216,573	0	2,038,918	0	0	0
Non-Lighting	VSD	Each	199	15.0	NO	12,095,366	638	0	0	0	0	0.70	0.70	0.70	8,466,757	447	0	0	0	0
Non-Lighting	Compressed Air	Each	132	12.9	NO	6,846,490	909	0	0	0	0	0.70	0.70	0.70	4,792,543	636	0	0	0	0
Non-Lighting	Industrial Systems	Each	43	19.1	NO	5,213,959	955	0	0	0	0	0.70	0.70	0.70	3,649,771	669	0	0	0	0
Non-Lighting	Laboratory	Each	17	2.0	NO	800,610	80	0	0	0	0	0.70	0.70	0.70	560,427	56	0	0	0	0
Non-Lighting	Food Service Equipment	Each	184	16.9	NO	567,047	69	56,702	282	0	0	0.70	0.70	0.70	396,933	49	39,691	198	0	0
Thermostat	Thermostat	Each	54	10.9	NO	77,247	7	1	0	0	0	0.86	0.86	0.86	66,432	6	0	0	0	0
Non-Lighting	Commercial Laundry	Each	9	11.0	NO	1,463	0	0	0	0	0	0.70	0.70	0.70	1,024	0	0	0	0	0
<b>Total</b>						<b>266,167,845</b>	<b>44,937</b>	<b>2,999,487</b>	<b>282</b>	<b>0</b>	<b>-1,179,093</b>				<b>205,086,099</b>	<b>35,173</b>	<b>2,099,641</b>	<b>198</b>	<b>0</b>	<b>-943,274</b>

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.

\* 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).

†§ This program does not track HVAC heating fuel type, so there are no electric heating penalties. Gas heating penalties represent the program therms heating penalties. The therms penalties are not required to be applied to the program savings.

Source: ComEd tracking data and evaluation team analysis