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ComEd Strategic Energy Management Combined Evaluation Report

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

Presented to
ComEd

February 14, 2019

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Navigant

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Submitted to:

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1. INTRODUCTION

This report combines the key deliverables from the evaluation of the Strategic Energy Management Program for PY9. Each of these deliverables were drafted, reviewed and finalized during the course of the PY9 evaluation.

APPENDIX A. COMED PY9 NICOR GAS PY6 SEM IMPACT EVALUATION REPORT 2018-04-12 FINAL

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ComEd and Nicor Gas
Strategic Energy Management Program
Impact Evaluation Report

Energy Efficiency / Demand Response Plan:
Electric Program Year 9 (EPY9)
Gas Program Year 6 (GPY6)

Presented to

Commonwealth Edison Company

Nicor Gas

FINAL

April 12, 2018

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Strategic Energy Management Program Impact Evaluation Report

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1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd's Electric Program Year 9 (EPY9) and Nicor Gas' Program Year 6 (GPY6) Strategic Energy Management (SEM) 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. The appendix presents the impact analysis methodology. EPY9/GPY6 covers June 1, 2016 through December 31, 2017.

2. PROGRAM DESCRIPTION

The Strategic Energy Management (SEM) Program, managed by both ComEd and Nicor Gas, began as a pilot in EPY8/GPY5. The goal of the SEM Program is to apply a process of continuous energy management improvements that result in energy savings and demand reduction. The program seeks to educate participants in the identification of low cost and no cost measures, improve process efficiency, and reduce energy usage through behavioral changes. To encourage these savings, Nicor Gas provides an incentive of $0.10 per therm saved. In the Pilot year, ComEd provided a 10 percent bonus to rebates given on capital projects; after that year, an incentive of $0.01 per kWh saved has been given. While the utilities jointly manage the program, CLEAResult implements the day-to-day operation.

The program achieves energy savings through operational and maintenance (O&M) improvements, incremental increases in capital energy efficiency projects, additional capital projects that would not otherwise have been considered (e.g., process changes, consideration of energy efficiency in all capital efforts), and improved persistence for O&M and capital projects.

The SEM Program savings are calculated using site specific models developed by CLEAResult that have statistical regression analysis built into the model. The energy model uses two years of utility data prior to program participation. This data is associated with site information such as production and temperature to create baseline models that estimate a site's baseline usage based on these variables.

After program participation begins, the model compares baseline energy usage to post-participation consumption, adjusted for temperature and production, and any differences attributed to SEM activities.

The Pilot year began with 10 industrial participants enrolling in Cohort 1. In its second year, EPY9/GPY6, the program continued with seven of the Cohort 1 industrial participants and the addition of Cohort 2 with nine participants. Cohort 2 expanded the customer segment to include hospitals and universities in addition to the industrial segment. In August 2017, a Practitioner group was formed comprising of seven industrial and three commercial participants from Cohorts 1 and 2. This practitioner group was formed from sites that participated in the past and focused on maintaining changes and identifying new opportunities. Several of these sites had multiple models resulting in the 21 projects that were reviewed as a part of this evaluation.

Table 2-1. Cohort and Practitioner Timeline

Participant Group	Customer Segment	Time Period
Cohort 1 (Year 1)	10 Industrial	November 2, 2014 – October 31, 2015
Cohort 1 (Year 2)	7 Industrial	January 2, 2016 – December 31, 2016
Cohort 2 (Year 2)	2 Industrial 3 Hospitals 4 Universities	June 1, 2016 – May 31, 2017

Source: Navigant team analysis.

ComEd's goals for SEM in EPY9 were 6 GWhs of energy savings and to develop strong customer relationships resulting in increased participation in capital projects. Similarly, Nicor Gas' goals for Cohort 3 were SEM energy savings of 150,000 therms and an additional 200,000 therms of energy savings through Nicor's Business Energy Efficiency Rebate (BEER) and Business Custom programs. This program far exceeded these goals and acted as a "feeder" program into other utility offered programs such as BEER and Custom.

3. Program Savings

Table 3-1 and Table 3-2 summarize the incremental energy and demand savings the SEM Program achieved in PY9. The program had 21 participants in EPY9/GPY6 as shown in the above table. This program currently does not have demand savings calculators since savings are calculated using a whole building models.

Table 3-1. ComEd EPY9 Total Annual Incremental Savings

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Peak Demand Savings (kW)
Ex Ante Gross Savings	13,088,906	NA	NA
Program Gross Realization Rate	1.22	NA	NA
Verified Gross Savings	15,977,950	NA	NA
Program Net-to-Gross Ratio (NTGR)	1.00	NA	NA
Verified Net Savings	15,977,950	NA	NA

Source: ComEd and Nicor Gas tracking data and Navigant team analysis.

Table 3-2. Nicor Gas GPY6 Total Annual Incremental Savings

Savings Category	Energy Savings (Therms)
Ex Ante Gross Savings	1,917,723
Program Gross Realization Rate	1
Verified Gross Savings	1,917,797
Program Net-to-Gross Ratio (NTGR)	1
Verified Net Savings	1,917,797

Source: ComEd and Nicor Gas tracking data and Navigant team analysis.

4. Program Savings by Measure

The SEM program tracked and evaluated savings at the site level, rather than measure level. SEM Site level detail can be found in Appendix 2. Impact Analysis Detail. Site details can be found in Section 5.2

5. Impact Analysis Findings and Recommendations

5.1 Impact Parameter Estimates

As a behavioral based, model program, the program does not have standard impact parameters that are used to determine program savings. The program savings are calculated using billing regression methodologies built into the program models that are customized for each site.

5.2 Other Impact Findings and Recommendations

Details regarding site by site results are shown below:

Site 2
There appears to be an equation error in the SEM Tracking Models for this site. The implementer calculated an adjusted actual energy savings which subtracted a new plating line's energy from the actual energy. However, at the 3/27/2016 data point, the model's equation for adjusted actual energy stops accounting for the new plating-line.

Site 5
Navigant removed one more outlier for this site than the implementer. This outlier was the data taken during 10/3/16-10/9/2016 when the total production was higher than 110% of the maximum production level in the baseline period. The implementer noted the same outlier but retained this point after conducting analysis and determining that the point was not statistically different than others around it. The implementer capped the variable at the limit of 110% the baseline maximum, allowing the site to claim a conservative amount of savings to avoid penalizing the site and removing the savings altogether. Navigant chose not to keep the data point as capping the data point creates a mismatch with the actual billing data used to estimate savings.

Site 8
Navigant removed two outliers from this site. The first data point is that between 11/21/2016 and 11/26/2016 where the adjusted production of PM23 (production variable in model) was 69% of the minimum adjusted production of PM23 in the baseline period. The second data point is that between 12/26/12016 and 1/1/2017 where the adjusted production of PM23 was zero. The implementer marked both points as outliers as well by highlighting them in red but decided to keep both without explanation in their report.

Navigant removed the same two outlying data points from the gas model for this site as for the electric model above.

Site 9
Navigant removed one outlier from 4/2/2016 to 4/8/2016. During this period, the Mill 1's production was more than 110% of the maximum production in the baseline. Lighting capital projects were also installed at this site in the baseline period on 10/01/2015. The implementer recorded that these lighting projects were not in place during the measurement period of the model so no savings were prorated in the measurement period. However, it seems more likely that these lighting projects would have affected the measurement period. These projects were installed late in the baseline period and therefore may not have been fully considered in the baseline model. Navigant was concerned that this project may have been directly affecting the whole building site usage in the measurement period and accounted for the savings portion obtained by the lighting incentivized projects in the measurement period.

Site 11
An incentivized lighting project was installed at this site in the baseline period on 7/15/2015. The implementer recorded that these lighting projects were not in place before the measurement period so no savings were prorated in the measurement period. However, it seems more likely that these lighting projects would have affected the measurement period. These projects were installed late in the baseline period and therefore may not have had been fully considered in the baseline model. Navigant was concerned that this project may have been directly affecting the whole building site usage in the measurement period. Navigant accounted for the portion savings obtained by lighting incentivized projects by adding it to the measurement period.

Site 12
Navigant removed three outliers from the savings for this site. In all three cases, 7/17/2017-7/23/2016, 7/24/2016-7/30/2016, and 8/7/2016-8/13/2016, the cooling degree days CDD-70 were higher than the 110% maximum of the baseline. This resulted in the realization rate falling by 4%.

Site 13
Navigant removed one outlier from the savings for this site at the 7/17/2017-7/23/2016 data point. The cooling degree days CDD-65 was much higher than the 110% maximum of the baseline.

Site 15 through Site 18
Navigant removed four outliers from the savings for these projects. In three cases, 7/17/2017-7/23/2016, 7/24/2016-7/30/2016, and 8/7/2016-8/13/2016, the cooling degree days CDD-70 were higher than the 110% maximum of the baseline. One outlier occurred at 7/17/2017-7/23/2016 in which the cooling degree days CDD-55 was higher than the 110% maximum of the baseline.

Site 20
Navigant removed three outliers from the savings for this site. In all three cases, 7/17/2017-7/23/2016, 7/24/2016-7/30/2016, and 8/7/2016-8/13/2016, the cooling degree days CDD-70 were higher than the 110% maximum of the baseline.

Site 21
The electric savings for this site are much higher than the implementer reported. Navigant identified that a capital project that was installed by the SEM program had a negative effect on the SEM savings. The SEM program correctly removed the impact of the capital project savings by using reported ex ante savings, but between 10/20/2016 and 12/31/2016 the capital project did not seem to result in the savings equal to claimed ex ante savings resulting in the negative impact on the SEM savings. Navigant calculated the impact of this issue in several ways including adding a variable to represent this event. This variable was statistically significant and aligned with the installation of several process equipment VFD's projects. When this effect was accounted for the site realization rate increased because the ex post savings increased.

Finding 1: As identified above, many sites had issues with the values of post variables falling outside of accepted standards more than 110% of maximum baseline or less than 90% of minimum baseline. In these cases, the model may not accurately represent what is occurring during these periods.

Recommendation 1:

- The implementer should continue to identify when the values of the variables fall outside of these accepted levels and account for them appropriately, by testing their impact and/or removing them as needed.
- Justification for removal of a data point should be clear and grounded in real-world effects, as much as possible, and not just model inconsistencies.
- Any time periods with outliers in the baseline should be compared to the post condition to identify any seasonal effects.

- If outliers require removal of data points, savings should be adjusted to represent 12 months of savings.

Finding 2: The capital project occurring at site 21 greatly affected the claimed SEM savings for the site and the SEM Program. This is a controls project that did not achieve savings for the initial four to five months of the project. The SEM Program correctly removed the impact of the capital project savings by using reported ex ante savings, but between 10/20/2016 and 12/31/2016 the capital project did not seem to result in the savings equal to claimed ex ante savings, resulting in the negative impact on the SEM savings. Navigant calculated the impact of this issue in several ways including adding a variable to represent this event. When this effect was accounted for the site realization rate increased because the ex post savings increased.

Recommendation 2: If the models display strange results when considering installed capital projects, the implementer should coordinate with the capital project team or the utility to resolve the issue.

Finding 3: Currently, when an energy model results in negative savings the program claims zero savings for the site. Navigant followed this procedure and the reported ex-post savings reflects this practice. If negative savings are included as a part of the program savings, the final savings are as follows:

Table 5-1. EPY9/GPY6 Savings Including Negative Results

Program Details	Ex Post Evaluation	Negative Savings Included
Participants	21	21
Total Ex Ante Savings (kWh)	13,088,906	8,646,900
Total Ex Post Savings (kWh)	15,977,950	11,585,585
Electric RR	1.22	1.34
Total Ex Ante Savings (Therm)	1,917,723	986,679
Total Ex Post Savings (Therm)	1,917,797	1,058,656
Gas RR	1	1.07

This practice of zeroing negative savings projects runs the risk of biasing results. Navigant does not feel that the program is causing sites to use more energy. Instead, the negative savings in the energy models are likely due to unaccounted for site energy fluctuations such as: process changes, equipment changes, etc. This energy fluctuation could be caused by changes that occur at the site that are not identified by the model and it could affect savings both negatively or positively.

Recommendation 3: Further evaluation research into the negative savings discussion should be conducted in CY2018 to better understand this issue. Evaluation will consider and work with program leads to research the source of negative savings in CY2018 or CY2019. To further that research, the NREL Strategic Energy Management (SEM) Evaluation Protocol[1] states "Evaluators should report point estimates of SEM program savings for the reporting period and standard errors or confidence intervals to indicate the program savings uncertainty." The implementer should consider including factors that indicate the level of uncertainty for program savings so that there can be more confidence in final results. These overall program

[1] https://www.nrel.gov/docs/fy17osti/68316.pdf

error bands should be discussed internally with the evaluator and the utility to provide confidence in the final claimed savings.

6. Appendix 1. Impact Analysis Methodology

6.1 Verified Gross Program Savings Analysis Approach

Verified gross savings from the EPY9/GPY6 SEM Program were calculated using implementer provided engineering models that are grounded in site-specific data. These multi-regression models draw upon site data including energy usage, production, weather data and seasonality effects (including holidays or shutdowns). Electric and gas savings were independently evaluated using separate energy models. The verified gross savings reported includes interactive effects. With very few exceptions, the program design and calculation approach for the SEM Program does not allow us to quantify and remove the interactive effects due to the installation of multiple measures within the same timeframe. These methods closely follow the guidance of the NREL UMP protocol for SEM but the program should consider including the level of uncertainty as indicated above in Finding 3.

Navigant staff carefully reviewed the models using the following procedure:

- A site-specific analysis approach was implemented. Because this program contains primarily behavioral-based changes, the International Performance Measurement and Verification Protocol (IPMVP) option C – billing/metered data regression, was the main approach to impact evaluation.

- The data collection focused on verifying and/or updating the assumptions that feed into the implementer's energy model for each site. This data included: program tracking data and supporting documentation (project specifications, invoices, etc.), utility billing and interval data, Navigant-calibrated building automation system (BAS) trend logs and telephone conversations with onsite staff.

This data was used with other information collected from the site to identify operating characteristics of the site both pre- and post- program participation. If major changes occurred at the site during or after the SEM activities, Navigant adjusted the energy model to account for these changes. The changes that could affect the model savings include:

- Change in hours of operation
- Change in numbers of employees
- Change in production
- Other measures installed at the site that were implemented through other Utility EE/DR programs or outside of the ComEd or Nicor Gas programs.

6.2 Verified Net Program Savings Analysis Approach

Navigant calculated the verified net energy and demand savings by multiplying the verified gross savings estimates by a deemed net-to-gross ratio (NTGR). Table 6-1 shows the deemed NTGR values for EPY9

and GPY6. The deemed NTGR value of 1.00 for electric savings and 1.00 for gas savings were agreed to by stakeholders in discussions in the SAG.[2]

Table 6-1. Deemed NTGR Values for EPY9/GPY6

Program Channel	EPY9/GPY6 Deemed NTGR Value
Electric	1.00
Natural Gas	1.00

Source: ComEd_NTG_History_and_PY9_Recommendations_2016-02-26_Final.xlsx and Nicor_Gas_GPY6_NTG_Values_2016-02-29_Final.xlsx, which are to be found on the http://www.ilsag.info/net-to-gross-framework.html

7. Appendix 2. Impact Analysis Detail

The program had an electric realization rate (RR) above 1.0 due to a site over estimating the impact of a capital project on the site's SEM savings. This was not the fault of the SEM Program, which used the reported ex ante savings provided by the utility. Instead, savings for the capital project were overestimated and not fully realized for several months which negatively impacted the SEM savings. Table 7-1 summarizes the site by site level incremental electric and gas savings the SEM Program achieved in EPY9/GPY6. A detailed site by site summary is included in Section 5.2.

[2] Source: ComEd_NTG_History_and_PY9_Recommendations_2016-02-26_Final.xlsx and Nicor_Gas_GPY6_NTG_Values_2016-02-29_Final.xlsx, which are to be found on the IL SAG web site here: http://www.ilsag.info/ntg_2016.html

Table 7-1. PY9 Energy Savings by Measures

Site	Ex Ante Gross Savings (KWh)	Ex-Post Gross Savings (KWh)	Verified Gross Realization Rate	Ex Ante Gross Savings (Therms)	Ex-Post Gross Savings (Therms)	Verified Gross Realization Rate
Site 1	0	0	0.00	0	0	0.00
Site 2	852,198	852,112	1.00	0	0	0.00
Site 3	2,606,757	2,606,757	1.00	665,917	665,917	1.00
Site 4	0	0	0.00	0	0	0.00
Site 5	948,907	911,592	0.96	329,338	325,059	0.99
Site 6	0	0	0.00	0	0	0.00
Site 7	952,272	952,203	1.00	10,633	10,675	1.00
Site 8	0	0	0.00	0	0	0.00
Site 9	71,190	69,224	0.97	0	0	0.00
Site 10	3,175,951	3,036,442	0.96	0	0	0.00
Site 11	282,587	277,231	0.98	0	0	0.00
Site 12	27,983	1,231	0.04	0	0	0.00
Site 13	0	0	0.00	13,334	13,707	1.03
Site 14	1,155,823	1,155,823	1.00	0	0	0.00
Site 15	800,201	800,201	1.00	0	0	0.00
Site 16	0	0	0.00	69,046	69,046	1.00
Site 17	0	0	0.00	0	0	0.00
Site 18	0	0	0.00	29,019	29,270	1.01
Site 19	148,865	148,865	1.00	25,498	25,498	1.00
Site 20	547,576	497,321	0.91	0	0	0.00
Site 21	1,518,595	4,668,946	3.07	774,938	778,626	1.00
Total	13,088,905	15,977,948	1.22	1,917,723	1,917,798	1.00

Source: ComEd and Nicor Gas tracking data and Navigant team analysis.

Also see site details in Section 5.2.

For each site, Navigant reviewed and updated the implementer provided engineering models. Navigant staff generally followed the process below for this review:

Step 1- Navigant recreated the provided energy models to ensure they aligned with the provided data.

Step 2- Navigant confirmed that the model saving calculations accounted for all capital projects.

Step 3- Navigant identified and accounted for any short-term effects that were occurring outside of the SEM influence. The telephone interviews with the site staff confirmed these changes.

Step 4- Navigant made additional changes to the model as needed. Changes may include excluding certain outlier data points or including additional variables.

Several sites reported no electric or gas savings ex ante. Although activities were completed at these sites the energy model was unable to detect energy savings occurring at these site for a variety of reasons. For these sites, Navigant claimed zero savings to align with the implementer but each site model was verified and checked.

8. Appendix 3. TRC Detail

Table 8-1. PY9 SEM Impact Evaluation TRC Variables

Project	Unit	Measure Life	Ex Ante kWh	Verfied kWh Savings
Site 1	Per Site	5	0	0
Site 2	Per Site	5	852,198	852,198
Site 3	Per Site	5	2,606,757	2,606,757
Site 4	Per Site	5	0	0
Site 5	Per Site	5	948,907	911,592
Site 6	Per Site	5	0	0
Site 7	Per Site	5	952,272	952,272
Site 8	Per Site	5	0	0
Site 9	Per Site	5	71,190	69,224
Site 10	Per Site	5	3,175,951	3,036,442
Site 11	Per Site	5	282,587	277,231
Site 12	Per Site	5	27,983	1,231
Site 13	Per Site	5	0	0
Site 14	Per Site	5	1,155,823	1,155,823
Site 15	Per Site	5	800,210	800,210
Site 16	Per Site	5	0	0
Site 17	Per Site	5	0	0
Site 18	Per Site	5	0	0
Site 19	Per Site	5	148,865	148,865
Site 20	Per Site	5	547,576	49,321
Site 21	Per Site	5	1,518,595	4,668,946
Total			13,088,914	15,530,112

* This TRC variable table only includes cost-effectiveness analysis inputs available at the time of finalizing PY9 impact analysis and findings. 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 once complete.

APPENDIX B. COMED NICOR GAS GPY6-EPY9 2016 SEM PROCESS EVALUATION MEMO 2018-09-04

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To: ComEd and Nicor Gas
CC: Jennifer Morris, ICC
From: Navigant Consulting

Date: September 4, 2018

Re: ComEd and Nicor Gas EPY9/GPY6 Strategic Energy Management Process Evaluation Memo

INTRODUCTION

This report presents the results of the process evaluation of ComEd and Nicor Gas' Strategic Energy Management (SEM) Program for Electric Plan Year 9 (EPY9) and Gas Plan Year 6 (GPY6). It presents a summary of the process evaluation findings for the program period June 1, 2016 through December 31, 2017.

EVALUATION APPROACH AND OBJECTIVES

Research for the GPY6/EPY9 process evaluation was conducted through in-depth interviews. We interviewed four participants from Cohort 1, six from Cohort 2, the implementation contractor and the two program managers from both utilities to assess their satisfaction and perspective on the program and to identify program improvements. Table 1 provides the questions considered in the evaluation effort:

Table 1. Process Evaluation Questions and Activities

Process Evaluation Research Questions	Evaluation Activity
Process Evaluation Questions	
1. What is the satisfaction of the participants?	• Participant interviews
2. How can the program structure be improved?	• Program staff interview • CLEAResult interview • Participant interviews
3. What were the major results of the SEM training?	• Program staff interview • CLEAResult interview • Participant interviews
4. What were the motivating factors for a facility to choose to participate?	• Participant interviews
5. What differences were there in terms of customer experience and success from Cohorts 1 and 2?	• Program staff interview • CLEAResult interview • Participant interviews

Source: ComEd and Nicor Gas GPY6/EPY9Strategic Energy Management (SEM) Program, June 29, 2018

PROGRAM DESCRIPTION

The SEM Program, jointly managed by ComEd and Nicor Gas and implemented by CLEAResult, began as a pilot in EPY8/GPY5. The goal of the SEM Program is to apply a process of continuous energy management improvements that result in energy savings and demand reduction. The program seeks to educate participants in the identification of low cost and no cost measures, improve process efficiency, and reduce energy usage through behavioral changes. To encourage these savings, Nicor Gas provides an incentive of $0.10 per therm saved. In the pilot year (EPY8), ComEd provided a 10 percent bonus to rebates given on capital projects; after that year, an incentive of $0.01 per kWh saved has been given.

The achievement of energy savings is through operational and maintenance (O&M) improvements, incremental increases in capital energy efficiency projects, additional capital projects that would not otherwise have been considered (e.g., process changes, consideration of energy efficiency in all capital efforts), and improved persistence for O&M and capital projects.

The SEM Program savings are calculated using site specific models developed by CLEAResult. The energy model measurement of savings is determined by collecting two years of utility data prior to program participation. This data is associated with site information such as production and temperature to create baseline models that estimate a site's usage based on these variables.

After program participation begins, the baseline model then considers the collected variables to estimate energy usage as if the site continued this usage pattern. The models' baseline energy is then compared to actual bills and any differences are assumed to be influenced by SEM activities.

The pilot year began with 11 industrial participants enrolling in Cohort 1. In its second year - EPY9/GPY6, the program continued with eight of the Cohort 1 industrial participants and the addition of Cohort 2 with nine participants. Cohort 2 expanded the customer segment to include hospitals and universities in addition to the industrial segment. In August 2017, a Practitioner Group was formed comprising of seven industrial and three commercial participants from Cohorts 1 and 2. For ease of reference, Table 2 provides the cohort timeline.

Table 2. Cohort and Practitioner Timeline

Participant Group	Customer Segment	Time Period
Cohort 1	11 Industrial	November 2, 2014 – October 31, 2015
Cohort 1	8 Industrial	January 2, 2016 – December 31, 2016
Cohort 2	2 Industrial 3 Hospitals 4 Universities	June 1, 2016 – May 31, 2017
Practitioner Group (made up of previous participants)	7 Industrial 3 Commercial	Began in August 2017 with rolling enrollment. The Practitioner participant's usage will be re-baselined each year with the savings calculated on the previous 12-month usage.

Source: Navigant analysis

ComEd's goals for SEM in EPY9 were 6 GWhs of energy savings and to develop strong customer relationships resulting in increased participation in capital projects. Similarly, Nicor Gas' goals for GPY6 were SEM energy savings of 150,000 therms and an additional 200,000 therms of energy savings through Nicor Gas' Business Energy Efficiency Rebate (BEER) and Business Custom programs. This program far exceeded these goals and acted as a "feeder" program into other utility offered programs such as BEER and Custom.

As Table 3 reflects, both utilities exceeded their goals with ComEd achieving 15.9 GWhs of energy savings and Nicor Gas achieving energy savings of 1,917,797 therms.

Table 3. SEM Goals and achievements by Utility

Utility	EPY9/GPY6 Goal	EPY9/EPY6 Ex Post Gross
ComEd	6,000,000 kWh	15,977,947 kWh
Nicor Gas	200,000 therms	1,917,798 therms

Source: ComEd and Nicor Gas Strategic Energy Management Program Impact Evaluation Report, April 12, 2018

PROGRAM SATISFACTION

Consistent with last year's process evaluation, the customer satisfaction with the SEM Program continues to be high for both Cohorts. The response range for both Cohorts was 8 to 10 (on a 1-10 scale where 1 is not at all satisfied and 10 is very satisfied) with an average of 9.3 for Cohort 1 and an average of 9.4 for Cohort 2. When asked if there was anything ComEd (and/or) Nicor Gas could do to increase the satisfaction with the program one participant said:

> *"Keep doing what you are doing. It was wonderfully helpful to be able to pick-up the phone, ask for help and immediately receive it."*

Figure 1. Participant Satisfaction

Source: Navigant interview analysis

PROGRAM STRUCTURE

The structure of the program is similar to other SEM programs across the country by providing workshops to train the participant in the identification of low-cost or no cost behavioral energy saving measures at their facility. ComEd and Nicor Gas' SEM Program is unique with the identification of both electric and gas savings; most of the other utility SEM programs address either one or the other but not both energy

sources. The participating customers who make behavioral changes ensure these measures stay in place by developing written documentation of the implemented measures. In addition to the training, an energy model is given to each participant to track the energy savings of their facility over a pre-established baseline year. The energy model provides the participant the ability to monitor their implemented savings as well as help measure future projects and their associated benefits.

These low or no cost recommendations are identified through an energy scan (a walk-through audit). However, during the energy scan other equipment upgrade recommendations that qualify for rebates may be given. The current customers participating in the SEM Program are familiar with the rebate programs and provided some feedback regarding these programs as well.

A customer commented that the approval of rebates should be different for the various tiers of customers. They felt that larger customers who have worked with both utilities over the years and implement energy efficiency projects on a regular basis should not have to go through the same approval process as the smaller customers. It's a burden for these customers to delay the implementation of a project while waiting for the application's approval. Another comment made was the required information needed in the application process was confusing and more direction on the required information was needed.

> *"The application process for rebates can be cumbersome. It would be nice to have a flow diagram with the different rebates as to what is required and timelines in addition to the written instructions. Sometimes pre-applications are needed, sometimes they aren't."*

Overall, the ComEd and Nicor Gas customers are pleased with the program. Customers appreciate both energy uses being addressed in one program and are looking forward to the added help/support of ComEd and Nicor Gas' engineers to help identify and implement the low cost or no cost and other energy saving measures.

MOTIVATION FACTORS

The participants felt the SEM Program provided value beyond the energy savings including:

- Improved comfort
- Reduced water usage
- Increased system capacity
- Reduced operating and maintenance costs, all of which directly affects the bottom line.

For many customers, the efficiency of their plant is measured on the quantity of goods produced; therefore, the ability to produce the same amount or more of product with a lower energy cost is important.

The SEM Program was very influential in the customer's decision to pursue capital projects. The energy model predicted the energy usage of various equipment options providing a better understanding of the long-term energy savings of higher efficiency units. The offsetting energy savings along with the rebates allowed the customer to cost justify the additional equipment cost and lower the payback period and improve their ROI.

> *"The big project that came through SEM was the large and comprehensive review of our compressed air program, we were aware of it, but not in the framework of looking at it. That triggered a review of other processes. We found 600 leaks, now we have a routine of looking for leaks."*

TRAINING

When asked what were the important benefits of the training workshops, the participants identified the following:

- The model and its ability to help the customer cost-justify projects.
- The knowledge gained regarding emerging trends regarding the various energy efficiency opportunities and rebate offerings.
- The affect utilities have on the operation of a facility and how their costs can be lowered.

While pleased with the training, some suggestions for improvement were given. For a highly specialized customer, no recommendations were given to help lower the usage of their unique high-energy equipment. While it is unrealistic to expect the implementer to be aware of every manufacturing process, it would be helpful to the customer if the implementer did have access to experts across all manufacturing processes that could consult with the customer to identify ways to reduce their consumption.

Another suggestion addressed the training. Training workshops were not provided to Cohort 1 in the second year; rather CLEAResult met with the participant at their facilities to discuss the status of identified projects and provide any needed support. One Cohort 1 participant did comment they would have liked to have group meetings periodically during the second year to hear what others are doing and brain-storm off of each other's ideas and projects.[1]

COHORTS 1 AND 2 - CUSTOMER EXPERIENCE

In the first year of the program, the participants of Cohort 1 were recruited from a list of the largest industrial customers of both utilities. When recruiting participants that were large customers of both utilities for Cohort 2, the market segment was expanded from exclusively industrial to include hospitals and universities.

In December 2016, the Future Energy Jobs Act was enacted exempting customers with a demand of equal to or greater than 10 MWs from participating in energy efficiency programs. The 10 MW exemption started June 1st, 2017. There were two customers in the first Cohort who no longer qualified due to the exemption but were allowed to finish their second year of the program. This regulatory change will affect the customers ComEd recruits in the future for the program.

The types of implemented projects differed between the customer segments. The industrial customers focused their attention on equipment with high energy consumption, turning it off when not in use and considering the efficiency of new equipment before purchasing. The commercial sites used capital-based projects, focusing on controls to achieve their savings. For both sectors, it was limited time or budgets that prevented them from implementing additional identified energy savings measures.

The participation levels of the hospitals and universities in Cohort 2 were affected by the business conditions specific to their segment which prevented them from fully engaging in the program and achieving significant results. Some of the participants from the hospital segment were merged with other hospitals preventing them from engaging in the program. For the universities, changes in the energy champion half way into the program delayed project implementation, as well as budget constraints.

While HVAC and lighting are the primary energy measures used by hospitals and universities, there is enough difference between the two segments in their usage that having a separate meeting to discuss

[1] It should be noted that the program had meetings but the participant either was not aware of them or no longer recalled them.

specific ways each can save energy would be helpful. When asked "What could ComEd or Nicor do to increase your satisfaction with the program" a university participant responded "I just think the helping within the year, making a special event for the just the higher-ed group or the hospitals to have their own event. You will have more similarity."

GPY5-EPY8 Process Evaluation Recommendation – Status Update

In last year's GPY5-EPY8 SEM Evaluation Report, there were three process recommendations included in the report - Table 4 is an update on those recommendations.

Table 4. GPY5-EPY8 Process Evaluation Recommendations

	GPY5-EPY8 Evaluation Recommendations	Status Update
Recommendation 6	While group training can be beneficial for team building, an option for those companies that cannot attend every meeting would be to record the meetings for them to review another time.	The SEM training workshops were not recorded; however, if a customer was not able to attend a workshop, notes and slide decks from the meetings were provided along with follow-up emails. If further information or explanation was needed, CLEAResult met with the participant one-on-one to share the training information.
Recommendation 7	To help the sites with limited staff address the findings of the onsite energy scan, the utility or implementer could provide a dedicated onsite resource to ease the workload of the participant. This resource would be knowledgeable of the rebates and services each utility provides. In addition, this resource could provide help to develop project proposals of measures identified during the energy scan including the cost-benefit analysis. This resource could then follow through with rebate applications and supporting paperwork. This resource should be made available - or if already available - should be clearly communicated to the sites.	This recommendation was implemented with an energy advisor offered to the sites to assist in gathering documentation and completing the rebate forms. ComEd also provided an engineer to go onsite to help with the identification of the low cost or no cost and other opportunities and implementation of the projects.

	GPY5-EPY8 Evaluation Recommendations	Status Update
Recommendation 8	As Nicor Gas and ComEd develop their marketing message for future Cohorts, highlighting these benefits to their customers may increase the participation percentage.	The marketing message has expanded to include the experiences of past participants and how the program has benefited them. In addition, this shared program is one of the few joint SEM programs in the country, where a customer can address their electric as well as gas needs.

Source: Navigant interview analysis

GPY6-EPY9 Findings and Recommendations

Table 5. GPY6-EPY9 Process Evaluation Findings and Recommendations

	Evaluation Findings		Evaluation Recommendations
Finding 1	Participant satisfaction is high and customers appreciate the training workshops and knowledge gained in how to maintain an energy efficient facility.	**Recommendation 1**	Continue providing the SEM Program to help customers implement low cost no cost behavioral energy efficiency improvements.
Finding 2	Across the country, more businesses are pursuing energy efficiency improvements for corporate goals such as improved comfort, reduced water usage, increased system capacity and reduced operating and maintenance costs - all of which directly affects the bottom line. lower operating & maintenance costs, reduced green-house gas contributions and sustainability. For many participants, the decision to implement an efficiency improvement is based solely on the payback of the measure. Therefore, identifying both the energy and non-energy savings would provide the most accurate return on investment.	**Recommendation 2**	Continue to identify and explain the non-energy benefits of energy conservation to help facilities justify the purchase of high efficiency equipment. The Energy Model is a whole building analysis and not measure by measure. If possible, the model should consider the non-energy impacts of a measure providing the participant the most accurate financial scenario.

	Evaluation Findings		Evaluation Recommendations
Finding 3	SEM encourages participants to participate in the utilities' rebate programs and purchase energy efficient equipment. However, some of the participants were unable to receive rebates due to the rebate application requirements. Large manufacturing facilities have limited time to purchase and install new equipment making it difficult to receive rebate approval for the new equipment prior to purchasing.	**Recommendation 3**	Both utilities conduct a review of their application process and requirements, and if possible, streamline it for these customers. Allowing these customers streamlined access to the rebate programs will allow the utilities to capture the energy savings they influenced.
Finding 4	Some of the customers were confused by the requirements of the rebate? application process.	**Recommendation 4**	In addition to the written instructions, the utilities could develop a flow diagram with the different rebates delineating their requirements for any pre-approvals and timelines.
Finding 5	One participant suggested the program could improve satisfaction by offering special events targeting specific segments.	**Recommendation 5**	Consider adding special events that target the needs of specific segments (e.g., universities, hospitals).
Finding 6	A participant commented that they would have liked to continue the group meetings periodically during the second year to hear what others are doing and brain-storm off of each other's ideas and projects. This participant did not remember that training workshops were provided to Cohort 1 in the second year; and CLEAResult met with the participant at their facilities to discuss the status of identified projects and provide any needed support.	**Recommendation 6**	In November 2017, a Practitioner Cohort of past participants was formed. This Practitioner Cohort should be continued as collaborative between participants. This is a feature of the SEM training that participants across all utilities really appreciate. Hearing of other's efforts and successes helps to motivate the participant in pursuing energy efficiency improvements in their own facilities.

Source: Navigant analysis