



# Joint Utility Public Housing Energy Savings Impact Evaluation Report

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

Presented to  
ComEd  
Nicor Gas  
Peoples Gas  
North Shore Gas

**FINAL**

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## 1. INTRODUCTION

This report presents the results of the impact evaluation of the Joint Utility CY2018 Public Housing Energy Savings (PHES) Program implemented for ComEd, Nicor Gas, Peoples Gas and North Shore Gas companies. It presents a description of the program, a summary of 2018 participation, a summary of the energy and demand impacts for the total program; and more detailed impact information by relevant measure. The appendix presents the impact analysis methodology. CY2018 covers January 1, 2018 through December 31, 2018.

## 2. PROGRAM DESCRIPTION

The PHES Program works with Public Housing Authorities (PHAs) in ComEd and gas utility service territories to achieve electric and gas savings. The PHA itself is the program participant, though the residents of the properties are directly impacted by the program through in-unit and common area upgrades. In 2018, the program provided direct installation measures to residential units, including LEDs, advanced power strips, and gas-saving measures such as faucet aerators and programmable thermostats. The program also incented common area and outdoor lighting, envelope upgrades, furnace replacements, and refrigeration upgrades. The program had eight<sup>1</sup> unique PHA participants, who completed 105 projects across their campuses and buildings.<sup>2</sup> ComEd served all program participants and projects. Participants could complete in-unit upgrades, common area upgrades, or both. In CY2018 the program distributed 11,907 measures as shown in Table 2-1 and Figure 2-1.

**Table 2-1. CY2018 Volumetric Findings Detail**

Participation	In-Unit Upgrades	Common Area Upgrades	Total
Participants (PHAs)*	7	7	8*
Installed Projects	20	85	105
Measure Count†	5,276	6,631	11,907

\*The total number of participants does not equal the sum of in-unit and common area upgrade participants because one participant could complete in-unit upgrades, common area upgrades, or both.

†Total measure count excludes measures quantified in feet or MBH.

Source: ComEd tracking data and Navigant team analysis.

**Table 2-2. CY2018 Participation by Utility**

Participation	Participants (PHAs)	Installed Projects	Measure Count*
ComEd	8	105	11,907
Nicor Gas	4	43	766
North Shore Gas	2	3	550
Peoples Gas	1	20	445

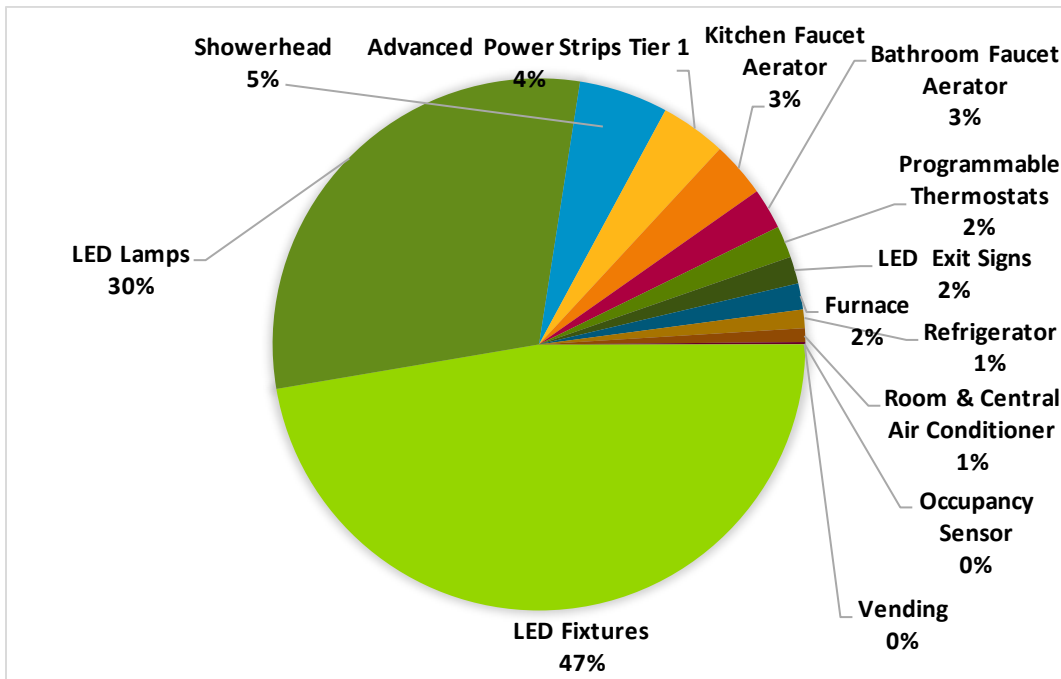
\* Total measure count excludes measures quantified in feet or MBH.

Source: ComEd tracking data and Navigant team analysis.

<sup>1</sup> There are 21 PHAs in the ComEd service territory.

<sup>2</sup> One PHA may own multiple campuses or buildings and complete several independent projects.

Figure 2-1. Number of Measures Installed by Type



### 3. PROGRAM SAVINGS DETAIL

Table 3-1 summarizes the incremental energy and demand savings the PHES Program achieved in CY2018. The gas savings are only those that the gas utilities are not claiming and ComEd can claim.<sup>3</sup> The program achieved CY2018 verified net savings of 2,472,099 kWh. Total electric plus gas (therms converted to kWh) program savings for CY2018 is 2,540,045 kWh.

<sup>3</sup> Each joint utility program had a pre-determined allocation of savings to ComEd versus the gas utilities. For this program, ComEd can claim 2% of the savings, and the gas utilities can claim 98%. This avoids double counting of savings. In terms of understanding which gas utility completed which project, the implementer tracked and verified which gas utility installed which projects.

**Table 3-1. CY2018 Total Annual Incremental Electric Savings**

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Summer Peak Demand Savings (kW)
<b>Electricity</b>			
Ex Ante Gross Savings	2,296,730	0	146
Program Gross Realization Rate	1.08	NA	1.14
Verified Gross Savings	2,472,099	327	166
Program Net-to-Gross Ratio (NTG)	1.00	1.00	1.00
Verified Net Savings	2,472,099	327	166
<b>Converted from Gas*</b>			
Ex Ante Gross Savings	66,115	NA	NA
Program Gross Realization Rate	1.03	NA	NA
Verified Gross Savings	67,946	NA	NA
Program Net-to-Gross Ratio (NTG)	1.00	NA	NA
Verified Net Savings	67,946	NA	NA
<b>Total Electric Plus Gas</b>			
Ex Ante Gross Savings	2,362,845	0	146
Program Gross Realization Rate	1.07	NA	1.14
Verified Gross Savings	2,540,045	327	166
Program Net-to-Gross Ratio (NTG)	1.00	1.00	1.00
Verified Net Savings	2,540,045	327	166

Note: Gas savings reported here reflect a 2% allocation of total gas savings to ComEd.

NA = Not applicable

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

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

Source: ComEd tracking data and Navigant team analysis.

**Table 3-2. CY2018 Total Annual Incremental Therm Savings**

Savings Category	Nicor Gas (therms)	Peoples Gas (Therms)	North Shore Gas (Therms)
<b>Natural Gas*</b>			
Ex Ante Gross Savings	84,070	22,071	4,358
Program Gross Realization Rate	1.05	0.97	0.82
Verified Gross Savings	88,588	21,414	3,590
Program Net-to-Gross Ratio (NTG)	1.00	1.00	1.00
Verified Net Savings	88,588	21,414	3,590

Note: Gas savings reported here reflect a 2% allocation of total gas savings to ComEd.

\* Natural gas savings with electric interactive effects removed.

Source: ComEd, Nicor Gas, Peoples Gas, and North Shore Gas tracking data and Navigant team analysis.

## 4. CUMULATIVE PERSISTING ANNUAL SAVINGS

The measure-specific and total verified gross savings for the PHES Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2018 are shown in the following tables and figure. The program achieved CY2018 verified net savings of 2,472,099 kWh. The program achieved 67,946 kWh CPAS equivalent of gas savings converted to electricity that might be counted toward

ComEd's goal<sup>4</sup> (shown in the gas CPAS table). Adding the savings converted from gas savings to the electric savings produces CY2018 savings of 2,540,045 kWh.

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<sup>4</sup> Each joint utility program had a pre-determined allocation of savings to ComEd versus the gas utilities. For this program, ComEd can claim 2% of the savings, and the gas utilities can claim 98%. This avoids double counting of savings. In terms of understanding which gas utility completed which project, the implementer tracked and verified which gas utility installed which projects.

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

End Use Type	Research Category	EUL	CY2018 Verified Gross Savings	NTG*	Lifetime Net Savings†	Verified Net kWh Savings									
						2018	2019	2020	2021	2022	2023	2024	2025	2026	
Lighting (In-Unit)	Interior LED Lighting	10.0	73,236	1.00	399,632	73,236	73,236	73,236	25,704	25,704	25,704	25,704	25,704	25,704	
Lighting (In-Unit)	Exterior LED Lighting	6.1	815	1.00	3,131	815	815	815	221	221	221	22			
Lighting (Common Area)	Interior LED Lighting	10.0	177,519	1.00	1,013,571	177,519	177,519	177,519	177,519	177,519	125,019	239	239	239	
Lighting (Common Area)	Linear LED Lighting	8.1	733,336	1.00	5,558,627	733,336	733,336	733,336	652,669	652,669	652,669	652,669	652,669	95,274	
Lighting (Common Area)	Exterior LED Lighting	10.2	997,968	1.00	10,081,413	997,968	997,968	997,968	984,672	984,672	984,672	984,672	984,672	984,672	
Lighting (Common Area)	Linear Fluorescent - Delamping	10.2	209,615	1.00	2,137,618	209,615	209,615	209,615	209,615	209,615	209,615	209,615	209,615	209,615	
Lighting (Common Area)	Occupancy Sensors	8.0	3,174	1.00	25,392	3,174	3,174	3,174	3,174	3,174	3,174	3,174	3,174		
LED Exit Sign	LED Exit Sign	16.0	38,194	1.00	611,107	38,194	38,194	38,194	38,194	38,194	38,194	38,194	38,194	38,194	
HVAC	Programmable Thermostat	5.0	7,005	1.00	35,026	7,005	7,005	7,005	7,005	7,005					
HVAC	Reprogram Thermostat	2.0	1,602	1.00	3,205	1,602	1,602								
HVAC (In-Unit)	Space Cooling	12.0	911	1.00	10,935	911	911	911	911	911	911	911	911	911	
HVAC (In-Unit)	Space Heating	20.0	121,716	1.00	2,434,320	121,716	121,716	121,716	121,716	121,716	121,716	121,716	121,716	121,716	
Advanced Power Strip	APS (Tier 1)	7.0	33,844	1.00	236,905	33,844	33,844	33,844	33,844	33,844	33,844	33,844			
Appliances (In-Unit)	Refrigerator	12.0	65,755	1.00	197,718	65,755	65,755	65,755	65,755	50	50	50	50	50	
Refrigeration	Controls	5.0	3,226	1.00	16,130	3,226	3,226	3,226	3,226	3,226					
Envelope (Common Area)	Insulation	25.0	4,181	1.00	104,536	4,181	4,181	4,181	4,181	4,181	4,181	4,181	4,181	4,181	
<b>CY2018 Program Total Electric CPAS</b>			<b>2,472,099</b>		<b>22,934,972</b>	<b>2,472,099</b>	<b>2,472,099</b>	<b>2,470,496</b>	<b>2,328,406</b>	<b>2,262,701</b>	<b>2,199,969</b>	<b>2,074,991</b>	<b>2,041,126</b>	<b>1,480,557</b>	
<b>CY2018 Program Expiring Electric Savings‡</b>								<b>1,602</b>	<b>143,692</b>	<b>209,398</b>	<b>272,129</b>	<b>397,107</b>	<b>430,973</b>	<b>991,542</b>	



End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting (In-Unit)	Interior LED Lighting	25,704											
Lighting (In-Unit)	Exterior LED Lighting												
Lighting (Common Area)	Interior LED Lighting	239											
Lighting (Common Area)	Linear LED Lighting												
Lighting (Common Area)	Exterior LED Lighting	984,672	194,806										
Lighting (Common Area)	Linear Fluorescent - Delamping	209,615	41,470										
Lighting (Common Area)	Occupancy Sensors												
LED Exit Sign	LED Exit Sign	38,194	38,194	38,194	38,194	38,194	38,194	38,194					
HVAC	Programmable Thermostat												
HVAC	Reprogram Thermostat												
HVAC (In-Unit)	Space Cooling	911	911	911									
HVAC (In-Unit)	Space Heating	121,716	121,716	121,716	121,716	121,716	121,716	121,716	121,716	121,716	121,716	121,716	
Advanced Power Strip	APS (Tier 1)												
Appliances (In-Unit)	Refrigerator	50	50	50									
Refrigeration	Controls												
Envelope (Common Area)	Insulation	4,181	4,181	4,181	4,181	4,181	4,181	4,181	4,181	4,181	4,181	4,181	4,181
<b>CY2018 Program Total Electric CPAS</b>		<b>1,385,283</b>	<b>401,328</b>	<b>165,053</b>	<b>164,092</b>	<b>164,092</b>	<b>164,092</b>	<b>164,092</b>	<b>125,897</b>	<b>125,897</b>	<b>125,897</b>	<b>125,897</b>	<b>4,181</b>
<b>CY2018 Program Expiring Electric Savings†</b>		<b>1,086,816</b>	<b>2,070,770</b>	<b>2,307,046</b>	<b>2,308,007</b>	<b>2,308,007</b>	<b>2,308,007</b>	<b>2,308,007</b>	<b>2,346,201</b>	<b>2,346,201</b>	<b>2,346,201</b>	<b>2,346,201</b>	<b>2,467,917</b>

End Use Type	Research Category	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Lighting (In-Unit)	Interior LED Lighting												
Lighting (In-Unit)	Exterior LED Lighting												
Lighting (Common Area)	Interior LED Lighting												
Lighting (Common Area)	Linear LED Lighting												
Lighting (Common Area)	Exterior LED Lighting												
Lighting (Common Area)	Linear Fluorescent - Delamping												
Lighting (Common Area)	Occupancy Sensors												
LED Exit Sign	LED Exit Sign												
HVAC	Programmable Thermostat												
HVAC	Reprogram Thermostat												
HVAC (In-Unit)	Space Cooling												
HVAC (In-Unit)	Space Heating												
Advanced Power Strip	APS (Tier 1)												
Appliances (In-Unit)	Refrigerator												
Refrigeration	Controls												
Envelope (Common Area)	Insulation	4,181	4,181	4,181	4,181								
<b>CY2018 Program Total Electric CPAS</b>		<b>4,181</b>	<b>4,181</b>	<b>4,181</b>	<b>4,181</b>	-	-	-	-	-	-	-	-
<b>CY2018 Program Expiring Electric Savings†</b>		<b>2,467,917</b>	<b>2,467,917</b>	<b>2,467,917</b>	<b>2,467,917</b>	<b>2,472,099</b>	<b>2,472,099</b>	<b>2,472,099</b>	<b>2,472,099</b>	<b>2,472,099</b>	<b>2,472,099</b>	<b>2,472,099</b>	<b>2,472,099</b>

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

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

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

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

Source: Navigant analysis

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

End Use Type	Research Category	EUL	CY2018 Verified Gross Savings (Therms)	NTG*	Lifetime Net Savings†	Verified Net Therms Savings									
						2018	2019	2020	2021	2022	2023	2024	2025	2026	
HVAC	Programmable Thermostat	5.0	152.3	1.0	761.4	152.3	152.3	152.3	152.3	152.3					
HVAC	Reprogram Thermostat	2.0	34.8	1.0	69.7	34.8	34.8								
HVAC (In-Unit)	Space Heating	20.0	1,171.3	1.0	9,255.9	1,171.3	1,171.3	1,171.3	1,171.3	1,171.3	1,171.3	159.1	159.1	159.1	
HVAC (Common Ar	Space Heating	3.0	289.5	1.0	868.6	289.5	289.5	289.5							
Envelope (Commor	Insulation	25.0	90.9	1.0	2,272.5	90.9	90.9	90.9	90.9	90.9	90.9	90.9	90.9	90.9	
Envelope (Commor	Weatherization	15.0	300.3	1.0	4,504.8	300.3	300.3	300.3	300.3	300.3	300.3	300.3	300.3	300.3	
Hot Water	Bathroom Faucet Aerator	9.0	7.4	1.0	66.6	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	
Hot Water	Kitchen Faucet Aerator	9.0	41.1	1.0	370.3	41.1	41.1	41.1	41.1	41.1	41.1	41.1	41.1	41.1	
Hot Water	Showerhead	10.0	230.5	1.0	2,304.7	230.5	230.5	230.5	230.5	230.5	230.5	230.5	230.5	230.5	
CY2018 Program Total Gas CPAS (Therms)			2,318		20,474	2,318	2,318	2,283	1,994	1,994	1,842	829	829	829	
CY2018 Program Total Gas CPAS (kWh Equivalent)‡					600,103	67,946	67,946	66,925	58,439	58,439	53,976	24,309	24,309	24,309	
CY2018 Program Expiring Gas Savings (Therms)§					56,026		-	35	324	324	477	1,489	1,489	1,489	
CY2018 Program Expiring Gas Savings (kWh Equivalent)‡§					1,642,121		-	1,021	9,507	9,507	13,971	43,637	43,637	43,637	

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
HVAC	Programmable Thermostat												
HVAC	Reprogram Thermostat												
HVAC (In-Unit)	Space Heating	159.1	159.1	159.1	159.1	159.1	159.1	159.1	159.1	159.1	159.1	159.1	
HVAC (Common Ar	Space Heating												
Envelope (Commor	Insulation	90.9	90.9	90.9	90.9	90.9	90.9	90.9	90.9	90.9	90.9	90.9	90.9
Envelope (Commor	Weatherization	300.3	300.3	300.3	300.3	300.3	300.3						
Hot Water	Bathroom Faucet Aerator												
Hot Water	Kitchen Faucet Aerator												
Hot Water	Showerhead	230.5											
CY2018 Program Total Gas CPAS (Therms)		781	550	550	550	550	550	250	250	250	250	250	91
CY2018 Program Total Gas CPAS (kWh Equivalent)‡		22,886	16,131	16,131	16,131	16,131	16,131	7,329	7,329	7,329	7,329	7,329	2,664
CY2018 Program Expiring Gas Savings (Therms)§		1,537	1,768	1,768	1,768	1,768	1,768	2,068	2,068	2,068	2,068	2,068	2,227
CY2018 Program Expiring Gas Savings (kWh Equivalent)‡§		45,060	51,815	51,815	51,815	51,815	51,815	60,618	60,618	60,618	60,618	60,618	65,282

End Use Type	Research Category	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
HVAC	Programmable Thermostat												
HVAC	Reprogram Thermostat												
HVAC (In-Unit)	Space Heating												
HVAC (Common Ar	Space Heating												
Envelope (Common	Insulation	90.9	90.9	90.9	90.9								
Envelope (Common	Weatherization												
Hot Water	Bathroom Faucet Aerator												
Hot Water	Kitchen Faucet Aerator												
Hot Water	Showerhead												
CY2018 Program Total Gas CPAS (Therms)		91	91	91	91	-	-	-	-	-	-	-	-
CY2018 Program Total Gas CPAS (kWh Equivalent)‡		2,664	2,664	2,664	2,664	-	-	-	-	-	-	-	-
CY2018 Program Expiring Gas Savings (Therms)§		2,227	2,227	2,227	2,227	2,318	2,318	2,318	2,318	2,318	2,318	2,318	2,318
CY2018 Program Expiring Gas Savings (kWh Equivalent)‡§		65,282	65,282	65,282	65,282	67,946	67,946	67,946	67,946	67,946	67,946	67,946	67,946

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

Note: Gas savings reported here reflect a 2% allocation of total gas savings to ComEd.

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

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

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

‡§ Expiring savings (therm) are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.

Source: Navigant analysis

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

End Use Type	Research Category	EUL	CY2018 Verified Gross Savings	NTG*	Lifetime Net Savings†	Verified Net kWh Savings (Including Those Converted from Gas Savings)									
						2018	2019	2020	2021	2022	2023	2024	2025	2026	
Lighting (In-Unit)	Interior LED Lighting	10.0	73,236	1.0	399,632	73,236	73,236	73,236	25,704	25,704	25,704	25,704	25,704	25,704	
Lighting (In-Unit)	Exterior LED Lighting	6.1	815	1.0	3,131	815	815	815	221	221	221	22	-	-	
Lighting (Common A)	Interior LED Lighting	10.0	177,519	1.0	1,013,571	177,519	177,519	177,519	177,519	177,519	125,019	239	239	239	
Lighting (Common A)	Linear LED Lighting	8.1	733,336	1.0	5,558,627	733,336	733,336	733,336	652,669	652,669	652,669	652,669	652,669	95,274	
Lighting (Common A)	Exterior LED Lighting	10.2	997,968	1.0	10,081,413	997,968	997,968	997,968	984,672	984,672	984,672	984,672	984,672	984,672	
Lighting (Common A)	Linear Fluorescent - Direct	10.2	209,615	1.0	2,137,618	209,615	209,615	209,615	209,615	209,615	209,615	209,615	209,615	209,615	
Lighting (Common A)	Occupancy Sensors	8.0	3,174	1.0	25,392	3,174	3,174	3,174	3,174	3,174	3,174	3,174	3,174	-	
LED Exit Sign	LED Exit Sign	16.0	38,194	1.0	611,107	38,194	38,194	38,194	38,194	38,194	38,194	38,194	38,194	38,194	
HVAC	Programmable Thermostat	5.0	11,469	1.0	57,344	11,469	11,469	11,469	11,469	11,469	-	-	-	-	
HVAC	Reprogram Thermostat	2.0	2,623	1.0	5,246	2,623	2,623	-	-	-	-	-	-	-	
HVAC (In-Unit)	Space Cooling	12.0	911	1.0	10,935	911	911	911	911	911	911	911	911	911	
HVAC (In-Unit)	Space Heating	20.0	156,047	1.0	2,705,609	156,047	156,047	156,047	156,047	156,047	156,047	126,380	126,380	126,380	
HVAC (Common Area)	Space Heating	3.0	8,486	1.0	25,459	8,486	8,486	8,486	-	-	-	-	-	-	
Advanced Power Strips	(Tier 1)	7.0	33,844	1.0	236,905	33,844	33,844	33,844	33,844	33,844	33,844	33,844	-	-	
Appliances (In-Unit)	Refrigerator	12.0	65,755	1.0	263,424	65,755	65,755	65,755	65,755	50	50	50	50	50	
Refrigeration	Controls	5.0	3,226	1.0	16,130	3,226	3,226	3,226	3,226	3,226	-	-	-	-	
Envelope (Common)	Insulation	25.0	6,846	1.0	171,143	6,846	6,846	6,846	6,846	6,846	6,846	6,846	6,846	6,846	
Envelope (Common)	Weatherization	15.0	8,802	1.0	132,034	8,802	8,802	8,802	8,802	8,802	8,802	8,802	8,802	8,802	
Hot Water	Bathroom Faucet Aerator	9.0	217	1.0	1,952	217	217	217	217	217	217	217	217	217	
Hot Water	Kitchen Faucet Aerator	9.0	1,206	1.0	10,855	1,206	1,206	1,206	1,206	1,206	1,206	1,206	1,206	1,206	
Hot Water	Showerhead	10.0	6,755	1.0	67,549	6,755	6,755	6,755	6,755	6,755	6,755	6,755	6,755	6,755	
<b>CY2018 Program Total CPAS</b>			<b>2,540,045</b>		<b>23,535,075</b>	<b>2,540,045</b>	<b>2,540,045</b>	<b>2,537,422</b>	<b>2,386,846</b>	<b>2,321,140</b>	<b>2,253,945</b>	<b>2,099,300</b>	<b>2,065,434</b>	<b>1,504,865</b>	
<b>CY2018 Program Expiring Savings‡</b>								<b>2,623</b>	<b>153,199</b>	<b>218,905</b>	<b>286,100</b>	<b>440,745</b>	<b>474,611</b>	<b>1,035,180</b>	

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting (In-Unit)	Interior LED Lighting	25,704	-	-	-	-	-	-	-	-	-	-	-
Lighting (In-Unit)	Exterior LED Lighting	-	-	-	-	-	-	-	-	-	-	-	-
Lighting (Common Area)	Interior LED Lighting	239	-	-	-	-	-	-	-	-	-	-	-
Lighting (Common Area)	Linear LED Lighting	-	-	-	-	-	-	-	-	-	-	-	-
Lighting (Common Area)	Exterior LED Lighting	984,672	194,806	-	-	-	-	-	-	-	-	-	-
Lighting (Common Area)	Linear Fluorescent - Direct	209,615	41,470	-	-	-	-	-	-	-	-	-	-
Lighting (Common Area)	Occupancy Sensors	-	-	-	-	-	-	-	-	-	-	-	-
LED Exit Sign	LED Exit Sign	38,194	38,194	38,194	38,194	38,194	38,194	38,194	-	-	-	-	-
HVAC	Programmable Thermostat	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Reprogram Thermostat	-	-	-	-	-	-	-	-	-	-	-	-
HVAC (In-Unit)	Space Cooling	911	911	911	-	-	-	-	-	-	-	-	-
HVAC (In-Unit)	Space Heating	126,380	126,380	126,380	126,380	126,380	126,380	126,380	126,380	126,380	126,380	126,380	-
HVAC (Common Area)	Space Heating	-	-	-	-	-	-	-	-	-	-	-	-
Advanced Power Strips	Advanced Power Strips (Tier 1)	-	-	-	-	-	-	-	-	-	-	-	-
Appliances (In-Unit)	Refrigerator	50	50	50	-	-	-	-	-	-	-	-	-
Refrigeration	Controls	-	-	-	-	-	-	-	-	-	-	-	-
Envelope (Common)	Insulation	6,846	6,846	6,846	6,846	6,846	6,846	6,846	6,846	6,846	6,846	6,846	6,846
Envelope (Common)	Weatherization	8,802	8,802	8,802	8,802	8,802	8,802	-	-	-	-	-	-
Hot Water	Bathroom Faucet Aerator	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Kitchen Faucet Aerator	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Showerhead	6,755	-	-	-	-	-	-	-	-	-	-	-
<b>CY2018 Program Total CPAS</b>		<b>1,408,168</b>	<b>417,459</b>	<b>181,184</b>	<b>180,223</b>	<b>180,223</b>	<b>180,223</b>	<b>171,420</b>	<b>133,226</b>	<b>133,226</b>	<b>133,226</b>	<b>133,226</b>	<b>6,846</b>
<b>CY2018 Program Expiring Savings†</b>		<b>1,131,876</b>	<b>2,122,586</b>	<b>2,358,861</b>	<b>2,359,822</b>	<b>2,359,822</b>	<b>2,359,822</b>	<b>2,368,625</b>	<b>2,406,819</b>	<b>2,406,819</b>	<b>2,406,819</b>	<b>2,406,819</b>	<b>2,533,199</b>

End Use Type	Research Category	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Lighting (In-Unit)	Interior LED Lighting	-	-	-	-	-	-	-	-	-	-	-	-
Lighting (In-Unit)	Exterior LED Lighting	-	-	-	-	-	-	-	-	-	-	-	-
Lighting (Common A	Interior LED Lighting	-	-	-	-	-	-	-	-	-	-	-	-
Lighting (Common A	Linear LED Lighting	-	-	-	-	-	-	-	-	-	-	-	-
Lighting (Common A	Exterior LED Lighting	-	-	-	-	-	-	-	-	-	-	-	-
Lighting (Common A	Linear Fluorescent - Dr	-	-	-	-	-	-	-	-	-	-	-	-
Lighting (Common A	Occupancy Sensors	-	-	-	-	-	-	-	-	-	-	-	-
LED Exit Sign	LED Exit Sign	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Programmable Thermo	-	-	-	-	-	-	-	-	-	-	-	-
HVAC	Reprogram Thermostat	-	-	-	-	-	-	-	-	-	-	-	-
HVAC (In-Unit)	Space Cooling	-	-	-	-	-	-	-	-	-	-	-	-
HVAC (In-Unit)	Space Heating	-	-	-	-	-	-	-	-	-	-	-	-
HVAC (Common A	Space Heating	-	-	-	-	-	-	-	-	-	-	-	-
Advanced Power Str	APS (Tier 1)	-	-	-	-	-	-	-	-	-	-	-	-
Appliances (In-Unit)	Refrigerator	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	Controls	-	-	-	-	-	-	-	-	-	-	-	-
Envelope (Common	Insulation	6,846	6,846	6,846	6,846	-	-	-	-	-	-	-	-
Envelope (Common	Weatherization	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Bathroom Faucet Aerat	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Kitchen Faucet Aerator	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	Showerhead	-	-	-	-	-	-	-	-	-	-	-	-
<b>CY2018 Program Total CPAS</b>		<b>6,846</b>	<b>6,846</b>	<b>6,846</b>	<b>6,846</b>	-	-	-	-	-	-	-	-
<b>CY2018 Program Expiring Savings‡</b>		<b>2,533,199</b>	<b>2,533,199</b>	<b>2,533,199</b>	<b>2,533,199</b>	<b>2,540,045</b>	<b>2,540,045</b>	<b>2,540,045</b>	<b>2,540,045</b>	<b>2,540,045</b>	<b>2,540,045</b>	<b>2,540,045</b>	<b>2,540,045</b>

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

Note: Gas savings reported here reflect a 2% allocation of total gas savings to ComEd.

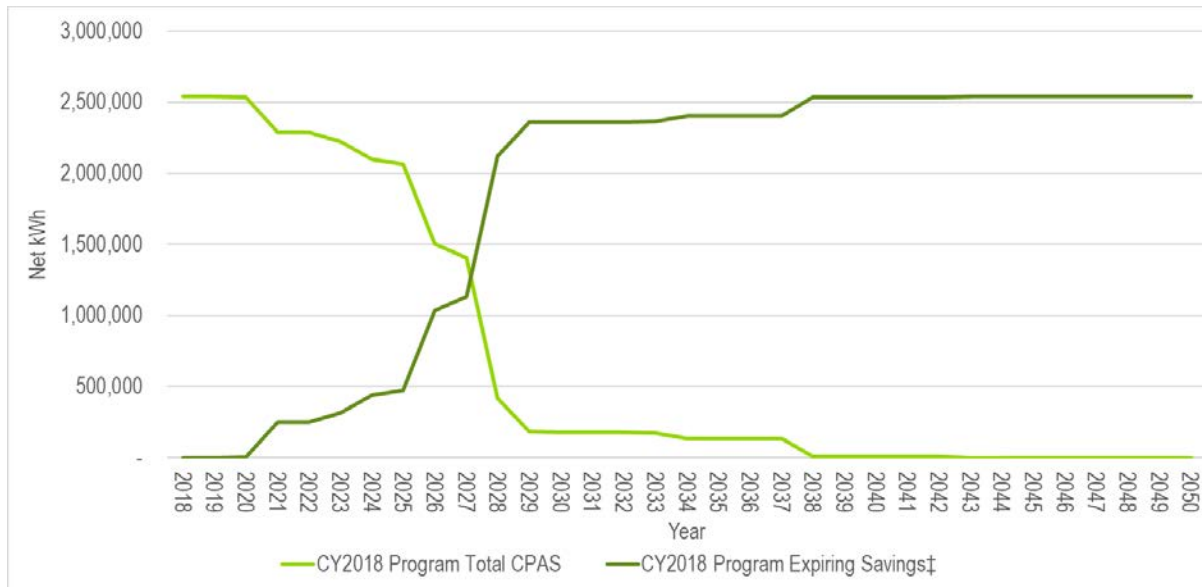
\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

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

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

Source: Navigant analysis

**Figure 4-1. Cumulative Persisting Annual Savings**



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

## 5. PROGRAM SAVINGS BY MEASURE

The program includes the following measures as shown in the following tables.

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

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)	Effective Useful Life
Lighting (In-Unit)	Interior LED Lighting	73,235	1.00	73,236	1.00	73,236	10.0
Lighting (In-Unit)	Exterior LED Lighting	815	1.00	815	1.00	815	6.1
Lighting (Common Area)	Interior LED Lighting	181,142	0.98	177,519	1.00	177,519	10.0
Lighting (Common Area)	Linear LED Lighting	621,404	1.18	733,336	1.00	733,336	8.1
Lighting (Common Area)	Exterior LED Lighting	970,983	1.03	997,968	1.00	997,968	10.2
Lighting (Common Area)	Linear Fluorescent - De	209,144	1.00	209,615	1.00	209,615	10.2
Lighting (Common Area)	Occupancy Sensors	3,174	1.00	3,174	1.00	3,174	8.0
LED Exit Sign	LED Exit Sign	41,132	0.93	38,194	1.00	38,194	16.0
HVAC	Programmable Thermc	7,005	1.00	7,005	1.00	7,005	5.0
HVAC	Reprogram Thermostat	1,602	1.00	1,602	1.00	1,602	2.0
HVAC (In-Unit)	Space Cooling	5,786	0.16	911	1.00	911	12.0
HVAC (In-Unit)	Space Heating	120,428	1.01	121,716	1.00	121,716	20.0
Advanced Power Strip	APS (Tier 1)	33,796	1.00	33,844	1.00	33,844	7.0
Appliances (In-Unit)	Refrigerator	21,362	3.08	65,755	1.00	65,755	12.0
Refrigeration	Controls	3,226	1.00	3,226	1.00	3,226	5.0
Envelope (Common Area)	Insulation	2,494	1.68	4,181	1.00	4,181	25.0
<b>Total</b>		<b>2,296,730</b>	<b>1.08</b>	<b>2,472,099</b>	<b>1.00</b>	<b>2,472,099</b>	<b>NA</b>

NA =Not applicable

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

Source: ComEd tracking data and Navigant team analysis.



**Table 5-2. CY2018 Demand Savings by Measure**

End Use Type	Research Category	Ex Ante Gross Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Demand Reduction (kW)	NTG*	Verified Net Demand Reduction (kW)
Lighting (In-Unit)	Interior LED Lighting	NR	NA	98.8	1.00	98.8
Lighting (Common Area)	Interior LED Lighting	NR	NA	23.5	1.00	23.5
Lighting (Common Area)	Linear LED Lighting	NR	NA	142.6	1.00	142.6
Lighting (Common Area)	Linear Fluorescent - Delamping	NR	NA	35.5	1.00	35.5
Lighting (Common Area)	Occupancy Sensors	NR	NA	2.5	1.00	2.5
LED Exit Sign	LED Exit Sign	NR	NA	5.0	1.00	5.0
HVAC (In-Unit)	Space Cooling	NR	NA	4.3	1.00	4.3
Advanced Power Strip	APS (Tier 1)	NR	NA	4.7	1.00	4.7
Appliances (In-Unit)	Refrigerator	NR	NA	9.9	1.00	9.9
	<b>Total</b>	<b>NR</b>	<b>NA</b>	<b>326.8</b>	<b>1.00</b>	<b>326.8</b>

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

NR = Not reported

NA = Not applicable

Source: ComEd tracking data and Navigant team analysis.

**Table 5-3. CY2018 Summer Peak Demand Savings by Measure**

End Use Type	Research Category	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Peak Demand Reduction (kW)	NTG*	Verified Net Peak Demand Reduction (kW)
Lighting (In-Unit)	Interior LED Lighting	7.2	1.00	7.2	1.00	7.2
Lighting (In-Unit)	Exterior LED Lighting	0.1	0.00	0.0	1.00	0.0
Lighting (Common Area)	Interior LED Lighting	23.9	0.98	23.4	1.00	23.4
Lighting (Common Area)	Linear LED Lighting	76.6	1.19	91.3	1.00	91.3
Lighting (Common Area)	Linear Fluorescent - Delamping	26.1	0.87	22.7	1.00	22.7
Lighting (Common Area)	Occupancy Sensors	1.2	1.00	1.2	1.00	1.2
LED Exit Sign	LED Exit Sign	5.4	0.93	5.0	1.00	5.0
HVAC (In-Unit)	Space Cooling	0.0	NA	1.3	1.00	1.3
Advanced Power Strip	APS (Tier 1)	5.5	0.69	3.8	1.00	3.8
Appliances (In-Unit)	Refrigerator	0.0	NA	9.9	1.00	9.9
	<b>Total</b>	<b>146.1</b>	<b>1.14</b>	<b>165.9</b>	<b>1.00</b>	<b>165.9</b>

NA = Not applicable

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

Source: ComEd tracking data and Navigant team analysis.

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

End Use Type	Research Category	Ex Ante Gross Savings	Verified Gross Realization Rate	Verified Gross Savings	NTG*	Verified Net Savings	Effective Useful Life
HVAC	Programmable Thermostat	152	1.00	152	1.00	152	5.0
HVAC	Reprogram Thermostat	35	1.00	35	1.00	35	2.0
HVAC (In-Unit)	Space Heating	1,172	1.00	1,171	1.00	1,171	20.0
HVAC (Common Area)	Space Heating	319	0.91	290	1.00	290	3.0
Envelope (Common Area)	Insulation	58	1.57	91	1.00	91	25.0
Envelope (Common Area)	Weatherization	241	1.25	300	1.00	300	15.0
Hot Water	Bathroom Faucet Aerator	7	1.00	7	1.00	7	9.0
Hot Water	Kitchen Faucet Aerator	41	1.00	41	1.00	41	9.0
Hot Water	Showerhead	230	1.00	230	1.00	230	10.0
	<b>Total Therms</b>	<b>2,256</b>	<b>1.03</b>	<b>2,318</b>	<b>1.00</b>	<b>2,318</b>	<b>NA</b>
	<b>Total kWh Converted From Therms†</b>	<b>66,115</b>	<b>1.03</b>	<b>67,946</b>	<b>1.00</b>	<b>67,946</b>	<b>NA</b>

Note: Savings reported here reflect a 98% allocation of total gas savings to the gas utilities and a 2% allocation of gas savings to ComEd.

NA = Not applicable

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

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

Source: ComEd tracking data and Navigant team analysis.

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

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Lighting (In-Unit)	Interior LED Lighting	73,235	1.00	73,236	1.00	73,236
Lighting (In-Unit)	Exterior LED Lighting	815	1.00	815	1.00	815
Lighting (Common Area)	Interior LED Lighting	181,142	0.98	177,519	1.00	177,519
Lighting (Common Area)	Linear LED Lighting	621,404	1.18	733,336	1.00	733,336
Lighting (Common Area)	Exterior LED Lighting	970,983	1.03	997,968	1.00	997,968
Lighting (Common Area)	Linear Fluorescent - Delamping	209,144	1.00	209,615	1.00	209,615
Lighting (Common Area)	Occupancy Sensors	3,174	1.00	3,174	1.00	3,174
LED Exit Sign	LED Exit Sign	41,132	0.93	38,194	1.00	38,194
HVAC	Programmable Thermostat	11,469	1.00	11,469	1.00	11,469
HVAC	Reprogram Thermostat	2,623	1.00	2,623	1.00	2,623
HVAC (In-Unit)	Space Cooling	5,786	0.16	911	1.00	911
HVAC (In-Unit)	Space Heating	154,773	1.01	156,047	1.00	156,047
HVAC (Common Area)	Space Heating	9,343	0.91	8,486	1.00	8,486
Advanced Power Strip	APS (Tier 1)	33,796	1.00	33,844	1.00	33,844
Appliances (In-Unit)	Refrigerator	21,362	3.08	65,755	1.00	65,755
Refrigeration	Controls	3,226	1.00	3,226	1.00	3,226
Envelope (Common Area)	Insulation	4,191	1.63	6,846	1.00	6,846
Envelope (Common Area)	Weatherization	7,068	1.25	8,802	1.00	8,802
Hot Water	Bathroom Faucet Aerator	217	1.00	217	1.00	217
Hot Water	Kitchen Faucet Aerator	1,206	1.00	1,206	1.00	1,206
Hot Water	Showerhead	6,755	1.00	6,755	1.00	6,755
	<b>Total</b>	<b>2,362,845</b>	<b>1.07</b>	<b>2,540,045</b>	<b>1.00</b>	<b>2,540,045</b>

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

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

Source: ComEd tracking data and Navigant team analysis.

**Table 5-6. CY2018 Natural Gas Energy Savings by Measure – Nicor Gas**

Offering	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)
HVAC	Programmable Thermostat	7,462	1.00	7,462	1.00	7,462
HVAC	Reprogram Thermostat	1,707	1.00	1,707	1.00	1,707
HVAC (In-Unit)	Space Heating	57,394	1.00	57,394	1.00	57,394
HVAC (Common Area)	Space Heating	0	NA	0	1.00	0
Envelope (Common Area)	Insulation	2,837	1.57	4,454	1.00	4,454
Envelope (Common Area)	Weatherization	11,815	1.25	14,716	1.00	14,716
Hot Water	Bathroom Faucet Aerator	132	1.00	132	1.00	132
Hot Water	Kitchen Faucet Aerator	583	1.00	583	1.00	583
Hot Water	Showerhead	2,139	1.00	2,139	1.00	2,139
	<b>Total†</b>	<b>84,070</b>	<b>1.05</b>	<b>88,588</b>	<b>NA</b>	<b>88,588</b>

Note: Savings reported here reflect a 98% allocation of applicable gas savings to Nicor Gas and a 2% allocation of gas savings to ComEd.

NA = Not applicable

\* A deemed value. Source: Nicor\_Gas\_GPY7\_NTG\_Values\_2017-03-01\_Final.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† The total excludes the electric interactive effects on the total therms.

Source: Nicor Gas tracking data and Navigant team analysis.

**Table 5-7. CY2018 Natural Gas Energy Savings by Measure – Peoples Gas**

Offering	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)
HVAC	Programmable Thermostat	0	NA	0	1.00	0
HVAC	Reprogram Thermostat	0	NA	0	1.00	0
HVAC (In-Unit)	Space Heating	0	NA	0	1.00	0
HVAC (Common Area)	Space Heating	15,612	0.96	14,955	1.00	14,955
Envelope (Common Area)	Insulation	0	NA	0	1.00	0
Envelope (Common Area)	Weatherization	0	NA	0	1.00	0
Hot Water	Bathroom Faucet Aerator	6	1.00	6	1.00	6
Hot Water	Kitchen Faucet Aerator	508	1.00	508	1.00	508
Hot Water	Showerhead	5,945	1.00	5,945	1.00	5,945
	<b>Total†</b>	<b>22,071</b>	<b>0.97</b>	<b>21,414</b>	<b>NA</b>	<b>21,414</b>

Note: Savings reported here reflect a 98% allocation of applicable gas savings to People's Gas and a 2% allocation of gas savings to ComEd.

NA = Not applicable

\* A deemed value. Source: PGL\_NSG\_GPY7\_NTG\_Values\_2017-03-01\_Final.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† The total excludes the electric interactive effects on the total therms.

Source: Peoples Gas tracking data and Navigant team analysis.

**Table 5-8. CY2018 Natural Gas Energy Savings by Measure – North Shore Gas**

Offering	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)
HVAC	Programmable Thermostat	0	NA	0	1.00	0
HVAC	Reprogram Thermostat	0	NA	0	1.00	0
HVAC (In-Unit)	Space Heating	0	NA	0	1.00	0
HVAC (Common Area)	Space Heating	0	NA	-768	1.00	-768
Envelope (Common Area)	Insulation	0	NA	0	1.00	0
Envelope (Common Area)	Weatherization	0	NA	0	1.00	0
Hot Water	Bathroom Faucet Aerator	224	1.00	224	1.00	224
Hot Water	Kitchen Faucet Aerator	925	1.00	925	1.00	925
Hot Water	Showerhead	3,209	1.00	3,209	1.00	3,209
	<b>Total†</b>	<b>4,358</b>	<b>0.82</b>	<b>3,590</b>	<b>NA</b>	<b>3,590</b>

Note: Savings reported here reflect a 98% allocation of applicable gas savings to North Shore Gas and a 2% allocation of gas savings to ComEd.

NA = Not applicable

\* A deemed value. Source: PGL\_NSG\_GPY7\_NTG\_Values\_2017-03-01\_Final.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† The total excludes the electric interactive effects on the total therms.

Source: North Shore Gas tracking data and Navigant team analysis.

## 6. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

### 6.1 Impact Parameter Estimates

The EM&V team calculated verified savings for the PHES Program by applying savings algorithms from the Illinois Technical Reference Manual (TRM) v6.0. The team leveraged program tracking data such as LED wattage, LED lamp type, installed measure location (e.g., for faucet aerators), boiler capacity and efficiencies (for tune-up measures), and insulation R-values to inform savings assumptions. For variables not informed by the tracking data the evaluation team relied on defaults from the IL TRM V6.0.

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

**Table 6-1. Savings Parameters**

Gross Savings Input Parameters	Value	Units	Deemed * or Evaluated?	Source
Quantity	Varies	# measures	Evaluated	Tracking Database
NTG	100	%	Deemed	IL SAG Consensus†
Gross Savings per Unit, Deemed Measures	Varies	kWh	Deemed	IL TRM v6.0
Effective Useful Life (EUL)	Varies	Years	Deemed	IL TRM v6.0

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

† A deemed value. NTG ratios for ComEd, Nicor Gas, Peoples Gas and North Shore Gas are available on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

### 6.2 Other Impact Findings and Recommendations

The evaluation team has developed several recommendations based on findings from the CY2018 evaluation, as follows:

**Finding 1.** The evaluation team was unable to calculate a realization rate for gross demand savings since ComEd does not track gross demand values.

**Recommendation 1.** The evaluation team recommends ComEd track gross demand reduction.

**Finding 2.** The evaluation team found variability in realization rates at the measure level.

**Recommendation 2.** Provide all variable inputs in accordance with the IL TRM for measures that incorporate custom calculations (i.e., gas furnace, boiler tune-up, refrigerator, room air conditioner, air sealing, attic insulation), to allow for more transparent comparison between ex ante and verified savings.

**Recommendation 3.** Incorporate actual equipment specifications in accordance with the IL TRM in ex ante calculations for variables where the IL TRM allows actual values to be used (e.g., wattages, capacities, etc.).

**Recommendation 4:** Apply an in-service rate of 98% to all common area lighting measures as specified in the IL TRM.

## 7. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

The evaluation team calculated gross verified savings for the PHES Program by applying savings algorithms from the IL TRM v6.0. The team prioritized project specific information to inform savings calculations where the IL TRM advises to use actual values. For variables where project information did not provide this information, the evaluation team relied on defaults from the IL TRM v6.0.

The evaluation team calculated verified net energy and demand savings by multiplying the verified gross savings estimates by a deemed NTG of 1.0. In CY2018, the NTG estimates used to calculate the verified net savings were approved through a consensus process managed through the Illinois Energy Efficiency Stakeholder Advisory Group (IL SAG).

## 8. APPENDIX 2. IMPACT ANALYSIS DETAIL

The differences between the ex ante and verified per unit gross savings estimates by measure are discussed below. However, since the evaluation team did not receive ex ante savings calculations and variable assumptions for all custom calculated CY2018 measures, we are unable to identify all the differences between ex ante and verified per unit savings for those measures. We note where this occurs below.

### *LEDs (Common Area)*

- **LED Wattage:** To calculate verified savings, the evaluation team applied the average actual installed LED wattage specified in the project documentation provided by the implementer, where available. The project documentation provided specification sheets for the exact installed LED model. The IL TRM states to use the actual wattage when known, otherwise use the default wattages presented within the TRM.
- **In-service Rate:** The evaluation team applied an in-service rate of 98% to verified savings, as specified in the IL TRM v6.0. The implementation team did not apply the in-service rate adjustment to ex ante calculations.

### *LEDs (Exit Signs)*

- **LED Wattage:** To calculate verified savings for LED exit signs, the evaluation team applied the actual installed LED exit sign wattage (3.5W) specified in the provided project documentation.

The project documentation included specification sheets for the exact installed LED exit sign model. The IL TRM v6.0 states to use the actual wattage when known, otherwise use the default exit sign wattage of 2W. The implementation team used the default wattage of 2W in ex ante calculations.

### *LEDs (Exterior)*

- **In-service Rate:** The evaluation team applied an in-service rate of 98% to verified savings, as specified in the IL TRM v6.0. The implementation team did not apply the in-service rate adjustment to ex ante calculations.
- **Wattages:** The evaluation team used baseline and efficient wattages from the program tracking database for the Exterior/Garage LED measures, whereas the Implementation Team used default values from the IL TRM v6.0.

### *Advanced Power Strips*

- **Delivery Type:** During the Wave 1 review, the evaluation team pointed out that ex ante savings inconsistently applied the deemed values from the IL TRM v6.0 for different delivery mechanisms for energy and demand. The implementation team corrected this issue for energy savings, but the issue still exists for demand savings, which continue to use “all other delivery mechanisms” rather than “energy efficiency kit”. The evaluation team received confirmation from the implementer that all advanced power strips are leave-behind and therefore should apply the deemed “energy efficiency kit” TRM values consistently for both energy and demand savings.

### *All Custom Measures*

- For custom measures, including gas furnace, boiler tune-up, refrigerator, room AC, air sealing, and attic insulation, the evaluation team used the algorithms and default assumptions where applicable from the IL TRM v6.0. We also leveraged values from the program tracking database as much as possible such as R-values and areas of insulation for attic insulation measures and capacities and efficiencies for boiler tune-up measures. However, the spreadsheet documenting ex ante assumptions provided by the implementation team includes the equation and methodology for determining ex ante savings, but does not include all variable inputs for these measures specified in the IL TRM such as heating capacity, full load hours, equipment efficiencies, R-values of insulation, areas of installed insulation, etc. Therefore, we are unable to pinpoint specific reasons for differences in realization rates for these custom calculated measures.
- Negative space heating savings resulted from boiler tune-up measures where reported efficiency values were lower after the tune-up occurred.

## **9. APPENDIX 3. TOTAL RESOURCE COST DETAIL**

Table 9-1, below, shows the Total Resource Cost (TRC) table. It includes only the cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to evaluation later.

**Table 9-1. Total Resource Cost Savings Summary**

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Verified Gross Savings (kWh)	Verified Gross Peak Demand Reduction (kW)	Baseline Shift	Verified Heating Penalty (therms)
Lighting (In-Unit)	Interior LED Lighting	Lamps	2,796	10.0	73,236	7.19	Percentages vary by bulb type (in 2021)	-1,682
Lighting (In-Unit)	Exterior LED Lighting	Lamps	10	6.1	815	0.00	Percentages vary by bulb type (in 2021)	N/A
Lighting (Common Area)	Interior LED Lighting	Lamps	1,110	10.0	177,519	23.45	N/A	-3,893
Lighting (Common Area)	Linear LED Lighting	Fixtures	3,187	8.1	733,336	91.29	Percentages vary by bulb type (in 2021)	-16,295
Lighting (Common Area)	Exterior LED Lighting	Lamps	1,841	10.2	997,968	N/A	Percentages vary by bulb type (in 2021)	N/A
Lighting (Common Area)	Linear Fluorescent - Delam	Fixtures	280	10.2	209,615	22.71	N/A	-118
Lighting (Common Area)	Occupancy Sensors	Each	15	8.0	3,174	1.22	N/A	-70
LED Exit Sign	LED Exit Sign	Each	196	16.0	38,194	5.05	N/A	-838
HVAC	Programmable Thermostat	Each	188	5.0	7,005	N/A	N/A	N/A
HVAC	Reprogram Thermostat	Each	43	2.0	1,602	N/A	N/A	N/A
HVAC (In-Unit)	Space Cooling	Each	99	12.0	911	1.29	N/A	N/A
HVAC (In-Unit)	Space Heating	Each	189	20.0	121,716	N/A	Federal baseline (2024)	N/A
Advanced Power Strip	APS (Tier 1)	Each	476	7.0	33,844	3.80	N/A	N/A
Appliances (In-Unit)	Refrigerator	Each	134	12.0	65,755	9.91	Federal baseline (2022)	N/A
Refrigeration	Controls	Each	2	5.0	3,226	N/A	N/A	N/A
Envelope (Common Area)	Insulation	Square feet	70,440	25.0	4,181	N/A	N/A	N/A
<b>Total</b>			<b>N/A</b>	<b>N/A</b>	<b>2,472,099</b>	<b>165.90</b>		<b>-22,896</b>

Note: For income eligible programs, the net to gross ratio is deemed to be one, and therefore, gross savings equal net savings. For the purposes of reporting, we have included only gross savings here.

NA = Not applicable

Source: ComEd tracking data and Navigant team analysis.

**Table 9-2. Total Resource Cost Savings Summary for Nicor Gas**

End Use Type	Research Category	Units	Quantity	Effective Useful Life (years)	Verified Gross Savings (therms)	Verified Net Savings (therms)	Baseline Shift
HVAC	Programmable Thermostat	Each	188	5.0	7,462	7,462	N/A
HVAC	Reprogram Thermostat	Each	43	2.0	1,707	1,707	N/A
HVAC (In-Unit)	Space Heating	Each	189	20.0	57,394	57,394	Federal baseline (2024)
Envelope (Common Area)	Insulation	Square feet	70,440	25.0	4,454	4,454	N/A
Envelope (Common Area)	Weatherization	Linear feet	28,335	15.0	14,716	14,716	N/A
Hot Water	Bathroom Faucet Aerator	Each	108	9.0	132	132	N/A
Hot Water	Kitchen Faucet Aerator	Each	116	9.0	583	583	N/A
Hot Water	Showerhead	Each	122	10.0	2,139	2,139	N/A
<b>Total</b>			<b>N/A</b>	<b>N/A</b>	<b>88,588</b>	<b>88,588</b>	

NA = Not applicable

Source: Navigant analysis of tracking data.

**Table 9-3. Total Resource Cost Savings Summary for Peoples Gas**

End Use Type	Research Category	Units	Quantity	Effective Useful Life (years)	Verified Gross Savings (therms)	Verified Net Savings (therms)	Baseline Shift
HVAC (Common Area)	Space Heating	MBH input	142,788	3.0	14,955	14,955	Federal baseline (2024)
Hot Water	Bathroom Faucet Aerator	Each	5	9.0	6	6	N/A
Hot Water	Kitchen Faucet Aerator	Each	101	9.0	508	508	N/A
Hot Water	Showerhead	Each	339	10.0	5,945	5,945	N/A
<b>Total</b>			<b>N/A</b>	<b>N/A</b>	<b>21,414</b>	<b>21,414</b>	

NA = Not applicable

Source: Navigant analysis of tracking data

**Table 9-4. Total Resource Cost Savings Summary for North Shore Gas**

End Use Type	Research Category	Units	Quantity	Effective Useful Life (years)	Verified Gross Savings (therms)	Verified Net Savings (therms)	Baseline Shift
HVAC (Common Area)	Space Heating	MBH input	3,000	3.0	-768	-768	Federal baseline (2024)
Hot Water	Bathroom Faucet Aerator	Each	183	9.0	224	224	N/A
Hot Water	Kitchen Faucet Aerator	Each	184	9.0	925	925	N/A
Hot Water	Showerhead	Each	183	10.0	3,209	3,209	N/A
	<b>Total</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>3,590</b>	<b>3,590</b>	

NA = Not applicable

Source: Navigant analysis of tracking data.