NAVIGANT

ComEd National Theatre for Children's Middle School Kits IPA Program Impact Evaluation Report

Energy Efficiency / Demand Response Plan: Plan Year 9 (PY9)

Presented to
ComEd

FINAL

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1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd's PY9 National Theatre for Children's (NTC) Middle School Kits 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. Appendix 1. Impact Analysis Methodology presents the impact analysis methodology. PY9 covers June 1, 2016 through December 31, 2017.

2. PROGRAM DESCRIPTION

The program focused on sixth, seventh and eighth grade students and their families throughout the ComEd service territory to deliver a multiplatform, behavior-driven, in-school program. The program featured live, educational theatre performances to the entire school rather than to one grade at a time. After students saw the performance, they were sent home with workbooks to complete. In addition to homework assignments, the workbooks contained an offer of a free energy efficiency kit to be delivered to their home. Parents requested to receive a kit and stated whether they had a gas or electric water heater and based on their response, NTC shipped them one of two types of kits. Homes with gas water heaters received a kit with different measures than those with electric water heaters. Reply cards included in each kit sent home to the parents, asked installation and satisfaction questions. Parents were incentivized to return the cards with the chance to win $1,000 from a one-time drawing from everyone who returned them.

The NTC Schools program's primary focus was to produce electricity savings in the residential sector by motivating students and their families to take steps to reduce energy consumption by electric water heating and lighting in their home.

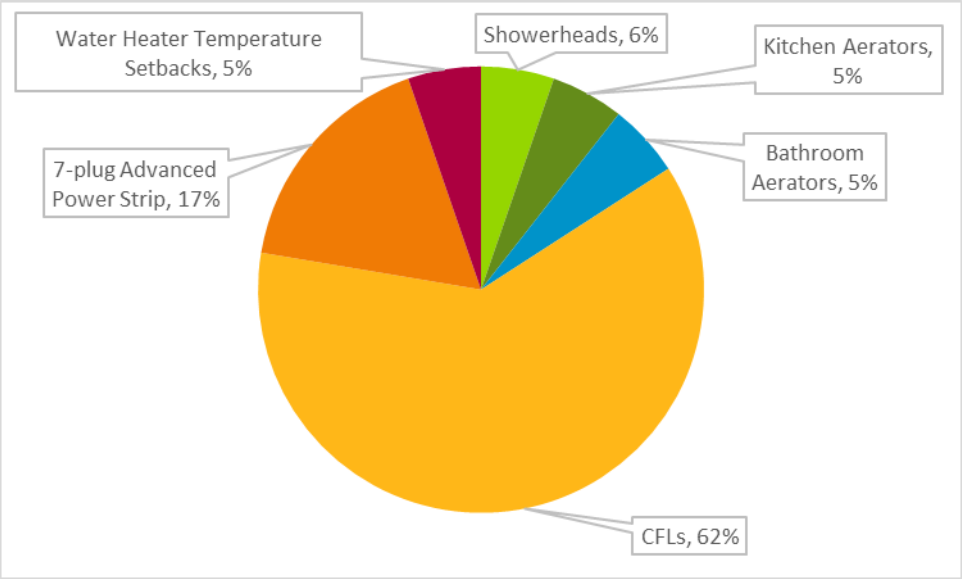
A total of 12,412 kits were distributed as part of the program in PY9 containing 55,530 measures, as shown in the following table and graph.

Table 2-1. PY9 Volumetric Findings Detail

Participation	PY9 Electric Kits	PY9 Gas Kits	Total PY9 Kits
Number of Measures Per Kit	6	4	
Total Number of Kits Distributed	2,941	9,471	12,412
Number of Showerheads Distributed	2,941	0	2,941
Number of Kitchen Aerators Distributed	2,941	0	2,941
Number of Bathroom Aerators Distributed	2,941	0	2,941
Number of CFLs Distributed	5,882	28,413	34,295
Number of 7-plug Advanced Power Strip Distributed	0	9,471	9,471
Number of Water Heater Temperature Setbacks (Gauge Cards)	2,941	0	2,941
Total Number of Measures Distributed	17,646	37,884	55,530

Source: ComEd tracking data and Navigant team analysis.

Figure 2-1. Percentage of total Measure Distribution by Type



Source: Evaluation Analysis

3. Program Savings

Table 3-1 summarizes the total incremental energy, demand and peak demand savings in PY9 of the NTC Middle School Kits Program.

Table 3-1. PY9 Total Annual Incremental Savings

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Peak Demand Savings (kW)
Ex Ante Gross Savings	2,499,952	NR*	NR*
Program Gross Realization Rate	89%	NA	NA
Verified Gross Savings	2,232,283	5,781	278
Program Net-to-Gross Ratio (NTGR)	1.00	1.00	1.00
Verified Net Savings	2,232,283	5,781	278

*Not Reported
Source: ComEd tracking data and Navigant team analysis.

4. Program Savings by Measure

Table 4-1, Table 4-2, and Table 4-3 below show the total PY9 energy, demand and peak demand savings for all measures respectively. The CFLs are further sub-divided by the kit type in which they were included. The 7-plug advanced power strips and low flow showerheads contributed the most savings, accounting for 42 and 22 percent of the total program savings, respectively.

Table 4-1. PY9 Energy Savings by Measure

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTGR *	Verified Net Savings (kWh)	Technical Measure Life	Persistence	Effective Useful Life (EUL)†
Hot Water	1.5 GPM Kitchen Faucet Aerator	242,927	93%	227,114	1.00	227,114	NA	NA	9
Hot Water	1.0 GPM Bathroom Faucet Aerator	31,469	113%	35,504	1.00	35,504	NA	NA	9
Hot Water	1.5 GPM Low-flow Showerhead	464,768	104%	482,225	1.00	482,225	NA	NA	10
Hot Water	Water Temperature Gauge Card	239,986	2%	5,709	1.00	5,709	NA	NA	2
Lighting	13W ENERGY STAR® CFL (Electric Kit)	93,524	100%	93,063	1.00	93,063	NA	NA	4
Lighting	13W ENERGY STAR® CFL (Gas Kit)	451,767	100%	449,542	1.00	449,542	NA	NA	4
Consumer Electronics	7-plug Advanced Power Strip – Tier 1	975,513	96%	939,126	1.00	939,126	NA	NA	4
	Total‡	2,499,952	89%	2,232,283	1.00	2,232,283			

* A deemed value. Source: ComEd_NTG_History_and_PY9_Recommendations_2016-02-26_Final.xlsx, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html.
† EUL is a combination of technical measure life and persistence.
‡ Numbers may not sum exactly due to rounding.
Source: ComEd tracking data and Navigant team analysis.

Table 4-2. PY9 Demand Savings by Measure

End Use Type	Research Category	Ex Ante Gross Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Demand Reduction (kW)	NTGR*	Verified Net Demand Reduction (kW)
Hot Water	1.5 GPM Kitchen Faucet Aerator	NR†	NA	2,590	1.00	2,590
Hot Water	1.0 GPM Bathroom Faucet Aerator	NR	NA	378	1.00	378
Hot Water	1.5 GPM Low-flow Showerhead	NR	NA	1,937	1.00	1,937
Hot Water	Water Temperature Gauge Card	NR	NA	1	1.00	1
Lighting	13W ENERGY STAR® CFL (Electric Kit)	NR	NA	128	1.00	128
Lighting	13W ENERGY STAR® CFL (Gas Kit)	NR	NA	616	1.00	616
Consumer Electronic	7-plug Advanced Power Strip – Tier 1	NR	NA	132	1.00	132
	Total‡	NR	NA	5,781	1.00	5,781

* A deemed value. Source: ComEd_NTG_History_and_PY9_Recommendations_2016-02-26_Final.xlsx, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html.
† Not Reported
‡ Numbers may not sum exactly due to rounding.
Source: ComEd tracking data and Navigant team analysis.

Table 4-3. PY9 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)	NTGR*	Verified Peak Net Demand Reduction (kW)
Hot Water	1.5 GPM Kitchen Faucet Aerator	NR†	NA	57	1.00	57
Hot Water	1.0 GPM Bathroom Faucet Aerator	NR	NA	8	1.00	8
Hot Water	1.5 GPM Low-flow Showerhead	NR	NA	54	1.00	54
Hot Water	Water Temperature Gauge Card	NR	NA	1	1.00	1
Lighting	13W ENERGY STAR® CFL (Electric Kit)	NR	NA	9	1.00	9
Lighting	13W ENERGY STAR® CFL (Gas Kit)	NR	NA	44	1.00	44
Consumer Electronic	7-plug Advanced Power Strip – Tier 1	NR	NA	105	1.00	105
	Total‡	NR	NA	278	1.00	278

* A deemed value. Source: ComEd_NTG_History_and_PY9_Recommendations_2016-02-26_Final.xlsx, which is to be found on the IL SAG web site here: http://ilsag.info/net-to-gross-framework.html.
† Not Reported
‡ Numbers may not sum exactly due to rounding.
Source: ComEd tracking data and Navigant team analysis.

5. Impact Analysis Findings and Recommendations

5.1 Impact Parameter Estimates

Navigant's analysis of the ComEd PY9 NTC Middle School Kits Program resulted in a verified energy and peak demand savings of 2,232,283 kWh and 278 kW respectively. The verified gross realization rate for energy savings is 89 percent. The discrepancy between the ex post and ex ante energy savings, highlighted in Table 4-1, is due to the issues stated below.

The ex ante calculations used the IL TRM v5.0 in-service rate (ISR) values deemed for direct mail kit measures instead of those deemed for school kit measures to calculate the savings for CFLs, low flow faucet aerators and low flow showerheads. Navigant agrees that using the ISR values for direct mail kit measures is appropriate since the NTC program is an opt-in program and participants must request kits prior to receiving them. Navigant used custom ISR values for the water heater temperature setback and advanced power strip measures because the IL TRM v5.0 does not deem ISR values for these measures. These custom ISR values were based on the participant survey data collected and provided by NTC. Navigant also used findings from the PY9 ComEd Elementary Energy Education (EEE) Kit evaluation to calculate certain custom inputs for the CFLs, low flow faucet aerators and low flow showerheads. The custom inputs and reasons for their use are further detailed in Section 5.2.

Navigant calculated savings for each measure following the algorithms defined by the Illinois TRM v5.0. These savings algorithms can be found in Appendix 1. Impact Analysis Methodology. A comparison of the input parameters used by NTC and Navigant to calculate the energy and peak demand savings for the PY9 analysis is shown in Appendix 2. Impact Analysis Detail

The following table details all the custom and deemed inputs used for calculating the energy and demand savings for each measure as well as their sources.

Table 5-1. Verified Gross Savings Parameters

Measure	Custom* Input Parameters	Deemed† Input Parameters	Custom Input Data Source	Deemed† Input Data Source
CFLs	WattsEE, quantity, WHFe, WHFd	WattsBase, Hours, CF, ISR	NTC Tracking data, PY9 ComEd EEE Kits evaluation	IL TRM v5.0 Section 5.5.1
Kitchen and Bathroom Faucet Aerators	Household, FPH, quantity	GPM_base, L_base, GPM_low, L_low, DF, EPG_electric, CF, Hours, ISR, %ElectricDHW	NTC Tracking data, PY9 ComEd EEE Kits evaluation	IL TRM v5.0 Section 5.4.4
Low Flow Showerheads	SPH, quantity, Household	GPM_base, L_base, L_low, SPCD, EPG_electric, CF, ISR, %ElectricDHW, GPM_low, Hours	NTC Tracking data, PY9 ComEd EEE Kits evaluation	IL TRM v5.0 Section 5.4.5
Water Heater Temperature Setback	ISR, quantity	U, A, Hours, 3412, RE_electric, CF, Tpre, Tpost, %ElectricDHW	NTC Tracking data and participant survey	IL TRM v5.0 Section 5.4.6
7-plug Advanced Power Strip – Tier 1	ISR, quantity	ΔkWh, Hours, CF	NTC Tracking data and participant survey	IL TRM v5.0 Section 5.2.1

* Based on the participant survey data provided by NTC and the PY9 ComEd EEE Kits evaluation
†State of Illinois Technical Reference Manual version 5.0 from http://www.ilsag.info/technical-reference-manual.html.

5.2 Other Impact Findings and Recommendations

PY9 impact findings and recommendations for measures included in the NTC Middle School Kits Program are listed below.

5.2.1 CFLs

Finding 1. The ex ante calculations assume that all the CFLs were installed in single family (SF) households while determining the Waste Heat Factor for energy (WHFe) and the Waste Heat Factor for demand (WHFd) values.

Recommendation 1. Since the program is not designed exclusively for SF households, Navigant recommends using an assumption of 64 percent SF and 36 percent[1] multifamily (MF) households and calculate the weighted averages of IL TRM v5.0 deemed SF and MF WHFe and WHFd values.

5.2.2 Bathroom and Kitchen Low Flow Faucet Aerators

Finding 2. The ex ante calculations assume that all bathroom and kitchen faucet aerators were installed in SF households to determine the average number of people per household (Household) and faucets per household (FPH) values**.**

Recommendation 2. Since the program is not designed exclusively for SF households, Navigant recommends using an assumption of 64 percent SF and 36 percent MF households and calculate the weighted averages of IL TRM v 5.0 deemed SF and MF Household and FPH values.

[1] The percentage of single-family and multi-family households is based on the findings described in the PY9 ComEd EEE Kits evaluation impact report.

5.2.3 Low Flow Showerheads

Finding 3. The ex ante calculations assume that all showerheads were installed in SF households while determining the average number of people per household (Household) and showerheads per household (SPH) values.

Recommendation 3. Since the program is not designed exclusively for SF households, Navigant recommends using an assumption of 64 percent SF and 36 percent MF households and calculate the weighted averages of IL TRM v 5.0 deemed SF and MF Household and SPH values.

5.2.4 Water Heater Temperature Setback

Finding 4. The surface area and capacity of the participants' water storage tanks was not tracked in the participant survey responses and the IL TRM v5.0 deemed values of 24.99 ft^2 and 50 gallons was used in both the ex ante and ex post calculations.

Finding 5. The ex ante calculations did not use an ISR value for the water heater temperature setback measure. The Errata to the IL TRM v5.0, effective 06/01/2016, deems the use of a custom ISR value for the water heater temperature setback measures.

Recommendation 4. Navigant recommends using an ISR of 2.38 percent based on the participant survey responses provided by NTC.

5.2.5 Advanced Power Strip (7-plug) – Tier 1

Finding 6. The ex ante calculations did not use an ISR value for the advanced power strip measures included in the kit. The IL TRM v5.0 does not include advanced power strips distributed via a kit program, and states that the savings should be verified by evaluation.

Recommendation 5. Navigant recommends using a custom ISR of 96 percent based on the participant survey responses provided by NTC.

6. Appendix 1. Impact Analysis Methodology

Navigant calculated verified gross and net savings using the following algorithms as defined by the IL TRM v5.0 in PY9.

6.1 CFLs

Navigant used measure level inputs deemed by the IL TRM v5.0 along with custom input values based on evaluation findings of the PY9 ComEd EEE Kits program. Table 5-1 shows the source of all the inputs used. The verified energy and peak demand savings are highlighted in Table 4-1 and Table 4-3, respectively. Appendix 2. Impact Analysis Detail compares the input assumptions used by NTC and Navigant in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the IL TRM:

Equation 1. CFL Savings Equation and Inputs, IL TRM v5.0 Section 5.5.1

*Verified Gross Annual kWh Savings = ((WattsBase - WattsEE) / 1000) * ISR * Hours * WHFe * quantity*

*Verified Gross Annual kW Savings = ((WattsBase - WattsEE) / 1000) * ISR * WHFd * CF * quantity*

Where:

WattsBase	*= Baseline wattage, based on lumens of the LED and CFL bulbs and program year installed*
WattsEE	*= Actual wattage of LED and CFL included in the kits*

ISR = *In Service Rate, the percentage of units sent that are actually in service.*
Hours = *Average hours of use per year*
WHFe = *Waste heat factor for energy to account for cooling energy savings from efficient lighting*
WHFd = *Waste heat factor for demand to account for cooling savings from efficient lighting.*

quantity = *total number of measures distributed in PY9*

6.2 Bathroom and Kitchen Low Flow Faucet Aerators

Navigant used measure level inputs deemed by the IL TRM v5.0 along with custom input values based on evaluation findings of the PY9 ComEd EEE Kits program. Table 5-1 shows the source of all the inputs used. The verified energy and peak demand savings are highlighted in Table 4-1 and Table 4-3, respectively. Appendix 2. Impact Analysis Detail compares the input assumptions used by NTC and Navigant in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the IL TRM:

Equation 2. Low Flow Faucet Aerators Savings Equation and Inputs, IL TRM v5.0 Section 5.4.4

*Verified Gross Annual kWh Savings = %ElectricDHW * ((GPM_base * L_base - GPM_low * L_low) * Household * 365.25 *DF / FPH) * EPG_electric * ISR * quantity*
*Verified Gross Annual kW Savings = Verified Gross Annual kWh Savings / Hours * CF * quantity*

Where:

%ElectricDHW = *proportion of water heating supplied by electric resistance heating*
GPM_base = *Average flow rate, in gallons per minute, of the baseline faucet*
GPM_low = *Average flow rate, in gallons per minute, of the low flow faucet aerator*
L_base = *Average baseline daily length faucet use per capita for faucet of interest in minutes*
L_low = *Average retrofit daily length faucet use per capita for faucet of interest in minutes*
Household = *Average number of people per household*
365.25 = *Days per year, on average.*
DF = *Drain Factor*
FPH = *Faucets Per Household*
EPG_electric = *Energy per gallon of water used by faucet supplied by electric water heater*
ISR = *In service rate of aerator*
Hours = *Annual electric DHW recovery hours for faucet use*
CF = *Coincidence Factor for electric load reduction*
quantity = *total number of kits in PY9*

6.3 Low Flow Showerheads

Navigant used measure level inputs deemed by the IL TRM v5.0 along with custom input values based on evaluation findings of the PY9 ComEd EEE Kits program. Table 5-1 shows the source of all the inputs used. The verified energy and peak demand savings are highlighted in Table 4-1 and Table 4-3, respectively. Appendix 2. Impact Analysis Detail compares the input assumptions used by NTC and Navigant in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the TRM:

Equation 3. Low Flow Showerheads Savings Equation and Inputs, IL TRM v5.0 Section 5.4.5

*Verified Gross Annual kWh Savings = %ElectricDHW * ((GPM_base * L_base - GPM_low * L_low) * Household * SPCD * 365.25 / SPH) * EPG_electric * ISR * quantity*

*Verified Gross Annual kW Savings = Verified Gross Annual kWh Savings / Hours * CF * quantity*

Where:

%ElectricDHW	*= proportion of water heating supplied by electric resistance heating*
GPM_base	*= Flow rate of the baseline showerhead*
GPM_low	*= As-used flow rate of the low flow showerhead*
L_base	*= Shower length in minutes with baseline showerhead*
L_low	*= Shower length in minutes with low flow showerhead*
Household	*= Average number of people per household*
SPCD	*= Showers Per Capita Per Day*
365.25	*= Days per year, on average.*
SPH	*= Showerheads Per Household*
EPG_electric	*= Energy per gallon of hot water supplied by electric*
ISR	*= In service rate of showerhead*
Hours	*= Annual electric DHW recovery hours for showerhead use*
CF	*= Coincidence Factor for electric load reduction*
quantity	*= total number of kits distributed in PY9*

6.4 Water Heater Temperature Setback

Navigant used measure level inputs deemed by the IL TRM v5.0 along with custom input values based on the participant survey results provided by NTC to calculate the ex post savings. Table 5-1 shows the source of all the inputs used. The verified energy and peak demand savings are highlighted in Table 4-1 and Table 4-3, respectively. Appendix 2. Impact Analysis Detail compares the input assumptions used by NTC and Navigant in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the TRM:

Equation 4. Water Heater Temperature Setback Savings Equation and Inputs, IL TRM v5.0 Section 5.4.6

*Verified Gross Annual kWh Savings = ((U * A * (Tpre – Tpost) * Hours) / (3412 * RE_electric)) * ISR * %ElectricDHW * quantity*

*Verified Gross Annual kW Savings = Verified Gross Annual kWh Savings / Hours * CF * quantity*

Where:

U	*= Overall heat transfer coefficient of tank (Btu/Hr-°F-ft2)*
A	*= Surface area of storage tank (square feet)*
Tpre	*= Actual hot water setpoint prior to adjustment*
Tpost	*= Actual new hot water setpoint, which may not be lower than 120 degrees*
Hours	*= Number of hours in a year*
3412	*= Conversion from Btu to kWh*
RE_electric	*= Recovery efficiency of electric hot water heater*
ISR	*= In service rate of showerhead*
%ElectricDHW	*= proportion of water heating supplied by electric resistance heating*
CF	*= Summer Peak Coincidence Factor for measure*
Quantiity	*= total number of kits distributed in PY9*

6.5 Advanced Power Strip – Tier 1 (7-plug)

Navigant used both custom values and measure level inputs deemed by the IL TRM v5.0 to estimate savings. Navigant determined the in-service rate based on the participant survey results provided by NTC to calculate the ex post savings. Table 5-1 shows the source of all the inputs used. The verified energy and peak demand savings are highlighted in Table 4-1 and Table 4-3, respectively. Appendix 2. Impact Analysis Detail compares the input assumptions used by NTC and Navigant in the ex ante and ex post calculations.

Energy and demand savings are estimated using the following formula as specified in the TRM:

Equation 5. Advanced Power Strip (7-plug) Equation and Inputs, IL TRM v5.0 Section 5.2.1

*Verified Gross Annual kWh Savings = kWh * ISR*

*Verified Gross Annual kW Savings = Verified Gross Annual kWh Savings / Hours * CF * quantity*

Where:

kWh = Assumed annual kWh savings per unit (103 kWh)
ISR = In Service Rate, dependent on delivery mechanism
Hours = Annual number of hours during which the controlled standby loads are turned off
CF = Coincidence Factor for electric load reduction
quantity = total number of kits distributed in PY9

7. Appendix 2. Impact Analysis Detail

The tables below show the comparison of input assumptions used by Navigant and NTC in ex ante and ex post calculations for the measures with discrepancies between ex ante and ex post values.

Table 7-1. CFLs - Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed/Custom	Discrepancy?
43	43	WattsBase	IL TRM 5.5.1	Deemed	-
13	13	WattsEE	Specifications	Actual	-
0.66	0.66	ISR	IL TRM 5.5.1	Deemed	-
759	759	Hours	IL TRM 5.5.1	Deemed	-
1.0528	1.06	WHFe	ComEd PY9 EEE	Custom	Yes
1.0956	1.11	WHFd	ComEd PY9 EEE	Custom	Yes
0.071	0.071	CF	IL TRM 5.5.1	Deemed	-

Source: ComEd tracking data and Navigant team analysis.

Table 7-2. Kitchen Aerators - Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed/Custom	Discrepancy?
1.00	1.00	%ElectricDHW	IL TRM 5.4.4	Deemed	-
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Actual	-
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	-
2.3944	2.56	Household	ComEd PY9 EEE	Custom	Yes
0.75	0.75	DF	IL TRM 5.4.4	Deemed	-
1.00	1.00	FPH	IL TRM 5.4.4	Deemed	-
0.0969	0.0969	EPG_electric	IL TRM 5.4.4	Deemed	-
0.6	0.6	ISR	IL TRM 5.4.4	Deemed	-
0.022	0.022	CF	IL TRM 5.4.4	Deemed	-
87.69	87.69	Hours	IL TRM 5.4.4	Deemed	-

Source: ComEd tracking data and Navigant team analysis.

Table 7-3. Bathroom Aerators - Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed/Custom	Discrepancy?
1.00	1.00	%ElectricDHW	IL TRM 5.4.4	Deemed	-
1.39	1.39	GPM_base	IL TRM 5.4.4	Deemed	-
0.94	0.94	GPM_low	Specifications	Actual	-
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	-
2.3944	2.56	Household	ComEd PY9 EEE	Custom	Yes
0.9	0.9	DF	IL TRM 5.4.4	Deemed	-
2.3512	2.83	FPH	ComEd PY9 EEE	Custom	Yes
0.0795	0.0795	EPG_electric	IL TRM 5.4.4	Deemed	-
0.63	0.63	ISR	IL TRM 5.4.4	Deemed	-
0.022	0.022	CF	IL TRM 5.4.4	Deemed	-
15.91	15.91	Hours	IL TRM 5.4.4	Deemed	-

Source: ComEd tracking data and Navigant team analysis.

Table 7-4. Low flow Showerhead - Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed/Custom	Discrepancy?
1.00	1.00	%ElectricDHW	IL TRM 5.4.5	Deemed	-
2.35	2.35	GPM_base	IL TRM 5.4.5	Deemed	-
1.5	1.5	GPM_low	Specifications	Deemed	-
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	-
2.3944	2.56	Household	ComEd PY9 EEE	Custom	Yes
0.6	0.6	SPCD	IL TRM 5.4.5	Deemed	-
1.6136	1.79	SPH	ComEd PY9 EEE	Custom	Yes
0.117	0.117	EPG_electric	IL TRM 5.4.5	Deemed	-
0.65	0.65	ISR	IL TRM 5.4.5	Deemed	-
0.0278	0.0278	CF	IL TRM 5.4.5	Deemed	-
248.94	248.94	Hours	IL TRM 5.4.5	Deemed	-

Source: ComEd tracking data and Navigant team analysis.

Table 7-5. Water Heater Temperature Setback Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed/Custom	Discrepancy?
0.08	0.08	U	IL TRM 5.4.6	Deemed	-
24.99	24.99	A	IL TRM 5.4.6	Deemed	-
135	135	Tpre	IL TRM 5.4.6	Deemed	-
120	120	Tpost	IL TRM 5.4.6	Deemed	-
8766.00	8766.00	Hours	IL TRM 5.4.6	Deemed	-
3412.00	3412.00	Conversion from 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	-
0.0238	1	ISR	Participant Survey	Custom	Yes

Source: ComEd tracking data and Navigant team analysis.

Table 7-6. 7-plug Advanced Power Strip Custom and Deemed Values Comparison

Value, Navigant	Value, Implementer	Variable	Source	Deemed/Custom	Discrepancy?
103	103	kWh	IL TRM 5.2.1	Deemed	-
7129	7129	Hours	IL TRM 5.2.1	Deemed	-
0.8	0.8	CF	IL TRM 5.2.1	Deemed	-
0.96	1.0	ISR	Survey	Custom	Yes

Source: ComEd tracking data and Navigant team analysis.

8. Appendix 3. Total Resource Cost Detail

The Total Resource Cost (TRC) variable table below only includes cost-effectiveness analysis inputs available at the time of finalizing this PY9 NTC Middle School Kits IPA program 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 at a later date. EULs are subject to change and are not final.

Table 8-1. 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	1.5 GPM Kitchen Faucet Aerator	Each	2,941	9	242,927	NR*	227,114	57
Hot Water	1.0 GPM Bathroom Faucet Aerator	Each	2,941	9	31,469	NR	35,504	8
Hot Water	1.5 GPM Low-flow Showerhead	Each	2,941	10	464,768	NR	482,225	54
Hot Water	Water Temperature Gauge Card	Each	2,941	2	239,986	NR	5,709	1
Lighting	13W ENERGY STAR® CFL (Electric Kit)	Each	5,882	4	93,524	NR	93,063	9
Lighting	13W ENERGY STAR® CFL (Gas Kit)	Each	28,413	4	451,767	NR	449,542	44
Consumer I	7-plug Advanced Power Strip – Tier 1	Each	9,471	4	975,513	NR	939,126	105

* Not Reported

Source: ComEd tracking data and Navigant team analysis.