



ComEd AirCare Plus 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 and process evaluation of the PY8¹ AirCare Plus (ACP) program. The aim of the ACP program was to optimize the energy performance of HVAC packaged rooftop units and split systems, including mechanical adjustments (tune-ups) and hardware retrofits. The ACP program included an IPA element for customers ≤ 100 kW and an EEPS element for customers >100kW. CLEAResult implemented the ACP program which was launched during PY7; however, the program did not have attributable savings in PY7. The primary measures available through the ACP program were AC tune-up, thermostat replacement and adjustment, economizer repair and optimization, and clogged v-belt installation. The program also includes incentives for economizer repair, replacement and adjustment of economizer changeover sensor, digital economizer upgrade, replacement of damper assembly, and mechanical reduction of over-ventilation.

E.1. Program Savings

Table E-1 summarizes the electricity savings from the ACP program, including the PY8 total verified gross and net savings. Savings by EEPS are included in Table E-2 and IPA in Table E-3.

Table E-1. PY8 Total Program Electric Savings

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Savings	10,445†	N/A	N/A
Verified Gross Savings	10,464	0.850	0.407
Verified Net Savings	9,418†	0.765	0.367

†EEPS and IPA numbers do not sum exactly due to rounding

Table E-2. PY8 Total Program EEPS Electric Savings

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Savings	2,797	N/A	N/A
Verified Gross Savings	2,786	0.716	0.343
Verified Net Savings	2,507	0.645	0.309

Source: ComEd tracking data and Navigant team analysis.

Table E-3. PY8 Total Program IPA Electric Savings

Savings Category	Energy Savings (MWh)	Demand Savings (MW)	Peak Demand Savings (MW)
Ex Ante Gross Savings	7,647	N/A	N/A
Verified Gross Savings	7,678	0.134	0.064
Verified Net Savings	6,910	0.120	0.058

Source: ComEd tracking data and Navigant team analysis.

¹ The PY8 program year began June 1, 2015 and ended May 31, 2016.

E.2. Program Savings by Measure

Table E-4. PY8 Program Results by Measure

Research Category	Ex Ante Gross Savings (MWh)	Verified Gross Savings (MWh)	Verified Gross Peak Demand Reduction (MW)	Verified Gross Realization Rate	NTGR†	Verified Net Savings (MWh)	Verified Net Peak Demand Reduction (MW)
AC Tune-up < 10 Ton (unit size)	163	163	0.084	1.00	0.90	147	0.076
AC Tune-up >= 10 Ton (unit size)	633	638	0.321	1.01	0.90	574	0.289
Cogged V-Belt	9	9	0.002	1.00	0.90	9	0.002
Economizer repair and optimization	31	25	N/A	0.82	0.90	23	N/A
Thermostat Adjustment	881	822	N/A	0.93	0.90	740	N/A
Thermostat Replacement	8,728	8,807	N/A	1.01	0.90	7,926	N/A
Total	10,445	10,464	0.407	1.00	0.90	9,418‡	0.367

Source: ComEd tracking data and Navigant team analysis.

† 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>

‡ Numbers do not sum exactly due to rounding.

E.4. Program Volumetric Detail

The ACP program had 424 participating businesses and 92 participating unique customer contacts in PY8 and distributed 1,454 measures as shown in the following table.

Table E-5. PY8 Volumetric Findings Detail

Participation	Number
Participating Businesses	424
Participating Unique Customer Contacts	92
Number of Units/Projects	1,454

Source: ComEd tracking data and Navigant team analysis.

E.5. Results Summary

The following table summarizes the key metrics from PY8.

Table E-6. PY8 Results Summary

Participation	Units	PY8
Net Savings	MWh	9,418
Net Peak Demand Reduction	MW	0.367
Gross Savings	MWh	10,464
Gross Peak Demand Reduction	MW	0.407
Program Realization Rate	%	1.00
Program NTG Ratio †	#	0.9
Measures Installed	#	1,424
Customers Touched	#	92

Source: ComEd tracking data and Navigant team analysis.

† 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>

E.6. Findings and Recommendations

The following provides insight into key program findings and recommendations.²

Tracking Database

Finding 1. The tracking database contained all the inputs needed to develop the savings estimates. There were some cases where the implementer used a custom data point which was not provided to Navigant in the original dataset. The Implementer has been working with ComEd in order to improve data quality.

Recommendation 1. Provide all inputs used in the savings calculations to ensure accurate and thorough evaluation results.

Finding 2. The tracking database did not track peak or overall demand savings.

Recommendation 2. Include peak and overall demand savings in the data provided to Navigant.

Net Savings Estimates

Finding 3. The program achieved overall net savings of 9,418 MWh and peak demand savings of 0.367 MW. This was approximately 59 percent of the program’s net savings target of 16,047 MWh. This may be because the program was in its first year with savings, and also because of the weather dependent nature of the program measures.

Gross Savings Estimates

Finding 4. The program achieved overall gross savings of 10,454 MWh and peak demand savings of 0.407 MW.

Process Evaluation

Finding 5. Program participants were generally satisfied with the program. Navigant identified two program improvements that could be made in order to increase satisfaction. Navigant notes the Implementer is improving customer follow-up in PY9.

Recommendation 3. To improve participant satisfaction with the program, ComEd could consider increasing marketing for this program.

² Numbered findings and recommendations in this section are the same as those found in the Findings and Recommendations section of the evaluation report for ease of reference between each section.

Recommendation 4 To improve participant satisfaction with the program, CLEAResult should continue to offer training for all those who will be interacting with customers, including customer service/sales training.

1. INTRODUCTION

1.1 Program Description

The aim of the AirCare Plus (ACP) program was to optimize the energy performance of HVAC packaged rooftop units and split systems, including mechanical adjustments (tune-ups) and hardware retrofits. This program consists of an IPA element for customers ≤ 100 kW and an EEPS element for customers >100 kW. ACP was implemented by CLEAResult and was launched during PY7; however, the program did not have attributable savings in PY7. The primary measures available through ACP were AC tune-up, thermostat replacement and adjustment, economizer repair and optimization, and cogged v-belt installation. The program also included incentives for economizer repair, replacement and adjustment of economizer changeover sensor, digital economizer upgrade, replacement of damper assembly, and mechanical reduction of over-ventilation.

1.2 Evaluation Objectives

The evaluation team identified the following key researchable questions for PY8.

1.2.1 Impact Questions

1. Are the engineering work paper algorithms and inputs accurate and reasonable?
2. What are the program's verified gross savings?
3. What are the program's verified net savings?

1.2.2 Process Questions

There was a limited process evaluation performed for this program in conjunction with the impact analysis activities.

2. EVALUATION APPROACH

The primary objective of the evaluation of the ACP program was to determine gross and net program savings.

2.1 Overview of Data Collection Activities

The core data collection activities included an “engineering desk review” of the program’s tracking database to determine the program’s net and gross savings using the results of previous net-to-gross evaluation efforts.

Table 2-1. Primary Data Collection Activities

What	Who	Target Completes	Completes Achieved	When
Program Tracking Database	Participants	Based on participation	Census	September – October 2016
In Depth Interviews	Program Manager/Implementer Staff	2	2	November 2016
Telephone Survey	Participating Customers	Based on participation	19	August-September 2016

Table 2-2. Additional Resources

Reference Source	Author	Application	Gross Impacts	Process
Illinois Technical Reference Manual v4 and v5			X	

2.2 Verified Savings Parameters

Navigant calculated verified gross and net program impacts for four types of measures: AC tune-up, clogged v-belt, economizer repair and optimization, and thermostat replacement/adjustment. These measures accounted for all quantifiable PY8 electric savings.

2.2.1 Verified Gross Program Savings Analysis Approach

Navigant calculated the unit savings using the algorithms from the Illinois TRM v4.0 (except in the case of the economizer measure, which used v5.0 because the measure was not contained in v4.0). The Illinois TRM deems most of the savings algorithms for the ACP program (for detailed description of engineering algorithms and inputs used, see section 3.3).

The following table presents the deemed input parameter source that Navigant used by measure. The Illinois TRM v4.0 allowed for custom or actual values to be used for some of the input parameters. Navigant based these values on the program tracking database when available.

Table 2-3. Verified Savings Parameter Data Sources

Gross Savings Measure	Deemed Input Data Source
AC Tune-Up	Illinois TRM v4.0 – Section 4.4.1
Cogged V-Belt	Illinois TRM v4.0 – Section 4.4.30
Economizer Repair and Optimization	Illinois TRM v5.0 – Section 4.4.35
Thermostat Replacement	Illinois TRM v4.0 – Section 4.4.18
Thermostat Adjustment	Illinois TRM v4.0 – Section 4.4.25

2.2.2 Verified Net Program Savings Analysis Approach

Verified net energy and demand (coincident peak and overall) savings were calculated by multiplying the verified gross savings estimates by a net-to-gross ratio (NTGR). In PY8, the NTGR estimates used to calculate the net verified savings were defined by SAG as documented in a spreadsheet.³

2.3 Process Evaluation

A limited process evaluation was conducted for PY8. It was based on interviews with program staff and the implementation contractor, and the analysis of participating customer responses through a telephone survey.

³ Source: A deemed value. 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>

3. GROSS IMPACT EVALUATION

Navigant’s review of the ex ante calculations for the ComEd PY8 ACP program resulted in verified gross savings of 10,464 MWh and peak demand savings of 0.407 MW. The verified gross realization rate for energy savings is 100 percent.

3.1 Tracking System Review

CLEAResult’s tracking system and savings documentation for PY8 consisted of (1) a spreadsheet containing measure type, quantity, energy and demand savings and (2) savings calculators for each of the measures.

Key findings include:

1. Overall, Navigant received all applicable data needed in order to conduct the gross impact analysis.
2. The original database provided to Navigant did not contain all the custom inputs used by the implementer to calculate gross savings.
3. It was sometimes difficult for Navigant to find the source of discrepancies because the actual savings calculations were embedded in the CLEAResult database; this database was not provided to Navigant.

3.2 Program Volumetric Findings

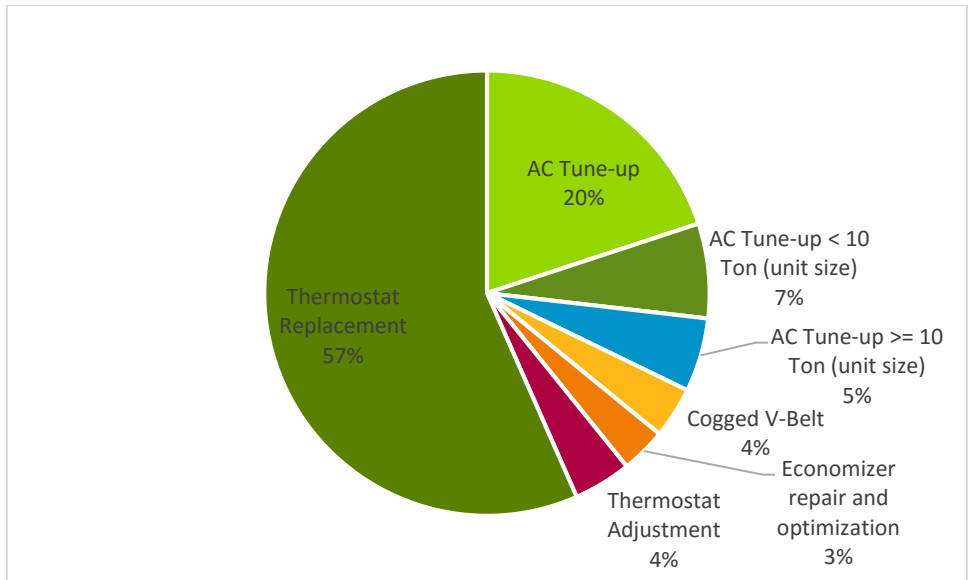
The program incented 1,454 measures in PY8. The volumetric findings are detailed in Table 3-1 and presented visually in Figure 3-1.

Table 3-1. PY8 Volumetric Findings Detail

Participation	Number
Participating Businesses	424
Participating Unique Customer Contacts	92
AC Tune-up - Test In Incentive Kicker (All units that are enrolled and tested in)	290
AC Tune-up < 10 Ton (unit size)	100
AC Tune-up >= 10 Ton (unit size)	78
Cogged V-Belt	54
Economizer repair and optimization	48
Thermostat Adjustment	61
Thermostat Replacement	823
Number of Units/Projects	1,454

Source: ComEd tracking data and Evaluation Team analysis.

Figure 3-1. Number of Measures Installed by Type



Source: Evaluation Team analysis

3.3 Gross Program Impact Parameter Estimates

As described in Section 2, energy and demand savings were estimated using TRM v4.0 or v 5.0. The evaluation team conducted research to validate the parameters that were not specified in the TRM. The savings parameters are shown in the following table.

Table 3-2. Verified Gross Savings Parameters

Gross Savings Input Parameters	Deemed† or Evaluated?
Quantity	Evaluated
Measure Type and Eligibility	Evaluated
Gross Savings per Unit, Sampled Deemed Measures	Deemed
Gross Savings per Unit, Sampled Non-Deemed Measures	Evaluated

† State of Illinois Technical Reference Manual version 4.0 from <http://www.ilsag.info/technical-reference-manual.html>.

The differences between the ex-ante and ex-post savings estimates are discussed by measure below.

3.3.1 AC Tune-Up

For this measure, Navigant used the measure level inputs deemed by the IL TRM v4.0⁴ to calculate energy savings. The realization rate for units > 10 tons is 101 percent and the realization rate for those units < 10 tons was 100 percent. The TRM used the following algorithms to calculate savings for this measure:

For units with cooling capacities less than 65 kBtu/hr:

⁴ Illinois Statewide Technical Reference Manual for Energy Efficiency Version 4.0 Final. <http://www.ilsag.info/technical-reference-manual.html> Accessed: September 16, 2016.

$$\Delta\text{kWh} = (\text{kBtu/hr}) * [(1/\text{SEERbefore}) - (1/\text{SEERafter})] * \text{EFLH}$$

For units with cooling capacities equal to or greater than 65 kBtu/hr:

$$\Delta\text{kWh} = (\text{kBtu/hr}) * [(1/\text{EERbefore}) - (1/\text{EERafter})] * \text{EFLH}$$

Navigant believes the 1 percent discrepancy for units > 10 tons was attributable to (1) some contractor errors in entering the efficiency data (2) software inconsistencies, which were later resolved by CLEARResult.

3.3.2 Thermostat Adjustment/Replacement

For this measure, Navigant used the measure level inputs deemed by the IL TRM v4.0 to calculate energy savings for these measures. The realization rate for these measures was 93 percent for thermostat adjustment and 101 percent for thermostat replacement. The TRM used the following algorithms to calculate savings for this measure:

$$\Delta\text{kWh} = [\text{Baseline Energy Use (kWh/Ton)} - \text{Proposed Energy Use (kWh/Ton)}] * \text{Cooling Capacity (Tons)}$$

The realization rate of 93 percent for the thermostat adjustment measures was attributed to the retail thermostat adjustment measures. This set of measures had an average realization rate of 33 percent. Navigant believes this was likely attributable to a difference in the hours of use used for the retail thermostat adjustment measure between CLEARResult and Navigant.

3.3.3 Cogged V-Belt

For this measure, Navigant used the measure level inputs deemed by the IL TRM v4.0⁵ to calculate energy savings. The realization rate for this measure was 100 percent. The TRM used the following algorithm to calculate savings for this measure:

$$\Delta\text{kWh} = \text{kWconnected} * \text{Hours} * \text{ESF}$$

3.3.4 Economizer

For this measure, Navigant used the measure level inputs deemed by the IL TRM v5.0⁶ to calculate energy savings since the economizers were not in IL TRM 4.0. The realization rate for this measure was 82 percent. The TRM v5.0 used the following algorithm to calculate savings for this measure:

$$\Delta\text{kWh} = [\text{Baseline Energy Use (kWh/Ton)} - \text{Proposed Energy Use (kWh/Ton)}] * \text{Cooling Capacity (Tons)}$$

One project accounts for most of the difference in ex ante and ex post savings. The sticker number 102-133 reported ex ante savings of 9,803 kWh (the other projects in the data have average savings of 485 kWh). Navigant believes there was an error in the ex ante savings for this sticker number.

⁵ Illinois Statewide Technical Reference Manual for Energy Efficiency Version 4.0 Final. <http://www.ilsag.info/technical-reference-manual.html> Accessed: September 16, 2016.

⁶ Illinois Statewide Technical Reference Manual for Energy Efficiency Version 5.0 Final http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Version_5/Final/IL-TRM_Version_5.0_dated_February-11-2016_Final_Compiled_Volumes_1-4.pdf Accessed: September 29, 2016.

3.4 Verified Gross Program Impact Results

The resulting total program verified gross savings was 10,464 MWh and 0.407 MW as shown in the following tables. The tables present savings at the measure group level and includes a breakdown of both EEPS and IPA savings.

Table 3-3. PY8 Verified Gross Total Impact Savings Estimates by Measure Type

Research Category	Ex Ante Gross Savings (MWh)	Verified Gross Savings (MWh)	Verified Gross Demand Reduction (MW)	Verified Gross Realization Rate
AC Tune-up < 10 Ton (unit size)	163	163	0.084	1.00
AC Tune-up >= 10 Ton (unit size)	633	638	0.321	1.01
Cogged V-Belt	9	9	0.002	1.00
Economizer repair and optimization	31	25	N/A	0.82
Thermostat Adjustment	881	822	N/A	0.93
Thermostat Replacement	8,728	8,807	N/A	1.01
Total	10,445	10,464	0.407	1.00

Source: Evaluation Team analysis.

Table 3-4. PY8 EEPS Verified Gross Impact Savings Estimates by Measure Type

Research Category	Ex Ante Gross Savings (MWh)	Verified Gross Savings (MWh)	Verified Gross Peak Demand Reduction (MW)	Verified Gross Realization Rate
AC Tune-up < 10 Ton (unit size)	82	83	0.043	1.00
AC Tune-up >= 10 Ton (unit size)	590	594	0.299	1.02
Cogged V-Belt	7	7	0.001	1.00
Economizer repair and optimization	30	24	N/A	1.11
Thermostat Adjustment	846	787	N/A	1.01
Thermostat Replacement	1,242	1,291	N/A	1.00
Total	2,797	2,786	0.343	1.00

Source: Evaluation Team analysis.

Table 3-5. PY8 IPA Verified Gross Impact Savings Estimates by Measure Type

Research Category	Ex Ante Gross Savings (MWh)	Verified Gross Savings (MWh)	Verified Gross Peak Demand Reduction (MW)	Verified Gross Realization Rate
AC Tune-up < 10 Ton (unit size)	80	80	0.041	1.00
AC Tune-up >= 10 Ton (unit size)	43	44	0.023	1.02
Cogged V-Belt	2	2	0.001	1.00
Economizer repair and optimization	1	1	N/A	1.11
Thermostat Adjustment	35	35	N/A	1.01
Thermostat Replacement	7,486	7,515	N/A	1.00
Total	7,647	7,678†	0.064†	1.00

Source: Evaluation Team analysis.

†Numbers do not sum exactly due to rounding.

4. NET IMPACT EVALUATION

SAG determined⁷ that the NTG values for this program should be deemed prospectively and used to calculate verified net savings. The tables below shows the deemed NTG values and the PY8 total verified net savings, as well as a savings breakdown by EEPS and IPA.

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

Research Category	Ex Ante Gross Savings (MWh)	Verified Gross Savings (MWh)	Verified Gross Peak Demand Reduction (MW)	Verified Gross Realization Rate	NTGR†	Verified Net Savings (MWh)	Verified Net Peak Demand Reduction (MW)
AC Tune-up < 10 Ton (unit size)	163	163	0.084	1.00	0.90	147	0.076
AC Tune-up >= 10 Ton (unit size)	633	638	0.321	1.01	0.90	574	0.289
Cogged V-Belt	9	9	0.002	1.00	0.90	9	0.002
Economizer repair and optimization	31	25	N/A	0.82	0.90	23	N/A
Thermostat Adjustment	881	822	N/A	0.93	0.90	740	N/A
Thermostat Replacement	8,728	8,807	N/A	1.01	0.90	7,926	N/A
Total	10,445	10,464	0.407	1.00	0.90	9,418‡	0.367

Source: Evaluation Team analysis.

† 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>

‡ Numbers do not sum exactly due to rounding.

Table 4-2. PY8 EEPS Verified Net Impact Savings Estimates by Measure Type

Research Category	Ex Ante Gross Savings (MWh)	Verified Gross Savings (MWh)	Verified Gross Peak Demand Reduction (MW)	Verified Gross Realization Rate	NTGR†	Verified Net Savings (MWh)	Verified Net Peak Demand Reduction (MW)
AC Tune-up < 10 Ton (unit size)	82	83	0.043	1.00	0.90	74	0.039
AC Tune-up >= 10 Ton (unit size)	590	594	0.299	1.01	0.90	535	0.269
Cogged V-Belt	7	7	0.001	1.00	0.90	6	0.001
Economizer repair and optimization	30	24	N/A	0.81	0.90	22	N/A
Thermostat Adjustment	846	787	N/A	0.93	0.90	708	N/A
Thermostat Replacement	1,242	1,291	N/A	1.04	0.90	1,162	N/A
Total	2,797	2,786	0.343	1.00	0.90	2,507	0.309

Source: Evaluation Team analysis.

† 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>

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Table 4-3. PY8 IPA Verified Net Impact Savings Estimates by Measure Type

Research Category	Ex Ante Gross Savings (MWh)	Verified Gross Savings (MWh)	Verified Gross Peak Demand Reduction (MW)	Verified Gross Realization Rate	NTGR†	Verified Net Savings (MWh)	Verified Net Peak Demand Reduction (MW)
AC Tune-up < 10 Ton (unit size)	80	80	0.041	1.00	0.90	72	0.037
AC Tune-up >= 10 Ton (unit size)	43	44	0.023	1.02	0.90	40	0.020
Cogged V-Belt	2	2	0.001	1.00	0.90	2	0.001
Economizer repair and optimization	1	1	N/A	1.00	0.90	1	N/A
Thermostat Adjustment	35	35	N/A	1.01	0.90	32	N/A
Thermostat Replacement	7,486	7,515	N/A	1.00	0.90	6,764	N/A
Total	7,647	7,678‡	0.064‡	1.00		6,910‡	0.058

Source: Evaluation Team analysis.

† 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>

‡ Numbers do not sum due to rounding.

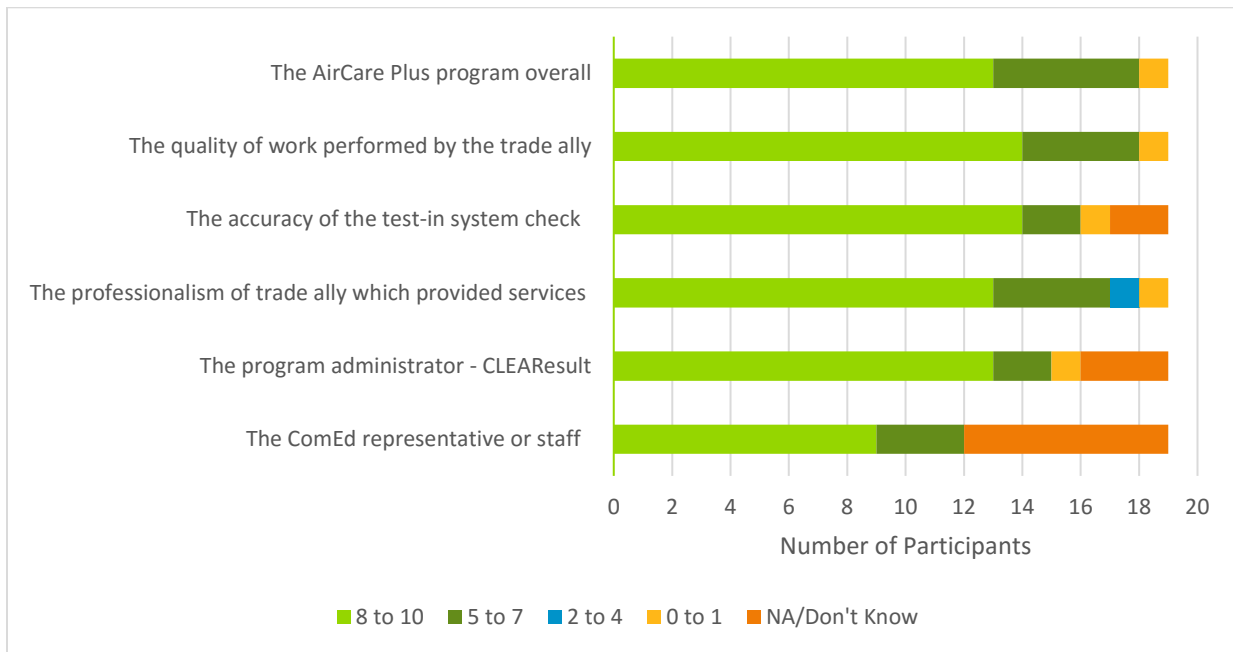
5. PROCESS EVALUATION

A limited process evaluation was conducted for the ACP program in PY8. This section includes findings on participant satisfaction with the program, marketing, and areas for improvement reported by participants.

5.1 Participant Satisfaction

Participants reported high satisfaction with the ACP program, with 68 percent of participants reporting satisfaction as an eight or higher on a ten-point scale⁸. Participants also reported high satisfaction with other program elements including the quality of work performed by the trade ally, the accuracy of the test-in system check, the professionalism of the trade ally, the program administrator, and ComEd (Figure 5-1). Additionally, 47 percent of participants reported their opinion of ComEd as being “more favorable” after participating in the program (53 percent reported their opinion of ComEd stayed the same, no participants reported their opinion of ComEd being less favorable).

Figure 5-1. Participant Satisfaction with Program Aspects



Source: Evaluation Team analysis

5.2 Marketing

The highest percentage of participants (27 percent) reported learning about the program through a trade ally or contractor. Participants also reported learning about the program through the program implementer (17 percent), a bill insert (17 percent), a solicitation (11 percent) or through a ComEd account manager (11 percent). This was consistent with the type of marketing reported by the CLEAResult program manager.

⁸ Participants were asked to rate their satisfaction “on a scale of 0 to 10, where 0 is very dissatisfied and 10 is very satisfied.”

5.3 Areas for Improvement Reported by Participants

Most of the surveyed participants did not have suggestions for improvements. Some cited areas for improvements were (1) additional marketing by ComEd and (2) more professionalism from on-site staff. Participants reported dissatisfaction with being unaware of the program prior to a trade ally or contractor coming to their facility. To address this, ComEd could consider increasing marketing for this program specifically. Participants also reported instances of unprofessional or inexperienced program staff. During the program manager interview, CLEAResult noted most of the contractors who began in the program are no longer participating, indicating the majority of contractors were relatively new to the program. In addition, CLEAResult had increased training for their contractor network by including sales training. This finding underscored the importance of training, including training for all those who will be interacting with customers.

The areas for improvement reported by the participants are listed with frequencies below:

- No suggestions for improvements (six participants)
- ComEd should do more marketing for the program (four participants)
- On-site staff should be more professional (four participants)
- Keep the options for upgrade simple (one participant)
- Additional information on cost savings (one participant)
- Additional interaction with ComEd (one participant)
- Additional follow-up from the contractors (one participant)
- Serve smaller AC units (one participant)

6. FINDINGS AND RECOMMENDATIONS

This section summarizes the key impact and process findings and recommendations.

Tracking Database

Finding 1. The tracking database contained all the inputs needed to develop the savings estimates. There were some cases where the implementer used a custom data point which was not provided to Navigant in the original dataset. The Implementer has been working with ComEd in order to improve data quality.

Recommendation 1. Provide all inputs used in the savings calculations to ensure accurate and thorough evaluation results.

Finding 2. The tracking database did not track peak or overall demand savings.

Recommendation 2. Include peak and overall demand savings in the data provided to Navigant.

Net Savings Estimates

Finding 3. The program achieved overall net savings of 9,418 MWh and peak demand savings of 0.367 MW. This was approximately 59 percent of the program's net savings target of 16,047 MWh. This may be because the program was in its first year with savings, and also because of the weather dependent nature of the program measures.

Gross Savings Estimates

Finding 4. The program achieved overall gross savings of 10,454 MWh and peak demand savings of 0.407 MW.

Process Evaluation

Finding 5. Program participants were generally satisfied with the program. Navigant identified two program improvements that could be made in order to increase satisfaction. Navigant notes the Implementer is improving customer follow-up in PY9.

Recommendation 3. To improve participant satisfaction with the program, ComEd could consider increasing marketing for this program.

Recommendation 4 To improve participant satisfaction with the program, CLEAResult could continue to offer training for all those who will be interacting with customers, including customer service/sales training.

Program Volumetric Findings

Finding 6. The program had 424 participating business and 92 participating unique customer contacts in PY8 and distributed 1,454 measures.

7. APPENDIX

7.1 Net-to-Gross Results

Navigant did attempt to quantify net-to-gross results using a participant survey. However, due to the number of responses received (19 responses, representing 9 percent of total program savings), Navigant recommends re-fielding the survey with additional participants next year in order to develop statistically significant results.

The preliminary results of the net-to-gross research resulted in free-ridership of 0.19, spillover of 0.01, and overall net-to-gross ratio of 0.82. The survey guide and net-to-gross methodology used are included in the .pdf below.

7.2 ComEd PY8 AirCare Plus Participant Guide

AirCare Plus Participant Survey
May 25, 2016

Introduction

Hello, this is _____ from Navigant calling on behalf of ComEd regarding your company's participation in the AirCare Plus Program. May I please speak with <CONTACTNAME>?

Our records show that <COMPANY> participated in the AirCare Plus Program run by ComEd and CLEAResult (if needed, the administrator for the program), and we are calling to conduct a follow-up study about your company's participation in this program. ComEd will use the information that you and other participants share with us to improve the AirCare Plus Program. I was told you're the person most knowledgeable and the most involved with the AirCare Plus process. Is this correct? [IF NOT, ASK TO BE TRANSFERRED TO DECISION MAKER OR SOMEONE FAMILIAR WITH THE BASIS FOR THE DECISION TO PARTICIPATE. RECORD NAME & NUMBER.]

[IF NEITHER DECISION MAKER OR SOMEONE FAMILIAR WITH THE BASIS FOR THE DECISION TO PARTICIPATE, TERMINATE CALL]

Your participation in this survey is anonymous. Your individual answers will remain confidential and reported only in the aggregate.

Are you driving a car or doing anything else that requires your focused attention?

(INTERVIEWER: IF RESPONDENT SAYS YES, READ; Due to safety reasons we will need to call you back at a more convenient time. Thank you.)

- 1 Yes (*SET AS SOFT CALLBACK*)
- 2 No

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

(IF NEEDED: Is it possible that someone else handled the AirCare Plus project?)

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Maintenance Background

A1 First, according to our records, you participated in the AirCare Plus program run by ComEd between June 1, 2015 and March 1, 2016. [IF NEEDED: The AirCare Plus Program provides incentives for thermostats and electric HVAC tune-ups.]

Do you recall participating in the AirCare Plus Program?

- 1 Yes
- 2 No
- 98 (Don't know)
- 99 (Refused)

[If no, thank and end call.]

A2 Next, I'd like to confirm the following information regarding your participation in the AirCare Plus Program. I understand that you completed the program at <FACILITY> at <ADDRESS>. The project was completed at about <DATE>and you implemented <LIST MEASURES> measures. Does that sound right?

- 1 Yes
- 2 No
- 98 (Don't know)
- 99 (Refused)

If A2 = 2, ask A3

A3. Can you provide detail on your participation in the program?

[OPEN END, record detail on date, facility, and equipment]

Project Background

B1. what reason or reasons did you have for participating in the AirCare Plus Program?

00. (RECORD VERBATIM) _____: Were there any other reasons?

- 98. (Don't know)
- 99. (Refused)

B2A. Before learning about the the Program, had your company ever conducted HVAC tune-ups, programmable thermostat installation, or economizer upgrades at this facility or any of your other facilities?

- 1. Yes, at this facility
- 2. Yes, at other facilities
- 3. Yes, at both this and other facilities
- 4. No
- 98. (Don't know)
- 99. (Refused)

[SKIP TO B2BB IF B2A=4. SKIP to N1 if B2A= 98, 99]

B2B. Did you receive an incentive or another form of utility or government financial support for performing this previous work?

- 1. Yes
- 2. No
- 98. (Don't know)
- 99. (Refused)

IF B2A=4, THEN ASK. ELSE N1.

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B2BB. What were the main factor or factors, if any, that kept you from performing HVAC upgrades in prior years (participant can select multiple responses)? [DO NOT READ]

1. Was not aware of services provided by ComEd
2. Did not understand the procedures and benefits of tune-ups
3. The cost of having an HVAC audit and tune-up was too high
4. Not aware of qualified providers
5. Management was opposed
00. (Other, specify)
98. (Don't know)
99. (Refused)

AirCare Plus Participant Survey

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Decision Influences

FREE RIDERSHIP

N1 Did you learn about your organization's eligibility for the AirCare Plus program BEFORE or AFTER you decided to complete [MEASURE] upgrades at this facility?

- 1 Before
- 2 After
- 88 (Don't know)
- 99 (Refused)

N2. Now I'm going to ask you to rate the importance of several factors that might have influenced your decision to conduct the test-in system check and commit the funding to complete Air Care Plus upgrades at your facility. 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 participate in the program [FOR N3A-I, RECORD 0 to 10; 96=Not Applicable; 98=Don't Know; 99=Refused]

PROGRAM COMPONENTS SCORE [ROTATE N4A-N4I]

- N3A. The initial system check study
- N3B. Your company's policies or guidelines
- N3C. The recommendation from the Trade Ally/contractor
- N3D. Previous experience with the energy efficiency upgrades offered through the program (for example, AC tune-ups, economizers, programmable thermostats)
- N3E. The marketing materials you received about the AirCare Plus Program
- N3F. The recommendation from your ComEd Account Manager
- N3G. The program incentive
- N3H. Payback on the investment with the incentive
- N3I. The standard practice in your business/industry

N3J. Were there any other factors that we haven't discussed that were influential in your decision to participate in the program? [OPEN END; 96=Nothing else influential, 98=don't know, 99=Refused]

[Ask if N3D > 7]

N3K. You indicated that previous experience with this type of equipment was important in your decision to install the <MEASURE TYPE> that qualified for the ComEd incentive. Was this previous experience associated with equipment you installed with an earlier ComEd incentive, or did you install that equipment on your own?

- 1. With ComEd incentive
- 2. On my own/No ComEd incentive
- 3. Both
- 4. DK
- 5. Refused

PROGRAM INFLUENCE SCORE

Thinking about this a little differently, I would like you to compare the importance of the program with the importance of other factors in upgrading to a higher energy efficient <MEASURE TYPE> for your project.

You told me that the following other factors were important:

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

- N3B. Your company's policies or guidelines
- N3D. Previous experience with the energy efficiency equipment

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- N3I. The standard practice in your business/industry
N3J. If listed other non-program factor

N4. If you had a TOTAL of 100 points that reflect the importance in your decision to implement the AirCare Plus program and you had to divide those between 1) the program, and 2) other factors I just mentioned, how many points would you give to the importance of the program? When I say "program", I am including education and support from the trade ally and incentives from ComEd.

N4A And how many points would you give to other factors? Record <OTHERPTS>

[ASK INC1 IF N4 and N4a do not add up to 100]

INC1. The last question asked you to divide a total of 100 points between the program and other factors. You noted that you would give <N4 RESPONSE> points to the program. Does that mean you would give <OTHERPTS> points to other factors?

CONSISTENCY CHECK

[ASK IF TWO OR MORE OF , N3B, N3D, N3I, N3K, > 7 AND OTHERPTS < 30]

N5B. Earlier you stated that factors other than the program were very important, but you gave all other factors a rating of <OTHERPTS>. Can you help me understand why you gave them this rating?
RECORD RESPONSE – ASK IF RESPONDENT WANTS TO CHANGE PREVIOUS RESPONSES

[ASK IF TWO OR MORE OF N3A, N3C, N3E, N3F, N3G, N3H > 7 AND N4 RESPONSE < 30]

N5B. Earlier you stated that various aspects of the program were very important, but you gave all program factors a rating of < N4 RESPONSE >. Can you help me understand why you gave them this rating?
RECORD RESPONSE – ASK IF RESPONDENT WANTS TO CHANGE PREVIOUS RESPONSES

NO-PROGRAM SCORE

N6. Using a likelihood scale from 0 to 10, where 0 is "Not at all likely" and 10 is "Extremely likely," if the utility program had not been available, what is the likelihood that you would have installed exactly the same equipment without any aspects of the program?

[ASK NGA IF N6 > 0]

- N6A. Approximately when would you have installed the equipment, in months after the equipment was installed by the program?
A. 0-12 months (record number of months)
B. More than 12 months

CONSISTENCY CHECK

[ASK N7A IF N3G=8,9,10 AND N6=8,9,10]

N7A When you answered ...<N3G RESPONSE> ... for the question about the influence of the incentive, I would interpret that to mean that the incentive was quite important to your decision to install. Then, when you answered <N6 RESPONSE> for how likely you would be

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to install the same project or efficiency of equipment without the incentive, it sounds like the incentive was not very important in your installation decision.

I want to check if I am misunderstanding your answers or if the questions may have been unclear. Can you discuss the role the incentive played in your decision to install this efficient equipment?

00 [Record VERBATIM]

98 (Don't know)

99 (Refused)

N7B Would you like for me to change your score on the importance of the incentive that you gave a rating of <N3E RESPONSE> or change your rating on the likelihood you would install the same equipment without the incentive which you gave a rating of <N6 RESPONSE> and/or we can change both if you wish?

1 (Change importance of incentive rating)

2 (Change likelihood to install the same equipment rating)

3 (Change both)

4 (No, don't change)

8 (Don't know)

9 (Refused)

[ASK IF N7b=1,3]

N7C How important was... availability of the PROGRAM incentive? (IF NEEDED: in your DECISION to install the equipment) [Scale of 0 to 10, where 0 means not at all important and 10 means extremely important; 98=Don't know, 99=Refused]

[ASK IF N7b=2,3]

N7D If the utility program had not been available, what is the likelihood that you would have installed exactly the same project? [Scale of 0 to 10, where 0 means "Not at all likely" and 10 means "Extremely likely"; 98=Don't know, 99=Refused]

SPILLOVER

SO1. Since receiving an incentive for the project we just discussed, have you installed any ADDITIONAL energy efficiency equipment at this facility or at your other facilities within ComEd's service territory that did NOT receive incentives through any utility or government program?

SO2. What equipment did you implement without an incentive?

SO3. How many of <MEASUREX> did you install?

- i. Can you describe the type of equipment installed? (RECORD TYPE). Can you describe the Efficiency? (RECORD Efficiency) How about the size? (Record size). Lastly, are there any other attributes about this equipment that you might mention?Type
- ii. Efficiency
- iii. Size
- iv. Other attributes

SO4. "How influential was your experience in the program in your decision to implement this equipment, using a scale of 0 to 10, where 0 is not at all influential and 10 is extremely influential?"

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SO5. How did your experience with the program influence your decision to install this additional high-efficiency equipment?

SO6. "If you had not participated in the program, how likely is it that your organization would still have implemented this equipment, using a 0 to 10 scale, where 0 means you definitely WOULD NOT have implemented this equipment and 10 means you definitely WOULD have implemented this equipment?"

SO7. Can you briefly explain why you decided to install this energy efficiency equipment on your own, rather than going through a ComEd program?

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Process Module

MARKETING AND OUTREACH

MK1. How did you first hear about the AirCare Plus Program? (DO NOT READ)

1. Trade Ally/Contractor
2. CLEAResult- the program implementer
3. ComEd Account manager
5. ComEd Website
7. Friend, colleague, or word of mouth
9. Utility marketing material – case studies overview sheets, marketing video
00. (Other, specify)
98. (Don't know)
99. (Refused)

MK2. What marketing materials, if any, do recall for the AirCare Plus Program?

1. Yes, (Specify below)
2. No [SKIP TO MK5]
98. (Don't know) [SKIP TO MK5]
- 99 (Refused) [SKIP TO MK5]

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1. Presentation or workshop
2. Program overview sheet
3. Case Study
4. Utility website(s)
5. Direct Mail
6. Fact sheets
7. Program Forms
00. (Other, please specify)
98. (Don't know)
99. (Refused)

MK4. On a scale of 0 to 10, where 0 means "Not at all useful" and 10 means "Extremely Useful", how useful were these materials in learning more about the program? [SCALE 0-10; 98=don't know, 99=Refused]

MK5. What are the best ways of reaching companies like yours to provide information about energy efficiency programs? [DO NOT READ?] [MULTIPLE RESPONSE, UP TO 3]

1. Bill inserts
2. Flyers or mailings
3. E-mail
4. Telephone
5. Key Account Executive
7. Industry events or shows
00. Other, specify
98. (Don't know)
99. (Refused)

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PROGRAM SATISFACTION

PS1. On a scale of 0 to 10, where 0 is very dissatisfied and 10 is very satisfied, how would you rate your satisfaction with...? [SCALE 0-10; 96=not applicable, 98= Don't know, 99=Refused]

- a. The professionalism of trade ally which provided services
- b. The accuracy of the test-in system check
- c. The quality of work performed by the trade ally
- d. The program administrator - CLEAResult
- e. The ComEd representative or staff
- f. The AirCare Plus program overall

[ASK IF PS1a, b, c, d, e, f, g, h, i<4]

PS2. You gave a rating of lower than four out of ten to [attribute or attributes], could you please tell me the reason or reasons behind the dissatisfied rating(s)? [OPEN END; 98=DK; 99=REF]

PS3. Thinking about your program experience, has your opinion of ComEd become more favorable, less favorable, or stayed the same? [OPEN END; 98=DK; 99=REF]

AWARENESS

A1. My next questions are about your awareness of the energy efficiency equipment available through AirCare Plus program PRIOR to participating. Would you say you were aware of all, some, or none of the energy efficiency savings equipment before the study?

1. All
2. Some
3. None
98. (Don't know)
99. (Refused)

[SKIP TO A2ab IF A1=1, 3, 98, 99].

A2. Which of the following program services and qualifying equipment were you previously aware of? Were you aware of the opportunities related to... (1=Yes, 2=No, 98=Don't know, 99=Refused) Multiple OK

- a. Tune-Up
- b. Economizer Improvements
- c. Thermostat

A2ab What factor or factors, if any, kept you from pursuing these program services in prior years?? [DO NOT READ]

1. Was not aware of the savings opportunity
2. Lack of incentive for addressing
3. Did not understand benefits of addressing the opportunity
4. The cost of addressing the opportunity was too high
5. Had insufficient in-house staffing to address the opportunity
6. Had inadequate in-house expertise to address the opportunity
7. Not aware of qualified contractors
8. Management was against making changes
00. (Other, specify)
98. (Don't know)
99. (Refused)

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BENEFITS

BB1. What is the biggest strength or strengths of the AirCare Plus Program?

[DO NOT READ; MULTIPLE RESPONSE, UP TO 3]

1. Helps reduce the company's energy bills
2. Saves energy
3. Improves the performance of equipment
5. Prolongs equipment life
00. (Other, specify)
98. (Don't know)
99. (Refused)

FEEDBACK AND RECOMMENDATIONS

R1. Based on your experience, would you recommend the AirCare program to your peers inside or outside of your organization?

1. Yes
2. No
3. Maybe
8. (Don't know)
9. (Refused)

R2. What suggestions, if any, do you have for improving the program?

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Firmographics

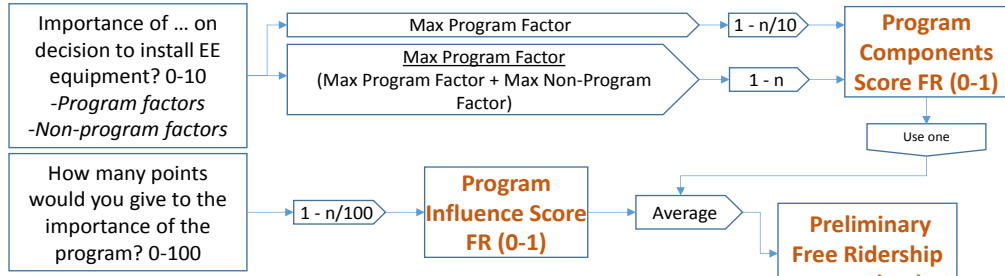
I only have a few questions left.

- F1. Does your company own, rent or manage this facility?
- 1 (Own)
 - 2 (Rent)
 - 3 (Manage)
 - 00 (Other, specify)
 - 98 (Don't know)
 - 99 (Refused)
- F2. How many full-time maintenance staff work at this building – excluding house-keeping staff?
- [NUMBER]
- F3. Which of the following best describes your facility? This facility is...
- 1. My company's only location
 - 2. One of several locations owned or operated by my company
 - 3. The headquarters location of a company with several locations
 - 8. (Don't know)
 - 9. (Refused)
- F4. In comparison to other companies in your industry, would you describe your company as...
- 1. A small company
 - 2. A medium-sized company
 - 3. A large company
 - 4. (Not applicable)
 - 8. (Don't know)
 - 9. (Refused)

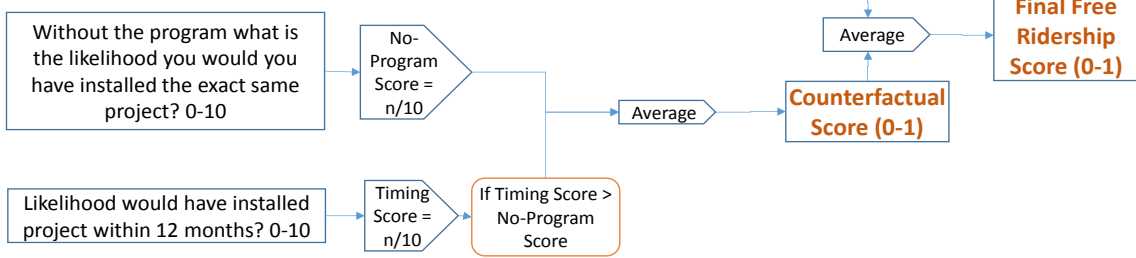
Those are all of the questions I have. Thank you very much for your participation!

**Net to Gross Methodology
Free Ridership**

Program Influence



Counterfactual



Spillover

$$Spillover\ Score = (Measure\ Attribution\ Score\ 1 + (10 - Measure\ Attribution\ Score\ 2))/2$$

$$Spillover = \frac{Spillover\ score\ (0 - 1) * Energy\ Savings\ from\ Influenced\ Project\ (kWh)}{Total\ Sample\ Savings\ (kWh)}$$