

# ComEd Public Sector Custom Impact Evaluation Report

Energy Efficiency / Demand Response Plan:  
Plan Year 9 Bridge Period (PY9) –  
(June 2, 2017 – December 31, 2017)

Presented to  
Commonwealth Edison Company

**FINAL**

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## 1. INTRODUCTION

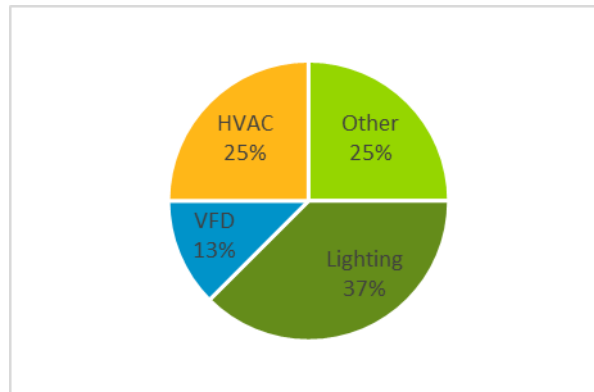
This report presents the results of the impact evaluation of ComEd's Public Sector Custom Program PY9 bridge period, June 2, 2017 through December 31, 2017. It presents a summary of the energy and demand impacts for the total program, broken out by relevant measure and program structure details. Section 7 (Appendix )1 presents the impact analysis methodology.

## 2. PROGRAM DESCRIPTION

ComEd's Smart Ideas for Your Business suite of energy efficiency programs for public sector customers includes a Custom Incentives (Custom) Program. This program provides a custom incentive, based on a formula, for less common or more complex energy-saving measures installed in qualified retrofit and equipment replacement projects. Custom incentives are available based on the project's kWh savings, provided the project meets all program eligibility requirements. For eligible projects, the program pays an incentive of \$0.07/kWh saved.

The program had eight participants during the PY9 bridge period. The projects consisted of HVAC, VFD, Lighting, and "Other" measures, as shown in Figure 2-1. There were three lighting projects, two HVAC projects, two "Other" projects, and one VFD project. The evaluation team created the measure distribution chart using measure end uses listed in the final tracking database.

**Figure 2-1. Number of Measures Installed by Type**



## 3. PROGRAM SAVINGS

Table 3-1 summarizes the incremental energy and demand savings the Custom Incentives Program achieved in PY9.

**Table 3-1. PY9 Total Annual Incremental Savings**

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Peak Demand Savings (kW)
Ex Ante Gross Savings	466,676	N/A	2
Program Gross Realization Rate	0.96	N/A	34.48
Verified Gross Savings	447,093	N/A	71
Program Net-to-Gross Ratio (NTGR)	0.58	N/A	0.58
Verified Net Savings	259,314	N/A	41

Source: ComEd tracking data and Navigant team analysis.

## 4. PROGRAM SAVINGS BY MEASURE

The program includes four measures as shown in the following table. The Lighting and VFD measures contributed the most savings.

**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)†
Other	Other	11,590	90%	10,431	0.58	6,050	13	1	13
Lighting	Lighting	292,979	87%	253,860	0.58	147,239	12	1	12
VFD	VFD	121,447	118%	143,848	0.58	83,432	15	1	15
HVAC	HVAC	40,661	96%	38,954	0.58	22,594	15	1	15
	Total	466,676	96%	447,093	0.58	259,314			

\* 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.  
Source: ComEd tracking data and Navigant team analysis.

**Table 4-2. 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 Net Peak Demand Reduction (kW)
Other	Other	0	-	0	0.58	0
Lighting	Lighting	2	13.84	28	0.58	16
VFD	VFD	0	-	42	0.58	25
HVAC	HVAC	0	-	0	0.58	0
	Total	2	34.48	71	0.58	41

\* 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>.

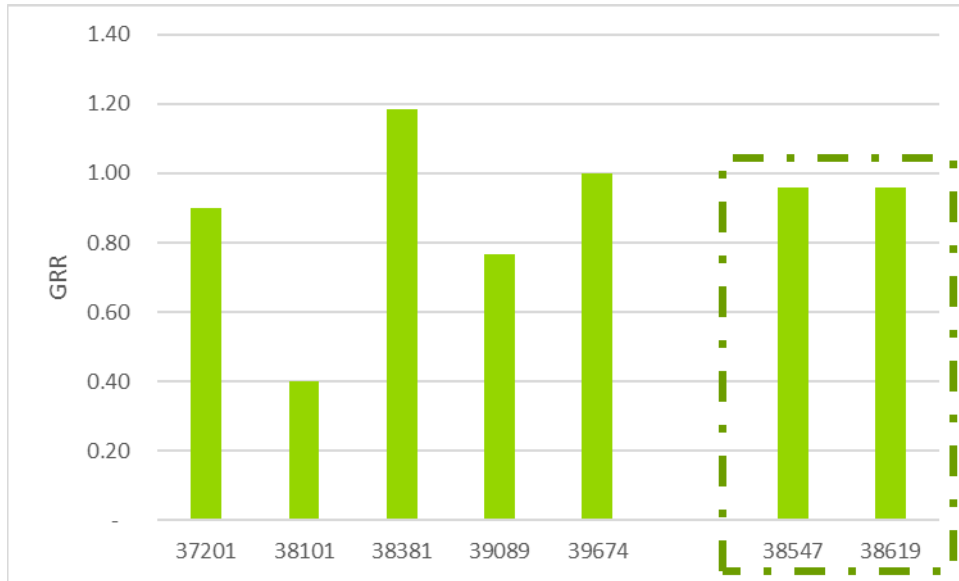
Source: ComEd tracking data and Navigant team analysis.

## 5. PROGRAM IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

Figure 5-1 below shows a comparison of the energy rates for every site. The bridge period PY9 energy-savings realization rate results ranged from 0.40 to 1.18, which resulted in a program-level energy realization rate of 0.96. The peak demand savings are not shown here, as only one of the eight sites reported demand savings, while the evaluation team found peak demand savings for three total sites. One of the eight sites did not report any energy or demand savings and is therefore not included in the figure below.

The evaluation team did not receive enough documentation about projects 38547 and 38619 to be able to evaluate them. Therefore, they were assigned the program-level GRR of 0.96.

Figure 5-1. Energy Realization Rates



**Finding 1.** There are eight projects in the population tracking data, but one project did not report any energy or demand savings.

**Recommendation 1.** Periodically checking the database and removing projects that are not applicable will help to ensure a complete and accurate portrayal of program status.

**Finding 2.** For two of the eight projects, the team received insufficient documentation for a desk review. For project 38547, none of the multiple calculators provided matched the final savings in the tracking data. For project 38619, the eQuest model was not provided, so the evaluation team was not able to review the calculations. Additionally, for the project with no savings claimed, 38803, no documentation was available to be downloaded.

**Recommendation 2.** Documentation is key for the evaluation team to accurately validate the claimed savings. Ensuring that paperwork and calculations match the claimed savings in the tracking data shows traceability and transparency in the savings calculations.

**Finding 3.** Lack of claimed demand savings for projects continues to be an issue for the ComEd Custom Program. Peak demand savings were only claimed for one of the eight projects in the population.

**Recommendation 3.** Demand savings should be claimed for all projects that save energy over the PJM peak summer period of 1:00-5:00 PM Central Prevailing Time on non-holiday weekdays, during the months of June through August and reported in the tracking system.

**Finding 4.** The calculations for many of the projects utilized minimal site-specific data and focused mostly on TRM values to inform project calculations.

**Recommendation 4.** The larger incentives of the Custom Program provide the unique opportunity to take advantage of site-specific information including meter data and onsite survey observations and findings to portray savings more accurately that are specific to that facility. Use of standard TRM assumptions should be kept to a minimum and should be replaced with meter data whenever possible. Future evaluation efforts will utilize a more robust onsite evaluation, and the use of standard TRM assumptions may hurt a project savings.

## 6. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

The evaluation team performed engineering calculations to derive evaluated gross energy and demand savings based on the engineering desk review process. The savings are site-specific and therefore require site-specific calculators and algorithms in conjunction with data collected from the site. The evaluation team utilized the documentation provided to determine installed measure characteristics, assess operating hours and relevant modes of operation, identify the characteristics of the replaced equipment, support the selection of baseline conditions, and perform ex post savings calculations. Each site evaluation used peak kW savings calculation methodology that was consistent with PJM peak summer demand requirements<sup>1</sup> for each project to calculate the peak kW reduction. The team estimated the lifetime energy and demand savings by multiplying the verified savings by the effective useful life for each measure.

The evaluation of the Public-Sector Custom Program attempted a census of all eight projects in the program population. Two of the projects were found to be unreviewable, as there was insufficient documentation provided, and a third project had no ex ante claimed savings and no documentation available. Therefore, the evaluation team calculated a program-level realization rate based on their review of five projects. For the remaining project, that program-level realization rate was used to calculate the overall savings for those projects.

## 7. APPENDIX 2. IMPACT ANALYSIS DETAIL

Table 7-1 and Table 7-2 show the savings by site. Most of the savings are due to projects 39674, 38381, and 39089, which account for almost 90% of the ex post energy savings and all the ex post demand savings.

**Table 7-1. PY9 Energy Savings by Site**

Sampled Application ID	End Use	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTGR *	Verified Net Savings (kWh)
37201	Other	11,590	90%	10,431	0.58	6,050
38101	Lighting	12,921	40%	5,168	0.58	2,998
38381	VFD	121,447	118%	143,848	0.58	83,432
39089	Lighting	134,554	77%	103,088	0.58	59,791
39674	Lighting	145,504	100%	145,603	0.58	84,450
38547	HVAC	7,737	96%	7,412	0.58	4,299
38619	HVAC	32,924	96%	31,542	0.58	18,294
38803	Other	-	-	-	0.58	-
	Total	466,676	96%	447,093	0.58	259,314

\* 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>.  
Source: ComEd tracking data and Navigant team analysis.

<sup>1</sup> PJM defines the coincident summer peak period as 1:00-5:00 PM Central Prevailing Time on non-holiday weekdays, during the months of June through August.

**Table 7-2. PY9 Peak Demand Savings by Site**

Sampled Application ID	End Use	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTGR *	Verified Net Savings (kWh)
37201	Other	11,590	90%	10,431	0.58	6,050
38101	Lighting	12,921	40%	5,168	0.58	2,998
38381	VFD	121,447	118%	143,848	0.58	83,432
39089	Lighting	134,554	77%	103,088	0.58	59,791
39674	Lighting	145,504	100%	145,603	0.58	84,450
38547	HVAC	7,737	96%	7,412	0.58	4,299
38619	HVAC	32,924	96%	31,542	0.58	18,294
38803	Other	-	-	-	0.58	-
	Total	466,676	96%	447,093	0.58	259,314

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Source: ComEd tracking data and Navigant team analysis.

The evaluation team uncovered some issues in three of the eight projects, which resulted in energy or demand realization rates with a discrepancy of greater than 10% from a realization rate of 1.0. Some key observations from these site-specific evaluation results are discussed below for each project that saw large differences in savings.

- Project #38101: The evaluation team believes that the ex ante calculation used 3,650 annual operating hours. The project calculation was provided in the form of a PDF and not a live calculation sheet so we could not verify that. However, the post-inspection form provided in the documentation identifies the annual operating hours to be 1,460. Additionally, peak demand savings were claimed, even though the project was for outdoor lighting, which does not operate during peak periods.
- Project #38381: Documentation for the project states that a new system can reduce operation to 45hz at steady state. The ex ante baseline calculations were based on an operation at 45hz; however, as the operation at 45hz was a result of the new installed system, the evaluation team changed the baseline to 60hz. Additionally, the team calculated peak demand savings for this project.
- Project #39089: Only a PDF version of the calculator was provided, but it appeared to show the annual hours of operation as 0 in the post-case. Therefore, the savings provided were based on the baseline consumption. Due to a lack of any additional information, the evaluation team used operation hours of 8,766 (based on the TRM) to calculate savings.

## 8. APPENDIX 3. TRC DETAIL

Total Resource Cost (TRC) related data for the projects in the Custom Public Sector Program sample can be found in Table 8-1.



**Table 8-1. Total Resource Cost Savings Summary**

Application ID	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)
37201	Other	Each	1	13	11,590	-	10,431	-
38101	Lighting	Each	1	12	12,921	2	5,168	-
38381	VFD	Each	1	15	121,447	-	143,848	42
39089	Lighting	Each	1	12	134,554	-	103,088	12
39674	Lighting	Each	1	12	145,504	-	145,603	17
38547	HVAC	Each	1	15	7,737	-	7,412	-
38619	HVAC	Each	1	15	32,924	-	31,542	-
38803	Other	Each	1	-	-	-	-	-

The Total Resource Cost (TRC) variable table only includes cost-effectiveness analysis inputs available at the time of finalizing this PY9 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. Further, detail in this table (e.g., EULs) other than final PY9 savings and program data are subject to change and are not final.