



# ComEd Industrial Systems Optimization Evaluation Report

**FINAL**  
**Energy Efficiency / Demand Response Plan:**  
**Plan Year 8 (PY8)**  
**(6/1/2015-5/31/2016)**

**Presented to**  
**Commonwealth Edison Company**

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## E. EXECUTIVE SUMMARY

This report presents a summary of the findings and results from the impact evaluation of the PY8<sup>1</sup> Industrial Systems Optimization Program. The Program started in PY4 with compressed air systems and has expanded over the past few years to include process cooling and industrial refrigeration systems. Beginning in PY8, the program was further expanded to include Express and Leak Repair only options. The Industrial Systems Optimization Program offers a combination of technical assistance and financial incentives. The technical assistance includes an industrial systems study which assesses the performance of the facility's industrial compressed air, process cooling, and refrigeration systems to ensure efficient, economical operation. The study examines the systems' operating characteristics to help identify cost-effective energy saving measures using a combination of capital investment and low or no cost measures.

### E.1. Program Savings

Table E-1 summarizes the electricity savings from the Industrial Systems Optimization Program.

**Table E-1. PY8 Total Program Electric Savings**

Savings Category	Energy Savings (MWh)	Demand Savings (MW)
Ex Ante Gross Savings	36,901	4.419
Verified Gross Savings	39,434	4.868
Verified Net Savings	29,576	4.089

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

\* Minor discrepancies between Ex Ante and Verified Savings are due to rounding.

Based on the gross impact sample size of 10 projects in PY8, the evaluation results yielded an energy gross realization of 1.07 and peak demand realization rate of 1.10. The relative precision for the gross impact results at a one-tailed 90 percent confidence level is plus or minus six percent for the energy realization rate and plus or minus seven percent for the peak demand realization rate. The majority of the projects had a realization rate close to 100 percent indicating a stable program with appropriate due diligence procedures for the ex ante savings analysis.

Overall, the program team succeeded in ensuring the installation and proper operation of the implemented measures. The program team continues to collect site-specific pre- and post-metered data for all projects, which enables accurate estimation of ex ante savings. In general, the program team successfully collected site specific pre- and post-measurement and verification (M&V) data using acceptable methods based on industry practices. The M&V data provided by the program team was useful for the evaluation and allowed the evaluation team to complete the analysis for five of the ten projects in the sample using a desk review procedure. For these five projects, the evaluation team conducted a telephone interview with the site contact to verify the installation of the equipment, validate the data provided by the program team and facilitate the collection of missing data needed to complete the review.

<sup>1</sup> The PY8 program year began June 1, 2015 and ended May 31, 2016.

## E.5. Results Summary

The following table summarizes the key metrics from PY8.

Table E-2. PY8 Results Summary

Participation	Units	PY8
Verified Net Savings	MWh	29,576
Verified Net Demand Reduction	MW	4.089
Verified Gross Savings	MWh	39,434
Verified Gross Demand Reduction	MW	4.868
Program Realization Rate	%	1.07
Program Demand Realization Rate	%	1.10
Program Energy NTG Ratio †	#	0.75
Program Demand NTG Ratio †	#	0.84
Projects Completed	#	74

Source: ComEd tracking data and Navigant team analysis.

† A deemed value. Source: ComEd\_NTG\_History\_and\_PY8\_Recommendation\_2014-02-

28\_Final\_EMV\_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

## E.6. Findings and Recommendations

The PY8 gross realization rate for the Industrial Systems Optimization Program of 1.07 for energy is higher than previous years. The PY8 project-level gross realization rates for energy ranged from 0.92 to 1.47. The energy realization rate for six of the ten projects in the gross sample was around 100 percent. This is a great improvement from the previous year.

Overall, the program team did very well in ensuring all the implemented measures were installed and operating as planned. The program team continues to collect site specific pre- and post-metered data for all projects. Even though the program realization rate is close to 100 percent, there is room for improvement. The evaluation team would like to present some of the findings and recommendations that can be utilized to fine tune the current approach that would help in more accurate estimation of ex ante savings.

**Finding 1.** The evaluation team made minor adjustments to the savings for the projects 31195 and 31473, because of changes in the normalization procedures recommended in these specific cases. Normalizing is a crucial step in estimating the savings for a custom project. In most cases, the program team follows standard procedures to normalize the data to ensure consistency between the pre and post case operation. For the projects listed above, the evaluation team made minor adjustments to the normalizing procedures adopted by the program team. These adjustments are detailed in the individual site reports.

**Recommendation 1.** The evaluation team recommends the program team review these site reports and that the changes in normalizing procedures should be applied to projects in the future, where applicable.

**Finding 2.** For three projects (31473, 30454 and 30460), the savings were adjusted because of errors in the ex ante calculations or data related issues. The program team has improved the

QA/QC process over the past few years but the evaluation team identified some errors in ex ante calculations for a small number of projects.

**Recommendation 2.** The evaluation team believes that the adjustments to the ex ante savings can be minimized even further in the future by developing an even stronger QA/QC process. Some essential checks can be put in place to ensure that there are no calculation errors. Also, the collected data should be reviewed thoroughly to eliminate errors and outliers, so that the data represent normal operation.

**Finding 3.** The evaluation team found that savings for the leak saving projects are heavily reliant on the template. The templates used by the program team have been reviewed previously by the evaluation team and are reasonable to use. However, in some cases, the template may not fully capture the intricacies of the individual projects.

**Recommendation 3.** The evaluation team believes that using the templates is an acceptable approach going forward, as long as site specific adjustments are made to the templates as required.

## 1. INTRODUCTION

### 1.1 Program Description

The ComEd Smart Ideas for Your Business program provides incentives for business customers who upgrade their facilities with energy efficient equipment. This incentive program is available to all eligible, nonpublic, commercial and industrial customers in ComEd's service territory. ComEd's Smart Ideas for Your Business suite of energy efficiency programs includes an Industrial Systems Optimization Program. This program offers comprehensive studies of compressed air systems, industrial refrigeration systems, or process cooling systems.

The Industrial Systems Optimization portion of ComEd's Smart Ideas for Your Business Program included only compressed air systems in PY4. From PY5, the Industrial Systems Optimization Program was expanded to include the study of process cooling systems and industrial refrigeration systems. Beginning in PY8, the program was further expanded to include Express and Leak Repair only options. These complemented the comprehensive compressed air system offerings and allowed for the inclusion of smaller systems and customers who were looking to only implement leak repairs.

The Industrial Systems Optimization Program offers a combination of technical assistance and financial incentives. Technical assistance includes an industrial systems study which assesses the performance of the facility's industrial compressed air system, process cooling system and refrigeration system to ensure efficient, economical operation. This service examines the system's operating characteristics to help identify energy saving measures, using a combination of capital investments and low or no cost measures. In addition to the study, ComEd provides a one-time incentive to cover the costs of the equipment and installation of the implementation bundle. For the compressed air projects, the implementation bundle includes compressed air leak repair, installation of no-loss condensate drains, installations of high-efficiency air nozzles, and optimization of compressor operation controls. In addition to this, other measures not part of the implementation bundle may be eligible for a one-time incentive of \$0.07 per annual kWh saved after proper implementation of recommendations identified through the Industrial Systems Optimization Program. Eligible annual kWh savings are determined through measurement and verification activities. The total incentive cannot exceed 100 percent of the total implementation costs and 100 percent of the total incremental costs for improvements recommended in the study.

The Industrial Systems Program also started offering the Compressed Air Leak Repair Program and the Compressed Air Express program. As part of the Compressed Air Leak Program, ComEd provides up to \$12/hp incentive for leak survey and repairs. The Express program targets the smaller capacity systems and it offers measures like air leaks, no-loss drains, air nozzles, pressure reduction, controls optimization, outdoor air intake, LP drop filters, Variable Speed Drive (VSD) compressors, dew point optimization and adding blower air knives.

### 1.2 Evaluation Objectives

The Evaluation Team identified the following key researchable questions for PY8:

1. Estimate the gross impacts from the program.
2. Identify opportunities for improvement to the program impact calculations and estimates.
3. Assess whether or not the program met its energy savings goals.

One of the key evaluation objectives is to provide early feedback for large or complex projects before it is finalized and incentives are paid. This is to ensure that the calculation methodology and M&V plans align with the expectations of the evaluation team.



A net-to-gross ratio will be calculated in PY9 using the combination of PY8 and PY9 participant surveys for use in future evaluations.

As many features of this program remain similar to prior years, and process findings change relatively little from year to year, a process evaluation was not performed for PY8.

## 2. EVALUATION APPROACH

Program Year 8 (PY8) represents the fourth full year of implementation for the Industrial Systems Optimization Program. For the PY8 evaluation, the evaluation team developed gross program impact results based on detailed M&V analysis for five projects and through engineering desk reviews supported with telephone interviews for the remaining five projects.

### 2.1 Overview of Data Collection Activities

The core data collection activities included on-site audits and desk reviews in support of gross impact analysis, and telephone surveys in support of NTG analysis. The full set of data collection activities is shown in the following tables.

**Table 2-1. Primary Data Collection Activities**

What	Who	Target Completes	Completes Achieved	When	Comments
Onsite M&V Audit	Participants	5	5	July – October 2016	All Stratum 1 Projects and sampled projects from Stratum 2.
Desk Reviews†	Participants	5	5	August – October 2016	Sampled projects from Stratum 2 and Stratum 3
Telephone Survey‡	Participants	10	9	September – October 2016	Data collection supporting NTG research and process analysis.

† Reviews include engineer conducted telephone interviews.

‡The telephone survey results are not used for the PY8 evaluation, but will be used to calculate a combined PY8 and PY9 NTGR. These telephone surveys are currently in progress and the evaluation team is in the process of completing the last telephone survey in the gross sample.

### 2.2 Verified Savings Parameters

The following table presents the parameters that were used in the verified gross and net savings calculations and indicates which were examined through evaluation activities and which were deemed.

**Table 2-2. Verified Savings Parameter Data Sources**

Gross Savings Input Parameters	Data Source	Deemed † or Evaluated?
Gross Energy Savings Realization Rate	PY8 Analysis	Evaluated
Gross Peak Demand Savings Realization Rate	PY8 Analysis	Evaluated
NTG Ratio	SAG†	Deemed†
Net Energy Savings	PY8 Analysis	Evaluated
Net Peak Demand Savings	PY8 Analysis	Evaluated

† Source: ComEd\_NTG\_History\_and\_PY8\_Recommendation\_2014-02-28\_Final\_EMV\_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

#### 2.2.1 Verified Gross Program Savings Analysis Approach

The objective of the gross program savings evaluation is to verify the veracity and accuracy of the PY8 ex ante gross savings estimates in the Industrial Systems Optimization Program tracking system. The PY8 evaluation activities included on-site M&V analysis for five projects and desk reviews for five projects. The savings reported for the completed PY8 projects were evaluated using the methods outlined directly below.

On-site data collection included verification of measure installation, system operation and specific details of any variation between observed ex ante and ex post findings. On-site audits also entailed collection of customer-stored data to support downstream M&V calculations. Measurement data obtained from the sites, including spot measurements, run-time hour data logging, and post-installation interval metering. The information collected on-site was used to calibrate site-specific analyses. Customer-supplied data from energy management systems (EMS) or supervisory control and data acquisition (SCADA) systems were also obtained when available.

Desk reviews involved review of project documentation provided by the program, an engineering review of the algorithms and an audit of ex ante calculation models used by the program to estimate energy and peak demand savings. The engineering audit of program calculations determined if the inputs for the program calculations were reasonable and acceptable or if they needed any revisions based on evaluation findings. In addition to the desk review, the evaluation team completed telephone interview with the site contacts and the information collected during the interviews was used to verify the savings estimates. The evaluation team asked the site contact to provide post-installation operating data electronically. Evaluation used that information collected to inform savings calculations.

We performed engineering calculations to derive verified gross kWh and kW savings based on data collected during the on-site visit or the desk review process. The team included a preliminary judgment in the engineering reviews to identify those assumptions with higher uncertainty or potential to influence the program savings estimates. The team used data obtained from the sampled sites to verify measure installation, 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. The peak kW savings calculation methodology the evaluation used was consistent with PJM peak summer demand requirements<sup>2</sup> for each project. The final step involved discussion of project-level results with the implementation teams and ComEd's program staff to ensure that both the evaluation team and the implementation teams are in agreement about their understanding of the project scope and details.

We then estimated verified gross savings for each sample site and, using sample weights, extrapolated from the sample to the population to calculate verified gross savings for the population. Additional details on the sampling approaches are provided below.

### 2.2.2 Verified Net Program Savings Analysis Approach

The primary objective of the net savings analysis is to determine the program's net effect on customers' electricity usage. After the evaluation team assessed gross program impacts, the net program impacts are derived by estimating a NTGR that quantifies the percentage of the gross program impacts. The Illinois Stakeholder Advisory Group (SAG) determined NTG values be deemed prospectively and used to calculate verified net savings for this program. The table below shows the deemed NTG values and the PY8 verified net savings.

**Table 2-3. Verified Net Savings Parameters**

Input Parameters	Value	Deemed or Evaluated?
Energy Savings NTGR	0.75	Deemed (derived from PY6 evaluation results)
Peak Demand Savings NTGR	0.84	Deemed (derived from PY6 kWh evaluation results) †

† A deemed value. Source: ComEd\_NTG\_History\_and\_PY8\_Recommendation\_2016-02-26\_Final\_EMV\_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

<sup>2</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.

Verified net energy and coincident peak demand savings were calculated by multiplying the verified gross savings estimates by the deemed NTGR. In PY8, the NTGR values used to calculate the verified net savings were based on NTGR research conducted in PY6. The NTGR evaluation results from PY6 for kWh is 0.75 and kW is 0.84. SAG approved and documented this NTGR method.<sup>3</sup>

As part of the PY8 evaluation, NTG analysis was not performed. The evaluation team performed the NTG interviews for the projects in the PY8 gross sample but the data will not be analyzed and reported for PY8. A combined analysis for PY8 and PY9 will be performed during the PY9 evaluation.

## 2.3 Sampling

### 2.3.1 Profile of Population

The Evaluation team divided the program population for the Industrial Systems Optimization Program into three size-based sampling strata as shown in Table 2-4 below. The number of projects is presented by strata, along with ex ante gross kWh claimed and ex ante gross kW claimed.

**Table 2-4. PY8 Program Participation by Sampling Strata**

Sampling Stratum	Ex ante MWh Impact Claimed	Ex ante MW Impact Claimed	Tracking Records	Incentive Paid to Applicant (\$)
1	13,202	1.52	6	707,324
2	11,412	1.34	13	344,423
3	12,287	1.56	55	332,479
PY8 Total	36,901	4.42	74	1,384,226

### 2.3.2 Gross Impact (M&V) Sample

Evaluation used a stratified random sampling approach to select the gross impact sample of 10 projects. Projects were sorted and placed in three strata using ex ante savings kWh. Table 2-5 provides a profile of the gross impact sample in comparison with the program population. The sample consisted of 10 applications, responsible for 11,812 MWh and represented 32 percent of the program population's ex ante impact claim. The ex ante based kWh sample weights for the three sampling strata are shown below.

**Table 2-5. PY8 Gross Impact Sample by Strata**

Sampling Strata	Population Summary			Completed Interviews		
	Number of Tracking Records (N)	Ex ante kWh Impact Claimed	kWh Weights	Number of Tracking Records (n)	Ex ante kWh	Sampled % of Population kWh
1	6	13,202	0.36	3	8,175	62%
2	13	11,412	0.31	3	2,761	24%
3	55	12,287	0.33	4	876	7%
PY8 Total	74	36,901	-	10	11,812	32%

Source: Evaluation Team analysis

<sup>3</sup> Source: ComEd\_NTG\_History\_and\_PY8\_Recommendation\_2016-02-26\_Final\_EMV\_Recommendations.xlsx, found on the IL SAG website at <http://ilsag.info/net-to-gross-framework.html>.

### ***2.3.3 Telephone Survey Sample***

Per the evaluation plan, the target for the participant surveys was to capture NTG results for all ten participants in the gross sample for the Industrial Systems Optimization Program in PY8. Data from these surveys were in support of the net-to-gross component of the evaluation.

### 3. GROSS IMPACT EVALUATION

The evaluation team reviewed ComEd’s tracking data extract to determine reported PY8 ex ante gross savings. The verified gross program impacts for the evaluation for the Industrial Systems Optimization Program were developed based on on-site M&V analysis for nine sites and engineering desk reviews for one project.

#### 3.1 Tracking System Review

ComEd provided the evaluation team with direct access to their on-line tracking system and data for evaluation purposes. The on-line system was easy to work with and provided viewing access to the project tracking data and downloading rights to project documentation in electronic format for each project. This documentation was complete and greatly facilitated the evaluation efforts.

#### 3.2 Gross Program Impact Parameter Estimates

Evaluation developed the gross program impacts based on on-site visits and detailed M&V analysis for five projects and thorough engineering desk reviews supported with telephone interviews for five projects. The verified gross impact results for PY8 are shown in Table 3-1 below.

Table 3-1. Verified Gross Savings Parameters

Gross Savings Input Parameters	Value	Deemed ‡ or Evaluated?
Energy Savings Realization Rate	1.07	Evaluated
Peak Summer Demand Savings Realization Rate	1.10	Evaluated

Source: Evaluation Team analysis

‡ State of Illinois Technical Reference Manual version 2.0 from <http://www.ilsag.info/technical-reference-manual.html>.

#### 3.3 Verified Gross Program Impact Results

Based on the gross impact sample size of 10 projects in PY8, the evaluation results yielded a gross energy realization rate of 1.07 and a gross demand realization rate of 1.10. The resulting total program verified gross savings is 39,434 MWh and 4.87 MW as shown in Table 3-2. The table presents the ex post savings for each strata but they are not statistically significant at the 90/10 level.

**Table 3-2. PY8 Verified Gross Impact Savings Estimates by Strata**

	Sample Size	Gross Energy Savings (MWh)	Gross Peak Demand Savings (MW)	Summer PJM Peak (MW)
<b>Strata 1</b>				
Ex ante Gross Savings		13,202	1.52	1.52
Verified Gross Realization Rate	3	99%	105%	105%
Verified Gross Savings		13,054	1.60	1.60
<b>Strata 2</b>				
Ex ante Gross Savings		11,412	1.34	1.34
Verified Gross Realization Rate	3	123%	118%	118%
Verified Gross Savings		14,015	1.58	1.58
<b>Strata 3</b>				
Ex ante Gross Savings		12,287	1.56	1.56
Verified Gross Realization Rate	4	101%	108%	108%
Verified Gross Savings		12,365	1.69	1.69
<b>Total</b>				
Ex ante Gross Savings		36,901	4.42	4.42
Verified Gross Realization Rate	10	107%	110%	110%
Verified Gross Savings		39,434	4.87	4.87

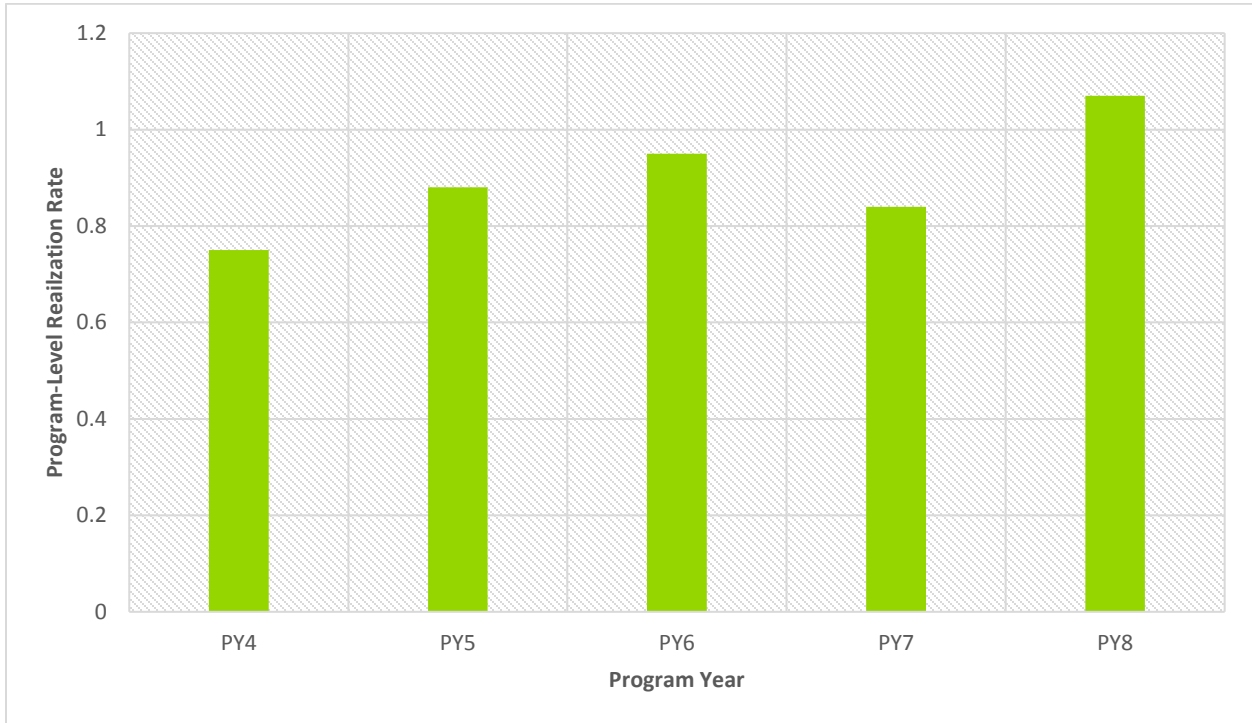
Source: Evaluation Team analysis.

†NA when the TRM determines the gross savings.

Note: Minor discrepancies in savings are due to rounding.

Figure 3-1 below compares the overall program-level energy gross realization rates over the last four years. At the program level, the energy GRR of 1.07 is up after recording a low GRR during the previous evaluation period. The higher GRR reflects conservation assumptions made in estimating project savings during PY8. While a higher GRR is better than a lower one, the ultimate goal for the program should be a gross realization rate close to 1.0.

Figure 3-1. PY8 Industrial Systems Optimization Program Energy Realization Rates across Program Years



Source: Evaluation Team analysis.

Table 3-3 below shows the sampled site-specific ex ante and ex post savings along with stratum level realization rates.



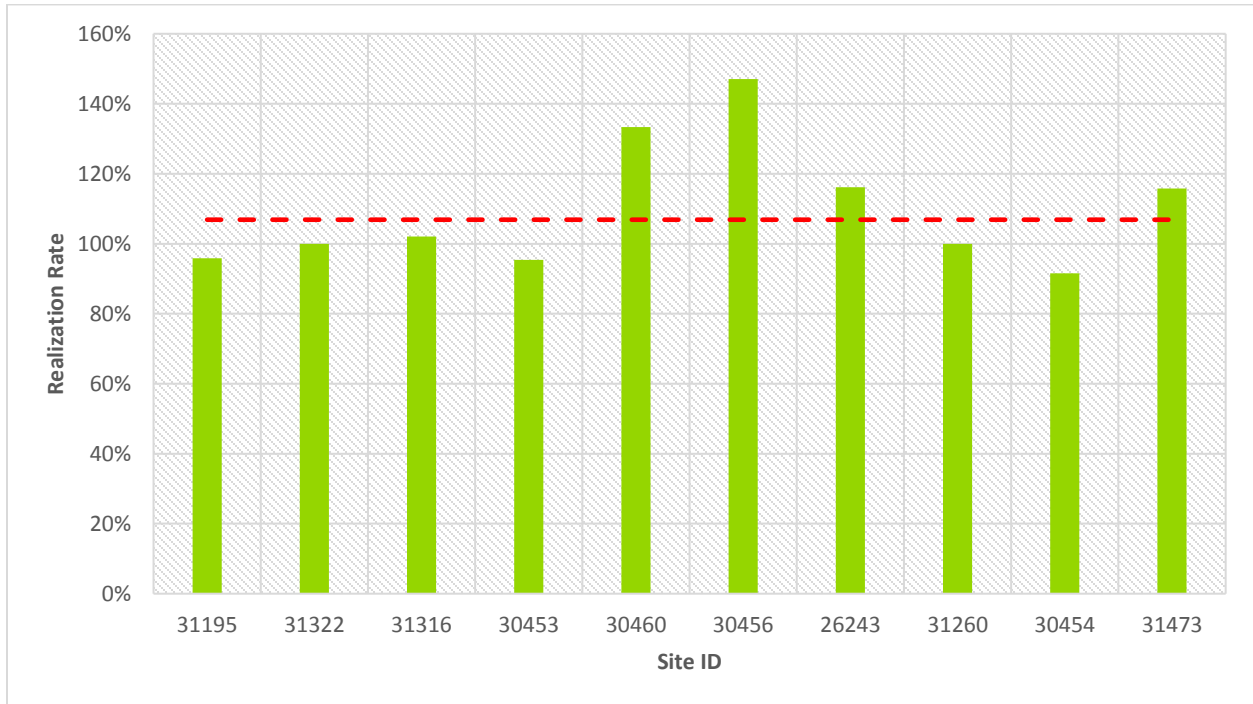
**Table 3-3. Gross Impact Realization Rate Results for the Selected Industrial Systems Optimization Sample**

Sampled Application ID	Sample-Based Ex Ante MWh Impact Claimed	Sample-Based Ex Ante kW Impact Claimed	Sampling Strata	Ex Ante-Based MWh Gross Impact Weights by Strata	Sample-Based Evaluation Research Findings Gross MWh Impact	Sample-Based Evaluation Research Findings Gross kW Impact	Application-Specific Evaluation Research Findings Gross MWh Realization Rate	Application-Specific Evaluation Research Findings Gross kW Realization Rate	Sample-Based Evaluation Research Findings Gross MWh Realization Rate	Sample-Based Evaluation Research Findings Gross kW Realization Rate
31195	3,063	350	1	0.37	2,937	342	0.96	0.98		
31322	3,442	392	1	0.42	3,442	393	1.00	1.00	0.99	1.05
31316	1,670	132	1	0.20	1,704	185	1.02	1.40		
30453	1,017	132	2	0.37	970	113	0.95	0.86		
30460	1,046	147	2	0.38	1,395	194	1.33	1.31	1.23	1.18
30456	698	80	2	0.25	1,026	117	1.47	1.47		
26243	52	8	3	0.06	60	9	1.16	1.15		
31260	211	23	3	0.24	211	23	1.00	1.00		
30454	411	40	3	0.47	376	52	0.92	1.30	1.01	1.08
31473	203	55	3	0.23	235	51	1.16	0.94		
<b>Total</b>	<b>11,812</b>	<b>1,358</b>	<b>-</b>	<b>NA</b>	<b>12,356</b>	<b>1,480</b>	<b>NA</b>	<b>NA</b>	<b>1.07</b>	<b>1.10</b>

Source: Evaluation Team analysis

The gross energy realization rates for all evaluated projects are shown below in Figure 3-2. The PY8 site-level energy realization rates ranged from 0.92 to 1.47. Other than few projects, majority of the projects had energy realization rate close to 100%. This is an improvement compared to last year and shows that the program team made adjustments which resulted in better estimation of ex ante savings.

**Figure 3-2. PY8 Industrial Systems Optimization Program Project Energy Realization Rates (Shown by Project ID)**

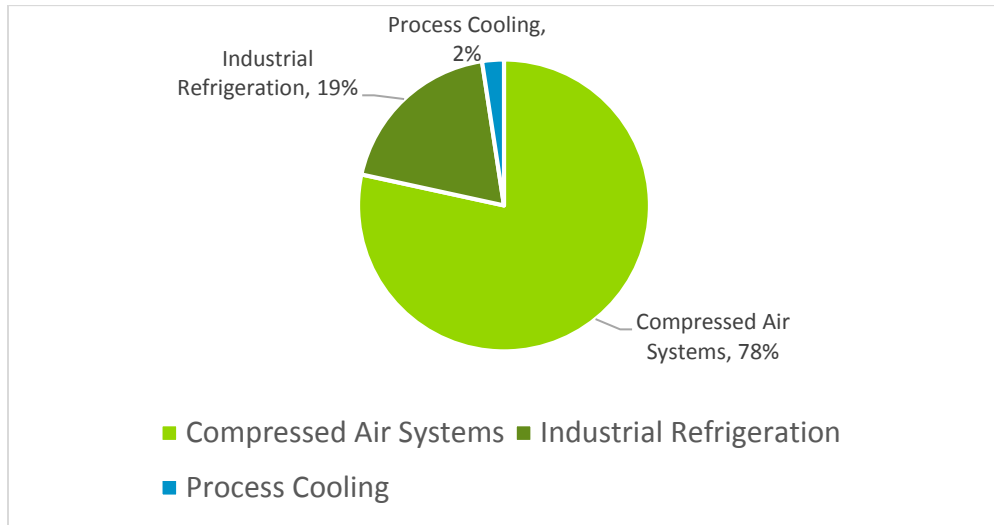


Source: Evaluation Team analysis.

The evaluation team also looked at the distribution of the ex ante program savings by end-use. The projects in the PY8 population were classified into three categories (Compressed Air Systems, Process Cooling and Industrial Refrigeration) based on the type of study that was performed.

Figure 3-3 shows the distribution of the ex ante savings by end-use. During PY8, the program has seen significant increase in the Compressed Air Projects and they accounted for almost 78% of the total savings. Out of the 74 projects in PY8, there were only four Process Cooling projects. The distribution of the projects changed significantly from PY7 program. In PY7, there is a nearly equal distribution of savings across the three end-uses with Compressed Air Systems representing approximately 36 percent of the ex ante savings. The distribution for PY8 suggests that the Compressed Air projects are getting a lot of traction from the vendors and customers.

Figure 3-3. Industrial System Program Distribution of Ex ante kWh Savings by End-use

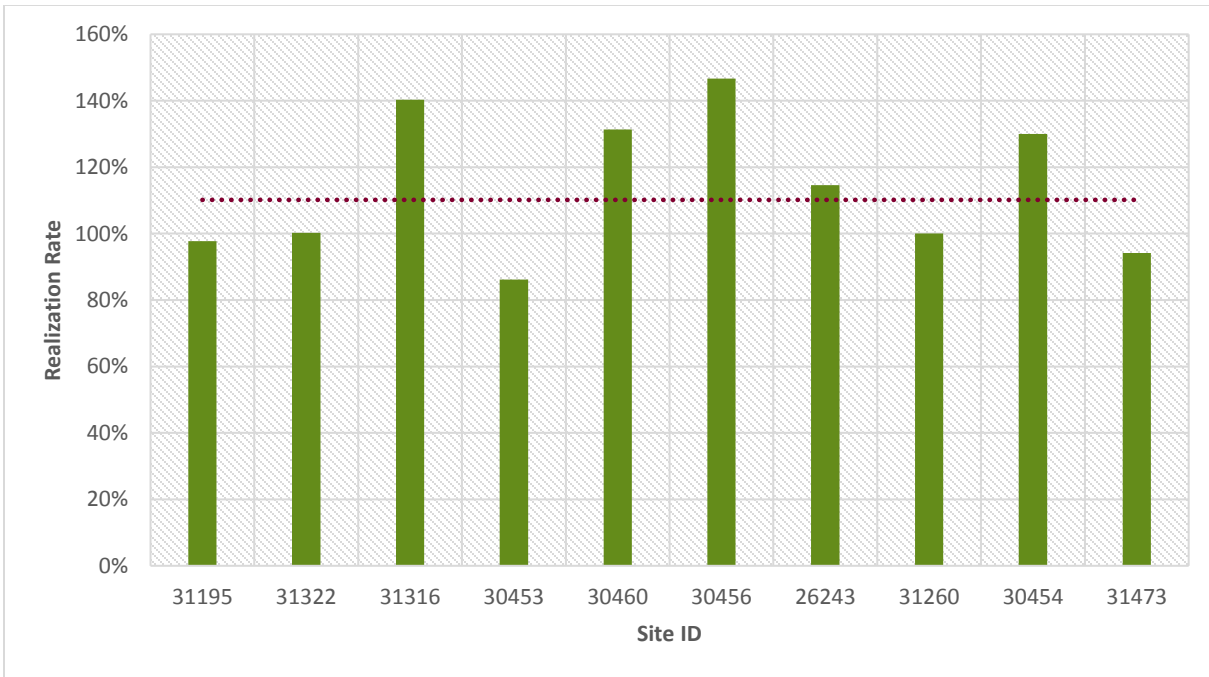


Source: Evaluation Team analysis.

The PJM peak summer demand savings realization rates for all evaluated projects, are shown below in Figure 3-4. The PY8 site-level demand realization rate results ranged from 0.86 to 1.47. The demand realization rate was close to 100% for many of the projects in the gross sample. Ex ante demand savings were reported for all the projects in the gross sample.

There was a lot of variation in the demand realization rates for PY7. The program team has done a great job in estimating the demand savings for the PY8 projects.

Figure 3-4. PY8 Industrial Systems Optimization Program PJM Peak Demand Realization Rates (Shown by Project ID)



Source: Evaluation Team analysis.

The relative precision for the gross impact results at a one-tailed 90 percent confidence level is plus or minus six percent for the kWh realization rate and plus or minus seven percent for the kW realization rate, as shown below in Table 3-4 and Table 3-5. The achieved relative precision rates at a one-tailed 90 percent confidence level for energy and demand is better than the evaluation targeted kWh realization rate of plus or minus 10 percent.

**Table 3-4. Gross kWh Realization Rates and Relative Precision at 90 %Confidence Level**

Sampling Strata	Relative Precision ±%	Low	Mean	High
1	2%	0.97	0.99	1.00
2	14%	1.06	1.23	1.40
3	8%	0.93	1.01	1.09
<b>PY8 Total</b>	<b>6%</b>	<b>1.01</b>	<b>1.07</b>	<b>1.13</b>

Source: Evaluation Team analysis.

**Table 3-5. Gross kW Realization Rates and Relative Precision at 90% Confidence Level**

Sampling Strata	Relative Precision ±%	Low	Mean	High
1	7%	0.98	1.05	1.13
2	17%	0.98	1.18	1.38
3	12%	0.95	1.08	1.21
<b>PY8 Total</b>	<b>7%</b>	<b>1.02</b>	<b>1.10</b>	<b>1.18</b>

Source: Evaluation Team analysis

The evaluation team has provided ComEd with site-specific M&V reports for each verified project. These site-specific impact evaluation reports summarize the ex ante savings in the final application submitted, M&V plan, and data collected at the site and all of the calculations and parameters used to estimate savings.

Savings for four of the 10 projects were adjusted by more than 10% of the ex ante savings. Some observations from these four projects are listed by project ID:

- 26243:** The facility has a total of 2,300 gallons of storage accessible to compressor AC-2 (excluding two 300-gallon storage tanks dedicated to compressor AC-1 and AC-3), which resulted in the facility having a total of 3.4 gallons of storage per CFM of trim compressor capacity. The ex post analysis changed the compressor control curve from load/no load with one gallon per CFM to load/no load with three gallons per CFM. This adjustment increased the ex post energy and demand savings by approximately 22 percent. In addition, the ex post analysis was adjusted to account for the specific power reduction for the time that the system was in operation but compressor AC-2 was not operating. Switching the trim compressor to AC-3 for this time reduced the savings by 6%.
- 31473:** There were a couple of changes made to the project that had impact on the ex ante savings. The first change was removal of portion of pre and post case data that was inconsistent with the expected operation and appeared to include meter errors. This adjustment increased the

savings for this project. The increase was partially offset by the second change, normalization of the compressed air system operation to ensure consistency in both pre- and post-case operation.

- **30460:** Adjustments were made to compressed air leak measures, no-loss condensate drains and pressure set point reductions. For compressed air leaks, a number of conservative assumptions were made by the ex ante team in their calculations. The evaluation team used the trend data to update the ex ante assumptions. For the no-loss drains and pressure set-point reductions, there was a difference in methodology between the ex ante and ex post calculations which increased savings for these measures. The differences in the approaches are explained in detail in the site report provided to the ComEd team.
- **30456:** Ex ante calculations estimated savings for air leaks measure based on the standard leak repair workbook. The ex ante analysis did not account for the difference in compressor operation that resulted from the reduction in air leaks. Because of the leak reduction one compressor was able to be turned off for the night and weekend hours.

## 4. NET IMPACT EVALUATION

The Illinois Stakeholder Advisory Group (SAG)<sup>4</sup> determined that the NTG values for the Industrial System Optimization Program should be deemed prospectively and used to calculate verified net savings. The table below shows the deemed NTG values and the PY8 verified net savings.

**Table 4-1. PY8 Verified Net Impact Savings Estimates by Measure Type**

Gross Savings Input Parameters	Value	Deemed † or Evaluated?
Energy Savings NTG Ratio	0.75	Deemed
Demand NTG Ratio	0.84	Deemed

† A deemed value. Source: ComEd\_NTG\_History\_and\_PY8\_Recommendation\_2014-02-28\_Final\_EMV\_Recommendations.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>

Unlike previous program cycles, the PY8 program cycle did not perform NTG research to calculate NTGR based on the PY8 evaluation findings alone. Instead, the evaluation team and ComEd decided that a joint PY8/PY9 NTG evaluation would be performed. Therefore, the evaluation team performed telephone surveys of the eight gross sample points in PY8, but the analysis will be performed and combined with the PY9 findings.

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<sup>4</sup> Source: ComEd\_NTG\_History\_and\_PY8\_Recommendations\_2015-02-24\_v2\_clean.xls, which is to be found on the IL SAG website here: <http://ilsagfiles.org/>

## 5. FINDINGS AND RECOMMENDATIONS

The PY8 gross realization rate for the Industrial Systems Optimization Program of 1.07 for energy is higher than previous years. The PY8 project-level gross realization rates for energy ranged from 0.92 to 1.47. The energy realization rate for six of the ten projects in the gross sample were around 100 percent. This is a great improvement from the previous year.

Overall, the program team did very well in ensuring all the implemented measures were installed and operating as planned. The program team continues to collect site specific pre- and post-metered data for all projects. Even though the program realization rate is close to 100 percent, there is room for improvement. The evaluation team would like to present some of the findings and recommendations that can be utilized to fine tune the current approach that would help in more accurate estimation of ex ante savings.

**Finding 1.** The evaluation team made minor adjustments to the savings for the projects 31195 and 31473, because of changes in the normalization procedures recommended in these specific cases. Normalizing is crucial step in estimating the savings for a custom project. In most cases, the program team follows standard procedures to normalize the data to ensure consistency between the pre and post case operation. For the projects listed above, the evaluation team made minor adjustments to the normalizing procedures adopted by the program team. These adjustments are detailed in the individual site reports.

**Recommendation 1.** The evaluation team recommends the program team review these site reports and that the changes in normalizing procedures should be applied to projects in the future, where applicable.

**Finding 2.** For three projects (31473, 30454 and 30460), the savings were adjusted because of errors in the ex ante calculations or data related issues. The program team has improved the QA/QC process over the past few years but the evaluation team identified some errors in ex ante calculations for a small number of projects.

**Recommendation 2.** The evaluation team believes that the adjustments to the ex ante savings can be minimized even further in the future by developing an even stronger QA/QC process. Some essential checks can be put in place to ensure that there are no calculation errors. Also, the collected data should be reviewed thoroughly to eliminate errors and outliers, so that the data represent normal operation.

**Finding 3.** The evaluation team found that savings for the leak saving projects are heavily reliant on the template. The templates used by the program team have been reviewed previously by the evaluation team and are reasonable to use. However, in some cases, the template may not fully capture the intricacies of the individual projects.

**Recommendation 3.** The evaluation team believes that using the templates is an acceptable approach going forward, as long as site specific adjustments are made to the templates as required.

## 6. APPENDIX

### 6.1 Participant Survey

**COMED SMART IDEAS FOR YOUR BUSINESS PROGRAM  
PARTICIPANT SURVEY – INDUSTRIAL SYSTEMS PROJECTS  
PY8 Draft**

**Introduction**

Hello, this is \_\_\_\_\_ from Itron calling on behalf of ComEd regarding your company’s participation in the Industrial Systems program. May I please speak with [**CONTACTNAME**]?

Our records show that [**COMPANY**] completed a <**PROJECT\_TYPE**> project in ComEd’s Smart Ideas for Your Business Industrial Systems Program, and we are calling to conduct a follow-up study about your firm’s participation in this program. Our records indicate that you’re the person most knowledgeable and the most involved with the decision to participate in the program. Is this correct? [IF NOT, ASK TO BE TRANSFERRED TO THE DECISION MAKER OR SOMEONE FAMILIAR WITH THE BASIS FOR THE DECISION TO PARTICIPATE OR RECORD NAME & NUMBER.]

[IF NEITHER DECISION MAKER OR SOMEONE FAMILIAR WITH THE BASIS FOR THE DECISION TO PARTICIPATE, IS AVAILABLE TERMINATE AND CALL REFERRAL]  
(IF NEEDED: Is it possible that someone else dealt with the <**PROJECT\_TYPE**> project?)

This survey will take about 20 minutes. Is now a good time? [If no, schedule call-back]

**Participation Verification**

- A1 First, according to our records, you participated in ComEd’s Smart Ideas for Your Business Industrial Systems Program between <**MONTH/YEAR**>. *[IF NEEDED: the ComEd Smart Ideas for Your Business Industrial Systems Program promotes energy efficiency improvements to industrial facilities with a primary focus on Compressed Air, Industrial Refrigeration, and Process Cooling system improvements. The program offers technical assessments to help identify applicable measures and analyze the energy and cost savings of the recommended measures. The program also offers cash incentives to help cover a portion of the cost of making the recommended energy efficiency improvements to the energy using equipment.]*  
Do you recall participating in the ComEd Smart Ideas for Your Business Industrial Systems Program between <**MONTH/YEAR**>?
- 1. Yes
  - 2. No Thank & terminate
  - 88. Refused Thank & terminate
  - 99. Don’t know Thank & terminate
- A2 Next, I’d like to confirm the following information regarding your participation in the Industrial Systems Program. I understand that you participated at <**ADDRESS**>. The Industrial Systems study was completed in <**MONTH/YEAR**> by <**SERVICEPROVIDER**> and you implemented <**NO OF MEASURES**> measure(s), including <**MEASURE1**>, <**MEASURE2**>, <**MEASURE3**>.) Does that sound right?
- 1. Yes
  - 2. No Thank & terminate
  - 88. Refused Thank & terminate
  - 99. Don’t know Thank & terminate



## Project Background

- B1. Before I ask you specific questions about your decision, please tell me in your own words why you decided to look into making changes to improve the energy efficiency of the <PROJECT\_TYPE> equipment at this facility? Were there any other reasons?
- 77. RECORD VERBATIM
  - 88. Refused
  - 99. Don't know
- N1b Where did the idea to look into making changes to improve the energy efficiency of the <PROJECT\_TYPE> come from? [IF NEEDED: Did your company develop the idea, was it suggested by a vendor or consultant or the program Service Provider, was it the result of an audit, was it part of a larger expansion or remodeling effort?]
- 77. RECORD VERBATIM
  - 88. Refused
  - 99. Don't know
- S1. How did you first hear about the Industrial Systems Program? **[DO NOT READ]**
- 1. Service provider
  - 2. ComEd program representative
  - 3. ComEd Account manager
  - 4. ComEd Website
  - 5. Friend/colleague/word of mouth
  - 6. Contractor
  - 77. Other [RECORD VERBATIM]
  - 88. Refused
  - 99. Don't know
- S2. How long ago or when was this?
- 1. RECORD VERBATIM
  - 88. Refused
  - 99. Don't know
- B2a. Before learning about the ComEd Industrial Systems Program, had you ever made any other changes to improve the energy efficiency of your <PROJECT\_TYPE> equipment at this facility or any of your other facilities?
- 1. Yes, at this facility
  - 2. Yes, at another facility [skip the next two questions, go to B5]
  - 3. No [skip the next two questions, go to B5]
  - 88. Refused [skip the next two questions, go to B5]
  - 99. Don't know [skip the next two questions, go to B5]
- [ASK IF B2a=1]
- B2aa. Specifically, what did you have done at this facility?
- 77. RECORD VERBATIM
  - 88. Refused
  - 99. Don't know
- [ASK IF B2a=1]
- B2b. Did you receive an incentive or another form of financial support for this previous <PROJECT\_TYPE> project?
- 1. Yes
  - 2. No

- 88. Refused
- 99. Don't know

- B5. My next questions are about your awareness of the energy saving opportunities identified through your Industrial Systems study PRIOR to conducting it. Would you say you were aware of all, some, or none of the opportunities before the study? [if needed read: <MEASURE1 through MEASUREx>]
- 1. All [skip the next question]
  - 2. Some
  - 3. None [skip the next three questions]
  - 88. Refused [skip the next three questions]
  - 99. Don't know [skip the next three questions]

[ASK IF B5=2]

- B6. Which of the following energy saving opportunities were you previously aware of? Were you aware of the opportunities with your... (1=Yes, 2=No, 88=Refused, 99=Don't know)
- a. **MEASURE1**
  - b. **MEASURE2** [ASK IF MEASURE2 ne ""]
  - c. **MEASURE3** [ASK IF MEASURE3 ne ""]
  - d. **MEASURE4** [ASK IF MEASURE4 ne ""]
  - e. **MEASURE5** [ASK IF MEASURE5 ne ""]

[ASK IF B5=1,2]

- B2bb. What were the main factors that kept you from making the specific changes identified through the Industrial Systems Program Study PRIOR to your participation in the program?
- 77. [RECORD VERBATIM]
  - 88. Refused
  - 99. Don't know

[ASK IF B5=1,2]

- B2cc. Did the information you received through the program influence you to make any additional improvements or upgrades to the improvements you already had in mind?
- 1. Yes
  - 2. No
  - 88. Refused
  - 99. Don't know

[ASK IF B2cc=1]

- B2dd. Please explain what you were planning on doing before the program and how the program influenced you to make additional improvements or upgrades?
- 77. [RECORD VERBATIM]
  - 88. Refused
  - 99. Don't know

[ASK IF **MEASURES\_NOT\_INSTALLED** not blank]

- B8c. Our records show that your company did not install all of the measures recommended in the Industrial Systems study. What were the reasons why your company didn't implement the following measures: <MEASURES\_NOT\_INSTALLED>?
- 77. [RECORD VERBATIM]
  - 88. Refused
  - 99. Don't know

[ASK IF **NUM\_PROJECTS**>1]

- B7. Our records indicate that your company completed <NUM\_PROJECTS> projects through the program. Was your decision to participate in the program the same for each project?

- 1. Yes
- 2. No
- 77. Some decisions were the same (RECORD VERBATIM)
- 88. Refused
- 99. Don't know

**Decision Influences (\*USED IN NTG CALCULATOR\*)  
BEGIN LOOP FOR MEASURE1-MEASURE3**

- N1. When did you first learn about ComEd's Industrial Systems Program, was it BEFORE or AFTER you first began to THINK about implementing <MEASUREx>?
- 1. Before [skip the next question, go to N3]
  - 2. After
  - 88. Refused
  - 99. Don't know

[ASK IF N1=2, 88, 99]

- \*N2\*. Did you learn about ComEd's Program and the availability of technical assistance and incentives for energy efficiency improvements BEFORE or AFTER you DECIDED to implement <MEASUREx>?
- 1. Before
  - 2. After
  - 88. Refused
  - 99. Don't know

[IF N2 = 2 THEN ASK, ELSE SKIP TO N3.]

- N2a. How did you first learn about <MEASUREx>? [IF NEEDED: Were you working with another contractor?]
- 77. Record VERBATIM
  - 88. Refused
  - 99. Don't know
- N2b. Did you delay your project in order to receive the study/incentive through the Program?
- 1. Yes
  - 2. No
  - 88. Refused
  - 99. Don't know

[IF N2b = 1 THEN ASK, ELSE SKIP TO N3.]

- N2bb. How long did you delay your project to receive the study/incentive?
- 77. Record VERBATIM
  - 88. Refused
  - 99. Don't know

- N2c. Why did you decide to participate in the Smart Ideas for your Business Program AFTER you had decided to implement <MEASUREx>?
- 77. Record VERBATIM
  - 88. Refused
  - 99. Don't know

- \*N3\*. Now I'm going to ask you to rate the importance of several factors that might have influenced your decision to implement <MEASUREx>. On a scale from 0 to 10, where 0 means 'not at all important' and 10 means 'extremely important', how important were the following in your decision to implement <MEASUREx>.

[FOR N3a-m, RECORD 0 to 10; 96=Not Applicable; 88=Refused; 99=Don't know][If needed: How important in your DECISION to conduct the study and commit the funding to implement <MEASUREx> was...]

[ROTATE N3a-N3m]

- \*N3b\*. The availability of cash incentives for <MEASUREx>
- \*N3c\*. The comprehensive study funded by the Smart Ideas Program
- \*N3e\*. Previous experience with this type of project
- \*N3f\*. The recommendation from your ComEd Account Manager
- \*N3h\*. The information from the Industrial Systems Program Representative (Service Provider)
- \*N3i\*. Recommendation from an expert not affiliated with the program
- \*N3j\*. Standard practice in your business/industry
- \*N3l\*. Corporate policy or guidelines
- \*N3m\*. Payback on the investment with the incentives

\*N3n\*. Were there any other factors that we haven't discussed that were influential in your decision to implement <MEASUREx>? If so, what were they? [If needed: Are these other factors program related?]

- 77. Yes [RECORD VERBATIM]
- 96. Nothing else influential [skip the next question, go to N41]
- 88. Refused [skip the next question, go to N41]
- 99. Don't know [skip the next question, go to N41]

[ASK IF N3n=77]

\*N3nn\*. Using the same 0 to 10 scale, how would you rate the influence of this factor?

- #. RECORD 0 to 10
- 96. Not Applicable
- 88. Refused
- 99. Don't Know

[READ IF (N3a, N3b, N3c, N3e, N3f, N3h, N3i, N3j, N3l, N3m, OR N3n)=8,9,10]

You just told me that the following factors were important:

[READ IN ONLY ITEMS WHERE THEY GAVE A RATING OF 8 or higher]

**PROGRAM RELATED:**

- N3b. The availability of cash incentives for <MEASUREx>
- N3c. The comprehensive study funded by the Smart Ideas Program
- N3f. The recommendation from your ComEd Account Manager
- N3h. The information from the Industrial Systems Program Representative (Service Provider)

**OTHER FACTORS:**

- N3e. Previous experience with this type of project
- N3i. Recommendation from an expert not affiliated with the program
- N3j. Standard practice in your business/industry
- N3l. Corporate policy or guidelines
- N3m. Payback on the investment with the incentives
- N3n. Other factor

\*N41\*. If you were given a TOTAL of 10 points that reflect the importance in your decision to implement <MEASUREx>, and you had to divide those 10 points between: 1) the program and 2) other factors, how many points would you give to the importance of the PROGRAM? [IF NEEDED: Program factors include the cash incentives, the fully funded study, recommendations by ComEd staff or Service Provider.] Points given to program:

- #. RECORD 0 to 10
- 88. Refused
- 99. Don't Know

[CALCULATE VARIABLE "OTHERPTS" AS: 10 MINUS N41 RESPONSE; IF N41=88, 99, SET OTHERPTS=BLANK]

- \*N42\*. And how many points would you give to other factors? [IF NEEDED: Other factors include the previous experience, recommendations from people unrelated to the program, standard practice, corporate policy.] [The response should be <OTHERPTS> because both numbers should equal 10.]
- #. RECORD 0 to 10
  - 88. Refused
  - 99. Don't Know

## PAYBACK BATTERY

\*N10a\*. Did the cash incentive, including the avoided cost of the assessment, move <MEASUREx> within an acceptable payback cutoff point?

- 1. Yes
- 2. No
- 88. Refused
- 99. Don't know

## CONSISTENCY CHECK ON PROGRAM IMPORTANCE SCORE

[ASK IF (N41>=7 AND ALL OF (N3b, N3c, N3f, AND N3h)=0,1,2,3), ELSE SKIP TO N4e]

N4 You just gave <N41 RESPONSE> points to the importance of the program, I would interpret that to mean that the program was quite important to your decision to install this equipment. Earlier, when I asked about the importance of individual elements of the program I recorded some answers that would imply that they were not that important to you. Just to make sure I have recorded this properly, I have a couple questions to ask you.

N4a When asked about THE AVAILABILITY OF THE CASH INCENTIVE, you gave a rating of ...<N3B RESPONSE> ... out of ten, indicating that the cash incentive was not that important to you. Can you tell me why the cash incentive was not that important?

- 77. Record VERBATIM
- 88. Refused
- 99. Don't know

N4b When I asked you about THE COMPREHENSIVE STUDY, you gave a rating of ...<N3C RESPONSE> ... out of ten, indicating that the study was not that important to you. Can you tell me why the study was not that important?

- 77. Record VERBATIM
- 88. Refused
- 99. Don't know

N4c When I asked you about THE RECOMMENDATION FROM YOUR COMED ACCOUNT MANAGER, you gave a rating of ...<N3F RESPONSE> ... out of ten, indicating that the recommendation was not that important to you. Can you tell me why the recommendation was not that important?

- 77. Record VERBATIM
- 88. Refused
- 99. Don't know

N4d When asked about THE INFORMATION from the INDUSTRIAL SYSTEMS PROGRAM REP, you gave a rating of ...<N3H RESPONSE> ... out of ten, indicating that this information from the program rep was not that important to you. Can you tell me why this information was not that important?

- 77. Record VERBATIM
- 88. Refused
- 99. Don't know

[ASK IF N41<=3 AND ANY ONE OF (N3b, N3c, N3f, OR N3h =8,9,10) ELSE SKIP TO N9a]

N4e You just gave <N41 RESPONSE> points to the importance of the program. I would interpret that to mean that the program was not very important to your decision to make energy efficiency improvements to the <PROJECT\_TYPE>. Earlier, when I asked about the importance of individual elements of the program I recorded some answers that would imply that they were very important to you. Just to make sure I understand, would you explain why you scored the importance of the program a <N41 RESPONSE> in your decision to make energy efficiency improvements to the <PROJECT\_TYPE>?

### Actions Without the Program

ASK FOR MEASURE1, SKIP to N12 FOR MEASURE2 and MEASURE3

N9a. Now we would like you to think about the action you would have taken if the Program had not been available. If you had not received the ComEd comprehensive study, would you have undertaken a study on your own?

- 1. Yes
- 2. No
- 88. Refused
- 99. Don't know

\*N12\*. Now thinking about <MEASUREx> and its efficiency. Using a likelihood scale from 0 to 10, where 0 is "Not at all likely" and 10 is "Extremely likely", if the ComEd Industrial Systems program had NOT been available, what is the likelihood that you would have performed/installed the exact same measure?

- #. RECORD 0 to 10
- 88. Refused
- 99. Don't know

\*N13\*. Without the program, when do you think you would have implemented <MEASUREx>? Would you say...

- 1. At the same time [skip the next two questions, go to B1a]
- 2. Earlier [skip the next two questions, go to B1a]
- 3. Later
- 4. Never [skip the next two questions, go to B1a]
- 88. Refused [skip the next two questions, go to B1a]
- 99. Don't know [skip the next two questions, go to B1a]

[ASK IF N13=3]

\*N13a\*. How much later would you have implemented <MEASUREx>? Would you say...

- 1. 1 to 3 months later [skip the next question, go to B1a]
- 2. 4 to 6 months later [skip the next question, go to B1a]
- 3. 7 to 12 months later [skip the next question, go to B1a]
- 4. 13 to 24 months later [skip the next question, go to B1a]
- 5. More than 2 years later
- 88. Refused [skip the next question, go to B1a]
- 99. Don't know [skip the next question, go to B1a]

[ASK IF N13a=5]

N13b. Why do you think it would have been 2 or more years later?

- 77. RECORD VERBATIM
- 88. Refused

99. Don't know

ASK FOR MEASURE1, SKIP to CH1 AFTER MEASURE3

B1a Thinking about all of the questions we just discussed, would you say the decision making process was the same for <MEASURE2> and <MEASURE3>, or was each measure part of a separate decision?

- 1 Same decision making process for all
- 2 Different decision making process
- 77 Other, specify
- 88 Refused
- 99 Don't know

**END NTG LOOP**

If B1A=1 THEN MOVE ON TO CH1, ELSE BEGIN NTG LOOP FOR THE NEXT MEASURE

**Spillover and Channeling**

\*CH1\*. Since your participation in the Industrial Systems program, have you installed any additional energy efficient equipment at this facility?

- 1. Yes
- 2. No
- 88. Refused
- 99. Don't know

[ASK IF CH1=1(yes), ELSE SKIP TO S1]

\*CH2\*. What type of energy efficient equipment did you install?

- 77. RECORD VERBATIM
- 88. Refused [skip the next three questions, go to S1]
- 99. Don't know [skip the next three questions, go to S1]

\*CH2a\*. Did you receive an incentive from any utility or government program for this measure?

- 1. Yes
- 2. No
- 88. Refused
- 99. Don't know

\*CH3\*. On a scale of 0 to 10, where 0 means "no influence" and 10 means "greatly influenced," how much influence did your participation in the Industrial Systems Program have on your decision to install additional energy efficiency measures?

- #. SCALE 0-10
- 88. Refused
- 99. Don't know

[ASK IF CH3=8,9 or 10; ELSE SKIP TO S1]

CH4. How did the Industrial Systems Program influence your decision to install additional energy efficiency measures?

- 77. RECORD VERBATIM
- 88. Refused
- 99. Don't Know

*Those are all of the questions I have. Thank you very much for your participation!*

## 6.2 Technical Service Providers Telephone Survey

### Vendor NTG Survey Instrument – for ComEd Custom Programs – Industrial Systems version – PY8

#### Introduction

AA1. Hello, this is \_\_\_\_\_ from Itron calling on behalf of ComEd. THIS IS NOT A SALES CALL. I am calling about your firm's recent involvement in conducting a technical assessment study sponsored by ComEd for ... <%CUSTOMER>... through the ComEd Smart Ideas for Your Business Program on approximately ... <%STUDY\_DATE>... Our records indicate that ...<%CONTACT>... would be the person most knowledgeable about this. Is he/she available?

- 1 Yes AA5
- 2 No AA2
- 88 Refused Thank and Terminate
- 99 Don't know Thank and Terminate

AA2. Who would be the person most knowledgeable about your firm's involvement in conducting a technical assessment study sponsored by ComEd for ...<%CUSTOMER>... through the ComEd Smart Ideas for Your Business Program on approximately...<%STUDY\_DATE>?

- 1 Record name AA3
- 88 Refused Thank and Terminate
- 99 Don't know Thank and Terminate

AA3. May I speak with him/her?

- 1 Yes AA4
- 2 No (not available right now) SCHEDULE APPOINTMENT

AA4. Hello, this is \_\_\_\_\_ from Itron calling on behalf of ComEd. THIS IS NOT A SALES CALL. I was told that you are the person most knowledgeable about your firm's involvement in conducting a technical assessment study sponsored by ComEd for ...<%CUSTOMER>... through the ComEd Smart Ideas for Your Business Program on approximately...<%STUDY\_DATE>. Is this correct?

- 1 Yes A1
- 2 No, there is someone else (RECORD NAME AND ASK TO BE TRANSFERRED) AA5
- 3 No and I don't know who to refer you to Thank and Terminate
- 88 Refused Thank and Terminate
- 99 Don't know Thank and Terminate

AA5. Am I speaking with ...<%BETTER\_CONTACT> ...the representative of your company that worked with ...<%CUSTOMER>... during the time that your firm conducted a technical assessment study sponsored by ComEd? This study was conducted on approximately...<%STUDY\_DATE>.

- 1 Yes A1
- 2 Yes, but we need to make an appointment. Reschedule appt.
- 3 No but I will give you to the correct person. AA4
- 88 Refused Thank and Terminate
- 99 Don't know Thank and Terminate

Before we start, I would like to inform you that for quality control purposes, this call may be monitored by my supervisor. For the sake of expediency, we will be recording this interview.



- A1. Our records indicate that your firm conducted a technical assessment study sponsored by ComEd in which you recommended that <%CUSTOMER> install <%MEASURE1-%MEASURE3>. Is this correct?
- |    |            |                     |  |
|----|------------|---------------------|--|
| 1  | Yes        | A2                  |  |
| 2  | No         | Thank and Terminate |  |
| 88 | Refused    | Thank and Terminate |  |
| 99 | Don't know | Thank and Terminate |  |

*[DO NOT READ: The following question will determine if we ask about influences on their recommendations. Please be sure to be thorough with this question. If they truly only installed this equipment, then a "No" is fine]*

**LOOP/ASK FOR EACH MEASURE (1-3)**

- A2. As <%CUSTOMER>'s vendor, did you recommend the installation of this <%MEASUREx>?
- |    |            |    |    |
|----|------------|----|----|
| 1  | Yes        | A3 |    |
| 2  | No         | A3 |    |
| 88 | Refused    | A3 | A3 |
| 99 | Don't know | A3 |    |

- A3. Can you please explain what was your firm's involvement with ...<%CUSTOMER>'s ... implementation of <%MEASUREx>? [IF NEEDED: were they just an order taker, were they just equipment suppliers, or were they instrumental in what equipment was selected?....if they were instrumental, then you need to go back and correct the answer to the previous question.]
- |    |                 |                     |  |
|----|-----------------|---------------------|--|
| 77 | RECORD VERBATIM | A3a                 |  |
| 88 | Refused         | Thank and Terminate |  |
| 99 | Don't know      | Thank and Terminate |  |

- A3a. Does your company currently stock and sell <%MEASUREx>s?
- |    |            |    |  |
|----|------------|----|--|
| 1  | Yes        | V2 |  |
| 2  | No         | V2 |  |
| 88 | Refused    | V2 |  |
| 99 | Don't know | V2 |  |

*[READ] For the sake of expediency, during the balance of the interview, we will be referring to the ComEd Smart Ideas for Your Business Program as the PROGRAM and we will be referring to the installation of ... <%MEASUREx> as the MEASURE. I will repeat this from time to time during the interview as your organization may have installed more than one measure through more than one program.*

I am going to ask you to rate the importance of the ComEd Smart Ideas for Your Business in influencing your decision to recommend this <%MEASUREx> to ...<%CUSTOMER>.. Think of the degree of importance as being shown on a scale with equally spaced units from 0 to 10, where 0 means not at all important and 10 means very important, so that an importance rating of 8 shows twice as much influence as a rating of 4.

- V2. Using this 0 to 10 scale where 0 is NOT AT ALL IMPORTANT and 10 is EXTREMELY IMPORTANT, how important was the ComEd Smart Ideas for Your Business Program, including incentives as well as program services and information, in influencing your decision to recommend that ...<%CUSTOMER>... install the energy efficiency <%MEASUREx> at this time?
- |    |                              |    |  |
|----|------------------------------|----|--|
| #  | Record 0 to 10 score (_____) | V3 |  |
| 88 | Refused                      | V3 |  |
| 99 | Don't know                   | V3 |  |

- V3. And using a 0 to 10 likelihood scale where 0 is NOT AT ALL LIKELY and 10 is EXTREMELY LIKELY, if the ComEd Smart Ideas for Your Business Program, including incentives as well as

program services and information, had not been available, what is the likelihood that you would have recommended this specific <%MEASUREx> to ...<%CUSTOMER>?

#	Record 0 to 10 score (_____)	V4	
88	Refused		V4
99	Don't know	V4	

V4. Approximately, in what percent of technical assessment studies did you recommend this <%MEASUREx> before you learned about the ComEd Smart Ideas for Your Business Program?

%	Record PERCENTAGE	V5	
88	Refused		V5
99	Don't know	V5	

V5. And approximately in what percent of technical assessment studies do you recommend this <%MEASUREx> now that you have worked with the ComEd Smart Ideas for Your Business Program?

%	Record PERCENTAGE	V6a	
88	Refused		V6a
99	Don't know	V6a	

V6a. In what other ways has the ComEd Smart Ideas for Your Business Program influenced your recommendation that a customer install <%MEASUREx>?

1	Record FIRST mention	V6aa	
2	Record SECOND mention	V6aa	
3	Record THIRD mention	V6aa	
4	No other way	V7b	
88	Refused		V7b
99	Don't know	V7b	

IF V6a=1 THEN ASK, ELSE V6ab

V6aa. Using a 0 to 10 scale, how important was <%FIRST\_MENTION\_IN\_V6A > in your recommendation that a customer install <%MEASUREx>?

#	Record 0 to 10 score (_____)	V6a	
88	Refused		V6a
99	Don't know	V6a	

IF V6a=2 THEN ASK, ELSE V6ac

V6ab. Using a 0 to 10 scale, how important was <%SECOND\_MENTION\_IN\_V6A > in your recommendation that a customer install <%MEASUREx>?

#	Record 0 to 10 score (_____)	V6ac	
88	Refused		V6ac
99	Don't know	V6ac	

IF V6a=3 THEN ASK, ELSE V7b

V6ac. Using a 0 to 10 scale, how important was <%THIRD\_MENTION\_IN\_V6A > in your recommendation that a customer install <%MEASUREx>?

#	Record 0 to 10 score (_____)	V7b	
88	Refused		V7b
99	Don't know	V7b	

V7b. And how important was the information provided by the ComEd website in your recommendation that a customer install this MEASURE?

#	Record 0 to 10 score (_____)	V7c	
88	Refused		V7c
99	Don't know	V7c	

V7c. And how important was your firm's past participation in an incentive or study-based program sponsored by ComEd in your recommendation that a customer install this MEASURE?

#	Record 0 to 10 score (_____) V8	
88	Refused	V8
99	Don't know	V8

IF VENDOR ALSO STOCKS AND SELLS PROGRAM QUALIFYING <%MEASURE> (if A3a=1) THEN ASK V8. ELSE SKIP TO V15.

V8. Approximately, what percentage of your sales over the last 12 months of <%MEASUREx>s installed in ComEd's service territory are energy efficient models, that qualify for incentives from the program?

%	Record PERCENTAGE	V9
88	Refused	V9
99	Don't know	V9

V9. In what percent of sales situations do you encourage your customers in ComEd's service territory to purchase program qualifying <%MEASUREx>s?

%	Record PERCENTAGE	V9a
88	Refused	V10
99	Don't know	V10

IF V9 < 100% THEN ASK. ELSE SKIP TO V10.

V9a. In what sales situations do you NOT encourage your customers to purchase program qualifying <%MEASUREx>s? And why is that?

77	RECORD VERBATIM	V10
88	Refused	V10
99	Don't know	V10

V10. Of those installations of <%MEASUREx>s in ComEd's service territory that qualify for incentives, approximately what percentage do not receive the incentive?

%	Record PERCENTAGE	V11
88	Refused	V12
99	Don't know	V12

IF V10 > 0%

V11. Why do you think they do not receive the incentive?

77	RECORD VERBATIM	V12
88	Refused	V12
99	Don't know	V12

V12. Do you also recommend <%MEASUREx>s in areas where customers do not have access to incentives for energy efficient models?

1	Yes	V13
2	No	V14
88	Refused	V14
99	Don't know	V14

V13. About what percent of your sales of program-qualifying <%MEASUREx>s are represented by these areas where incentives are not offered?

%	Record PERCENTAGE	V14
88	Refused	V14
99	Don't know	V14

V14. Have you changed your stocking practices of <%MEASUREx>s as a result of ComEd's Program?  
 [IF NEEDED: BY STOCKING PRACTICES, I MEAN THE TYPES OF EQUIPMENT YOU  
 SUPPLY AND SELL IN COMED'S SERVICE TERRITORY.]

- 1 Yes V15
- 2 No V15
- 88 Refused V15
- 99 Don't know V15

IF V12=1

V15. Do you promote energy efficient equipment, such as <%MEASUREx>, equally in areas with and  
 without incentives??

- 1 Yes V16
- 2 No V16
- 88 Refused V16
- 99 Don't know V16

V16. Do you know of any other vendors that worked with <%CUSTOMER> during their implementation  
 and/or installation of <%MEASUREx>? For example engineers or designers?

- 1 Yes V16a
- 2 No V17
- 88 Refused V17
- 99 Don't know V17

V16a. Do you have their business name?

- 77 RECORD Business name and contact's name and phone number(s) V17
- 88 Refused V17
- 99 Don't know V17

**END LOOP – MEASURE 1-3**

**PROCESS MODULE**

V17. And finally, for verification purposes only, may I please have your first name?

- 77 RECORD VERBATIM END

END Those are all the questions I have for you today. Thank you very much for your time.

END OF SURVEY