



# Joint ComEd, Nicor Gas, Peoples Gas, and North Shore Gas Elementary Energy Education Kits Impact Evaluation Report

Energy Efficiency / Demand Response Plan:  
Program Year 2018 (CY2018)  
(01/01/2018-12/31/2018)

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 Elementary Energy Education (EEE) Program. It presents a summary of the energy and demand impacts for the total program and broken out by relevant measure and program structure details for each utility combination. The appendix presents the impact analysis methodology. CY2018 covers January 1, 2018 through December 31, 2018.

## 2. PROGRAM DESCRIPTION

This program is offered jointly to schools served by ComEd, Nicor Gas, Peoples Gas (PGL), and North Shore Gas (NSG). Nicor Gas also offered this program to schools who are served by Nicor Gas and an electricity provider other than ComEd (Nicor Gas Only). ComEd claimed all the electric savings from kits sent to the joint utility customers (ComEd-Nicor Gas, ComEd-PGL, and ComEd-NSG) while Nicor Gas, PGL, and NSG claimed the gas savings for the kits sent to their respective customers. Starting in CY2018, ComEd began offering additional kits to schools served by ComEd but none of the gas utilities (ComEd Only). ComEd claimed electric and gas savings for the ComEd Only kits.

Schools received an invitation to participate and register to receive program materials; alternatively, schools could register on the program website to join a waiting list if the program was fully-enrolled when they registered. Schools that previously participated in the program were also invited to participate again. The program used a “teacher-lead instruction” program model where the teacher could choose to teach the curriculum over five or ten days and focus on one kit measure per day. After the lesson, students took home a kit that included water conservation measures; instruments to measure water and ambient temperature, as well as water flow rates; LEDs; shower timers; and a student survey form where participants reported details of their family’s participation.

The EEE Program’s primary focus is to produce electricity and natural gas savings in the residential sector by motivating students and their families to reduce energy consumption for water heating and lighting in their home. A secondary goal of the program is to reduce residential water use. Additionally, the EEE Program aims to increase participation in other ComEd, Nicor Gas, PGL and NSG energy efficiency programs via cross-marketing and increased customer awareness of energy efficiency issues.

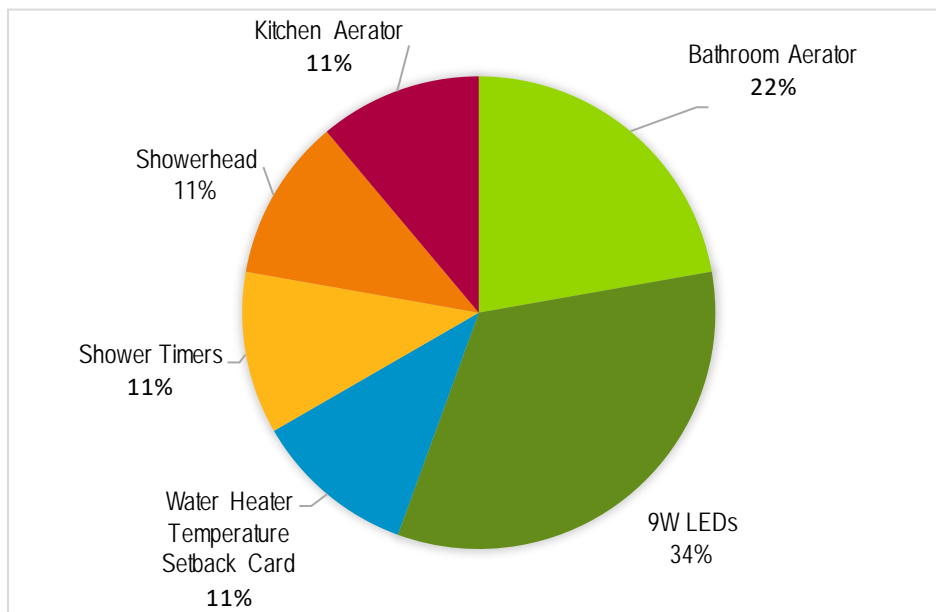
The EEE Program had varying levels of participation based on utility combination. Overall, the EEE Program had 53,401 total participants in CY2018 and distributed 477,093 measures as shown in the following table and graphs.

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

Participation	ComEd Only	ComEd/ PGL	ComEd/ NSG	ComEd/ Nicor Gas	Nicor Gas Only	Total
Number of Measures per Kit	9	9	9	9	6	
Number of Total Kits Distributed	17,123	16,323	1,915	16,868	1,172	53,401
Number of Showerheads Distributed	17,123	16,323	1,915	16,868	1,172	53,401
Number of Kitchen Aerators Distributed	17,123	16,323	1,915	16,868	1,172	53,401
Number of Bathroom Aerators Distributed	34,246	32,646	3,830	33,736	2,344	106,802
Number of 9.0-watt LEDs Distributed	51,369	48,969	5,745	50,604	0	156,687
Number Water Heater Temperature Setback Cards Distributed	17,123	16,323	1,915	16,868	1,172	53,401
Number of Shower Timers Distributed	17,123	16,323	1,915	16,868	1,172	53,401
Number of Total Measures Distributed	154,107	146,907	17,235	151,812	7,032	477,093

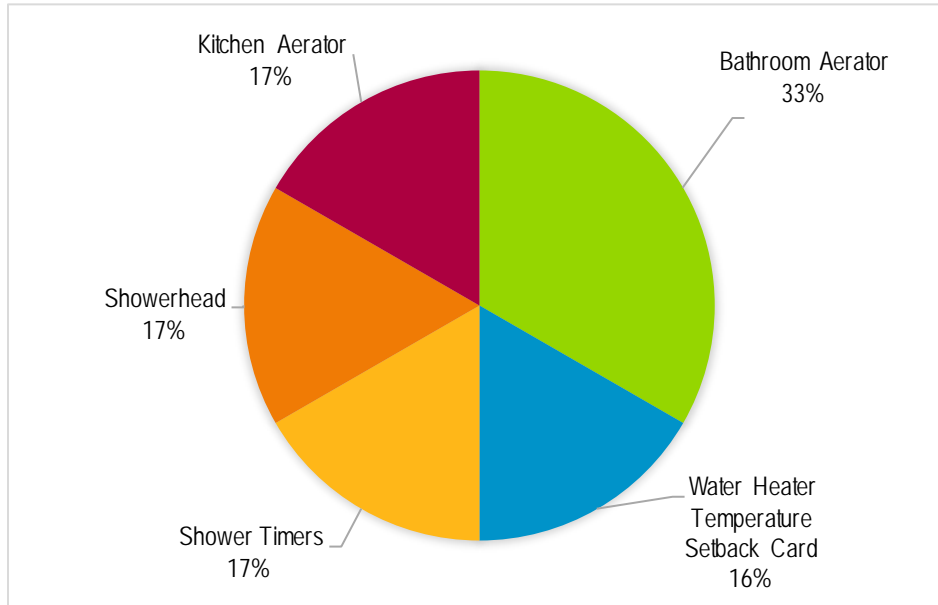
Source: ComEd tracking data and Navigant team analysis.

**Figure 2-1. Measures by Type for ComEd Only and All Joint Utility Kits**



Source: ComEd tracking data and Navigant team analysis.

Figure 2-2. Measures by Type for Nicor Gas Only Kits



Source: ComEd tracking data and Navigant team analysis.

### 3. PROGRAM SAVINGS DETAIL

Table 3-1 summarizes the incremental energy and demand savings the EEE Program achieved in CY2018. The gas savings in Table 3-1 are only those that the gas utilities are not claiming and ComEd can claim.<sup>1</sup> The ex ante and verified savings in Table 3-1 include carryover savings from PY9 as a separate line item.

Table 3-2 summarizes the incremental gas savings that gas utilities achieved through the EEE Program in CY2018. There are no carryover savings for the gas utilities.

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

**Table 3-1. ComEd 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	5,545,675	NR	575
Program Gross Realization Rate†	1.01	NA	1.02
Verified Gross Savings	5,627,782	18,331	584
Program Net-to-Gross (NTG) Ratio	1.00	1.00	1.00
PY9 Verified Net Carryover Savings	476,671	653	46
Total Verified Net Savings including Carryover	6,104,453	18,985	630
<b>Converted from Gas*</b>			
Ex Ante Gross Savings	5,229,539	NA	NA
Program Gross Realization Rate	0.99	NA	NA
Verified Gross Savings	5,157,303	NA	NA
Program Net-to-Gross (NTG) Ratio	1.00	NA	NA
Verified Net Savings	5,157,303	NA	NA
<b>Total Electric Plus Gas</b>			
Ex Ante Gross Savings	10,775,214	NR	575
Program Gross Realization Rate†	1.00	NA	1.02
Verified Gross Savings	10,785,085	18,331	584
Program Net-to-Gross (NTG) Ratio	1.00	1.00	1.00
PY9 Verified Net Carryover Savings	476,671	653	46
Total Verified Net Savings including Carryover	11,261,756	18,985	630

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

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

NR = Not reported

NA = Not applicable

Note: The coincident Summer Peak period is defined as 1:00-5:00 PM Central Prevailing Time on non-holiday weekdays, June through August. The demand savings are defined as the difference in kW in the baseline and post installation period for measures installed in year 2018.

Source: ComEd tracking data and Navigant team analysis.

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

Savings Category	Nicor Gas (Therms)	PGL (Therms)	NSG (Therms)
<b>Natural Gas*</b>			
Ex Ante Gross Savings	178,416	201,099	17,273
Program Gross Realization Rate	1.12	1.26	1.77
Verified Gross Savings	199,384	252,589	30,606
Program Net-to-Gross (NTG) Ratio	1.00	1.00	1.00
Verified Net Savings	199,384	252,589	30,606

\* Natural gas savings with electric interactive effects removed.

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



#### 4. COMED CUMULATIVE PERSISTING ANNUAL SAVINGS

The measure-specific and total verified savings for the EEE Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2018 are shown in the following tables and figure. ComEd is required to calculate the CPAS for each program under the Future Energy Jobs Act. As indicated in ComEd's 2018-2021 Energy Efficiency and Demand Response Plan<sup>2</sup>, "CPAS emphasizes a shift to valuing the lifetime savings of the measures versus only first-year savings." CPAS were not calculated for Nicor Gas, PGL, or NSG.

The total CPAS across all measures is 6,104,453 kWh. The program achieved 175,957 verified net therms of gas savings that will not be claimed by a gas utility, which is 5,157,303 kWh CPAS equivalent of gas savings converted to electricity that might be counted toward ComEd's goal<sup>3</sup> (the middle table in the following set of tables). Adding the savings converted from gas savings to the electric savings produces a total of 11,261,756 kWh of total CPAS.

The ex ante savings did not include an estimate for carryover savings from light bulbs distributed in PY9 but installed in CY2018. The Navigant team included an estimate for PY9 carryover into CY2018 in the CPAS.

The evaluation team applied the Energy Independence and Security Act (EISA) baseline for LED lamps starting in 2021. The EISA baseline shift only applies to LED omnidirectional bulbs. Beginning in 2021, the LED baseline shifts from 43 watts to 20 watts for LED lamps included in the kits.

<sup>2</sup> Commonwealth Edison Company's 2018-2021 Energy Efficiency and Demand Response Plan dated June 30, 2017, page 6.

<sup>3</sup> The evaluation will determine which gas savings not claimed by a gas utility will be counted toward ComEd's goal while producing the portfolio-wide Summary Report.



## Joint ComEd, Nicor Gas, Peoples Gas, and North Shore Gas Elementary Energy Education Kits Impact Evaluation Report

**Table 4-1. ComEd 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	
Hot Water	Showerhead (1.5 GPM) - Single Family	10.0	1,327,442	1.00	13,274,420	1,327,442	1,327,442	1,327,442	1,327,442	1,327,442	1,327,442	1,327,442	1,327,442	1,327,442	
Hot Water	Showerhead (1.5 GPM) - Multi Family	10.0	844,297	1.00	8,442,966	844,297	844,297	844,297	844,297	844,297	844,297	844,297	844,297	844,297	
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	9.0	526,690	1.00	4,740,207	526,690	526,690	526,690	526,690	526,690	526,690	526,690	526,690	526,690	
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	9.0	290,030	1.00	2,610,273	290,030	290,030	290,030	290,030	290,030	290,030	290,030	290,030	290,030	
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	9.0	50,764	1.00	456,873	50,764	50,764	50,764	50,764	50,764	50,764	50,764	50,764	50,764	
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	9.0	46,850	1.00	421,654	46,850	46,850	46,850	46,850	46,850	46,850	46,850	46,850	46,850	
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	9.0	49,292	1.00	443,630	49,292	49,292	49,292	49,292	49,292	49,292	49,292	49,292	49,292	
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	9.0	49,585	1.00	446,264	49,585	49,585	49,585	49,585	49,585	49,585	49,585	49,585	49,585	
Lighting	9.0-watt LED 1 - Single Family	10.0	605,373	1.00	3,144,325	605,373	605,373	605,373	189,744	189,744	189,744	189,744	189,744	189,744	
Lighting	9.0-watt LED 1 - Multi Family	10.0	254,664	1.00	1,322,733	254,664	254,664	254,664	79,820	79,820	79,820	79,820	79,820	79,820	
Lighting	9.0-watt LED 2 - Single Family	10.0	506,086	1.00	2,628,626	506,086	506,086	506,086	158,624	158,624	158,624	158,624	158,624	158,624	
Lighting	9.0-watt LED 2 - Multi Family	10.0	204,358	1.00	1,061,444	204,358	204,358	204,358	64,053	64,053	64,053	64,053	64,053	64,053	
Lighting	9.0-watt LED 3 - Single Family	10.0	440,124	1.00	2,286,018	440,124	440,124	440,124	137,949	137,949	137,949	137,949	137,949	137,949	
Lighting	9.0-watt LED 3 - Multi Family	10.0	175,609	1.00	912,118	175,609	175,609	175,609	55,042	55,042	55,042	55,042	55,042	55,042	
Hot Water	Water Heater Temperature Setback Electric SF	2.0	22,590	1.00	45,179	22,590	22,590								
Hot Water	Water Heater Temperature Setback Electric MF	2.0	10,841	1.00	21,683	10,841	10,841								
Hot Water	Shower Timer Install - Single Family	2.0	145,963	1.00	291,926	145,963	145,963								
Hot Water	Shower Timer Install - Multi Family	2.0	77,224	1.00	154,448	77,224	77,224								
Carryover	PY9 Carryover	7.8§	476,671	1.00	2,050,253	476,671	476,671	476,671	88,606	88,606	88,606	88,606	88,606	88,606	
<b>CY2018 Program Total Electric CPAS</b>			<b>6,104,453</b>		<b>44,755,039</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>5,847,835</b>	<b>3,958,787</b>	<b>3,958,787</b>	<b>3,958,787</b>	<b>3,958,787</b>	<b>3,958,787</b>	<b>3,958,787</b>	
<b>CY2018 Program Expiring Electric Savings‡</b>								<b>256,618</b>	<b>2,145,666</b>	<b>2,145,666</b>	<b>2,145,666</b>	<b>2,145,666</b>	<b>2,145,666</b>	<b>2,145,666</b>	



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End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Hot Water	Showerhead (1.5 GPM) - Single Family	1,327,442											
Hot Water	Showerhead (1.5 GPM) - Multi Family	844,297											
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family												
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family												
Lighting	9.0-watt LED 1 - Single Family	189,744											
Lighting	9.0-watt LED 1 - Multi Family	79,820											
Lighting	9.0-watt LED 2 - Single Family	158,624											
Lighting	9.0-watt LED 2 - Multi Family	64,053											
Lighting	9.0-watt LED 3 - Single Family	137,949											
Lighting	9.0-watt LED 3 - Multi Family	55,042											
Hot Water	Water Heater Temperature Setback Electric SF												
Hot Water	Water Heater Temperature Setback Electric MF												
Hot Water	Shower Timer Install - Single Family												
Hot Water	Shower Timer Install - Multi Family												
Carryover	PY9 Carryover	88,606											
<b>CY2018 Program Total Electric CPAS</b>		<b>2,945,576</b>	-	-	-	-	-	-	-	-	-	-	-
<b>CY2018 Program Expiring Electric Savings‡</b>		<b>3,158,877</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</b>	<b>6,104,453</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.

§ This is the weighted average EUL for all the lamps included in the carryover calculations from PY9. The PY9 carryover savings don't expire until 2027

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

Source: Navigant analysis



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

End Use Type	Research Category	EUL	CY2018 Verified		Lifetime Net Savings†	Verified Net Therms Savings									
			Gross Savings (Therms)	NTG*		2018	2019	2020	2021	2022	2023	2024	2025	2026	
Hot Water	Showerhead (1.5 GPM) - Single Family	10.0	75,291	1.0	752,907	75,291	75,291	75,291	75,291	75,291	75,291	75,291	75,291	75,291	
Hot Water	Showerhead (1.5 GPM) - Multi Family	10.0	38,589	1.0	385,889	38,589	38,589	38,589	38,589	38,589	38,589	38,589	38,589	38,589	
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	9.0	26,534	1.0	238,803	26,534	26,534	26,534	26,534	26,534	26,534	26,534	26,534	26,534	
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	9.0	15,358	1.0	138,224	15,358	15,358	15,358	15,358	15,358	15,358	15,358	15,358	15,358	
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	9.0	2,541	1.0	22,865	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	2,541	
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	9.0	2,424	1.0	21,816	2,424	2,424	2,424	2,424	2,424	2,424	2,424	2,424	2,424	
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	9.0	2,178	1.0	19,598	2,178	2,178	2,178	2,178	2,178	2,178	2,178	2,178	2,178	
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	9.0	2,178	1.0	19,603	2,178	2,178	2,178	2,178	2,178	2,178	2,178	2,178	2,178	
Lighting	9.0-watt LED 1 - Single Family	10.0	-	1.0	-										
Lighting	9.0-watt LED 1 - Multi Family	10.0	-	1.0	-										
Lighting	9.0-watt LED 2 - Single Family	10.0	-	1.0	-										
Lighting	9.0-watt LED 2 - Multi Family	10.0	-	1.0	-										
Lighting	9.0-watt LED 3 - Single Family	10.0	-	1.0	-										
Lighting	9.0-watt LED 3 - Multi Family	10.0	-	1.0	-										
Hot Water	Water Heater Temperature Setback Electric SF	2.0	1,783	1.0	3,566	1,783	1,783								
Hot Water	Water Heater Temperature Setback Electric MF	2.0	280	1.0	560	280	280								
Hot Water	Shower Timer Install - Single Family	2.0	6,588	1.0	13,175	6,588	6,588								
Hot Water	Shower Timer Install - Multi Family	2.0	2,214	1.0	4,428	2,214	2,214								
Carryover	PY9 Carryover	7.8	-	1.0	-										
CY2018 Program Total Gas CPAS (Therms)			175,957		1,621,436	175,957	175,957	165,092	165,092	165,092	165,092	165,092	165,092	165,092	
CY2018 Program Total Gas CPAS (kWh Equivalent)‡			5,157,303		47,524,291	5,157,303	5,157,303	4,838,839	4,838,839	4,838,839	4,838,839	4,838,839	4,838,839	4,838,839	
CY2018 Program Expiring Gas Savings (Therms)§							-	10,865	10,865	10,865	10,865	10,865	10,865	10,865	
CY2018 Program Expiring Gas Savings (kWh Equivalent)‡§							-	318,464	318,464	318,464	318,464	318,464	318,464	318,464	



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End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Hot Water	Showerhead (1.5 GPM) - Single Family	75,291											
Hot Water	Showerhead (1.5 GPM) - Multi Family	38,589											
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family												
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family												
Lighting	9.0-watt LED 1 - Single Family												
Lighting	9.0-watt LED 1 - Multi Family												
Lighting	9.0-watt LED 2 - Single Family												
Lighting	9.0-watt LED 2 - Multi Family												
Lighting	9.0-watt LED 3 - Single Family												
Lighting	9.0-watt LED 3 - Multi Family												
Hot Water	Water Heater Temperature Setback Electric SF												
Hot Water	Water Heater Temperature Setback Electric MF												
Hot Water	Shower Timer Install - Single Family												
Hot Water	Shower Timer Install - Multi Family												
Carryover	PY9 Carryover												
<b>CY2018 Program Total Gas CPAS (Therms)</b>		<b>113,880</b>	-	-	-	-	-	-	-	-	-	-	-
<b>CY2018 Program Total Gas CPAS (kWh Equivalent)‡</b>		<b>3,337,812</b>	-	-	-	-	-	-	-	-	-	-	-
<b>CY2018 Program Expiring Gas Savings (Therms)§</b>		<b>62,077</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>	<b>175,957</b>
<b>CY2018 Program Expiring Gas Savings (kWh Equivalent)‡§</b>		<b>1,819,491</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>	<b>5,157,303</b>

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

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

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

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

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

Source: Navigant analysis



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**Table 4-3. ComEd 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	
Hot Water	Showerhead (1.5 GPM) - Single Family	10.0	3,534,213	1.0	35,342,125	3,534,213	3,534,213	3,534,213	3,534,213	3,534,213	3,534,213	3,534,213	3,534,213	3,534,213	
Hot Water	Showerhead (1.5 GPM) - Multi Family	10.0	1,975,338	1.0	19,753,382	1,975,338	1,975,338	1,975,338	1,975,338	1,975,338	1,975,338	1,975,338	1,975,338	1,975,338	
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	9.0	1,304,392	1.0	11,739,530	1,304,392	1,304,392	1,304,392	1,304,392	1,304,392	1,304,392	1,304,392	1,304,392	1,304,392	
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	9.0	740,180	1.0	6,661,617	740,180	740,180	740,180	740,180	740,180	740,180	740,180	740,180	740,180	
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	9.0	125,226	1.0	1,127,038	125,226	125,226	125,226	125,226	125,226	125,226	125,226	125,226	125,226	
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	9.0	117,898	1.0	1,061,080	117,898	117,898	117,898	117,898	117,898	117,898	117,898	117,898	117,898	
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	9.0	113,117	1.0	1,018,057	113,117	113,117	113,117	113,117	113,117	113,117	113,117	113,117	113,117	
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	9.0	113,425	1.0	1,020,821	113,425	113,425	113,425	113,425	113,425	113,425	113,425	113,425	113,425	
Lighting	9.0-watt LED 1 - Single Family	10.0	605,373	1.0	3,144,325	605,373	605,373	605,373	189,744	189,744	189,744	189,744	189,744	189,744	
Lighting	9.0-watt LED 1 - Multi Family	10.0	254,664	1.0	1,322,733	254,664	254,664	254,664	79,820	79,820	79,820	79,820	79,820	79,820	
Lighting	9.0-watt LED 2 - Single Family	10.0	506,086	1.0	2,628,626	506,086	506,086	506,086	158,624	158,624	158,624	158,624	158,624	158,624	
Lighting	9.0-watt LED 2 - Multi Family	10.0	204,358	1.0	1,061,444	204,358	204,358	204,358	64,053	64,053	64,053	64,053	64,053	64,053	
Lighting	9.0-watt LED 3 - Single Family	10.0	440,124	1.0	2,286,018	440,124	440,124	440,124	137,949	137,949	137,949	137,949	137,949	137,949	
Lighting	9.0-watt LED 3 - Multi Family	10.0	175,609	1.0	912,118	175,609	175,609	175,609	55,042	55,042	55,042	55,042	55,042	55,042	
Hot Water	Water Heater Temperature Setback Electric SF	2.0	74,854	1.0	149,709	74,854	74,854								
Hot Water	Water Heater Temperature Setback Electric MF	2.0	19,055	1.0	38,110	19,055	19,055	-	-	-	-	-	-	-	
Hot Water	Shower Timer Install - Single Family	2.0	339,049	1.0	678,098	339,049	339,049								
Hot Water	Shower Timer Install - Multi Family	2.0	142,123	1.0	284,247	142,123	142,123								
Carryover	PY9 Carryover	7.8§	476,671	1.0	2,050,253	476,671	476,671	476,671	88,606	88,606	88,606	88,606	88,606	88,606	
CY2018 Program Total CPAS			11,261,756		92,279,330	11,261,756	11,261,756	10,686,674	8,797,626	8,797,626	8,797,626	8,797,626	8,797,626	8,797,626	
CY2018 Program Expiring Savings‡								575,082	2,464,130	2,464,130	2,464,130	2,464,130	2,464,130	2,464,130	



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End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Hot Water	Showerhead (1.5 GPM) - Single Family	3,534,213											
Hot Water	Showerhead (1.5 GPM) - Multi Family	1,975,338											
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family												
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family												
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family												
Lighting	9.0-watt LED 1 - Single Family	189,744											
Lighting	9.0-watt LED 1 - Multi Family	79,820											
Lighting	9.0-watt LED 2 - Single Family	158,624											
Lighting	9.0-watt LED 2 - Multi Family	64,053											
Lighting	9.0-watt LED 3 - Single Family	137,949											
Lighting	9.0-watt LED 3 - Multi Family	55,042											
Hot Water	Water Heater Temperature Setback Electric SF												
Hot Water	Water Heater Temperature Setback Electric MF	-											
Hot Water	Shower Timer Install - Single Family												
Hot Water	Shower Timer Install - Multi Family												
Carryover	PY9 Carryover	88,606											
<b>CY2018 Program Total CPAS</b>		<b>6,283,388</b>											
<b>CY2018 Program Expiring Savings‡</b>		<b>4,978,368</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>	<b>11,261,756</b>

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

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

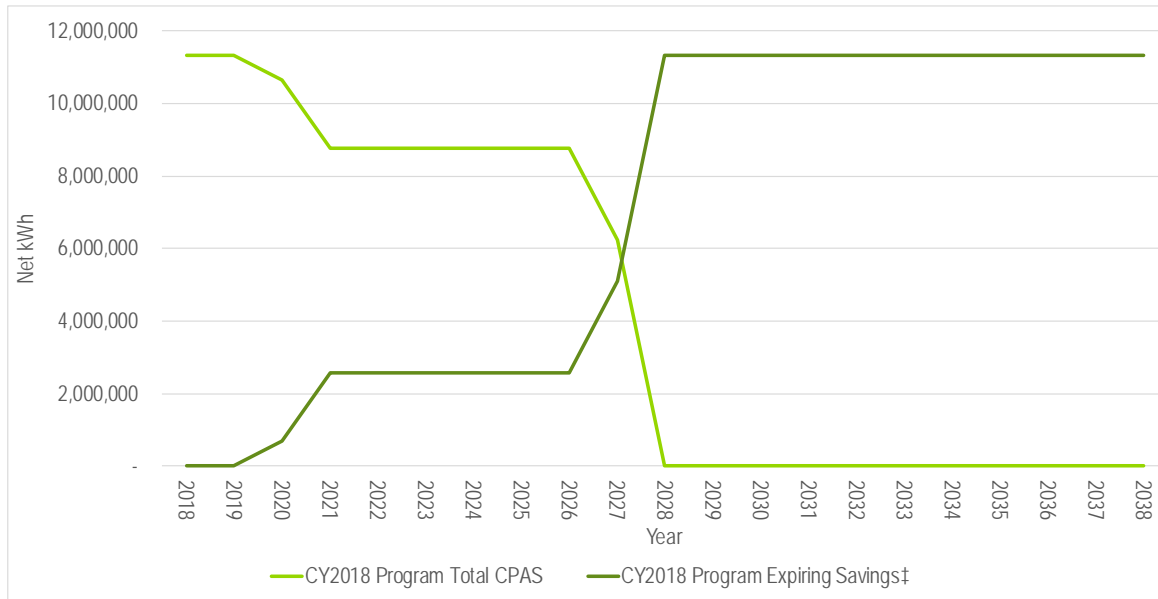
† Lifetime savings are the sum of CPAS savings through the EUL.

§ This is the weighted average EUL for all the lamps included in the carryover calculations from PY9. The PY9 carryover savings don't expire until 2027

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

Source: Navigant analysis

Figure 4-1. ComEd Cumulative Persisting Annual Savings



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

## 5. PROGRAM SAVINGS BY MEASURE

The Navigant team’s analysis of the ComEd CY2018 EEE Program resulted in a verified gross energy, peak demand, and natural gas savings of 6,104,453 kWh, 630 kW, and 175,957 therms, respectively. The verified gross realization rates for energy, peak demand savings, and natural gas savings attributable to ComEd were 110%, 110%, and 99%, respectively. These realization rates are calculated after adding the PY9 carryover savings to the CY2018 verified savings, since the ex ante savings don’t include PY9 carryover savings this leads to higher realization rates. The realization rates in Table 3-1 were calculated without including the PY9 carryover to highlight the overall impact of calculation discrepancies. The CY2018 verified energy and peak demand savings detailed in this section include carryover from PY9. Carryover savings were not included in the ex ante energy or peak demand savings.

Converting natural gas savings not claimed by a gas utility to electricity results in a total verified savings of 11,261,756 kWh, and a combined realization rate of 105%.

The evaluation team calculated verified gross natural gas savings of 199,384 therms for Nicor Gas, 252,589 therms for PGL, and 30,606 therms for NSG. The verified gross realization rate for natural gas was 112%, 126%, 177%, respectively.

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

The program includes energy efficient kits with various number of measures distributed to ComEd, Nicor Gas, PGL, and NSG customers. The measure level savings for each utility are shown in Table 5-1 through Table 5-8.



The energy efficiency kits distributed to ComEd Only, ComEd-Nicor Gas, ComEd-PGL, and ComEd-NSG participants included a low flow showerhead, faucet aerators, LEDs, a water heater temperature setback card, and a shower timer. The energy efficiency kits distributed to the Nicor Gas Only participants included a low flow showerhead, faucet aerators, a water heater temperature setback card, and a shower timer.

Across ComEd participants, LED bulbs and low flow showerheads contributed the most towards verified gross energy savings (36% for both), when considering electric savings only. Low flow showerheads and all aerators contributed the most to the verified gross energy savings (49% and 22%, respectively) after gas savings were converted to energy savings.

Low flow showerheads contribute the most towards the verified gross gas savings (60%, 64%, 66%) for Nicor Gas, PGL, and NSG, respectively. All kitchen aerators (23%, 21%, 20%, respectively) contributed the second largest verified gross savings for the gas utilities.

The following sections provide a summary of factors that contribute to the realization rates for each utility. A detailed description of the ex post analysis methodology and a comparison of the input variables to the savings equations are provided in Appendix 1 and Appendix 2.

### **5.1.1 ComEd**

The electric realization rate for ComEd is greater than 100%. The realization rate for single family showerheads and kitchen aerators, all bathroom faucet aerators, and all shower timers were greater than 100%. The evaluation team custom calculated the domestic hot water (DHW) fuel split which increased the amount of electric savings allocated to ComEd for hot water measures. The evaluation team calculated the custom DHW split using survey responses from participants in Wave 2 of CY2018. The evaluation team used Wave 2 survey responses because a diagram was included in the Wave 2 survey to help the participants better identify the type of water heater in their homes. Finally, in addition to the DHW split, the evaluation team custom calculated a higher usage factor for the shower timer measure, resulting in additional savings.

The realization rate for multifamily showerheads and kitchen aerators, all LED bulbs, and water temperature setback were lower than 100%. The evaluation team's analysis showed the actual temperature setback and in-service rate (ISR) of the hot water temperature setback measure was lower than the ex ante value. The ISR for LED bulbs that the evaluation team calculated in CY2018 was less than the ISR reported in the ex ante savings. A detailed comparison of values the evaluation used compared to ComEd for each of the program's measures is provided in section 8.1.1.

ComEd claimed a single therm value for each kit distributed (10.42 therms per kit) and did not break the ex ante savings down by measure. The ex ante value was referenced from Navigant's GPY6 Nicor Gas Elementary Energy Education (EEE) Impact Evaluation Report<sup>4</sup>. However, the measure level savings noted in Table 5-1 from the GPY6 Nicor Gas Report sum to 13.59 therms per kit. The evaluation team used the ratio of the per kit savings claimed by ComEd (10.42 therms) and the sum of the measure level savings noted in that (13.59 therms) to align the measure level ex ante savings. Table 5-4 shows the aligned ex ante measure level gas savings claimed by ComEd.

<sup>4</sup> Navigant's GPY6 Nicor Gas Elementary Energy Education Impact Evaluation Report can be found on the IL SAG web site here: [http://www.ilsag.info/nicor\\_gas\\_eval\\_reports.html](http://www.ilsag.info/nicor_gas_eval_reports.html)

**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
Hot Water	Showerhead (1.5 GPM) - Single Family	1,044,357	1.27	1,327,442	1.00	1,327,442	10.0
Hot Water	Showerhead (1.5 GPM) - Multi Family	940,732	0.90	844,297	1.00	844,297	10.0
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	394,999	1.33	526,690	1.00	526,690	9.0
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	298,140	0.97	290,030	1.00	290,030	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	38,365	1.32	50,764	1.00	50,764	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	45,457	1.03	46,850	1.00	46,850	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	37,242	1.32	49,292	1.00	49,292	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	49,174	1.01	49,585	1.00	49,585	9.0
Lighting	9.0-watt LED 1 - Single Family	621,609	0.97	605,373	1.00	605,373	10.0
Lighting	9.0-watt LED 1 - Multi Family	335,846	0.76	254,664	1.00	254,664	10.0
Lighting	9.0-watt LED 2 - Single Family	536,022	0.94	506,086	1.00	506,086	10.0
Lighting	9.0-watt LED 2 - Multi Family	279,772	0.73	204,358	1.00	204,358	10.0
Lighting	9.0-watt LED 3 - Single Family	472,573	0.93	440,124	1.00	440,124	10.0
Lighting	9.0-watt LED 3 - Multi Family	247,841	0.71	175,609	1.00	175,609	10.0
Hot Water	Water Heater Temperature Setback Electric	54,840	0.61	33,431	1.00	33,431	2.0
Hot Water	Shower Timer Install - Single Family	101,295	1.44	145,963	1.00	145,963	2.0
Hot Water	Shower Timer Install - Multi Family	47,390	1.63	77,224	1.00	77,224	2.0
Carryover	PY9 Carryover	NR	NA	476,671	1.00	476,671	7.8
	<b>Total</b>	<b>5,545,655</b>	<b>110%</b>	<b>6,104,453</b>	<b>1.00</b>	<b>6,104,453</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 available

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)
Hot Water	Showerhead (1.5 GPM) - Single Family	NR	NA	2,636	1.00	2,636
Hot Water	Showerhead (1.5 GPM) - Multi Family	NR	NA	1,675	1.00	1,675
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	NR	NA	2,966	1.00	2,966
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	NR	NA	1,632	1.00	1,632
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	NR	NA	1,898	1.00	1,898
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	NR	NA	928	1.00	928
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	NR	NA	1,843	1.00	1,843
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	NR	NA	982	1.00	982
Lighting	9.0-watt LED 1 - Single Family	NR	NA	835	1.00	835
Lighting	9.0-watt LED 1 - Multi Family	NR	NA	345	1.00	345
Lighting	9.0-watt LED 2 - Single Family	NR	NA	698	1.00	698
Lighting	9.0-watt LED 2 - Multi Family	NR	NA	277	1.00	277
Lighting	9.0-watt LED 3 - Single Family	NR	NA	607	1.00	607
Lighting	9.0-watt LED 3 - Multi Family	NR	NA	238	1.00	238
Hot Water	Water Heater Temperature Setback Electric	NR	NA	4	1.00	4
Hot Water	Shower Timer Install - Single Family	NR	NA	586	1.00	586
Hot Water	Shower Timer Install - Multi Family	NR	NA	180	1.00	180
Carryover	PY9 Carryover	NR	NA	653	1.00	653
<b>Total</b>		<b>NR</b>	<b>NA</b>	<b>18,985</b>	<b>1.00</b>	<b>18,985</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 available

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)
Hot Water	Showerhead (1.5 GPM) - Single Family	57	1.28	73	1.00	73
Hot Water	Showerhead (1.5 GPM) - Multi Family	51	0.92	47	1.00	47
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	48	1.35	65	1.00	65
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	36	0.99	36	1.00	36
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	31	1.34	42	1.00	42
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	19	1.05	20	1.00	20
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	30	1.34	41	1.00	41
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	21	1.03	22	1.00	22
Lighting	9.0-watt LED 1 - Single Family	61	0.97	59	1.00	59
Lighting	9.0-watt LED 1 - Multi Family	32	0.76	25	1.00	25
Lighting	9.0-watt LED 2 - Single Family	53	0.94	50	1.00	50
Lighting	9.0-watt LED 2 - Multi Family	27	0.73	20	1.00	20
Lighting	9.0-watt LED 3 - Single Family	46	0.93	43	1.00	43
Lighting	9.0-watt LED 3 - Multi Family	24	0.71	17	1.00	17
Hot Water	Water Heater Temperature Setback Electric	6	0.61	4	1.00	4
Hot Water	Shower Timer Install - Single Family	10	1.61	16	1.00	16
Hot Water	Shower Timer Install - Multi Family	1	8.67	5	1.00	5
Carryover	PY9 Carryover	NR	NA	46	1.00	46
	<b>Total†</b>	<b>575</b>	<b>1.10</b>	<b>630</b>	<b>1.00</b>	<b>630</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 available

† The measure level peak demand savings do not sum to the claimed 575 kW due to rounding.

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
Hot Water	Showerhead (1.5 GPM) - Single Family	73,884	1.02	75,291	1.00	75,291	10.0
Hot Water	Showerhead (1.5 GPM) - Multi Family	37,935	1.02	38,589	1.00	38,589	10.0
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	29,694	0.89	26,534	1.00	26,534	9.0
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	12,775	1.20	15,358	1.00	15,358	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	2,736	0.93	2,541	1.00	2,541	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	2,085	1.16	2,424	1.00	2,424	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	3,019	0.72	2,178	1.00	2,178	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	1,733	1.26	2,178	1.00	2,178	9.0
Lighting	9.0-watt LED 1 - Single Family	0	NA	0	1.00	0	10.0
Lighting	9.0-watt LED 1 - Multi Family	0	NA	0	1.00	0	10.0
Lighting	9.0-watt LED 2 - Single Family	0	NA	0	1.00	0	10.0
Lighting	9.0-watt LED 2 - Multi Family	0	NA	0	1.00	0	10.0
Lighting	9.0-watt LED 3 - Single Family	0	NA	0	1.00	0	10.0
Lighting	9.0-watt LED 3 - Multi Family	0	NA	0	1.00	0	10.0
Hot Water	Water Heater Temperature Setback Electric	2,816	0.73	2,063	1.00	2,063	2.0
Hot Water	Shower Timer Install - Single Family	9,394	0.70	6,588	1.00	6,588	2.0
Hot Water	Shower Timer Install - Multi Family	2,350	0.94	2,214	1.00	2,214	2.0
Carryover	PY9 Carryover	NR	NA	0	1.00	0	7.8
<b>Total Therms</b>		<b>178,422</b>	<b>0.99</b>	<b>175,957</b>	<b>1.00</b>	<b>175,957</b>	
<b>Total kWh Converted From Therms†</b>		<b>5,229,539</b>		<b>5,157,303</b>		<b>5,157,303</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 available

† 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 – ComEd Total Combining Electricity and Gas**

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG*	Verified Net Savings (kWh)
Hot Water	Showerhead (1.5 GPM) - Single Family	3,209,910	1.10	3,534,213	1.00	3,534,213
Hot Water	Showerhead (1.5 GPM) - Multi Family	2,052,605	0.96	1,975,338	1.00	1,975,338
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	1,265,328	1.03	1,304,392	1.00	1,304,392
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	672,590	1.10	740,180	1.00	740,180
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	118,544	1.06	125,226	1.00	125,226
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	106,564	1.11	117,898	1.00	117,898
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	125,741	0.90	113,117	1.00	113,117
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	99,976	1.13	113,425	1.00	113,425
Lighting	9.0-watt LED 1 - Single Family	621,609	0.97	605,373	1.00	605,373
Lighting	9.0-watt LED 1 - Multi Family	335,846	0.76	254,664	1.00	254,664
Lighting	9.0-watt LED 2 - Single Family	536,022	0.94	506,086	1.00	506,086
Lighting	9.0-watt LED 2 - Multi Family	279,772	0.73	204,358	1.00	204,358
Lighting	9.0-watt LED 3 - Single Family	472,573	0.93	440,124	1.00	440,124
Lighting	9.0-watt LED 3 - Multi Family	247,841	0.71	175,609	1.00	175,609
Hot Water	Water Heater Temperature Setback Electric	137,372	0.68	93,909	1.00	93,909
Hot Water	Shower Timer Install - Single Family	376,645	0.90	339,049	1.00	339,049
Hot Water	Shower Timer Install - Multi Family	116,256	1.22	142,123	1.00	142,123
Carryover	PY9 Carryover	NR	NA	476,671	1.00	476,671
	<b>Total†</b>	<b>10,775,193</b>	<b>1.05</b>	<b>11,261,756</b>	<b>1.00</b>	<b>11,261,756</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 available

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

Source: ComEd tracking data and Navigant team analysis.

**5.1.2 Nicor Gas**

The realization rate for Nicor Gas is 112%. The evaluation team custom calculated the DHW split which decreased the amount of gas savings allocated to Nicor Gas. The evaluation team calculated the custom DHW split using survey responses from participants in Wave 2 of CY2018. The evaluation team used Wave 2 survey responses because a diagram was included in the Wave 2 survey to help the participants better identify the type of water heater in their homes, and an option to choose “Can’t identify” was added.

The savings reduction due the DHW split was offset by increased ISRs for the showerhead and aerator measures. The evaluation team calculated the ISRs in the verified savings analysis using CY2018 survey data while the ISRs in the ex ante analysis were calculated using survey results from GPY1/EPY4. The evaluation team used the actual temperature setback reported by CY2018 participants in the student survey which was less than the assumed setback in the ex ante analysis causing the low realization rate for this measure. Additionally, the evaluation team claimed gas savings that resulted from the shower timers where the ex ante savings did not calculate savings for this measure. A detailed comparison of values for each Nicor Gas measure is provided in section 8.1.2.

**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)	Effective Useful Life
Hot Water	Showerhead (1.5 GPM)	105,157	1.14	119,684	1.00	119,684	10.0
Hot Water	Kitchen Aerator (1.5 GPM)	49,607	0.93	45,991	1.00	45,991	9.0
Hot Water	Bathroom Aerator (1.0 GPM)	12,291	0.87	10,733	1.00	10,733	9.0
Hot Water	Water Heater Temperature SetBack Gas	10,244	0.29	2,976	1.00	2,976	2.0
Hot Water	Shower Timer Install	NR	NA	19,999	1.00	19,999	2.0
<b>Total Therms†</b>		<b>178,416</b>	<b>1.12</b>	<b>199,384</b>	<b>1.00</b>	<b>199,384</b>	

\* 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 ex ante measure level gas savings do not sum to the claimed 178,416 therms due to rounding.

NR = Not reported

NA = Not available

Source: Nicor Gas tracking data and Navigant team analysis.

**5.1.3 PGL**

The realization rate for PGL is 126%. The evaluation team custom calculated the DHW split which increased the amount of gas savings allocated to PGL. The evaluation team calculated the custom DHW split using survey responses from participants in Wave 2 of CY2018. The evaluation team used Wave 2 survey responses because a diagram was included in the Wave 2 survey to help the participants better identify the type of water heater in their homes, and an option to choose “Can’t identify” was added. The custom ISRs the evaluation team calculated from CY2018 student survey data were three to five percent higher, on average, when compared to the ISRs used in the ex ante savings analysis.

Conversely, the actual setback in water heater temperature the evaluation team calculated based on the survey responses from CY2018 participants was less than what was assumed in the ex ante analysis. The evaluation team also calculated a lower custom value for the time saved due to using the shower timer than was assumed in the ex ante analysis. The savings reduction from the setback and time saved was small relative to the increase from the DHW split. A detailed comparison of values for each of the PGL measures is provided in section 8.1.3.

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

Offering	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)	Effective Useful Life
Hot Water	Showerhead (1.5 GPM) - Single Family	36,890	1.63	60,141	1.00	60,141	10.0
Hot Water	Showerhead (1.5 GPM) - Multi Family	72,964	1.39	101,370	1.00	101,370	10.0
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	20,730	1.06	22,075	1.00	22,075	9.0
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	25,137	1.23	30,838	1.00	30,838	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	1,632	1.41	2,305	1.00	2,305	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	3,101	1.71	5,310	1.00	5,310	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	1,632	1.38	2,246	1.00	2,246	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	3,428	1.60	5,488	1.00	5,488	9.0
Hot Water	Water Heater Temperature SetBack Gas	8,814	0.59	5,157	1.00	5,157	2.0
Hot Water	Shower Timer Install	26,770	0.66	17,660	1.00	17,660	2.0
<b>Total Therms</b>		<b>201,099</b>	<b>1.26</b>	<b>252,589</b>	<b>1.00</b>	<b>252,589</b>	

\* A deemed value. Source: PGL\_NS\_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>.

Source: Peoples Gas tracking data and Navigant team analysis.



### 5.1.4 North Shore Gas

The realization rate for NSG is 177%. The evaluation team custom calculated the DHW split which increased the amount of gas savings allocated to NSG. The evaluation team calculated the custom DHW split using survey responses from participants in Wave 2 of CY2018. The ISRs the evaluation calculated from CY2018 survey data were significantly higher, on average, when compared to the ISRs used in the ex ante savings analysis. Additionally, the water temperature setback reported by CY2018 participants was much larger than assumed in the ex ante analysis.

However, the realization rate for the shower timer was only 33%. The evaluation team calculated a lower custom value for the time saved due to using the shower timer than was assumed in the ex ante analysis. A detailed comparison of the values for each of the NSG measures is provided in section 8.1.4.

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

Offering	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)	NTG*	Verified Net Savings (Therms)	Effective Useful Life
Hot Water	Showerhead (1.5 GPM) - Single Family	4,481	3.07	13,762	1.00	13,762	10.0
Hot Water	Showerhead (1.5 GPM) - Multi Family	3,428	1.92	6,570	1.00	6,570	10.0
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	1,934	2.22	4,289	1.00	4,289	9.0
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	977	1.87	1,828	1.00	1,828	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	134	3.02	405	1.00	405	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	115	2.20	253	1.00	253	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	153	3.66	561	1.00	561	9.0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	38	13.19	505	1.00	505	9.0
Hot Water	Water Heater Temperature SetBack Gas	38	12.85	492	1.00	492	2.0
Hot Water	Shower Timer Install	5,975	0.33	1,942	1.00	1,942	2.0
<b>Total Therms</b>		<b>17,273</b>	<b>1.77</b>	<b>30,606</b>	<b>1.00</b>	<b>30,606</b>	

\* 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>.

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

## 6. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

### 6.1 Impact Parameter Estimates

Table 6-1 details all the custom and deemed inputs used for calculating the energy and demand savings for each measure, as well as their source. The evaluation team calculated savings for each measure based on the savings algorithms noted in the Illinois Technical Reference Manual (TRM) v6.0 and the IL TRM v6.0 Errata for each respective measure. The custom inputs were calculated using the CY2018 participant survey data supplied by the implementer.

**Table 6-1. Savings Parameters**

Measure	Custom Input Parameters	Deemed Input Parameters	Deemed* Input Data Source
Low-flow Showerhead	% DHW, Household, ISR, % SF, % MF, Hours	GPM_base, GPM_low, L_base, L_low, days/yr, SPCD, SPH, EPG, CF, NTG <sup>†</sup>	IL TRM v6.0 – Section 5.4.5
Kitchen Aerators	% DWH, Household, ISR, % SF, % MF, Hours	GPM_base, GPM_low, L_base, L_low, KFPH, EPG_electric, CF, NTG <sup>†</sup>	IL TRM v6.0 – Section 5.4.4
Bathroom Aerator	% DWH, Household, ISR, % SF, % MF, Hours	GPM_base, GPM_low, L_base, L_low, KFPH, EPG_electric, CF, NTG <sup>†</sup>	IL TRM v6.0 – Section 5.4.4
9W LEDs	WattsEE, ISR, % SF, % MF	Wattbase, Hours, WHFe, WHFd, CF, Leakage, NTG <sup>†</sup>	IL TRM v6.0 – Section 5.5.8 and IL TRM v6.0 Errata
Hot Water Temperature Setback	Tpre, Tpost, ISR, % DHW, % SF, % MF	U, A, Hours, RE_electric, CF	IL TRM v6.0 – Section 5.4.6
Shower Timer	% DHW, GPM, L_timer, Household, Usage, % SF, % MF, Hours	L_base, CF, SPCD, EPG_Electric	IL TRM v6.0 – Section 5.4.9

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

† A deemed value. Source: The NTG values for 2018 for all utilities are found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

## 6.2 CY2019 Carryover Savings Estimates

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

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

Table 6-2 shows that in CY2019, 42,891 bulbs, purchased during either PY9 or CY2018, are expected to be installed within ComEd service territory. The table provides both the gross and net energy and demand savings from these bulbs. The total net energy savings is estimated to be 1,636,142 kWh and 111 summer peak kW, which will be counted in CY2019 as Elementary Energy Education Program carryover savings.

**Table 6-2. CY2019 Verified Savings Carryover Estimate**

CY2019 Verified Savings Carryover Estimate	PY9 Bulbs	CY2018 Bulbs	CY2019 Carryover
Carryover Bulbs Installed During CY2019	15,389	27,502	42,891
Average Delta Watts	32.9	33.5	33.3
Average Installation Rate	1.00	1.00	1.00
Average Annual Hours of Use	1,089	1,089	1,089.00
Energy Interactive Effects	1.05	1.05	1.05
Demand Interactive Effects	1.10	1.10	1.10
Summer Peak Load Coincidence Factor	0.07	0.07	0.07
Carryover Gross Energy Savings (kWh)	578,701	1,057,442	1,636,142
Carryover Gross Demand Savings (kW)	552.88	1,011.51	1,564.40
Carryover Gross Summer Peak Demand Savings (kW)	39.25	71.82	111.07
Net-to-Gross Ratio	1.00	1.00	1.00
Carryover Net Energy Savings (kWh)	578,701	1,057,442	1,636,142
Carryover Net Demand Savings (kW)	552.88	1,011.51	1,564.40
Carryover Net Summer Peak Demand Savings (kW)	39.25	71.82	111.07
Effective Useful Life	6.6	9.0	8.2

### 6.3 Other Impact Findings and Recommendations

The evaluation team has developed several recommendations based on findings from the CY2018 evaluation and are detailed in the sections below.

#### 6.3.1 Program Level

**Finding 1.** The ex ante savings claimed for the Elementary Energy Education Program did not include carryover savings from PY9.

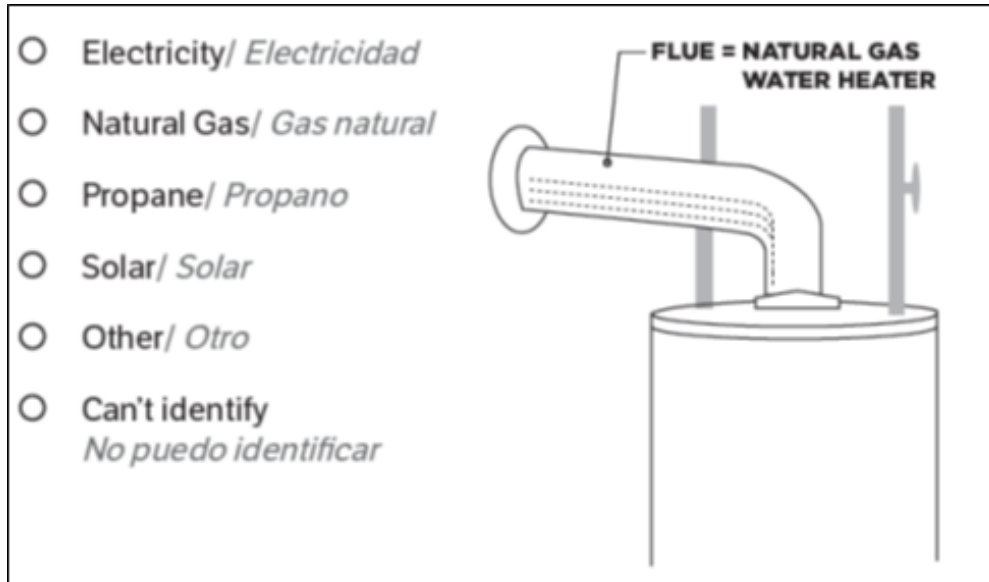
**Recommendation 1.** The evaluation team recommends tracking carryover savings on an ongoing basis and including carryover savings estimates in the ex ante energy and demand savings.

#### 6.3.2 Domestic Hot Water (DHW) Fuel Split

During the EPY9/GPY6 evaluation, the utilities expressed concerns that customers who were filling out the EEE student surveys could not properly identify their water heater fuel. To help address this issue, Navigant worked with the implementation contractor (IC) to make some changes to question HCU4 on the survey that asks how the water in the customer’s home is heated. The updated student survey was used during Wave 2 (fall of CY2018). The updates to the question and updated graphic are shown below.

- The question now includes a graphic showing an exhaust stack on a natural gas water heater.
- An option for “Can’t Identify” was added as an answer option.

Figure 6-1. Answers and Graphic for Water Heater Fuel Question (HCU4)

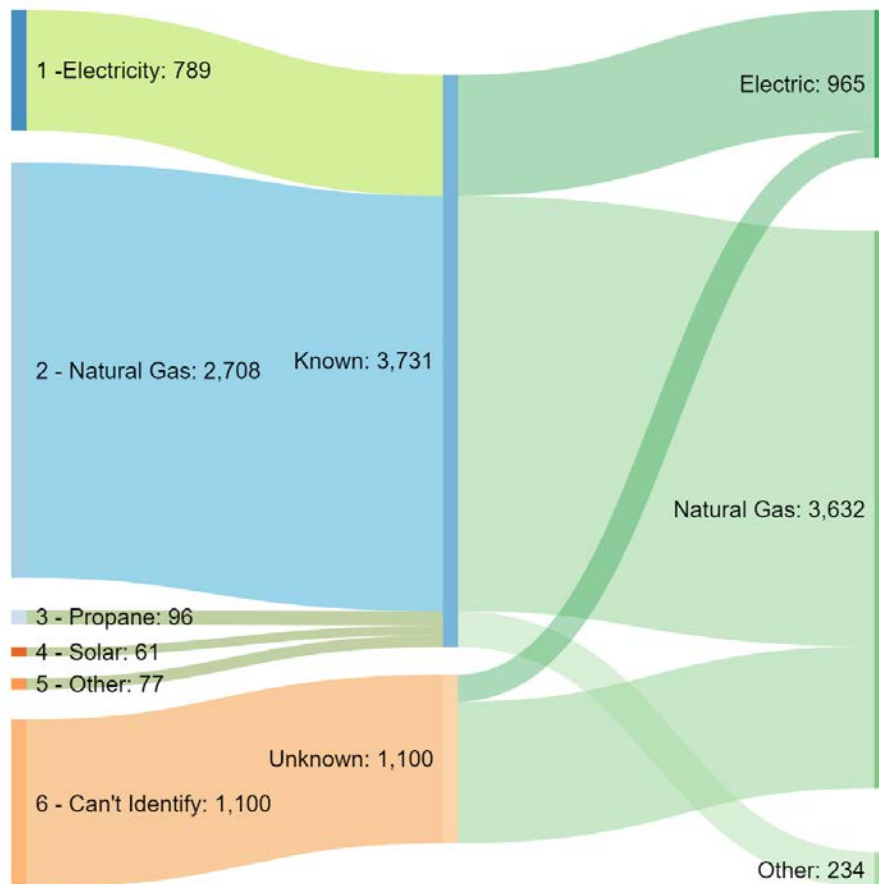


Source: Wave 2 EEE Student Survey Form

The CY2018 evaluation uses the updated survey data from Wave 2 to determine the DHW fuel split for the verified savings for all the participating utilities. In total, 4,831 completed surveys were received during Wave 2. The survey's responses were first classified into those who could identify their water heater (3,731 participants responded with options 1 through 5), and those who could not (1,100 responded with option 6 "Can't Identify").

Of those who could identify their water heater, about 21% indicated they had an electric water heater (789 out of 3,731). The evaluation team applied the IL TRM v6.0 estimate for percent of customers with electric water heaters (16%) to those customers who could not identify their water heater type. Thus, the program-wide number of customers with electric water heaters was determined by adding the number of customers with electric water heaters from the two groups. This resulted in 20.0% of EEE Wave 2 respondents having an electric water heater. Figure 6-2 shows this allocation process.

Figure 6-2. Allocation of “Can’t Identify” Survey Responses



Source: CY2018 Wave 2 survey data and Navigant team analysis.

Table 6-3 summarizes the DHW fuel split based on the CY2018 Wave 2 survey responses. The evaluation team applied the fuel splits in Table 6-3 to all the CY2018 survey data to calculate the verified gross savings for each utility. Individual fuel splits were not calculated for each utility due to reducing the sample size of survey responses.

Table 6-3. CY2018 DHW Fuel Split

DHW Type	Allocated Responses	Fuel Split
Electricity	965	0.20
Natural Gas	3,632	0.75
Other	234	0.05
<b>Total</b>	<b>4,831</b>	<b>1.00</b>

Source: CY2018 Wave 2 survey data and Navigant team analysis.

**Finding 2.** The IC used a different DHW split than the evaluation team to calculate ex ante savings for each utility and is presented in Table 6-4 below.

**Table 6-4. Summary of Ex Ante DHW Splits and of the Values**

Utility	% Electric DHW	% Fossil DHW	Source
ComEd	0.16	0.84	IL TRM v6.0
Nicor Gas	NA	0.84	IL TRM v6.0
Peoples Gas	NA	0.61	Custom calculated using GPY5 survey data*
North Shore Gas	NA	0.54	Custom calculated using GPY5 survey data*

\* Navigant's GPY5 Elementary Energy Education Joint Program Final Report, which is to be found on the IL SAG web site here: [http://www.ilsag.info/pg-nsg\\_eval\\_reports.html](http://www.ilsag.info/pg-nsg_eval_reports.html)

**Recommendation 2.** Navigant recommends the IC use the survey responses from each program year to custom calculate the DHW split, similar to the methodology outlined in Figure 6-2. Navigant also recommends that the IC use one DHW split to calculate savings for all the utilities. If a utility is not able to update the DHW split until the end of the program year, Navigant recommends the utilities use the CY2018 DHW split noted in Table 6-3 until the program data can be analyzed.

### 6.3.3 ComEd

**Finding 3.** The electric and demand ex ante savings for the measures distributed in the ComEd and joint utility kits were based on verified savings values from Navigant's PY9 EEE Program evaluation. The evaluation team used custom inputs to calculate the verified savings based on CY2018 survey responses provided by the IC. These custom inputs vary based on the survey responses received each year, which lead to discrepancies in realization rates.

**Recommendation 3.** Navigant recommends that ComEd claim the savings values calculated by the IC for the current program year in eTrack. The IC calculations use the survey responses from the current program year to calculate custom input parameters to the savings for each measure.

**Finding 4.** The ex ante gas savings reported by ComEd for ComEd Only kits were based on verified savings from Navigant's Nicor Gas GPY6 EEE Program evaluation. The evaluation team used custom inputs to calculate the verified savings based on CY2018 survey response provided by the IC. These custom inputs vary based on the survey responses received each year, which lead to discrepancies in realization rates.

**Recommendation 4.** Navigant recommends that ComEd claim the savings values calculated by the IC for the current program year in eTrack. The IC calculations use the survey responses from the current program year to calculate custom input parameters to the savings for each measure.

### 6.3.4 Nicor Gas

**Finding 5.** Nicor Gas used the IL TRM v6.0 DHW split and custom inputs to calculate the ex ante savings based on Navigant's GPY1/EPY4 calculations. The evaluation team used custom inputs to calculate the verified savings based on CY2018 survey responses provided by the IC. These custom inputs vary based on the survey responses received each year which lead to discrepancies in realization rates.

**Recommendation 5.** Navigant recommends that the IC use survey response results from CY2018 to calculate custom input parameters to the savings equations for each measure for

CY2019 program savings tracking. When CY2019 survey responses become available later in CY2019, the IC may consider further updates to custom inputs based on analyzing the latest survey data.

### 6.3.5 Peoples Gas and North Shore Gas

**Finding 6.** Peoples Gas and North Shore Gas used custom inputs to calculate the ex ante savings based on Navigant’s GPY5/EPY8 calculations. The evaluation team used custom inputs to calculate the verified savings based on CY2018 survey responses provided by the IC. These custom inputs vary based on the survey responses received each year which lead to discrepancies in realization rates.

**Recommendation 6.** Navigant recommends that the IC use survey response results from CY2018 to calculate custom input parameters to the savings equations for each measure for CY2019 program savings tracking. When CY2019 survey responses become available later in CY2019, the IC may consider further updates to custom inputs based on analyzing the latest survey data.

## 7. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

### Impact Parameter Estimate

The evaluation team utilized the appropriate input parameters and equations found in the IL TRM v6.0 and IL TRM v6.0 Errata. The evaluation team used the deemed input parameters for all measures except where survey data was available to custom calculate input parameters. A detailed summary of the input parameters used by the evaluation team and the IC is found in Appendix 2.

## 8. APPENDIX 2. IMPACT ANALYSIS DETAIL

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

## 8.1 ComEd Input and Assumption Comparison

**Table 8-1. Low Flow Showerhead – Custom and Deemed Values Comparison**

Navigant Value	ComEd Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.20	0.16	% ElectricDHW	Survey - HCU4	Custom	Yes
2.35	2.35	GPM_base	IL TRM 5.4.5	Deemed	-
1.50	1.50	GPM_low	Specifications	Custom	-
7.80	7.80	L_base	IL TRM 5.4.5	Deemed	-
7.80	7.80	L_low	IL TRM 5.4.5	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.5	Deemed	-
4.80	4.89	Household SF	Survey - HCU2	Custom	Yes
4.81	4.95	Household MF	Survey - HCU2	Custom	Yes
0.60	0.60	SPCD	IL TRM 5.4.5	Deemed	-
1.79	1.79	SPH SF	IL TRM 5.4.5	Deemed	-
1.30	1.30	SPH MF	IL TRM 5.4.5	Deemed	-
0.12	0.12	EPG_electric	IL TRM 5.4.5	Deemed	-
0.39	0.42	ISR SF	Survey - HA1	Custom	Yes
0.40	0.49	ISR MF	Survey - HA1	Custom	Yes
0.76	0.64	%SF	Survey - HCU1	Custom	Yes
0.24	0.36	%MF	Survey - HCU1	Custom	Yes
499.48	508.18	Hours - SF	IL TRM 5.4.5	Custom	Yes
500.49	514.91	Hours - MF	IL TRM 5.4.5	Custom	Yes
0.03	0.03	CF	IL TRM 5.4.5	Deemed	-
0.75	0.64	% FossilDHW	Survey - HCU4	Custom	Yes
0.01	0.01	EPG_gas SF	IL TRM 5.4.5	Deemed	-
0.01	0.01	EPG_gas MF	IL TRM 5.4.5	Deemed	-

Source: ComEd tracking data and Navigant team analysis.



**Table 8-2. Kitchen Faucet Aerator - Custom and Deemed Values Comparison**

Navigant Value	ComEd Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.20	0.16	%ElectricDHW	Survey - HCU4	Custom	Yes
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Deemed	-
4.50	4.50	L_base	IL TRM 5.4.4	Deemed	-
4.50	4.50	L_low	IL TRM 5.4.4	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.4	Deemed	-
4.80	4.89	Household SF	Survey - HCU2	Custom	Yes
4.81	4.95	Household MF	Survey - HCU2	Custom	Yes
0.75	0.75	DF	IL TRM 5.4.4	Deemed	-
1.00	1.00	KFPH	IL TRM 5.4.4	Deemed	-
0.10	0.10	EPG_electric	IL TRM 5.4.4	Deemed	-
0.24	0.28	ISR SF	Survey - HA2	Custom	Yes
0.39	0.38	ISR MF	Survey - HA2	Custom	Yes
0.76	0.64	%SF	Survey - HCU1	Custom	Yes
0.24	0.36	%MF	Survey - HCU1	Custom	Yes
176.11	179.18	Hours - SF	IL TRM 5.4.4	Custom	Yes
176.47	181.56	House - MF	IL TRM 5.4.4	Custom	Yes
0.02	0.02	CF	IL TRM 5.4.4	Deemed	-
0.75	0.64	%FossilDHW	Survey - HCU4	Custom	Yes
0.0042	0.0042	EPG_gas SF	IL TRM 5.4.5	Deemed	-
0.0048	0.0048	EPG_gas MF	IL TRM 5.4.5	Deemed	-

Source: ComEd tracking data and Navigant team analysis.

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

Navigant Value	ComEd Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.20	0.16	% ElectricDHW	Survey - HCU4	Custom	Yes
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Deemed	-
1.60	1.60	L_base	IL TRM 5.4.4	Deemed	-
1.60	1.60	L_low	IL TRM 5.4.4	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.4	Deemed	-
4.80	4.89	Household SF	Survey - HCU2	Custom	Yes
4.81	4.95	Household MF	Survey - HCU2	Custom	Yes
0.90	0.90	DF	IL TRM 5.4.4	Deemed	-
2.83	2.83	BFPH - SF	IL TRM 5.4.4	Deemed	-
1.50	1.50	BFPH - MF	IL TRM 5.4.4	Deemed	-
0.08	0.08	EPG_electric	IL TRM 5.4.4	Deemed	-
0.19	0.22	ISR SF - 1	Survey - HA3	Custom	Yes
0.26	0.25	ISR MF - 1	Survey - HA3	Custom	Yes
0.08	0.11	ISR SF - 2	Survey - HA3	Custom	Yes
0.12	0.13	ISR MF - 2	Survey - HA3	Custom	Yes
0.76	0.64	% SF	Survey - HCU1	Custom	Yes
0.24	0.36	% MF	Survey - HCU1	Custom	Yes
26.53	26.99	Hours - SF	IL TRM 5.4.4	Custom	Yes
50.15	51.59	Hours - MF	IL TRM 5.4.4	Custom	Yes
0.02	0.02	CF	IL TRM 5.4.4	Deemed	-
0.75	0.64	% FossilDHW	Survey - HCU4	Custom	Yes
0.0034	0.0034	EPG_gas SF	IL TRM 5.4.5	Deemed	-
0.0040	0.0040	EPG_gas MF	IL TRM 5.4.5	Deemed	-

Source: ComEd tracking data and Navigant team analysis.

**Table 8-4. LED - Custom and Deemed Values Comparison**

Navigant Value	ComEd Value	Variable	Source	Deemed/ Custom	Discrepancy?
43.00	43.00	WattsBase	IL TRM 5.5.1	Actual	-
9.50	9.50	WattsEE	Specifications	Actual	-
759.00	759.00	Hours	IL TRM 5.5.1	Deemed	-
1.06	1.06	WHFe - SF	IL TRM 5.5.1	Deemed	-
1.04	1.04	WHFe - MF	IL TRM 5.5.1	Deemed	-
0.00	0.00	Leakage	IL TRM 5.5.1	Actual	-
0.60	0.69	ISR - SF 1	Survey - HA4	Custom	Yes
0.62	0.68	ISR - MF 1	Survey - HA4	Custom	Yes
0.51	0.59	ISR - SF 2	Survey - HA4	Custom	Yes
0.48	0.57	ISR - MF 2	Survey - HA4	Custom	Yes
0.45	0.52	ISR - SF 3	Survey - HA5	Custom	Yes
0.40	0.50	ISR - MF 3	Survey - HA5	Custom	Yes
0.76	0.64	%SF	Survey - HCU1	Custom	Yes
0.24	0.36	%MF	Survey - HCU1	Custom	Yes
1.11	1.11	WHFd - SF	IL TRM 5.5.1	Deemed	-
1.07	1.07	WHFd - MF	IL TRM 5.5.1	Deemed	-
0.07	0.07	CF	IL TRM 5.5.2	Deemed	-
0.70	0.70	hHeat	IL TRM 5.5.1	Deemed	-
0.49	0.49	HF	IL TRM 5.5.1	Deemed	-
0.0341	0.0341	kWh to therms	IL TRM 5.5.1	Deemed	-

Source: CY2018 survey data and Navigant team analysis.

**Table 8-5. Water Heater Temperature Setback - Custom and Deemed Values Comparison**

Navigant Value	ComEd Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.08	0.08	U (HT coeff of tank)	IL TRM 5.4.6	Actual if known	-
24.99	24.99	A (Surface area)	IL TRM 5.4.6	Actual if known	-
4.85	1.79	(Tpre-Tpost) SF	Survey - HA13and14	Custom	Yes
2.30	3.69	(Tpre-Tpost) MF	Survey - HA13and14	Custom	Yes
8766.00	8766.00	Hours	IL TRM 5.4.6	Deemed	-
3412.00	3412.00	Btu to kWh	IL TRM 5.4.6	Deemed	-
0.98	0.98	RE_electric	IL TRM 5.4.6	Deemed	-
1.00	1.00	CF	IL TRM 5.4.6	Deemed	-
0.16	0.13	ISR SF	Survey - HA12	Custom	Yes
0.15	0.13	ISR MF	Survey - HA12	Custom	Yes
0.20	0.27	%ElectricDHW	Survey - HCU4	Custom	Yes
0.75	0.64	%GasDHW	Survey - HCU4	Custom	Yes
0.76	0.77	%SF	Survey - HCU1	Custom	Yes
0.24	0.23	%MF	Survey - HCU1	Custom	Yes
100,000	100,000	Btu to therms	IL TRM 5.4.6	Deemed	-
0.78	0.78	RE_gas - SF	IL TRM 5.4.6	Deemed	-
0.6700	0.6700	RE_gas - MF	IL TRM 5.4.6	Deemed	-

Source: ComEd tracking data and Navigant team analysis.

**Table 8-6. Shower Timer - Custom and Deemed Values Comparison**

Navigant Value	ComEd Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.20	0.16	% Electric DHW	Survey - HCU4	Custom	Yes
0.75	0.47	% Gas DHW	Survey - HCU4	Custom	Yes
2.01	1.77	GPM_MF	Survey - HA1	Custom	Yes
2.02		GPM_SF	Survey - HA1	Custom	Yes
7.80	7.80	L_base	IL TRM 5.4.9	Deemed	-
7.60	5.56	L_timer_MF	Survey - HA9, HA10	Custom	Yes
2.88	2.18	Household_MF	Survey - HA8	Custom	Yes
0.50	0.34	UsageFactor_MF	Survey - HA7	Custom	Yes
7.57	5.56	L_timer_SF	Survey - HA9, HA10	Custom	Yes
2.71	2.18	Household_SF	Survey - HA8	Custom	Yes
0.48	0.34	UsageFactor_SF	Survey - HA7	Custom	Yes
0.76	NA	% SF	Survey - HCU3	Custom	Yes
0.24		% MF	Survey - HCU4	Custom	Yes
241.90	170.71	Hours_SF	Survey - HA1, HA8	Custom	Yes
256.22	170.71	Hours_MF	Survey - HA1, HA8	Custom	Yes
0.03	0.03	CF	IL TRM 5.4.9	Deemed	-
365.25	365.25	Days/yr	IL TRM 5.4.9	Deemed	-
0.60	0.60	SPCD	IL TRM 5.4.9	Deemed	-
0.12	0.12	EPG_Electric	IL TRM 5.4.9	Deemed	-
0.0050	0.0050	EPG_gas SF	IL TRM 5.4.9	Deemed	-
0.0058	0.0058	EPG_gas MF	IL TRM 5.4.9	Deemed	-

Source: ComEd tracking data and Navigant team analysis.

Table 8-7 shows per-unit and total energy and demand savings for each kit distributed to ComEd electric customers as part of the EEE Program.

**Table 8-7. Verified Gross CY2018 ComEd Unit Energy and Demand Savings by Measure**

Measure	Energy Unit Savings (kWh)	Peak Demand Unit Savings (kW)	Demand Unit Savings (kW)	Gas Savings (Therms)*
Showerhead (1.5 GPM) - Single Family	25.42	0.001	0.050	4.40
Showerhead (1.5 GPM) - Multi Family	16.17	0.001	0.032	2.25
Kitchen Aerator (1.5 GPM) - Single Family	10.08	0.001	0.057	1.55
Kitchen Aerator (1.5 GPM) - Multi Family	5.55	0.001	0.031	0.90
Bathroom Aerator (1.0 GPM) Installed one - Single Family	0.97	0.001	0.036	0.15
Bathroom Aerator (1.0 GPM) Installed one - Multi Family	0.90	0.000	0.018	0.14
Bathroom Aerator (1.0 GPM) Installed Both - Single Family	0.94	0.001	0.035	0.13
Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	0.95	0.000	0.019	0.13
9.0-watt LED 1 - Single Family	11.59	0.001	0.016	0.00
9.0-watt LED 1 - Multi Family	4.88	0.000	0.007	0.00
9.0-watt LED 2 - Single Family	9.69	0.001	0.013	0.00
9.0-watt LED 2 - Multi Family	3.91	0.000	0.005	0.00
9.0-watt LED 3 - Single Family	8.43	0.001	0.012	0.00
9.0-watt LED 3 - Multi Family	3.36	0.000	0.005	0.00
Water Heater Temperature SetBack Electric SF	0.43	0.000	0.000	0.10
Water Heater Temperature SetBack Electric MF	0.21	0.000	0.000	0.02
Shower Timer Install - Single Family	2.79	0.000	0.011	0.38
Shower Timer Install - Multi Family	1.48	0.000	0.003	0.13
<b>Total Savings per Kit</b>	<b>107.7521</b>	<b>0.0112</b>	<b>0.3510</b>	<b>10.2761</b>
<b>Number of Kits</b>	<b>52,229</b>	<b>52,229</b>	<b>52,229</b>	<b>17,123</b>
<b>Total Savings†</b>	<b>5,627,782</b>	<b>584</b>	<b>18,331</b>	<b>175,957</b>

\* The per-unit gas savings are only for kits distributed to ComEd Only customers

† The Total Savings per Kit multiplied by the Number of Kits may not equal the Total Savings noted in the table due to rounding.

Source: ComEd tracking data and Navigant team analysis.

## 8.2 Nicor Gas Input and Assumption Comparison

**Table 8-8. Low Flow Showerhead - Custom and Deemed Values Comparison**

Navigant Value	Nicor Gas Value	Variable	Source	Deemed/Custom	Discrepancy?
0.75	0.84	% FossilDHW	Survey - HCU4	Custom	Yes
2.35	2.35	GPM_base	IL TRM 5.4.5	Deemed	-
1.5	1.5	GPM_low	Specifications	Actual	-
7.8	7.8	L_base	IL TRM 5.4.5	Deemed	-
7.8	7.8	L_low	IL TRM 5.4.5	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.5	Deemed	-
4.79	4.74	Household SF	Survey - HCU2	Custom	Yes
4.70		Household MF	Survey - HCU2	Custom	Yes
0.6	0.6	SPCD	IL TRM 5.4.5	Deemed	-
1.79	1.79	SPH SF	IL TRM 5.4.5	Deemed	-
1.3	1.3	S PH MF	IL TRM 5.4.5	Deemed	-
0.005	0.005	EPG_Gas_SF	IL TRM 5.4.5	Deemed	-
0.006	0.006	EPG_Gas_MF	IL TRM 5.4.5	Deemed	-
0.39	0.36	ISR SF	Survey - HA1	Custom	Yes
0.43		ISR MF	Survey - HA1	Custom	Yes
0.77	NA	% SF	Survey - HCU1	Custom	Yes
0.23		% MF	Survey - HCU1	Custom	Yes

Source: Nicor Gas tracking data and Navigant team analysis.

**Table 8-9. Kitchen Faucet Aerator - Custom and Deemed Values Comparison**

Navigant Value	Nicor Gas Value	Variable	Source	Deemed/Custom	Discrepancy?
0.75	0.84	% FossilDHW	Survey - HCU4	Custom	Yes
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Deemed	-
4.5	4.5	L_base	IL TRM 5.4.4	Deemed	-
4.5	4.5	L_low	IL TRM 5.4.4	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.4	Deemed	-
4.79	4.84	Household SF	Survey - HCU2	Custom	Yes
4.70	4.75	Household MF	Survey - HCU2	Custom	Yes
0.75	0.75	DF	IL TRM 5.4.4	Deemed	-
1	1	KFPH	IL TRM 5.4.4	Deemed	-
0.00415	0.00415	EPG_gas_SF	IL TRM 5.4.4	Deemed	-
0.005	0.005	EPG_gas_MF	IL TRM 5.4.4	Deemed	-
0.28	0.30	ISR SF	Survey - HA2	Custom	Yes
0.36	0.30	ISR MF	Survey - HA2	Custom	Yes
0.77	NA	% SF	Survey - HCU1	Custom	Yes
0.23	NA	% MF	Survey - HCU1	Custom	Yes

Source: Nicor Gas tracking data and Navigant team analysis.



**Table 8-10. Bathroom Faucet Aerator - Custom and Deemed Values Comparison**

Navigant Value	Nicor Gas Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.84	%FossilDHW	Survey - HCU4	Custom	Yes
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Deemed	-
1.60	1.6	L_base	IL TRM 5.4.4	Deemed	-
1.60	1.6	L_low	IL TRM 5.4.4	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.4	Deemed	-
4.79	4.84	Household SF	Survey - HCU2	Custom	Yes
4.70	4.75	Household MF	Survey - HCU2	Custom	Yes
0.90	0.9	DF	IL TRM 5.4.4	Deemed	-
2.83	2.83	BFPH_SF	IL TRM 5.4.5	Deemed	-
1.50	1.5	BFPH_MF	IL TRM 5.4.4	Deemed	-
0.00341	0.00341	EPG_gas_SF	IL TRM 5.4.4	Deemed	-
0.0040	0.004	EPG_gas_MF	IL TRM 5.4.4	Deemed	-
0.22	0.30	ISR SF - 1	Survey - HA2	Custom	Yes
0.24	0.30	ISR MF - 1	Survey - HA2	Custom	Yes
0.11	0.30	ISR SF - 2	Survey - HA2	Custom	Yes
0.12	0.30	ISR MF - 2	Survey - HA2	Custom	Yes
0.77	NA	%SF	Survey - HCU1	Custom	Yes
0.23	NA	%MF	Survey - HCU1	Custom	Yes

Source: Nicor Gas tracking data and Navigant team analysis.

**Table 8-11. Water Heater Temperature Setback - Custom and Deemed Values Comparison**

Navigator Value	Nicor Gas Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.08	0.08	U (HT coeff of tank)	IL TRM 5.4.6	Actual	-
24.99	24.99	A (Surface area)	IL TRM 5.4.6	Actual	-
6.15	10.00	(Tpre-Tpost)_SF	Survey - HA13and14	Custom	Yes
4.63	10.00	(Tpre-Tpost)_MF	Survey - HA13and15	Custom	Yes
8,766	8,766	Hours	IL TRM 5.4.6	Deemed	-
3,412	3,412	Btu to kWh	IL TRM 5.4.6	Deemed	-
0.78	0.78	RE_gas_SF	IL TRM 5.4.6	Deemed	-
0.67	0.78	RE_gas_MF	IL TRM 5.4.6	Deemed	Yes
0.15	0.29	ISR_SF	Survey - HA12	Custom	Yes
0.19	0.29	ISR_MF	Survey - HA12	Custom	Yes
0.77	NA	%SF	Survey - HCU1	Custom	Yes
0.23	NA	%MF	Survey - HCU1	Custom	Yes
0.75	0.84	% FossilDHW	Survey - HCU4	Custom	Yes

Source: Nicor Gas tracking data and Navigant team analysis.

**Table 8-12. Shower Timer - Custom and Deemed Values Comparison**

Navigator Value	Nicor Gas Value*	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	NA	% FossilDHW	Survey - HCU4	Custom	Yes
2.02	NA	GPM_SF	Survey - HA1	Custom	Yes
1.99	NA	GPM_MF	Survey - HA1	Custom	Yes
7.8	NA	L_base	IL TRM 5.4.9	Deemed	Yes
7.33	NA	L_timer_SF	Survey - HA9, HA10	Custom	Yes
2.60	NA	Household_SF	Survey - HA8	Custom	Yes
0.49	NA	UsageFactor_SF	Survey - HA7	Custom	Yes
7.27	NA	L_timer_MF	Survey - HA9, HA10	Custom	Yes
2.88	NA	Household_MF	Survey - HA8	Custom	Yes
0.50	NA	UsageFactor_MF	Survey - HA7	Custom	Yes
0.77	NA	%SF	Survey - HCU3	Custom	Yes
0.231	NA	%MF	Survey - HCU4	Custom	Yes
365.25	NA	Days/yr	IL TRM 5.4.9	Deemed	Yes
0.60	NA	SPCD	IL TRM 5.4.9	Deemed	Yes
0.01	NA	EPG_gas_SF	IL TRM 5.4.9	Deemed	Yes
0.01	NA	EPG_gas_MF	IL TRM 5.4.9	Deemed	Yes

\* Nicor did not claim savings for this measure.

Source: Nicor Gas tracking data and Navigant team analysis.

Table 8-13 shows the per-unit and total gas (therms) savings for each kit distributed to Nicor Gas customers as part of the EEE Program.

**Table 8-13. Verified Gross CY2018 Nicor Gas Unit Gas Savings by Measure**

Measure	Gas Unit Savings (therms)
Showerhead (1.5 GPM) - Single Family	4.36
Showerhead (1.5 GPM) - Multi Family	2.28
Kitchen Aerator (1.5 GPM) - Single Family	1.76
Kitchen Aerator (1.5 GPM) - Multi Family	0.79
Bathroom Aerator (1.0 GPM) Installed one - Single Family	0.18
Bathroom Aerator (1.0 GPM) Installed one - Multi Family	0.12
Bathroom Aerator (1.0 GPM) Installed Both - Single Family	0.17
Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	0.12
Water Heater Temperature SetBack Gas - Single	0.12
Water Heater Temperature SetBack Gas - Multi Family	0.04
Shower Timer Install - Single Family	0.77
Shower Timer Install - Multi Family	0.34
Total Kit Savings	11.0523
Number of Kits	18,040
Total Savings*	199,384

\* The Total Savings per Kit multiplied by the Number of Kits may not equal the Total Savings noted in the table due to rounding.

Source: Nicor Gas tracking data and Navigant team analysis.

### 8.3 Peoples Gas Input and Assumption Comparison

**Table 8-14. Low Flow Showerhead - Custom and Deemed Values Comparison**

Navigant Value	PGL Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.61	% FossilDHW	Survey - HCU4	Custom	Yes
2.35	2.35	GPM_base	IL TRM 5.4.5	Deemed	-
1.5	1.5	GPM_low	Specifications	Custom	-
7.8	7.8	L_base	IL TRM 5.4.5	Deemed	-
7.8	7.8	L_low	IL TRM 5.4.5	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.5	Deemed	-
5.00	4.85	Household SF	Survey - HCU2	Custom	Yes
4.99	5.00	Household MF	Survey - HCU2	Custom	Yes
0.6	0.6	SPCD	IL TRM 5.4.5	Deemed	-
1.79	1.79	SPH SF	IL TRM 5.4.5	Deemed	-
1.3	1.3	SPH MF	IL TRM 5.4.5	Deemed	-
0.00501	0.00501	EPG_gas SF	IL TRM 5.4.5	Deemed	-
0.00583	0.00583	EPG_gas MF	IL TRM 5.4.5	Deemed	-
0.46	0.33	ISR SF	Survey - HA1	Custom	Yes
0.53	0.51	ISR MF	Survey - HA1	Custom	Yes
0.52	0.56	% SF	Survey - HCU1	Custom	Yes
0.48	0.44	% MF	Survey - HCU1	Custom	Yes

Source: Peoples Gas tracking data and Navigant team analysis.

**Table 8-15. Kitchen Faucet Aerator - Custom and Deemed Values Comparison**

Navigator Value	PGL Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.61	%FossilDHW	Survey - HCU4	Custom	Yes
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Deemed	-
4.5	4.5	L_base	IL TRM 5.4.4	Deemed	-
4.5	4.5	L_low	IL TRM 5.4.4	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.4	Deemed	-
5.00	4.85	Household SF	Survey - HCU2	Custom	Yes
4.99	5.00	Household MF	Survey - HCU2	Custom	Yes
0.75	0.75	DF	IL TRM 5.4.4	Deemed	-
1	1	KFPH	IL TRM 5.4.4	Deemed	-
0.00415	0.00415	EPG_gas_SF	IL TRM 5.4.4	Deemed	-
0.00484	0.00484	EPG_gas_MF	IL TRM 5.4.4	Deemed	-
0.30	0.33	ISR SF	Survey - HA2	Custom	Yes
0.39	0.43	ISR MF	Survey - HA2	Custom	Yes
0.52	0.56	%SF	Survey - HCU1	Custom	Yes
0.48	0.44	%MF	Survey - HCU1	Custom	Yes

Source: Peoples Gas tracking data and Navigant team analysis.

**Table 8-16. Bathroom Faucet Aerator - Custom and Deemed Values Comparison**

Navigator Value	PGL Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.61	% FossilDHW	Survey - HCU4	Custom	Yes
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Deemed	-
1.6	1.6	L_base	IL TRM 5.4.4	Deemed	-
1.6	1.6	L_low	IL TRM 5.4.4	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.4	Deemed	-
5.00	4.48	Household SF	Survey - HCU2	Custom	Yes
4.99	5.00	Household MF	Survey - HCU2	Custom	Yes
0.9	0.9	DF	IL TRM 5.4.4	Deemed	-
2.83	2.83	BFPH_SF	IL TRM 5.4.4	Deemed	-
1.5	1.5	BFPH_MF	IL TRM 5.4.4	Deemed	-
0.003	0.003	EPG_gas_SF	IL TRM 5.4.4	Deemed	-
0.004	0.004	EPG_gas_MF	IL TRM 5.4.4	Deemed	-
0.25	0.22	ISR SF - 1	Survey - HA2	Custom	Yes
0.29	0.27	ISR MF - 1	Survey - HA2	Custom	Yes
0.12	0.11	ISR SF - 2	Survey - HA2	Custom	Yes
0.15	0.11	ISR MF - 2	Survey - HA2	Custom	Yes
0.52	0.56	%SF	Survey - HCU1	Custom	Yes
0.48	0.44	%MF	Survey - HCU1	Custom	Yes

Source: Peoples Gas tracking data and Navigant team analysis.

**Table 8-17. Water Heater Temperature Setback - Custom and Deemed Values Comparison**

Navigant Value	PGL Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.08	0.08	U (HT coeff of tank)	IL TRM 5.4.6	Actual	-
24.99	24.99	A (Surface area)	IL TRM 5.4.6	Actual	-
5.95	8.20	(Tpre-Tpost)_SF	Survey - HA13and14	Custom	Yes
5.69		(Tpre-Tpost)_MF	Survey - HA13and15	Custom	Yes
8766	8766	Hours	IL TRM 5.4.6	Deemed	-
3412	3412	Btu to kWh	IL TRM 5.4.6	Deemed	-
0.78	0.78	RE_gas_SF	IL TRM 5.4.6	Deemed	-
0.67	0.67	RE_gas_MF	IL TRM 5.4.6	Deemed	-
0.24	0.25	ISR_SF	Survey - HA12	Custom	Yes
0.33		ISR_MF	Survey - HA12	Custom	Yes
0.52	NA	%SF	Survey - HCU1	Custom	Yes
0.48		%MF	Survey - HCU1	Custom	Yes
0.75	0.61	% FossilDHW	Survey - HCU4	Custom	Yes

Source: Peoples Gas tracking data and Navigant team analysis.

**Table 8-18. Shower Timer - Custom and Deemed Values Comparison**

Navigant Value	PGL Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.47	% FossilDHW	Survey - HCU4	Custom	Yes
1.96	2.01	GPM_SF	Survey - HA1	Custom	Yes
1.90		GPM_MF	Survey - HA1	Custom	Yes
7.8	7.8	L_base	IL TRM 5.4.9	Deemed	-
7.37	5.65	L_timer_SF	Survey - HA9, HA10	Custom	Yes
3.07	2.18	Household_SF	Survey - HA8	Custom	Yes
0.52	0.34	UsageFactor_SF	Survey - HA7	Custom	Yes
7.45	5.65	L_timer_MF	Survey - HA9, HA10	Custom	Yes
3.13	2.18	Household_MF	Survey - HA8	Custom	Yes
0.53	0.34	UsageFactor_MF	Survey - HA7	Custom	Yes
0.52	NA	%SF	Survey - HCU3	Custom	Yes
0.48		%MF	Survey - HCU4	Custom	Yes
365.25	365.25	Days/yr	IL TRM 5.4.9	Deemed	-
0.60	0.60	SPCD	IL TRM 5.4.9	Deemed	-
0.0050	0.0050	EPG_gas_SF	IL TRM 5.4.9	Deemed	-
0.0058	0.0058	EPG_gas_MF	IL TRM 5.4.9	Deemed	-

Source: Peoples Gas tracking data and Navigant team analysis.

Table 8-19 shows the per-unit and total gas (therms) savings for each kit distributed to PGL customers as part of the EEE Program.

**Table 8-19. Verified Gross CY2018 PGL Unit Gas Savings by Measure**

Measure	Gas Unit Savings (therms)
Showerhead (1.5 GPM) - Single Family	3.68
Showerhead (1.5 GPM) - Multi Family	6.21
Kitchen Aerator (1.5 GPM) - Single Family	1.35
Kitchen Aerator (1.5 GPM) - Multi Family	1.89
Bathroom Aerator (1.0 GPM) Installed one - Single Family	0.14
Bathroom Aerator (1.0 GPM) Installed one - Multi Family	0.33
Bathroom Aerator (1.0 GPM) Installed Both - Single Family	0.14
Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	0.34
Water Heater Temperature SetBack Gas - Single	0.13
Water Heater Temperature SetBack Gas - Multi Family	0.18
Shower Timer Install - Single Family	0.58
Shower Timer Install - Multi Family	0.50
Total Kit Savings	15.4744
Number of Kits	16,323
Total Savings*	252,589

\* The Total Savings per Kit multiplied by the Number of Kits may not equal the Total Savings noted in the table due to rounding.

Source: Peoples Gas tracking data and Navigant team analysis.



## 8.4 North Shore Gas Input and Assumption Comparison

**Table 8-20. Low Flow Showerhead - Custom and Deemed Values Comparison**

Navigant Value	NSG Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.54	% FossilDHW	Survey - HCU4	Custom	Yes
2.35	2.35	GPM_base	IL TRM 5.4.5	Deemed	-
1.5	1.5	GPM_low	Specifications	Custom	-
7.8	7.8	L_base	IL TRM 5.4.5	Deemed	-
7.8	7.8	L_low	IL TRM 5.4.5	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.5	Deemed	-
4.71	4.75	Household SF	Survey - HCU2	Custom	Yes
4.58	4.89	Household MF	Survey - HCU2	Custom	Yes
0.6	0.6	SPCD	IL TRM 5.4.5	Deemed	-
1.79	1.79	SPH SF	IL TRM 5.4.5	Deemed	-
1.3	1.3	SPH MF	IL TRM 5.4.5	Deemed	-
0.00501	0.00501	EPG_gas SF	IL TRM 5.4.5	Deemed	-
0.00583	0.00583	EPG_gas MF	IL TRM 5.4.5	Deemed	-
0.67	0.31	ISR SF	Survey - HA1	Custom	Yes
0.59	0.39	ISR MF	Survey - HA1	Custom	Yes
0.74	0.73	% SF	Survey - HCU1	Custom	Yes
0.26	0.27	% MF	Survey - HCU1	Custom	Yes

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

**Table 8-21. Kitchen Faucet Aerator - Custom and Deemed Values Comparison**

Navigator Value	NSG Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.54	%FossilDHW	Survey - HCU4	Custom	Yes
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Deemed	-
4.5	4.5	L_base	IL TRM 5.4.4	Deemed	-
4.5	4.5	L_low	IL TRM 5.4.4	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.4	Deemed	-
4.71	4.75	Household SF	Survey - HCU2	Custom	Yes
4.58	4.89	Household MF	Survey - HCU2	Custom	Yes
0.75	0.75	DF	IL TRM 5.4.4	Deemed	-
1	1	KFPH	IL TRM 5.4.4	Deemed	-
0.00415	0.00415	EPG_gas_SF	IL TRM 5.4.4	Deemed	-
0.00484	0.00484	EPG_gas_MF	IL TRM 5.4.4	Deemed	-
0.37	0.23	ISR SF	Survey - HA2	Custom	Yes
0.40	0.27	ISR MF	Survey - HA2	Custom	Yes
0.74	0.73	%SF	Survey - HCU1	Custom	Yes
0.26	0.27	%MF	Survey - HCU1	Custom	Yes

Source: North Shore Gas tracking data and Navigant team analysis

**Table 8-22. Bathroom Faucet Aerator - Custom and Deemed Values Comparison**

Navigator Value	NSG Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.54	% FossilDHW	Survey - HCU4	Custom	Yes
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Deemed	-
1.6	1.6	L_base	IL TRM 5.4.4	Deemed	-
1.6	1.6	L_low	IL TRM 5.4.4	Deemed	-
365.25	365.25	days/year	IL TRM 5.4.4	Deemed	-
4.71	4.75	Household SF	Survey - HCU2	Custom	Yes
4.58	4.89	Household MF	Survey - HCU2	Custom	Yes
0.9	0.9	DF	IL TRM 5.4.4	Deemed	-
2.83	2.83	BFPH_SF	IL TRM 5.4.4	Deemed	-
1.5	1.5	BFPH_MF	IL TRM 5.4.4	Deemed	-
0.003	0.003	EPG_gas_SF	IL TRM 5.4.4	Deemed	-
0.004	0.004	EPG_gas_MF	IL TRM 5.4.4	Deemed	-
0.28	0.13	ISR SF - 1	Survey - HA2	Custom	Yes
0.24	0.16	ISR MF - 1	Survey - HA2	Custom	Yes
0.20	0.07	ISR SF - 2	Survey - HA2	Custom	Yes
0.24	0.02	ISR MF - 2	Survey - HA2	Custom	Yes
0.74	0.73	%SF	Survey - HCU1	Custom	Yes
0.26	0.27	%MF	Survey - HCU1	Custom	Yes

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

**Table 8-23. Water Heater Temperature Setback - Custom and Deemed Values Comparison**

Navigant Value	NSG Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.08	0.08	U (HT coeff of tank)	IL TRM 5.4.6	Actual	-
24.99	24.99	A (Surface area)	IL TRM 5.4.6	Actual	-
5.95	1.00	(Tpre-Tpost)_SF	Survey - HA13and14	Custom	Yes
5.69		(Tpre-Tpost)_MF	Survey - HA13and15	Custom	Yes
8766	8766	Hours	IL TRM 5.4.6	Deemed	-
3412	3412	Btu to kWh	IL TRM 5.4.6	Deemed	-
0.78	0.78	RE_gas_SF	IL TRM 5.4.6	Deemed	-
0.67	0.67	RE_gas_MF	IL TRM 5.4.6	Deemed	-
0.22	0.11	ISR_SF	Survey - HA12	Custom	Yes
0.28		ISR_MF	Survey - HA12	Custom	Yes
0.74	NA	%SF	Survey - HCU1	Custom	Yes
0.26		%MF	Survey - HCU1	Custom	Yes
0.75	0.54	% FossilDHW	Survey - HCU4	Custom	Yes

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

**Table 8-24. Shower Timer - Custom and Deemed Values Comparison**

Navigant Value	NSG Value	Variable	Source	Deemed/ Custom	Discrepancy?
0.75	0.47	% FossilDHW	Survey - HCU4	Custom	Yes
1.78	2.01	GPM_SF	Survey - HA1	Custom	Yes
1.85		GPM_MF	Survey - HA1	Custom	Yes
7.80	7.80	L_base	IL TRM 5.4.9	Deemed	-
7.37	5.65	L_timer_SF	Survey - HA9, HA10	Custom	Yes
3.07	2.18	Household_SF	Survey - HA8	Custom	Yes
0.52	0.34	UsageFactor_SF	Survey - HA7	Custom	Yes
7.45	5.65	L_timer_MF	Survey - HA9, HA10	Custom	Yes
3.13	2.18	Household_MF	Survey - HA8	Custom	Yes
0.53	0.34	UsageFactor_MF	Survey - HA7	Custom	Yes
0.74	NA	%SF	Survey - HCU3	Custom	Yes
0.26		%MF	Survey - HCU4	Custom	Yes
365.25	365.25	Days/yr	IL TRM 5.4.9	Deemed	-
0.60	0.60	SPCD	IL TRM 5.4.9	Deemed	-
0.0050	0.0050	EPG_gas_SF	IL TRM 5.4.9	Deemed	-
0.0058	0.0058	EPG_gas_MF	IL TRM 5.4.9	Deemed	-

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

Table 8-25 shows the per-unit and total gas (therms) savings for each kit distributed to NSG customers as part of the EEE Program.

**Table 8-25. Verified Gross CY2018 NSG Unit Gas Savings by Measure**

Measure	Gas Unit Savings (therms)
Showerhead (1.5 GPM) - Single Family	7.19
Showerhead (1.5 GPM) - Multi Family	3.43
Kitchen Aerator (1.5 GPM) - Single Family	2.24
Kitchen Aerator (1.5 GPM) - Multi Family	0.95
Bathroom Aerator (1.0 GPM) Installed one - Single Family	0.21
Bathroom Aerator (1.0 GPM) Installed one - Multi Family	0.13
Bathroom Aerator (1.0 GPM) Installed Both - Single Family	0.29
Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	0.26
Water Heater Temperature SetBack Gas - Single	0.17
Water Heater Temperature SetBack Gas - Multi Family	0.08
Shower Timer Install - Single Family	0.75
Shower Timer Install - Multi Family	0.27
Total Kit Savings	15.9825
Number of Kits	1,915
Total Savings*	30,606

\* The Total Savings per Kit multiplied by the Number of Kits may not equal the Total Savings noted in the table due to rounding.

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

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

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

# Joint ComEd, Nicor Gas, Peoples Gas, and North Shore Gas Elementary Energy Education Kits Impact Evaluation Report

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

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Verified Gross Savings (kWh)	Verified Gross Peak Demand Reduction (kW) *	Verified Gross Savings Therms	Gross Heating Penalty (kWh)	Gross Heating Penalty (Therms)	NTG Ratio (kWh)	Verified Net Savings (kWh)	Verified Net Peak Demand Reduction (kW)	Verified Net Savings Therms	Net Heating Penalty (kWh)	Net Heating Penalty (Therms)
Hot Water	Showerhead (1.5 GPM) - Single Family	Each	52,229	10.0	1,327,442	73	75,291	0	0	1.0	1,327,442	73	75,291	0	0
Hot Water	Showerhead (1.5 GPM) - Multi Family	Each	52,229	10.0	844,297	47	38,589	0	0	1.0	844,297	47	38,589	0	0
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	Each	52,229	9.0	526,690	65	26,534	0	0	1.0	526,690	65	26,534	0	0
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	Each	52,229	9.0	290,030	36	15,358	0	0	1.0	290,030	36	15,358	0	0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	Each	52,229	9.0	50,764	42	2,541	0	0	1.0	50,764	42	2,541	0	0
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	Each	52,229	9.0	46,850	20	2,424	0	0	1.0	46,850	20	2,424	0	0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	Each	52,229	9.0	49,292	41	2,178	0	0	1.0	49,292	41	2,178	0	0
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	Each	52,229	9.0	49,585	22	2,178	0	0	1.0	49,585	22	2,178	0	0
Lighting	9.0-watt LED 1 - Single Family	Lamp	52,229	10.0†	605,373	59	0	(46,311)	(10,057)	1.0	605,373	59	0	(46,311)	(10,057)
Lighting	9.0-watt LED 1 - Multi Family	Lamp	52,229	10.0†	254,664	25	0	(19,857)	(4,312)	1.0	254,664	25	0	(19,857)	(4,312)
Lighting	9.0-watt LED 2 - Single Family	Lamp	52,229	10.0†	506,086	50	0	(38,716)	(8,407)	1.0	506,086	50	0	(38,716)	(8,407)
Lighting	9.0-watt LED 2 - Multi Family	Lamp	52,229	10.0†	204,358	20	0	(15,934)	(3,460)	1.0	204,358	20	0	(15,934)	(3,460)
Lighting	9.0-watt LED 3 - Single Family	Lamp	52,229	10.0†	440,124	43	0	(33,670)	(7,312)	1.0	440,124	43	0	(33,670)	(7,312)
Lighting	9.0-watt LED 3 - Multi Family	Lamp	52,229	10.0†	175,609	17	0	(13,693)	(2,973)	1.0	175,609	17	0	(13,693)	(2,973)
Hot Water	Water Heater Temperature Setback Electric	Each	52,229	2.0	33,431	4	2,063	0	0	1.0	33,431	4	2,063	0	0
Hot Water	Shower Timer Install - Single Family	Each	52,229	2.0	145,963	16	6,588	0	0	1.0	145,963	16	6,588	0	0
Hot Water	Shower Timer Install - Multi Family	Each	52,229	2.0	77,224	5	2,214	0	0	1.0	77,224	5	2,214	0	0
Carryover	PY9 Carryover			7.8†	476,671	46	0	(36,724)	(7,975)	1.0	476,671	46	0	(36,724)	(7,975)

\* The measure level peak demand savings do not sum to the claimed 575 kW due to rounding.

† The CY2018 contribution to CPAS for these measures varies over time. See the CPAS tables in Section 4.

Source: ComEd tracking data and Navigant team analysis.

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

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Verified Gross Savings Therms	NTG Ratio (Therms)	Verified Net Savings Therms
Hot Water	Showerhead (1.5 GPM)	Each	18,040	10.0	119,684	1.0	119,684
Hot Water	Kitchen Aerator (1.5 GPM)	Each	18,040	9.0	45,991	1.0	45,991
Hot Water	Bathroom Aerator (1.0 GPM)	Each	36,080	9.0	10,733	1.0	10,733
Hot Water	Water Heater Temperature SetBack Gas	Each	18,040	2.0	2,976	1.0	2,976
Hot Water	Shower Timer Install	Each	18,040	2.0	19,999	1.0	19,999

Source: Navigant analysis of tracking data.

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

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Verified Gross Savings Therms	NTG Ratio (Therms)	Verified Net Savings Therms
Hot Water	Showerhead (1.5 GPM) - Single Family	Each	16,323	10.0	60,141	1.0	60,141
Hot Water	Showerhead (1.5 GPM) - Multi Family	Each	16,323	10.0	101,370	1.0	101,370
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	Each	16,323	9.0	22,075	1.0	22,075
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	Each	16,323	9.0	30,838	1.0	30,838
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	Each	16,323	9.0	2,305	1.0	2,305
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	Each	16,323	9.0	5,310	1.0	5,310
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	Each	16,323	9.0	2,246	1.0	2,246
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	Each	16,323	9.0	5,488	1.0	5,488
Hot Water	Water Heater Temperature SetBack Gas	Each	16,323	2.0	5,157	1.0	5,157
Hot Water	Shower Timer Install	Each	16,323	2.0	17,660	1.0	17,660

Source: Navigant analysis of tracking data

**Table 9-4. Total Resource Cost Savings Summary for NSG**

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Verified Gross Savings Therms	NTG Ratio (Therms)	Verified Net Savings Therms
Hot Water	Showerhead (1.5 GPM) - Single Family	Each	1,915	10.0	13,762	1.0	13,762
Hot Water	Showerhead (1.5 GPM) - Multi Family	Each	1,915	10.0	6,570	1.0	6,570
Hot Water	Kitchen Aerator (1.5 GPM) - Single Family	Each	1,915	9.0	4,289	1.0	4,289
Hot Water	Kitchen Aerator (1.5 GPM) - Multi Family	Each	1,915	9.0	1,828	1.0	1,828
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Single Family	Each	1,915	9.0	405	1.0	405
Hot Water	Bathroom Aerator (1.0 GPM) Installed one - Multi Family	Each	1,915	9.0	253	1.0	253
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Single Family	Each	1,915	9.0	561	1.0	561
Hot Water	Bathroom Aerator (1.0 GPM) Installed Both - Multi Family	Each	1,915	9.0	505	1.0	505
Hot Water	Water Heater Temperature SetBack Gas	Each	1,915	2.0	492	1.0	492
Hot Water	Shower Timer Install	Each	1,915	2.0	1,942	1.0	1,942

Source: Navigant analysis of tracking data.