



# ComEd Middle School Take Home Kits Impact Evaluation Report

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

Presented to  
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DRAFT

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## TABLE OF CONTENTS

1. Introduction .....	1
2. Program Description .....	1
3. Cumulative Persisting Annual Savings .....	2
4. Program Savings Detail .....	5
5. Program Savings by Measure .....	6
6. Impact Analysis Findings and Recommendations .....	7
6.1 Impact Parameter Estimates .....	7
6.2 CY2019 Carryover Estimate .....	9
6.3 Other Impact Findings and Recommendations .....	10
7. Appendix 1. Impact Analysis Methodology .....	11
8. Appendix 2. Impact Analysis Detail .....	11
9. Appendix 3. Total Resource Cost Detail .....	14

## LIST OF TABLES AND FIGURES

Figure 2-1. Number of Measures Distributed by Type .....	2
Figure 3-1. Cumulative Persisting Annual Savings .....	4
Table 2-1. CY2018 Volumetric Findings Detail .....	1
Table 3-1. Cumulative Persisting Annual Savings (CPAS) – Electric .....	3
Table 4-1. CY2018 Total Annual Incremental Electric Savings .....	5
Table 5-1. CY2018 Energy Savings by Measure – Electric .....	6
Table 5-2. CY2018 Demand Savings by Measure .....	7
Table 5-3. CY2018 Summer Peak Demand Savings by Measure .....	7
Table 6-1. Savings Parameters .....	8
Table 6-2. Single Family - Multifamily Split Summary .....	9
Table 6-3. CY2019 Verified Savings Carryover Estimate .....	10
Table 8-1. Kitchen Aerator – Custom and Deemed Values Comparison .....	11
Table 8-2. Bathroom Aerator – Custom and Deemed Values Comparison .....	12
Table 8-3. Showerhead – Custom and Deemed Values Comparison .....	13
Table 8-4. LED Bulbs – Custom and Deemed Values Comparison .....	13
Table 8-5. 7-Plug APS– Custom and Deemed Values Comparison .....	14
Table 9-1. Total Resource Cost Savings Summary .....	14

## 1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd’s CY2018 National Theatre for Children (NTC) Middle School Take Home Kit (Middle School Kits) Program. It presents a summary of the energy and demand impacts for the total program and is broken out by relevant measure and program structure details. The appendix presents the impact analysis methodology. CY2018 covers January 1, 2018 through December 31, 2018.

## 2. PROGRAM DESCRIPTION

The Middle School Kits Program targets sixth, seventh, and eighth grade teachers and school staff, students and their families throughout the ComEd service territory to deliver a multiplatform, behavior-driven, in-school program. The program features live, educational theatre performances by National Theater for Children (NTC) to the entire school rather than one grade at a time. After students see the performance, they are sent home with workbooks to fill out.

In addition to homework assignments, the workbooks contain an offer of a free energy efficiency kit that will be shipped to their home. Parents must request a kit and state whether they have a gas or electric water heater and based on their response, NTC will ship them one of two types of kits. Homes with gas water heaters are delivered a kit with different measures than those with electric water heaters.

The Middle School Kits Program’s primary focus is to produce electricity savings in the residential sector by motivating students and their families to take steps through reducing energy consumption for electric water heating and lighting in their home.

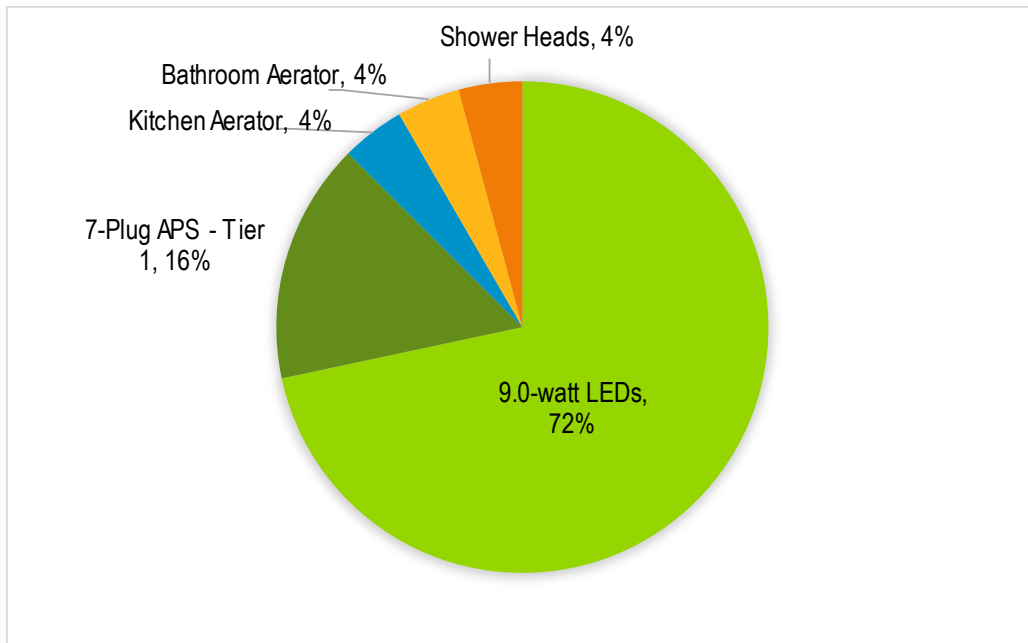
The program had 7,568 participants in CY2018 and distributed 37,840 measures as shown in the following table and graph.

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

Participation	Electric Kits	Gas Kits	Total Kits
Number of Measures per Kit	5	5	5
Number of Total Kits Distributed	1,579	5,989	7,568
Number of Kitchen Aerator	1,579	0	1,579
Number of Bathroom Aerator	1,579	0	1,579
Number of Shower Heads	1,579	0	1,579
Number of 9.0-watt LEDs	3,158	23,956	27,114
Number 7-Plug APS - Tier 1	0	5,989	5,989
Number of Total Measures Distributed	7,895	29,945	37,840

Source: ComEd tracking data and Navigant team analysis.

Figure 2-1. Number of Measures Distributed by Type



Source: ComEd tracking data and Navigant team analysis.

### 3. CUMULATIVE PERSISTING ANNUAL SAVINGS

The measure-specific and total verified gross savings for the Middle School Kits Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2018 are shown in the following tables and figure. The total CPAS across all measures is 1,368,039 kWh. ComEd did not claim any converted gas savings for the Middle School Kits Program in CY2018.

The Navigant team’s evaluated savings are nearly identical to those used in the ex ante analysis. The implementation contractor (IC) adopted the recommendations presented by the Navigant team within the Wave 1 interim results memo<sup>1</sup> and there were no significant changes to savings parameters between the Wave 1 analysis and the final report. The savings for this program were verified using Illinois Technical Reference Manual (TRM) v6.0.

The ex ante savings did not include an estimate for carryover savings from light bulbs distributed in PY9 but were 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>1</sup> ComEd NTC Middle School Kits CY2018 Data Review Memo. December 13, 2018.

**Table 3-1. Cumulative Persisting Annual Savings (CPAS) – Electric**

End Use Type	Research Category	EUL	CY2018 Verified Gross Savings	NTG*	Lifetime Net Savings†	Verified Net kWh Savings									
						2018	2019	2020	2021	2022	2023	2024	2025	2026	
Hot Water	Kitchen Aerator (1.5 GPM)	9.0	122,638	1.00	1,103,745	122,638	122,638	122,638	122,638	122,638	122,638	122,638	122,638	122,638	
Hot Water	Bathroom Aerator (1.0 GPM)	9.0	18,852	1.00	169,665	18,852	18,852	18,852	18,852	18,852	18,852	18,852	18,852	18,852	
Hot Water	Low-flow Showerhead (1.5 GPM)	10.0	258,044	1.00	2,580,444	258,044	258,044	258,044	258,044	258,044	258,044	258,044	258,044	258,044	
Lighting	9.0 watt LED - Electric Kit	10.0	63,228	1.00	332,879	63,228	63,228	63,228	20,456	20,456	20,456	20,456	20,456	20,456	
Lighting	9.0 watt LED - Gas Kit	10.0	479,638	1.00	2,525,155	479,638	479,638	479,638	155,177	155,177	155,177	155,177	155,177	155,177	
Consumer Electronics	7-plug Advanced Power Strip – Tier 1	7.0	425,638	1.00	2,979,468	425,638	425,638	425,638	425,638	425,638	425,638	425,638	425,638	425,638	
Carryover	PY9 Carryover	3.0	115,098	1.00	345,294	115,098	115,098	115,098							
<b>CY2018 Program Total Electric CPAS</b>			<b>1,483,137</b>		<b>10,036,649</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,000,806</b>	<b>1,000,806</b>	<b>1,000,806</b>	<b>1,000,806</b>	<b>575,168</b>	<b>575,168</b>	
<b>CY2018 Program Expiring Electric Savings‡</b>								<b>482,331</b>	<b>482,331</b>	<b>482,331</b>	<b>482,331</b>	<b>907,970</b>	<b>907,970</b>		

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Hot Water	Kitchen Aerator (1.5 GPM)												
Hot Water	Bathroom Aerator (1.0 GPM)												
Hot Water	Low-flow Showerhead (1.5 GPM)	258,044											
Lighting	9.0 watt LED - Electric Kit	20,456											
Lighting	9.0 watt LED - Gas Kit	155,177											
Consumer Electronics	7-plug Advanced Power Strip – Tier 1												
Carryover	PY9 Carryover												
<b>CY2018 Program Total Electric CPAS</b>		<b>433,678</b>											
<b>CY2018 Program Expiring Electric Savings‡</b>		<b>1,049,460</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>	<b>1,483,137</b>

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

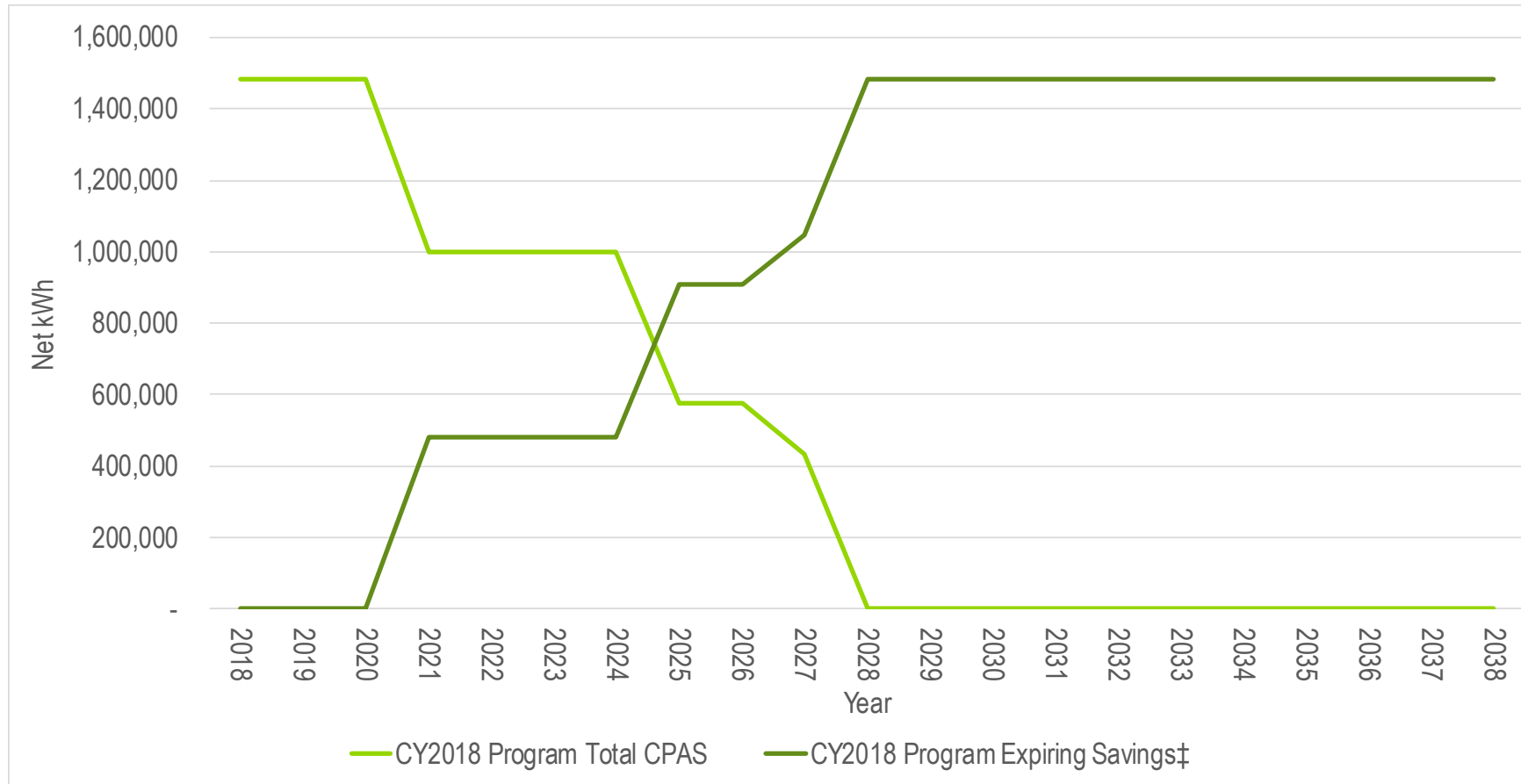
\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

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

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

Source: Navigant analysis

Figure 3-1. Cumulative Persisting Annual Savings



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

## 4. PROGRAM SAVINGS DETAIL

Table 4-1 summarizes the incremental energy and demand savings the Middle School Kits Program achieved in CY2018. ComEd did not claim any gas savings in CY2018. The ex ante and verified savings in Table 4-1 do not include carryover savings from PY9. The carryover savings from PY9 are included in tables in Section 5.

NTC calculated gross natural gas savings for the program, but this was done in error. Measures distributed in the electric kits (aerators, showerheads, and LEDs) should not be expected to generate natural gas savings since they were distributed only to participants who indicated they have an electric water heater. Participants who indicated they have a natural gas water heater did not receive any natural gas saving measures and received only LED lamps and an advanced power strip (APS).

**Table 4-1. CY2018 Total Annual Incremental Electric Savings**

Savings Category	Energy Savings (kWh)	Demand Savings (kW) <sup>†</sup>	Summer Peak Demand Savings (kW)
<b>Electricity</b>			
Ex Ante Gross Savings	1,367,995	NR	186
Program Gross Realization Rate	1.00	NA	0.96
Verified Gross Savings	1,368,039	4,279	179
Program Net-to-Gross (NTG) Ratio	1.00	1.00	1.00
Verified Net Savings	1,368,039	4,279	179
<b>Converted from Gas*‡</b>			
Ex Ante Gross Savings	NA	NA	NA
Program Gross Realization Rate	NA	NA	NA
Verified Gross Savings	NA	NA	NA
Program Net-to-Gross (NTG) Ratio	NA	NA	NA
Verified Net Savings	NA	NA	NA
<b>Total Electric Plus Gas</b>			
Ex Ante Gross Savings	1,367,995	NR	186
Program Gross Realization Rate	1.00	NA	0.96
Verified Gross Savings	1,368,039	4,279	179
Program Net-to-Gross (NTG) Ratio	1.00	1.00	1.00
Verified Net Savings	1,368,039	4,279	179

Note: NR = Not Reported by ComEd

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

† Gross demand savings were not reported (NR) by the implementation contractor. Realization rates for NR savings are not applicable (NA).

‡ Gas savings were not claimed by ComEd, and are not applicable (NA) for this program.

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 difference in kW in the baseline and post installation period for the measures installed in year 2018.

Source: ComEd tracking data and Navigant team analysis.



## 5. PROGRAM SAVINGS BY MEASURE

The Navigant team’s analysis of the ComEd CY2018 Middle School Kits Program resulted in a verified gross energy and peak demand savings of 1,483,137 kWh and 190 kW, respectively. The verified gross realization rates for energy and peak demand savings were 108% and 103%, respectively. Verified net energy and peak demand savings were 1,483,137 kWh and 190 kW, respectively, which exceeded the original CY2018 net energy savings target of 1,267,000 kWh<sup>2</sup>. The verified savings detailed in this section include PY9 Carryover savings.

The program includes 5 measures as shown in the following tables. The LED lamps and 7-Plug APS contributed the most savings at 40% and 31%, respectively. A summary of the program savings by measure is shown in the following tables. NTC did not calculate demand savings so Table 5-2 shows that ex ante values were not reported (NR) for demand, and the realization rate was not applicable (NA).

Realization rate differences for energy and peak demand savings at the measure level are entirely due to rounding differences. For example, the demand savings for LEDs reported in the ex ante analysis is 0.002 kW per lamp, while the evaluation used 0.0017 kW per lamp, consistent with the Wave 1 memo analysis.

**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	Kitchen Aerator (1.5 GPM)	122,641	1.00	122,638	1.00	122,638	9.0
Hot Water	Bathroom Aerator (1.0 GPM)	18,853	1.00	18,852	1.00	18,852	9.0
Hot Water	Low-flow Showerhead (1.5 GPM)	258,040	1.00	258,044	1.00	258,044	10.0
Lighting	9.0 watt LED - Electric Kit	63,223	1.00	63,228	1.00	63,228	10.0
Lighting	9.0 watt LED - Gas Kit	479,599	1.00	479,638	1.00	479,638	10.0
Consumer Electronics	7-plug Advanced Power Strip – Tier 1	425,638	1.00	425,638	1.00	425,638	7.0
Carryover	PY9 Carryover	NR	NA	115,098	1.00	115,098	3.0
<b>Total</b>		<b>1,367,995</b>	<b>1.08</b>	<b>1,483,137</b>	<b>1.00</b>	<b>1,483,137</b>	

Note: NR = Not Reported by ComED

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

Source: ComEd tracking data and Navigant team analysis.

<sup>2</sup> ComEd 2018 – 2021 Energy Efficiency and Demand Response Plan. June 30, 2017.

**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* 1.00	Verified Net Demand Reduction (kW)
Hot Water	Kitchen Aerator (1.5 GPM)	NR	NA	1,387	1.00	1,387
Hot Water	Bathroom Aerator (1.0 GPM)	NR	NA	1,133	1.00	1,133
Hot Water	Low-flow Showerhead (1.5 GPM)	NR	NA	1,032	1.00	1,032
Lighting	9.0 watt LED - Electric Kit	NR	NA	78	1.00	78
Lighting	9.0 watt LED - Gas Kit	NR	NA	590	1.00	590
Consumer Electronics	7-plug Advanced Power Strip – Tier 1	NR	NA	60	1.00	60
Carryover	PY9 Carryover	NR	NA	158	1.00	158
<b>Total</b>		<b>NR</b>	<b>NA</b>	<b>4,437</b>	<b>1.00</b>	<b>4,437</b>

Note: NR = Not Reported by ComED

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

† Gross demand savings were not reported (NR) by the implementation contractor.

‡ Realization rates for NR savings are not applicable (NA).

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* 1.00	Verified Net Peak Demand Reduction (kW)
Hot Water	Kitchen Aerator (1.5 GPM)	30	1.02	31	1.00	31
Hot Water	Bathroom Aerator (1.0 GPM)	25	0.99	25	1.00	25
Hot Water	Low-flow Showerhead (1.5 GPM)	28	1.01	29	1.00	29
Lighting	9.0 watt LED - Electric Kit	6	0.87	6	1.00	6
Lighting	9.0 watt LED - Gas Kit	48	0.87	42	1.00	42
Consumer Electronics	7-plug Advanced Power Strip – Tier 1	48	1.00	48	1.00	48
Carryover	PY9 Carryover	NR	NA	11	1.00	11
<b>Total</b>		<b>186</b>	<b>1.03</b>	<b>190</b>	<b>1.00</b>	<b>190</b>

Note: NR = Not Reported by ComED

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

Source: ComEd tracking data and Navigant team analysis.

## 6. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

### 6.1 Impact Parameter Estimates

The Navigant team calculated verified gross energy and demand savings using the algorithms in the Illinois Technical Reference Manual (IL TRM), version 6.0 and IL TRM version 6.0 Errata. The input parameters used in the calculations were also taken from the appropriate measure section in the TRM, or from ComEd specific data. A summary of the custom versus deemed parameters used is shown in the following table.

**Table 6-1. Savings Parameters**

Measure	Custom Input Parameters	Deemed Input Parameters	Deemed* Input Data Source
Kitchen Aerators	%SF, % MF, %ElectricDHW	Household, ISR, %SF, %MF, Hours, GPM_base, GPM_low, L_base, L_low, KFPH, EPG_electric, CF, NTG†	IL TRM v6.0 – Section 5.4.4
Bathroom Aerator	%SF, % MF, %ElectricDHW	Household, ISR, Hours, GPM_base, GPM_low, L_base, L_low, KFPH, EPG_electric, CF, NTG†	IL TRM v6.0 – Section 5.4.4
Low-flow Showerhead	%SF, % MF, %ElectricDHW	Household, ISR, Hours, GPM_base, GPM_low, L_base, L_low, days/yr, SPCD, SPH, EPG, CF, NTG†	IL TRM v6.0 – Section 5.4.5
9W LEDs	WattsEE, %SF, %MF	ISR, Wattbase, Hours, WHFe, WHFd, CF, Leakage, NTG†	IL TRM v6.0 – Section 5.5.8 and IL TRM v6.0 Errata
7-Plus APS – Tier 1	NA	kWh, ISR, Hours, CF	IL TRM v6.0 – Section 5.2.1

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

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

The evaluation used three custom inputs in the CY2018 verified savings calculations. The first custom input was the wattage of the LED bulbs distributed in the kits (9.0 watts). The second was the percent of customers who have electric hot water heaters. All customers who received an electric kit indicated they have an electric hot water heater, so the Navigant team used a custom input of 1.0 for the %ElectricDHW variable. The third custom input across all the measures in the program was the split between single family and multifamily homes (67% and 33%, respectively). The evaluation team calculated the split for the ex post analysis using a weighted average based on the ComEd Elementary Energy Education (EEE) kits student survey responses and verified savings from the three previous program years (PY7 through PY9). Equation 1 and Equation 2 show the formulas, and Table 6-2 shows the input parameters used in the weighted average calculation.

**Equation 1. Weighted Average %SF**

$$%SF_{WA} = \sum_{PY7, PY8, PY9} (%SF_i * \%Energy_i)$$

**Equation 2. Weighted Average %MF**

$$%MF_{WA} = 1 - \%SF_{WA}$$

Where:

$%SF_{WA}$  = Weighted average percent SF

$%SF_i$  = Percent single family in year i, from Table 6-2

$%Energy_i$  = Percent of energy savings in year i, from Table 6-2

$%MF_{WA}$  = Weighted average percent MF

**Table 6-2. Single Family - Multifamily Split Summary**

Program Year	Percent Single Family	Percent Multifamily	Ex Ante Gross Savings	Percent Energy Savings
PY7	73%	27%	1,944,113	20%
PY8	71%	29%	1,790,600	18%
PY9	64%	36%	6,079,289	62%
<b>Weighted Average</b>	<b>67%</b>	<b>33%</b>		

Source: ComEd tracking data and Navigant team analysis.

## 6.2 CY2019 Carryover Estimate

Calculation of the Calendar Year 2019 (CY2019) carryover estimate relies upon the IL TRM v6.0 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 v6.0, CY2018 program data).
- HOU and Peak CF – Verified savings estimate from the year of installation (source: IL TRM v6.0).
- Energy and Demand IE – Verified savings estimate from the year of installation (source: IL TRM v6.0.)
- Installation Rate - Verified savings estimate from the year of purchase (source: IL TRM v6.0). The Navigant team used the installation rates for each year for Direct Mail Kits specified in IL TRM v6.0.
- NTGR – Evaluation research from the year of purchase (source: PY9 and CY2018 Reports).

Table 6-3 shows that in CY2019, 7,911 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 256,703 kWh and 19.65 summer peak kW, which will be counted in CY2019 as Middle School Take Home Kits program carryover savings.

**Table 6-3. CY2019 Verified Savings Carryover Estimate**

CY2019 Verified Savings Carryover Estimate	PY9 Bulbs	CY2018 Bulbs	CY2019 Carryover
Carryover Bulbs Installed During CY2019	4,115	3,796	7,911
Average Delta Watts	30.0	34.0	31.9
Average Installation Rate	1.00	1.00	1.00
Average Annual Hours of Use	1,089	847	973
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)	141,549	115,154	256,703
Carryover Gross Demand Savings (kW)	135.26	141.56	276.82
Carryover Gross Summer Peak Demand Savings (kW)	9.60	10.05	19.65
Net-to-Gross Ratio	1.00	1.00	1.00
Carryover Net Energy Savings (kWh)	141,549	115,154	256,703
Carryover Net Demand Savings (kW)	135.26	141.56	276.82
Carryover Net Summer Peak Demand Savings (kW)	9.60	10.05	19.65
Effective Useful Life	2.0	9.0	5.4

### 6.3 Other Impact Findings and Recommendations

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

**Finding 1.** The ex ante savings claimed for the Middle School Take Home Kits 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.

**Finding 2.** The IC used the appropriate weighted average single family and multifamily split for the household characteristics parameters in the hot water measure savings calculations. The Navigant team recommended a 67% Single Family 33% multifamily split in the wave 1 memo.

**Finding 3.** The IC used the appropriate weighted average single family and multifamily split for the *WHFe* and *WHFd* input parameters for the 9W LED lamp measure.

**Finding 4.** The IC used the appropriate in-service rate (ISR) of 0.66 and *Watts\_base* (43 watts) from IL TRM v6.0 in the calculation of LED energy and peak demand savings.

**Finding 5.** The IC used the correct algorithms and input parameters from the IL TRM v6.0 to determine the peak demand savings for all measures included in the kits.

**Recommendation 2.** The Navigant team recommends that the ex ante savings continue to use the weighted average single family and multifamily split, ISR, *Watts\_base* and peak demand algorithms and input parameters from the IL TRM, absent any program changes.

**Finding 6.** The IC did not calculate demand savings (non-peak) for any of the measures included in the kits.

**Recommendation 3.** The Navigant team recommends the IC determine demand savings utilizing the algorithms and input parameters from the IL TRM. Non-peak demand savings are calculated using the same formulas but exclude the *CF* variable from the equations.

## 7. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

The evaluation team utilized the appropriate input parameters and equations found in the IL TRM v6.0. The evaluation team used the deemed input parameters from all measures except for three variables; WattsEE, %SF, and %MF. A detailed summary of the input parameters used by the evaluation team and the IC is found in Appendix 2. Impact Analysis Detail

## 8. APPENDIX 2. IMPACT ANALYSIS DETAIL

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

**Table 8-1. Kitchen Aerator – Custom and Deemed Values Comparison**

Navigant Value	ComEd Value	Variable	Source	Deemed/ Custom
1.00	1.00	% ElectricDHW	Actual	Custom
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed
0.94	0.94	GPM_low	IL TRM 5.4.4	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
2.56	2.56	Household SF	IL TRM 5.4.4	Deemed
2.10	2.10	Household MF	IL TRM 5.4.4	Deemed
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
0.60	0.60	ISR	IL TRM 5.4.4	Deemed
0.67	0.67	% SF	EEE Kit Survey Data	Custom
0.33	0.33	% MF	EEE Kit Survey Data	Custom
94.00	94.00	Hours - SF	IL TRM 5.4.4	Deemed
77.00	77.00	House - MF	IL TRM 5.4.4	Deemed
0.02	0.02	CF	IL TRM 5.4.4	Deemed

Source: ComEd tracking data and Navigant team analysis.

**Table 8-2. Bathroom Aerator – Custom and Deemed Values Comparison**

Navigant Value	ComEd Value	Variable	Source	Deemed/ Custom
1.00	1.00	% ElectricDHW	Actual	Custom
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed
0.94	0.94	GPM_low	IL TRM 5.4.4	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
2.00	2.00	Household SF	IL TRM 5.4.4	Deemed
2.56	2.56	Household MF	IL TRM 5.4.4	Deemed
2.10	2.10	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
0.63	0.63	ISR	IL TRM 5.4.4	Deemed
0.67	0.67	% SF	EEE Kit Survey Data	Custom
0.33	0.33	% MF	EEE Kit Survey Data	Custom
14.00	14.00	Hours - SF	IL TRM 5.4.4	Deemed
22.00	22.00	Hours - MF	IL TRM 5.4.4	Deemed
0.02	0.02	CF	IL TRM 5.4.4	Deemed

Source: ComEd tracking data and Navigant team analysis.

**Table 8-3. Showerhead – Custom and Deemed Values Comparison**

Navigant Value	ComEd Value Variable	Source	Deemed/ Custom
1.00	1.00 %ElectricDHW	IL TRM 5.4.5	Actual
2.35	2.35 GPM_base	IL TRM 5.4.5	Deemed
1.50	1.50 GPM_low	IL TRM 5.4.5	Deemed
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
2.56	2.56 Household SF	IL TRM 5.4.5	Deemed
2.10	2.10 Household MF	IL TRM 5.4.5	Deemed
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
0.65	0.65 ISR	IL TRM 5.4.5	Deemed
0.67	0.67 %SF	EEE Kit Survey Data	Custom
0.33	0.33 %MF	EEE Kit Survey Data	Custom
266.00	266.00 Hours - SF	IL TRM 5.4.5	Deemed
218.00	218.00 Hours - MF	IL TRM 5.4.5	Deemed
0.03	0.03 CF	IL TRM 5.4.5	Deemed

Source: ComEd tracking data and Navigant team analysis.

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

Navigant Value	ComEd Value Variable	Source	Deemed/ Custom
43.00	43.00 WattsBase	IL TRM 5.5.8	Actual (use table in IL TRM 5.5.8)
9.00	9.00 WattsEE	Specifications	Custom
847.00	847.00 Hours	IL TRM 5.5.8	Deemed
1.06	1.06 WHFe - SF	IL TRM 5.5.9	Deemed
1.04	1.04 WHFe - MF	IL TRM 5.5.10	Deemed
0.00	0.00 Leakage	IL TRM 5.5.11	Deemed
0.66	0.66 ISR	IL TRM 5.5.11	Deemed
0.67	0.67 %SF	EEE Kit Survey Data	Custom
0.33	0.33 %MF	EEE Kit Survey Data	Custom
1.11	1.11 WHFd - SF	IL TRM 5.5.11	Deemed
1.07	1.07 WHFd - MF	IL TRM 5.5.11	Deemed
0.07	0.07 CF	IL TRM 5.5.11	Deemed

Source: ComEd tracking data and Navigant team analysis.



**Table 8-5. 7-Plug APS– Custom and Deemed Values Comparison**

Navigant Value	ComEd Value Variable	Source	Deemed/ Custom
103.00	103.00 kWh	IL TRM 5.2.1	Deemed
0.69	0.69 ISR	IL TRM 5.2.1	Deemed
7129	7129 Hours	IL TRM 5.2.1	Deemed
0.80	0.80 CF	IL TRM 5.2.1	Deemed

Source: ComEd 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 evaluation later.

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

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (kWh)	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Savings (kWh)	Verified Gross Peak Demand Reduction (kW)
Hot Water	Kitchen Aerator (1.5 GPM)	Each	1,579	9.0	122,641	30.00	122,638	30.52
Hot Water	Bathroom Aerator (1.0 GPM)	Each	1,579	9.0	18,853	25.26	18,852	24.92
Hot Water	Low-flow Showerhead (1.5 GPM)	Each	1,579	10.0	258,040	28.42	258,044	28.68
Lighting	9.0 watt LED - Electric Kit	Lamp	3,158	10.0	63,223	6.32	63,228	5.52
Lighting	9.0 watt LED - Gas Kit	Lamp	23,956	10.0	479,599	47.91	479,638	41.86
Consumer Electronics	7-plug Advanced Power Strip – Tier 1	Each	5,989	7.0	425,638	47.91	425,638	47.76
Carryover	PY9 Carryover			3.0	NR	NR	115,098	11.20

Note: NR = Not Reported by ComED

Source: ComEd tracking data and Navigant team analysis.