NAVIGANT

Multi-Family Program Evaluation Report

Direct Install and Energy Assessment Jumpstart Program
Prescriptive Rebate Program
Custom Rebate Program
Partner Trade Ally Program
Gas Optimization Program

FINAL

Energy Efficiency Plan:
Gas Plan Year 5
(6/1/2015-5/31/2016)

Presented to
Peoples Gas and North Shore Gas

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Multi-Family Program Evaluation Report

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E. EXECUTIVE SUMMARY

This report presents a summary of the findings and recommendations from the impact and process evaluation of the GPY5[1] Peoples Gas (PGL) and North Shore Gas (NSG) Multi-Family Program (MESP or Multi-Family Program). The GPY5 evaluation represents the fifth year of evaluating the jointly implemented program by PGL and NSG companies and Commonwealth Edison Company (ComEd). The Multi-Family Program achieves natural gas energy savings for PGL and NSG and electric energy and demand savings for ComEd customers. ComEd's program is in electric program year 8 (EPY8) and PGL and NSG are in gas program year 5 (GPY5). Franklin Energy Services, LLC (FES or Franklin Energy) is the primary implementation contractor for the ComEd and PGL and NSG joint Multi-Family Program.

The PGL and NSG Multi-Family Program is designed to provide a "one-stop-shop" to multi-family property owners and managers to achieve comprehensive improvements in energy efficiency that previously would have required accessing multiple programs. The Multi-Family Program delivery approach consists of five paths.[2] The Direct Installation and Energy Assessment "Jumpstart" path of the program provides free energy efficiency products in residential dwelling units and common areas. The energy assessment identifies additional comprehensive efficiency upgrades. The Prescriptive Rebate and Partner Trade Ally (PTA) paths provide standardized incentives for energy efficient equipment based on the size and efficiency of the equipment installed or on a per unit basis. The PTA path provides higher incentives to a network of trade allies selected, screened and registered with the Multi-Family Program, who in turn offer better rebates to their customers to install energy-efficient products. The program's Custom path provides technical services and custom rebates for non-standard building improvement upgrades. Multi-family property owners and managers may also participate in the PGL and NSG Gas Optimization Study Program that provides gas optimization assessments for multi-family buildings for operation and maintenance issues that, if corrected, deliver energy and cost savings to building owners and managers.

In GPY5, Peoples Gas and NSG offered modifications to the Multi-Family Program delivery which included[3]:

1. Direct program rebates for weatherization measures (e.g., air sealing, attic insulation and duct sealing), which in the previous program year had been eligible for on-bill financing only.
2. Attainment of PTA status is tied to a contractor's engagement with at least 200 dwelling units to participate in the Multi-Family Jumpstart path.
3. Limitation of steam pipe insulation to 250 feet per building to ensure a diverse measure mix. In some cases, the program offered incentives up to 500 feet for PTAs that engaged more than 500 dwelling units in the Jumpstart path.

[1] The GPY5/EPY8 program year began June 1, 2015 and ended May 31, 2016.

[2] The Multi-Family Program bundles existing programs into paths, and allows all eligible customers to access any of the five paths as a one-stop-shop based on the customer's needs – the paths are: Direct Install and Assessment Jumpstart, Prescriptive Rebate, Partner Trade Ally (PTA) Incentives, Custom Incentives, and Gas Optimization (source: PGL & NSG Energy Efficiency Plan for the Second Triennial Plan period of June 1, 2014 – May 31, 2017 —Plan 2).

[3] Reviews from Q1 and Q2 EE Results and program supplemental reporting information (415753 Q1 Supplemental.pdf, dated 10/14/2015; and 420058 Q2 Supplemental, dated 1/11/2016).

Navigant's evaluation involved verifying the compliance of the program gross savings with the Illinois Technical Reference Manual version 4.0 (TRM v4.0)[4] and where needed, applying custom adjustment to claimed savings. Navigant calculated GPY5 verified net impact savings using the approved net-to-gross ratios (NTGR) deemed through Illinois Energy Efficiency Stakeholder Advisory Group (SAG) consensus.[5] The evaluation also included free ridership and spillover research with participant property owners and managers (decision-makers) to inform NTG recommendations for future use. The research included process evaluation and focused research on the decision makers and program trade allies.

E.1 Program Savings

Table E-1 summarizes the natural gas savings from the GPY5 Peoples Gas Multi-Family Program. The verified net savings are 1,909,484 therms, from the combined five program paths. The overall verified gross realization rate for energy savings is 103 percent, after Navigant made adjustments to the ex ante savings for some measures, including: programmable thermostats, pipe insulation, steam traps, boiler tune-ups, and custom measures.

Table E-1. GPY5 Peoples Gas Multi-Family Program Natural Gas Savings

Program/Path	Ex Ante Gross Savings[6] (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR[7]	Verified Gross Savings (Therms)	NTGR[8]	Verified Net Savings[9] (Therms)
Jumpstart/Direct Install	281,141	252,985	0.97	271,393	0.92	249,682
Prescriptive Incentive	370,443	311,173	1.00	370,128	0.87	322,012
PTA Incentive	1,210,502	1,198,397	1.05	1,270,910	0.99	1,258,200
Custom Incentive	72,928	56,884	1.02	74,572	0.78	58,166
Gas Optimization	21,002	21,423	1.00	21,004	1.02	21,424
GPY5 Total	**1,956,016**	**1,840,862**	**1.03**	**2,008,007**		**1,909,484**

Source: Evaluation analysis of GPY5 program tracking data (July 19, 2016 data extract) and Illinois Statewide Technical Reference Manuals.[10]

Table E-2 summarizes the natural gas savings from the GPY5 North Shore Gas Multi-Family Program. The verified net savings are 29,003 therms, with 100 percent verified gross realization rate.

[4] Illinois Statewide Technical Reference Manual for Energy Efficiency Version 4.0, available at: http://www.ilsag.info/technical-reference-manual.html.

[5] The Net-to-Gross Ratio (NTGR) used for calculating verified net savings is deemed prospectively through a consensus process managed by the Illinois Energy Efficiency Stakeholder Advisory Group (SAG). Deemed NTGRs (as well historical verified gross Realization Rates) are available at: http://ilsagfiles.org/SAG_files/NTG/2015_NTG_Meetings/Final_2015_Documents/Peoples_Gas_and_North_Shore_Gas_NTG_Summary_GPY1-5_2015-03-01_Final.pdf

[6] The term "Ex Ante" refers to the forecasted savings reported by the Program Administrator that have not been independently verified through evaluation. Savings that have been independently verified by the Evaluation Contractor are referred to as "Verified".

[7] Verified Gross Realization Rate (RR) = Verified Gross Savings/Ex Ante Gross Savings.

[8] The Net-to-Gross Ratio (NTGR) used for calculating verified net savings is deemed prospectively through a consensus process managed by the Illinois Energy Efficiency Stakeholder Advisory Group (SAG). Deemed NTGRs (as well historical verified gross Realization Rates) are available at: http://ilsagfiles.org/SAG_files/NTG/2015_NTG_Meetings/Final_2015_Documents/Peoples_Gas_and_North_Shore_Gas_NTG_Summary_GPY1-5_2015-03-01_Final.pdf

[9] Verified Net Savings = NTGR * Verified Gross Savings

[10] Illinois Statewide Technical Reference Manual for Energy Efficiency (TRM). The effective TRM for GPY5 is Version 4.0, available from the Illinois Energy Efficiency Stakeholder Advisory Group web site: http://www.ilsag.info/il_trm_version_4.html. The list of TRM Version 4.0 errata in effect for GPY5 is provided in TRM Version 5.0, available at: http://www.ilsag.info/il_trm_version_5.html

Table E-2. GPY5 North Shore Gas Multi-Family Program Natural Gas Savings

Program/Path	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Jumpstart/Direct Install	12,206	10,986	1.00	12,211	0.92	11,234
Prescriptive Incentive	1,071	964	1.00	1,071	0.92	986
PTA Incentives	15,608	15,452	1.00	15,608	0.99	15,452
Custom Incentive	1,706	1,331	1.00	1,706	0.78	1,331
Gas Optimization	0	0	0	0	1.02	0
GPY5 Total	**30,591**	**28,733**	**1.00**	**30,596**		**29,003**

Source: Evaluation analysis of GPY5 program tracking data (July 19, 2016 data extract) and Illinois Statewide Technical Reference Manuals.

E.2 Program Savings by Measure

Table E-3 summarizes the natural gas savings from the Peoples Gas Multi-Family Program by measure category. Details of the adjustment between the ex ante gross and verified gross savings are provided in Section 3.

Table E-3. GPY5 Peoples Gas Multi-Family Program Natural Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTGR†	Verified Net Savings (Therms)
Hot Water Efficiency	205,747	186,520	1.00	205,765	N/A	190,372
Programmable/Reprogram Thermostats	83,835	74,779	0.88	74,059	N/A	67,574
Attic/Pipe Insulation	262,634	252,823	1.22	320,014	N/A	311,157
Space, Process Heating & Controls	816,447	767,371	1.00	819,170	N/A	778,242
Custom/Gas Optimization	93,930	78,306	1.02	95,575	N/A	79,590
Other Measures[11]	493,423	481,063	1.00	493,424	N/A	482,549
GPY5 Total	**1,956,016**	**1,840,862**	**1.03**	**2,008,007**		**1,909,484**

Source: Evaluation analysis of GPY5 program tracking data (July 19, 2016 data extract).

* RR estimates are rounded to 2 digits. Direct application may produce rounding errors.

† NTGR values are shown as N/A to indicate values are not defined at the measure level but at the program path level.

Table E-4 summarizes the natural gas savings from the GPY5 North Shore Gas Multi-Family Program by measure category. Details of the adjustment between the ex ante gross and verified gross savings are provided in Section 3.

[11] Section 3 provides additional measure-level detail.

Table E-4. GPY5 North Shore Gas Multi-Family Program Natural Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTGR†	Verified Net Savings (Therms)
Hot Water Efficiency	6,251	5,626	1.00	6,252	N/A	5,752
Programmable/Reprogram Thermostats	2,880	2,592	1.00	2,879	N/A	2,648
Pipe Insulation	3,076	2,768	1.00	3,080	N/A	2,834
Space, Process Heating & Controls	16,679	16,416	1.00	16,679	N/A	16,438
Custom	1,706	1,331	1.00	1,706	N/A	1,331
GPY5 Total	**30,591**	**28,733**	**1.00**	**30,596**		**29,003**

Source: Evaluation analysis of GPY5 program tracking data (July 19, 2016 data extract).
* RR estimates are rounded to 2 digits. Direct application may produce rounding errors.
† NTGR values are shown as N/A to indicate values are not defined at the measure level but at the program path level.

E.3 Impact Estimate Parameters for Future Use

In the course of our GPY5 evaluation, Navigant conducted research on NTG parameters that may be considered for future deeming. The results of GPY5 evaluation research are shown in the following table.[12] Navigant recommends that NTG parameters for future use be based on Illinois TRM v6.0. Details of the research methods and results are provided in Section 7.1.

Table E-5. Net-to-Gross Parameters for Future Use from GPY5 Evaluation Research

Program/Path	Free Ridership	Spillover (Participant SO)	Spillover (TA SO)	Mean NTGR*	Data Source
Direct Installation	0.18	0.03	0	0.85	GPY5 Evaluation Research. Based on IL-NTG Methods
Custom	0.31	0.03	0	0.72	
Prescriptive (P)	0.27	0.03	0	0.76	
Trade Ally (PTA)	0.15	0.03	0	0.88	
Comprehensive Roll-up (P+PTA+Custom)	0.19	0.03	0	0.84	

Source: Evaluation Analysis.
* Mean NTGR =1 – Participant FR + Participant SO + Trade Ally SO

[12] Navigant assessed free ridership using the NTG protocols outlined in the Illinois TRM Version 6.0. The spillover estimate was also based on the Illinois TRM Version 6.0, which recommends using a spillover attribution threshold score of 5 instead of 7 that is prescribed in Illinois TRM V5.0 (Volume 4: Cross-Cutting Measures and Attachments, effective June 1st, 2016).

E.4 Program Volumetric Detail

Table E-6 and Table E-7 below present GPY5 program participation reported by the Program Administrator Franklin Energy for the Peoples Gas and North Shore Gas programs. Detailed volumetric breakdown of the measure type and savings quantity are provided in the program-level analysis in Section 3.

Table E-6. GPY5 Peoples Gas Multi-Family Program Primary Participation

Participation	Custom/ Gas Opt	Jumpstart/ DI	Prescriptive	PTA	Program Total
Participants[13]	10	947	141	161	1,259
Completed Projects	10	9,128	209	309	9,656
Total Measures[14]	10	24,454	603	1,461	26,528

Source: Navigant analysis of GPY5 program tracking data (July 19, 2016 data extract).

Table E-7. GPY5 North Shore Gas Multi-Family Program Primary Participation

Participation	Custom/ Gas Opt	Jumpstart/DI	Prescriptive	PTA	Program Total
Participants	1	120	1	7	129
Completed Projects	1	309	1	18	329
Total Measures	1	986	1	34	1,022

Source: Navigant analysis of GPY5 program tracking data (July 19, 2016 data extract).

E.5 Findings and Recommendations

The following provides insight into key program findings and recommendations.[15]

Verified Gross Impacts and Realization Rate

Finding 1. Navigant estimated 2,008,007 therms as the overall verified gross savings for the GPY5 Peoples Gas Multi-Family Program from the five program delivery paths. This translates to a 103 percent gross realization rate compared to the ex ante gross savings derived from the program tracking system. The North Shore Gas Program achieved 30,596 therms verified gross savings at a 100 percent gross realization rate.

Finding 2: Navigant adjusted the custom savings for 5 of the 10 custom and gas optimization projects in the PGL Program. Overall, the PGL custom measures achieved 102 percent

[13] Participants are defined based on the project site address and number of accounts.

[14] For evaluation reporting purpose, if a measure quantity is reported in the tracking system in linear feet, MBH, or square feet, Navigant treated each row entry of such measure as one measure quantity in this table.

[15] This is a subset of our findings and recommendations. Numbering on the 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.

realization rate, based on findings from usage and billing analysis and engineering verification of savings input assumptions. We also adjusted the savings for the TRM deemed measures including savings from steam pipe insulation and boiler measures and controls due to adjustment of the input assumptions. We identified some custom calculation errors that require attention.

Recommendation 1. Hours of operation used in the custom analysis calculations for space heating measures should be based on specific schedules or categorized appropriately with the period of the HVAC use. Adding boiler operation hours in the summer overestimates savings, as we found from the review of one custom project.

Recommendation 2. Additional quality control of the custom calculation workbooks could prevent small errors we observed, such as switching minimum and maximum input values, or sign changes in referenced equations leading to inaccurate heating cooling loads and savings claimed.

Recommendation 3. Include set point temperatures in documentation or calculation workbooks that are helpful in accurately recreating savings with billing analysis. Additionally, separating billing data to only include those projects being evaluated would be helpful to accurately recreate savings.

Verified Net Impacts

Finding 3. Navigant found that the ex ante net savings from direct install and prescriptive paths reported in the tracking system were derived from GPY4 deemed NTG values which were lower than the GPY5 deemed values. Using the corrected values and others deemed for the PTA and custom paths, Navigant estimated 1,909,484 therms overall verified net savings for the PGL program, and 29,003 therms for the North Shore Gas Program. If undetected, the error would have reduced the PGL verified net savings by 16,532 therms and NSG verified net savings by 267 therms.

Recommendation 4. Ensure that the deemed NTG input values in the tracking system used to estimate ex ante net savings are appropriately linked to the corresponding program year they were approved for. Navigant derives the measure level ex ante gross savings from net savings reported in the tracking system and compares that with verified gross savings. A wrong input of NTG values could affect Navigant's estimate of ex ante gross savings and gross realization rates.

Process Findings

Finding 6. Trade allies and participants were satisfied with the program. When asked to rate their satisfaction with the program on a scale of 0-10, TAs averaged 8.45 and participants averaged 8.9. When asked how other TAs perceived the program, half the responding TAs reported a favorable perception.

Finding 7. Forty five percent of all Customers rated receiving information about the Programs through the utility's website and/or customer service as Top Box, or an 8-10. They were least interested in receiving the information from TAs, with only 16 percent rating TAs as a Top Box source of information. The program is structured to depend on TAs for promotion.

Recommendation 7. Consider enhancements to the information on the programs posted on the utility websites to meet customer interest and demand. Examples include offering sections of the "Rebates & Programs" section of the utility website directed to multi-family owners and

managers and linking to that section from the Property Managers page under the “Partners” section. The program would be thoroughly described within the proposed section, and offer contact information, testimonials and links to applications.

Finding 8. Trade allies’ business models do not easily accommodate the PTA requirements, including that of offering DI leads to the implementer. The TAs work with the Comprehensive customers where a significant majority of the surveyed facilities are master metered, and seldom have the opportunity to develop leads while working on boilers, pipes and steam traps.

Recommendation 8. Consider restructuring the PTA requirements and benefits to encourage more of the existing TAs to participate.

Finding 9. Participant data included a significant amount of incorrect contact information, representing nine percent of our sample. Without correct contact information, we were not able to include these participants in evaluation research. The implementer may likewise have difficulty including this group in future outreach efforts.

Recommendation 9. The implementer should exert greater quality control over collecting participant information.

1. INTRODUCTION

1.1 Program Description

The Second Triennial Plan[16] of the Peoples Gas (PGL) and North Shore Gas (NSG) comprehensive Multi-Family Program bundles existing programs into five paths and allows all eligible customers to access any of the paths as a one-stop-shop based on the customer's needs. The paths are Direct Install, Engineering Assistance, Standard Incentives, Custom Incentives, and Gas Optimization. The GPY5 evaluation represents the fifth year of evaluating the jointly implemented program by PGL and NSG companies and Commonwealth Edison Company (ComEd). ComEd's program is in electric program year 8 (EPY8) and PGL and NSG are in gas program year 5 (GPY5). Franklin Energy Services LLC., (FES or Franklin Energy) is the implementation contractor for the joint program with trade ally engagement and technical support for program delivery and marketing.

The Direct Install (DI) and Energy Assessment "Jumpstart" path of the program provides free energy efficiency products in dwelling units and common areas.[17] The energy assessment identifies additional comprehensive efficiency upgrades that allow participants to implement deeper retrofit measures through other delivery paths.

The Prescriptive Rebate path provides standardized incentives for energy efficient equipment based on the size and efficiency of the equipment installed or on a per unit basis. The Partner Trade Ally (PTA) path also provides standardized incentives for energy efficient equipment based on the size and efficiency of the equipment installed or on a per unit basis while providing higher incentives to a network of trade allies selected, screened and registered with the Multi-Family Program. These PTAs in turn offer better rebates to their customers to install energy-efficient products.

The program's Custom path provides technical services and custom rebates for non-standard building improvement upgrades. Multi-family property owners and managers may also participate in the PGL and NSG Gas Optimization Study Program that provides gas optimization assessments for multi-family buildings for operation and maintenance issues that, if corrected, deliver energy and cost savings to building owners and managers supported by financial incentives.

Peoples Gas and NSG offered modifications in the Multi-Family Program delivery in GPY5, including[18]:

- Direct program rebates for weatherization measures (e.g., air sealing, attic insulation and duct sealing), which in the previous program year had been eligible for on-bill financing only.

[16] Peoples Gas/North Shore Gas Energy Efficiency Plan for the Second Triennial Plan period of June 1, 2014 – May 31, 2017 (known as —Plan 2). The comprehensive business program paths include – Direct Install, Engineering Assistance, Standard Incentives, Custom Incentives, and Gas Optimization.

[17] The Multi-Family Program bundles existing programs into paths, and allows all eligible customers to access any of the five paths as a one-stop-shop based on the customer's needs – the paths are: Direct Install and Assessment Jumpstart, Engineering Assistance, Standard Incentives, Custom Incentives, and Gas Optimization (source: PGL & NSG Energy Efficiency Plan for the Second Triennial Plan period of June 1, 2014 – May 31, 2017 —Plan 2).

[18] Reviews from Q1 and Q2 EE Results and program supplemental reporting information (415753 Q1 Supplemental.pdf, dated 10/14/2015; and 420058 Q2 Supplemental, dated 1/11/2016).

- Encouraged greater trade ally participation in the Multi-Family Program in GPY5 by obligating Trade Allies to engage customers to participate in the Multi-Family Jumpstart path in order to be eligible to deliver higher PTA incentives to customers. PTA status is attained once a contractor engages at least 200 living units to participate in the Multi-Family Jumpstart program.
- Limitation on steam pipe insulation to 250 feet per building to ensure a diverse measure mix. In some cases, the program offered incentives up to 500 feet for PTAs that engaged more than 500 living units in the Jumpstart program.
- Reduced the PGL GPY5 net savings goal by 22 percent due to strong program performance in GPY4 to balance the program over the three year period. Conversely, reduced the NSG GPY5 net savings goal reduction to 18 percent and shift of 82 percent to the Residential programs, due to limited opportunities in the multi-family market in the NSG area. [19]

1.2 Evaluation Objectives

The evaluation team identified the following key researchable questions for GPY5

1.2.1 Impact Questions

1. What are the program's verified gross savings? What caused the realization rate (RR) adjustments?
2. What are the program's verified net savings?
3. What updates are recommended for the Illinois Technical Reference Manual (TRM)?
4. What are the evaluation research values for free ridership and spillover?

1.2.2 Process Questions

Navigant's GPY5 process research activities for the PGL and NSG MF Programs included interviews with program management to verify our understanding of the program design, administration, marketing, and delivery, a CATI survey with customers, and in-depth interviews with trade allies to research questions pertaining to NTG and process evaluation. The following process topics were identified for research:

1. Program participation and barriers for trade allies
2. Graduation from direct install to comprehensive measures
3. Opportunities for program improvement
4. Marketing and program awareness
5. Customer and trade ally satisfaction with the programs and major program components
6. Differences between property managers and owners in decision making and satisfaction

[19] Reviews from Q1 and Q2 EE Results and program supplemental reporting information (received from FES, April, 2016).

2. EVALUATION APPROACH

This section provides an overview of the data collection methods, gross and net impact evaluation approaches, and process evaluation approaches that occurred for the GPY5 evaluation. To determine verified gross savings, the evaluation team verified per unit savings for each program measure by 1) reviewing the tracking database; 2) comparing the use of measure algorithms in the tracking database to their use in the Illinois TRM v4.0 to ensure that they are appropriately applied or through secondary research of custom inputs; and 3) cross-checking totals. Navigant multiplied measure quantities reported in the program tracking database by the verified per unit savings values. The verified net savings were calculated using net-to-gross ratios (NTGRs) that were deemed for GPY5.

2.1 Overview of Data Collection Activities

The core data collection activities included in-depth interviews with program managers, engineering and project file reviews, telephone surveys with participating decision maker property managers/owners, and interviews with program trade allies. The primary data collection activities are shown in the following table.

Table 2-1. Primary Data Collection Activities

What	Who	Completions Achieved	When	Comments
In Depth Interviews	Program Management	1	April 2016	Interview program staff and IC staff
Tracking System & Engineering Review	Participating Customers	All	March – Aug 2016	Gross savings verification using IL-TRM v4.0, or through research
Project File Reviews	Participating Customers	All (11 total)	Mar – Nov 2016	Review files of all completed custom projects (7 for PGL and 1 for NSG) and all gas optimization projects (3 for PGL)
Telephone Interviews	Participating Trade Allies	11	August – Sept 2016	Process and SO research
Telephone Surveys	Participating Decision Makers	59	Sept – Oct 2016	Process and NTG research

Source: Navigant.

2.2 Verified Savings Parameters

This section presents the approach Navigant employed in conducting verified gross and net program savings.

2.2.1 Verified Gross Program Savings Analysis Approach

Navigant estimated verified per-unit savings for each program measure using impact algorithms and input assumptions defined by the Illinois TRM for deemed measures[20], and evaluation research for non-deemed measures. Table 2-2 below presents the sources for parameters that were used in verified gross savings analysis, indicating which were examined through GPY5 evaluation research and which were deemed.

Table 2-2. GPY5 Verified Gross Savings Parameter Data Sources

Parameter	Data Source	Deemed or Evaluated?
Measure Quantity Installed	Program tracking system	Evaluated
Verified Gross Realization Rate	Program tracking data, TRM, Navigant	Evaluated
Residential HVAC measure savings assumptions	Illinois TRM, version 4.0, section 5.3*	Deemed
Commercial HVAC measure savings assumptions	Illinois TRM, version 4.0, section 4.4*	Deemed
Residential hot water measure savings assumptions	Illinois TRM, version 4.0, section 5.4*	Deemed
Commercial hot water measure savings assumptions	Illinois TRM, version 4.0, section 4.3*	Deemed
Steam traps savings assumptions	Illinois TRM, version 4.0, section 4.4.16*	Deemed
Residential pipe insulation savings assumptions	Illinois TRM, version 4.0, section 5.4*	Deemed
Commercial pipe insulation savings assumptions	Illinois TRM, version 4.0, section 4.4.14*	Deemed
Air Sealing/Attic Insulation	Illinois TRM, version 4.0, section 5.6*	Deemed
Programmable thermostat savings assumptions	Illinois TRM, version 4.0, section 4.3*	Deemed
Custom Analyses and Measures	Project File Review, Monthly Billing Data	Evaluated

Source: Evaluation analysis of programs data and Illinois TRM documents.
* Source: State of Illinois Technical Reference Manuals. PG&NSG MMDB PY5 - 04122016, produced by Franklin Energy Services.

The PGL Program completed seven custom projects and three gas optimization projects. The NSG Program completed one custom project. The evaluation team performed in-depth engineering file reviews and analysis of the claimed savings for all the measures, including billing analysis for some projects. We reviewed the engineering algorithms used by the program to calculate energy savings, calculation spreadsheets, invoices, measure specification sheets, and inspection reports. The savings evaluation approach was classified into one of two categories, 1) reasonable and acceptable, or 2) needs revision based on evaluation findings.

2.2.2 Verified Net Program Savings Analysis Approach

Verified net energy savings were calculated by multiplying the verified gross savings estimates by a deemed net-to-gross ratio (NTGR). In GPY5, the NTGRs used to calculate the verified net savings were based on past evaluation research and approved through a consensus process managed through the

[20] Because the Illinois TRM provides multiple options for selecting input assumptions, Franklin Energy Services produces a "Master Measure Database" spreadsheet that documents their approach to compliance with the Illinois TRM. The spreadsheet is PG&NSG MMDB PY5 - 04122016, produced by Franklin Energy

Illinois Energy Efficiency Stakeholder Advisory Group (SAG)[21]. Table 2-3 presents the deemed NTGR by program path.

Table 2-3. Net-to-Gross Ratios for Evaluation of the GPY5 Multi-Family Programs

Program Path/Measure	Utility	GPY5 Deemed NTG Value
Jumpstart/Direct Install	PGL & NSG	0.92
Prescriptive Incentives	PGL	0.87
	NSG	0.92
PTA Incentives	PGL & NSG	0.99
Custom Incentives	PGL & NSG	0.78
Gas Optimization	PGL & NSG	1.02

Source: Documents available on the Illinois Energy Efficiency Stakeholder Advisory Group web site.

2.3 Process Evaluation

Navigant's GPY5 process research activities for the PGL and NSG MF Programs included interviews with program management to verify our understanding of the program design, administration, marketing, and delivery. The evaluation team conducted a CATI survey with customers and in-depth interviews with TAs to research questions pertaining to NTG and Process. Process research addressed the following topics:

1. Program participation and barriers for trade allies
2. Graduation from direct install to comprehensive measures
3. Opportunities for program improvement
4. Marketing and program awareness
5. Customer and trade ally satisfaction with the programs and major program components
6. Differences between property managers and owners in decision making and satisfaction

[21] Source: Deemed NTGR values are available on the Illinois Energy Efficiency Stakeholder Advisory Group web site. http://ilsagfiles.org/SAG_files/NTG/2015_NTG_Meetings/Final_2015_Documents/Peoples_Gas_and_North_Shore_Gas_NTG_Summary_GPY1-5_2015-03-01_Final.pdf

3. GROSS IMPACT EVALUATION

This section provides detailed analysis and findings from the file reviews and tracking system review of the measures installed and gross savings by program path and delivery channel. Overall, the Peoples Gas GPY5 Multi-Family Program achieved 2,008,007 therms verified gross savings, representing a 103 percent gross realization rate. The North Shore Gas Program achieved 30,596 therms verified gross savings, representing a 100 percent gross realization rate. Navigant made adjustments to the savings input assumptions for programmable thermostats, steam pipe insulations, boiler tune ups and controls, and custom measures. The sections below provide details of the findings.

3.1 Program Tracking Data Review

Navigant reviewed the final GPY5 tracking data for the Multi-Family Programs downloaded from Franklin Energy Services' Efficiency Manager[22] program management information platform on July 19, 2016. The evaluation team reviewed the tracking data to verify the completeness and accuracy of the tracking system data to identify any issues that would affect the impact evaluation of the program. We compared the tracking system savings input assumptions to FES' "Master Measure Database" spreadsheet (MMDB)[23] that documents their approach to compliance with the Illinois TRM. We verified that the program tracking system was accurately recording measure counts and savings. We recommend updates of the input assumptions for certain measures to be consistent with the TRM.

Key findings include:

a. The tracking system reports ex ante net savings but not the gross savings as provided in the FES MMDB workbook. Navigant found that the ex ante net savings from Direct Install and Prescriptive paths reported in the tracking system were derived from GPY4 deemed NTG values which were lower than the GPY5 NTG deemed values. Navigant corrected the values and adjusted the net savings estimate accordingly. The error if undetected would have reduced the PGL verified net savings by 16,532 therms and NSG verified net savings by 267 therms.

b. The savings algorithm input for direct install programmable thermostats, installed on boiler systems uses a household factor deemed for single-family buildings (100 percent) rather than multifamily (65 percent). The implementer further assumed a boiler efficiency of 61.6 percent. This value is from Illinois TRM v4.0 Section 5.3.6, "Gas High Efficiency Boiler" and is a default baseline for early replacement if the actual baseline is unknown. By using this efficiency value, the implementer is assuming that all boilers controlled by the programmable thermostats are old and have very low efficiencies. Navigant instead used the value of 81.9 percent as described in Section 5.3.2, "Boiler Pipe Insulation." Eighty-one point nine percent is the default efficiency the TRM uses to describe the average efficiency of an existing boiler in the population as a whole. For this measure, the program should use the standard retrofit efficiency baseline of 81.9 percent or use default values from the customer application. These two adjustments reduced unit savings from 122.6 therms to 59.9 therms per thermostat. For common area programmable thermostats, Navigant found that the MMDB workbook averaged the ex ante savings across building types. This approach is reasonable, however we identified a minor error in the algorithm input and adjusted the gross unit savings from 126.2 therms to 124.6 therms per thermostat. Overall, the thermostat measure had 88 percent gross realization rate. Details of the verified unit gross savings are provided in Table 3-5.

[22] Previously referred to as Bensight.

[23] PG&NSG MMDB PY5 - 04122016, produced by Franklin Energy

c. The PY5 FES MMDB workbook contained duplicate savings calculations for steam pipe insulation feeding into the tracking system. FES clarified that the tracking system pulled both GPY4 and GPY5 default savings estimates from the FES MMDB spreadsheet. We reviewed the savings per unit linear foot for each pipe size and applied the necessary adjustments. The net effect is an upward adjustment of savings for certain steam pipe sizes and a lowered adjustment for others, resulting in 122 percent gross realization rate for the pipe insulation measure.

d. The tracking system contained a list of PGL projects labelled as "prescriptive change", which made up to 25 percent of the ex ante gross savings. FES clarified that using the TRM assumptions for these projects produced more savings than were consistent with the nature of the projects. FES capped the savings at 20 percent of the project accounts' annual gas usage. The evaluation team identified these measures included a blend of pipe insulation, steam trap projects and boiler tune-up measures. Our evaluation approach involved selecting of a random sample of projects where we reviewed savings input assumptions to compare with the claimed savings. We determined that the savings assumptions and the 20 percent savings cap were reasonable. We maintained a 100 percent gross realization rate.

e. The PGL GPY5 Program completed seven Custom and three Gas Optimization projects. The NSG Program completed one Custom project. Navigant performed engineering file reviews and analysis of the claimed savings, including billing analysis for some projects. The PGL Custom projects had an overall gross realization rate of 1.02 and the gas optimization projects had a 1.00 realization rate. The NSG Custom project was verified with 1.00 gross realization rate.

   - Four of the PGL Custom projects had a gross realization rate of 1.00 to 1.15, and three had realization rates below 1.00. All three PGL Gas Optimization projects had 1.00 gross realization rates, while the only Custom project in the NSG Program had a 1.00 realization rate.
   - Key evaluation adjustments resulted from reviewing hours of operation used in the custom analysis calculations for space heating measures to reflect the period of the HVAC use (eliminate summer hours), and reviewing the custom calculation workbooks to correct minor errors such as switching minimum and maximum input values or sign changes in referenced equations leading to inaccurate heating loads and savings calculation.
   - Navigant notes that including set point temperatures in documentation or calculation workbooks would be helpful in accurately recreating savings with billing analysis. Additionally, the implementation contractor could separate billing data to only include those projects evaluated. This would be helpful to accurately recreate savings.

3.2 Program Volumetric Findings

As shown in Table 3-1 and Table 3-2, the Peoples Gas Multi-Family Program reported 1,259 participants of multi-family property owners or managers in GPY5 and implemented 26,528 measures from 9,656 projects. The North Shore Gas Multi-Family Program reported 129 participants in GPY5 and implemented 1,022 measures from 329 projects.

Table 3-1. GPY5 Peoples Gas Multi-Family Program Primary Participation

Participation	Custom/ Gas Opt	Jumpstart/ DI	Prescriptive	PTA	Program Total
Participants[24]	10	947	141	161	1,259
Completed Projects	10	9,128	209	309	9,656
Total Measures[25]	10	24,454	603	1,461	26,528

Source: Navigant analysis of GPY5 program tracking data (July 19, 2016 data extract).

Table 3-2. GPY5 North Shore Gas Multi-Family Program Primary Participation

Participation	Custom/ Gas Opt	Jumpstart/DI	Prescriptive	PTA	Program Total
Participants	1	120	1	7	129
Completed Projects	1	309	1	18	329
Total Measures	1	986	1	34	1,022

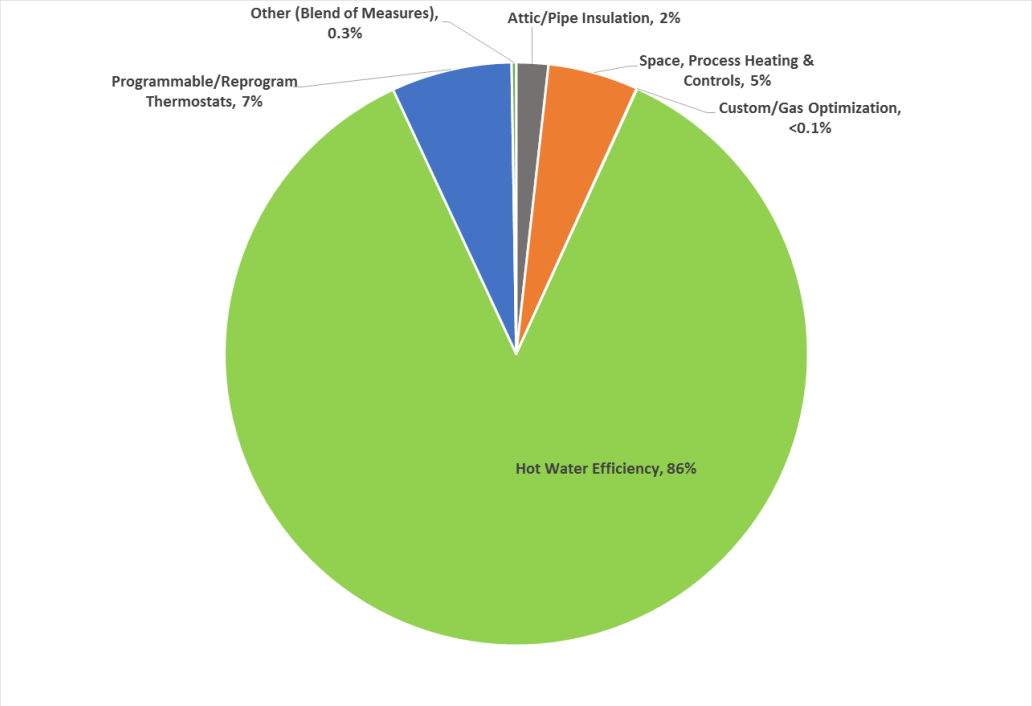
Source: Navigant analysis of GPY5 program tracking data (July 19, 2016 data extract).

Figure 3-1 and Figure 3-2 disaggregate the total measure quantities provided in Table 3-1 and Table 3-2 by measure type. For Peoples Gas, water efficiency measures which include direct install aerators and showerheads, and water heaters contributed 86 percent of the measure quantity in GPY5. The next major contributors were programmable/reprogram thermostats with seven percent, and space heating and process controls (seven percent). For North Shore Gas, water efficiency measures contributed 78 percent, followed by pipe insulation with 12 percent, and programmable/reprogram thermostats with seven percent.

[24] Participants are defined based on the project site address and number of accounts.

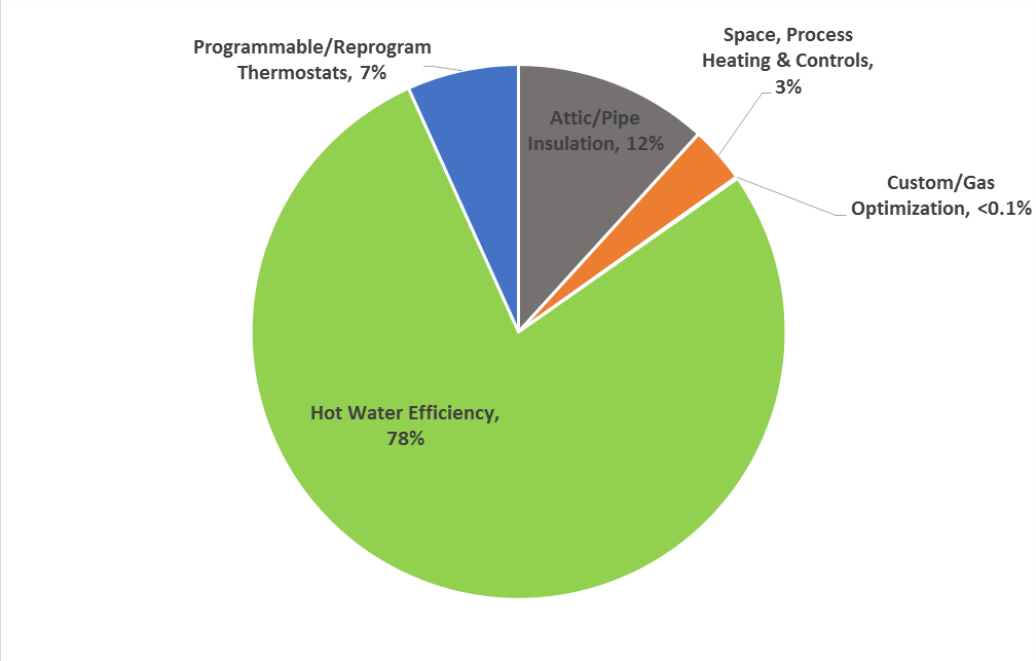
[25] For evaluation reporting purpose, if a measure quantity is reported in the tracking system in linear feet, MBH, or square feet, Navigant treated each row entry of such measure as one measure quantity in this table. Actual quantity of industrial steam traps are not reported in the tracking database. Navigant treated each row entry of such measure as one measure quantity in this table.

Figure 3-1. Peoples Gas: Participation Percentages by Measure Type



Source: Navigant Analysis

Figure 3-2. North Shore Gas: Participation Percentages by Measure Type



Source: Navigant Analysis

Table 3-3 and Table 3-4 below provide additional measure details by count and unit of savings measurement.

Table 3-3. Peoples Gas GPY5 Multi-Family Program Measure Count

Measure	Unit	Install Type	Ex Ante Measure Count	Verified Measure Count
Bathroom Aerator	Each	In-Unit	8,353	8,353
Kitchen Aerator	Each	In-Unit	6,630	6,630
Showerhead	Each	In-Unit	7,826	7,826
Programmable/Reprogram Thermostat	Each	In-Unit/Common Area	1,773	1,773
Pipe Insulation	Linear Feet	Common Area	30,821	30,821
1,2-Pipe Steam Averaging Controls	Dwelling Unit	Common Area	2,946	2,946
Boiler Reset Controls	MBH	Common Area	46,022	46,022
Boiler Tune Up - Space Heating	MBH	Common Area	160,131	160,131
Efficient Furnace	Each	In-Unit/Common Area	50	50
Boiler Tune Up - Process	MBH	Common Area	1,470	1,470
Efficient Boiler	MBH	Common Area	130,934	130,934
Steam Trap	Each	Common Area	995	995
Water Heater	Each	Common Area	449	449
Attic Insulation	Square Feet	Common Area	22,017	22,017
Air Sealing	CFM	Common Area	1,200	1,200
Custom Project	Each	Common Area	10	10
Other (Blend of measures)	Each	Common Area	68	68

Source: Navigant analysis of program tracking data.

Table 3-4. North Shore Gas GPY5 Multi-Family Program Measure Count

Measure	Unit	Install Type	Ex Ante Measure Count	Verified Measure Count
Bathroom Aerator	Each	In-Unit	291	291
Kitchen Aerator	Each	In-Unit	248	248
Showerhead	Each	In-Unit	258	258
Pipe Insulation	Linear Feet	Common Area	1,219	1,219
Programmable/Reprogram Thermostat	Each	In-Unit/Common Area	69	69
Boiler Tune Up - Space Heating	MBH	Common Area	15,175	15,175
Boiler Reset Controls	MBH	Common Area	8,640	8,640
Custom Project	Each	Common Area	1	1

Source: Navigant analysis of program tracking data.

Key findings include:

1. Participation in the Peoples Gas Multi-Family Program was lower in GPY5 compared to GPY4, especially in the Direct Install and PTA paths, which dropped about close to half in terms of measure and project counts. The Prescriptive projects and measures increased slightly in GPY5.
2. Similarly, the North Shore Gas Program participation was lower in GPY5 compared to GPY4, reporting less than half of what the program achieved in GPY4 in terms of measures and project counts.
3. The low participation in GPY5 can be partly attributed to the reduction in the net savings goal for both the PGL and NSG Programs in the course of the program year, as documented by the implementation contractor (Franklin Energy).[26]

3.3 Gross Program Impact Parameter Estimates

As described in Section 2, Navigant estimated verified per unit savings for each program measure using impact algorithms and input assumptions defined in the Illinois TRM (v4.0) and documentation of TRM compliance provided by Franklin Energy Services, including custom input assumptions. Table 3-5 presents the key parameters and the references used in the verified gross savings calculations.

[26] Reviews from Q1 and Q2 EE Results and program supplemental reporting information (received from FES, April, 2016).

Table 3-5. GPY5 Multi-Family Program Ex Ante and Verified Gross Savings Parameters

Measure	Ex Ante Gross Savings (Therms/Unit)	Verified Gross Savings (Therms/Unit)	Method	Data Source (TRM v4.0)
Bathroom Faucet Aerator	1.24	1.25	Deemed	Sections 4.3
Kitchen Faucet Aerator	5.12	5.13	Deemed	
Showerhead	17.89	17.89	Deemed	
Boiler Reset Controls	1.274	1.276	Deemed	Sections 4.4
Boiler Tune Up - Space Heating	0.374	0.376	Deemed	
Boiler Tune Up - Process	0.833	0.838	Deemed	
High Efficiency Boiler >=82% TE	Vary	Adjusted slightly lower	Deemed	
High Efficiency Furnace	132.89	132.89	Deemed	
Pipe Insulation	Vary	Adjusted higher	Deemed	Sections 4.4.14 & 4.4.24
Water Heater (0.67 EF) Indirect Water Heater 88% TE	119.0 48.70	119.0 48.70	Deemed	
HVAC Steam Traps (audited) HVAC Steam Traps (unaudited)	410.0 93.5 or 110.2	327.61 110.2	Deemed	Sections 4.4.16
Programmable/Reprogram Thermostat	CA=126.1 Furnace DI IU=40.5 Boiler DI IU=122.6 Boiler P IU=44.62	124.7 40.5 59.9 44.62	Deemed	Sections 4.4.18
Single-Pipe Steam Boiler Averaging Controls	61.09	61.09	Research	Evaluated
Attic Insulation	0.091	0.091	Deemed	Sections 5.6.1
Air Sealing	0.086	0.086	Deemed	Sections 5.6.4
Custom/Gas Optimization	vary	Verified with adjustment	Research	Evaluated

Source: Navigant analysis of program tracking data and Franklin Energy Services documents. Some minor differences occur due to rounding (e.g., faucet aerators). The effective TRM for GPY5 is Version 4.0, available from the Illinois Energy Efficiency Stakeholder Advisory Group web site: http://www.ilsag.info/il_trm_version_4.html.

3.4 Verified Gross Program Impact Results

As shown in Table 3-6, the GPY5 Peoples Gas Multi-Family Program reported ex ante gross energy savings of 1,956,016 therms. Evaluation adjustments resulted in verified gross energy savings of 2,008,007 therms, reflecting the program's gross realization rate of 103 percent.

Table 3-6. GPY5 Peoples Gas Multi-Family Program Impact Results

Measure Category	Quantity Unit	Verified Measure Quantity	Ex Ante Gross Savings (therms)	Verified Gross Realization Rate	Verified Gross Savings (therms)
Direct Install Measures					
Bathroom Aerator	Each	8,353	10,395	1.00	10,428
Kitchen Aerator	Each	6,630	33,971	1.00	33,991
Showerhead	Each	7,826	140,120	1.00	140,086
Prog/Reprog Thermostat	Each	1,522	72,636	0.87	62,859
Pipe Insulation (DHW)	Liner Feet	6,505	24,019	1.00	24,029
Direct Install Subtotal			*281,141*	*0.97*	*271,393*
Prescriptive/PTA Incentive Measures					
Water Heater	MBH	449	21,260	1.00	21,260
Pipe Insulation	Linear Feet	30,226	236,513	1.24	293,884
Attic Insulation	Square Ft.	22,107	1,999	1.00	1,999
Air Sealing	CFM	1,200	103	1.00	103
Steam System Averaging Controls	Unit	2,946	179,984	1.00	179,971
Boiler Tune-up, HAVC	MBH	160,131	59,778	1.00	59,724
Efficient Boiler	MBH	130,934	106,822	1.00	106,726
Efficient Furnace	Each	50	6,799	1.00	6,799
Steam Traps	Each	995	403,219	1.01	405,952
Boiler Reset Control	MBH	46,022	58,620	1.00	58,765
Boiler Tune-up, Process	MBH	1,470	1,225	1.01	1,232
Prog/Reprog Thermostat	Each	251	11,199	1.00	11,200
Other*	Each	68	493,423	1.00	493,423
Prescriptive/PTA Incentive Subtotal			*1,580,944*	*1.04*	*1,641,038*
Custom/Gas Optimization					
Custom Measures		10	93,930	1.02	95,575
GPY5 PGL MF Total			**1,956,016**	**1.03**	**2,008,007**

Sources: Program tracking data and Navigant analysis

* Projects with blend of steam traps, pipe insulation and HVAC measures with savings capped at 20 percent of annual gas usage.

As shown in Table 3-7, the GPY5 North Shore Gas Multi-Family Program reported ex ante gross energy savings of 30,591 therms. Minor evaluation adjustments resulted in verified gross energy savings of 30,596 therms, reflecting the program's gross realization rate that rounded to 100 percent.

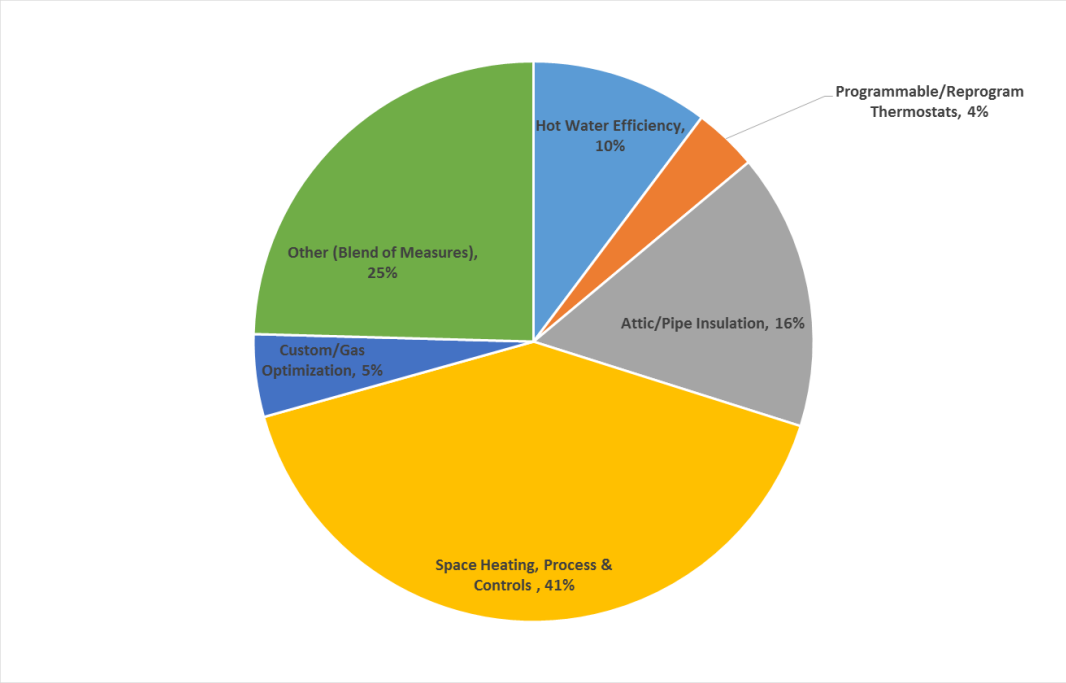
Table 3-7. GPY5 North Shore Gas Multi-Family Program Impact Results

Measure Category	Quantity Unit	Verified Measure Quantity	Ex Ante Gross Savings (therms)	Verified Gross Realization Rate	Verified Gross Savings (therms)
Direct Install Measures					
Bathroom Aerator	Each	291	326	1.00	363
Kitchen Aerator	Each	248	1,143	1.00	1,271
Showerhead	Each	258	4,156	1.00	4,617
Prog/Reprog Thermostat	Each	69	2,592	0.87	2,879
Pipe Insulation (DHW)	Liner Feet	1,219	2,768	1.00	3,080
Direct Install Subtotal			12,206	1.00	12,211
Prescriptive/PTA Incentive Measures					
Boiler Tune-up, HAVC	MBH	15,175	1,071	1.00	1,071
Boiler Reset Control	MBH	8,640	15,608	1.00	15,608
Prescriptive/PTA Incentive Subtotal			16,679	1.00	16,679
Custom/Gas Optimization					
Custom Tank Insulation		1	1,706	1.00	1,706
GPY5 PGL MF Total			**30,591**	**1.00**	**30,596**

Sources: Program tracking data and Navigant analysis
* Projects with blend of steam traps, pipe insulation and HVAC measures with savings capped at 20 percent of annual gas usage.

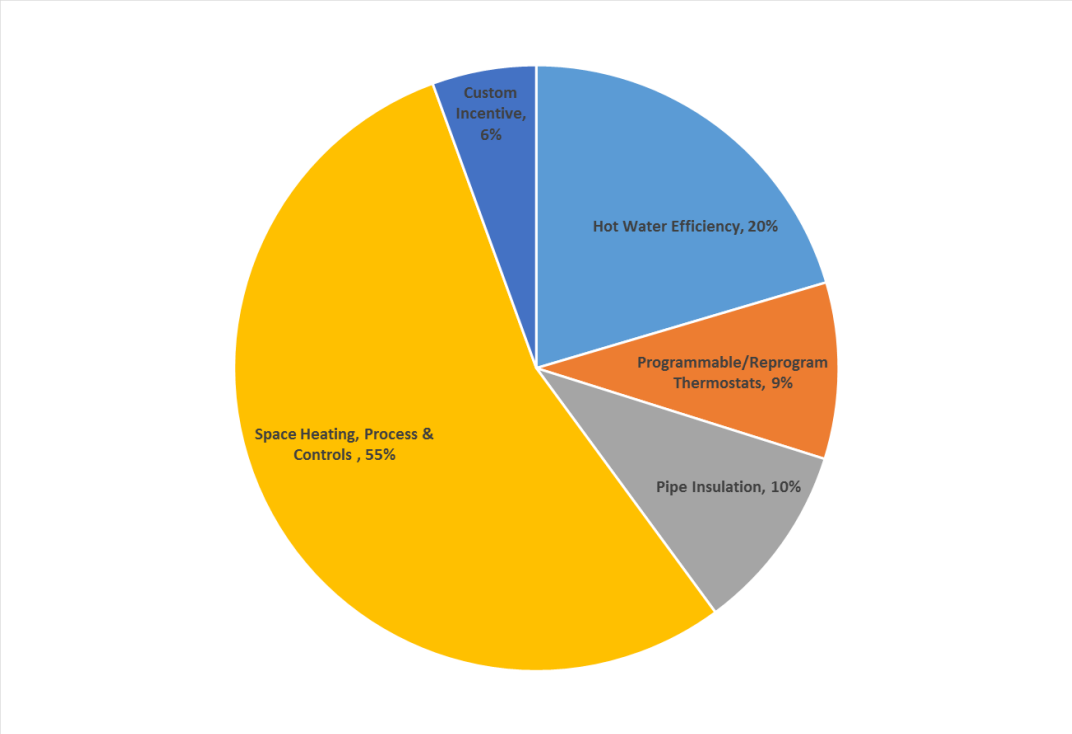
Figure 3-3 and Figure 3-4 disaggregate the total verified savings by measure type. For Peoples Gas, space heating, process and control measures contributed 41 percent of the verified gross savings followed by projects with a blend of steam traps and pipe insulation measures with 25 percent, pipe insulation measures with 16 percent, and direct install measures with 10 percent. For North Shore Gas, space heating, process and control measures contributed 55 percent of the verified gross savings, and direct install water efficiency measures contributed 20 percent.

Figure 3-3. Peoples Gas: Verified Gross Savings Percentages by Measure



Sources: Navigant analysis

Figure 3-4. North Shore Gas: Verified Gross Savings Percentages by Measure



Sources: Navigant analysis

4. NET IMPACT EVALUATION

Verified net energy savings were calculated by multiplying the verified gross savings estimates by a net-to-gross ratio. As noted in Section 2, the NTGR used to calculate the net verified savings for the GPY5 Multi-Family Program was deemed through a consensus process managed by the Illinois SAG.

When converting ex ante gross to ex ante net savings for tracking and reporting, Franklin Energy Services combines an additional adjustment factor with the net-to-gross ratio. The additional factor accounts for potential gross realization rate adjustments, and is based on a previous year realization rate. This factor must be accounted for when converting ex ante net savings reported in the tracking system to ex ante gross savings. The equations for GPY5 are:

GPY5 Ex Ante Net = Values reported in the GPY5 program tracking data

GPY5 Ex Ante Net = (GPY5 Ex Ante Gross * GPY4 Verified Gross RR) * GPY5 Deemed NTGR

GPY5 Ex Ante Gross = GPY5 Ex Ante Net / (GPY4 Verified Gross RR * GPY5 Deemed NTGR)

Table 4-1 below presents the Realization Rate and NTGRs used to calculate the program-level net savings.

Table 4-1. Peoples Gas and North Shore Gas GPY5 Program RR and NTGR Values

Program/Path	Embedded GPY4 RR Adjustment Factors	GPY4 RR Source	GPY5 Deemed NTGR	NTGR Source
Jumpstart/Direct Install	1.00	Navigant GPY4 Evaluation†	0.92	SAG‡
Prescriptive Incentives	1.00	Navigant GPY4 Evaluation†	0.87 0.92	SAG‡
PTA Incentives	1.00	Navigant GPY4 Evaluation†	0.99	SAG‡
Custom Incentives	1.00	Navigant GPY4 Evaluation†	0.78	SAG‡
Gas Optimization	1.00	Navigant GPY4 Evaluation†	1.02	SAG‡

Source: †Navigant evaluation report for the GPY4 Multi-Family Program is available at http://www.ilsag.info/evaluation-documents.html.
‡ Deemed Net-to-Gross Ratios are available from:
http://ilsagfiles.org/SAG_files/NTG/2015_NTG_Meetings/Final_2015_Documents/Peoples_Gas_and_North_Shore_Gas_NTG_Summary_GPY1-5_2015-03-01_Final.pdf

Table 4-2 summarizes the natural gas savings from the GPY5 Peoples Gas Multi-Family Program by end-use categories.

Table 4-2. GPY5 Peoples Gas Multi-Family Program Natural Gas Savings

Program/Path	Ex Ante Gross Savings[27] (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR[28]	Verified Gross Savings (Therms)	NTGR[29]	Verified Net Savings[30] (Therms)
Jumpstart/Direct Install	281,141	252,985	0.97	271,393	0.92	249,682
Prescriptive Incentive	370,443	311,173	1.00	370,128	0.87	322,012
PTA Incentive	1,210,502	1,198,397	1.05	1,270,910	0.99	1,258,200
Custom Incentive	72,928	56,884	1.02	74,572	0.78	58,166
Gas Optimization	21,002	21,423	1.00	21,004	1.02	21,424
GPY5 Total	**1,956,016**	**1,840,862**	**1.03**	**2,008,007**		**1,909,484**

Source: Evaluation analysis of GPY5 program tracking data (July 19, 2016 data extract) and Illinois Statewide Technical Reference Manuals.

Table 4-3 summarizes the natural gas savings from the GPY5 North Shore Gas Multi-Family Program by end-use categories.

Table 4-3. GPY5 North Shore Gas Multi-Family Program Natural Gas Savings

Program/Path	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Jumpstart/Direct Install	12,206	10,986	1.00	12,211	0.92	11,234
Prescriptive Incentive	1,071	964	1.00	1,071	0.92	986
PTA Incentives	15,608	15,452	1.00	15,608	0.99	15,452
Custom Incentive	1,706	1,331	1.00	1,706	0.78	1,331
Gas Optimization	0	0	0	0	1.02	0
GPY5 Total	**30,591**	**28,733**	**1.00**	**30,596**		**29,003**

Source: Evaluation analysis of GPY5 program tracking data (July 19, 2016 data extract) and Illinois Statewide Technical Reference Manuals.

[27] The term "Ex Ante" refers to the forecasted savings reported by the Program Administrator that have not been independently verified through evaluation. Savings that have been independently verified by the Evaluation Contractor are referred to as "Verified".
[28] Verified Gross Realization Rate (RR) = Verified Gross Savings/Ex Ante Gross Savings.
Verified Gross Savings = RR * Ex Ante Gross Savings
[29] The Net-to-Gross Ratio (NTGR) used for calculating verified net savings is deemed prospectively through a consensus process managed by the Illinois Energy Efficiency Stakeholder Advisory Group (SAG). Deemed NTGRs (as well historical verified gross Realization Rates) are available at:
http://ilsagfiles.org/SAG_files/NTG/2015_NTG_Meetings/Final_2015_Documents/Peoples_Gas_and_North_Shore_Gas_NTG_Summary_GPY1-5_2015-03-01_Final.pdf
[30] Verified Net Savings = NTGR * Verified Gross Savings

5. PROCESS EVALUATION

Navigant's GPY5 process research activities for the PGL and NSG MF Programs included interviews with program management to verify our understanding of the program design, administration, marketing, and delivery. The evaluation team conducted a CATI survey with customer decision makers and in-depth interviews with trade allies (TAs) to research questions pertaining to NTG and process evaluation. The NTG research approach and findings are further enumerated in Appendix 7.1.2. Process research addressed the following topics:

1. Program participation and barriers for trade allies
2. Graduation from direct install to comprehensive measures
3. Opportunities for program improvement
4. Marketing and program awareness
5. Customer and trade ally satisfaction with the programs and major program components
6. Differences between property managers and owners in decision making and satisfaction

To alleviate the burden on TAs' time, the evaluation team did not research certain topics that we had planned to investigate, including decision makers' understanding of roles and responsibilities regarding delivery paths, and assistance with other facilities in Chicagoland.

The evaluation team completed a NTG and process survey with 59 participants from a randomized sample of 450 participants with unique account names. Of these participants, eight percent included incorrect contact data and 15 percent refused to be surveyed. As shown in Table 5-1, we experienced 25 percent refusals with the direct install/incentive/PTA path, and 29 percent with the incentive path.

Table 5-1. Decision Maker Participant Survey Disposition

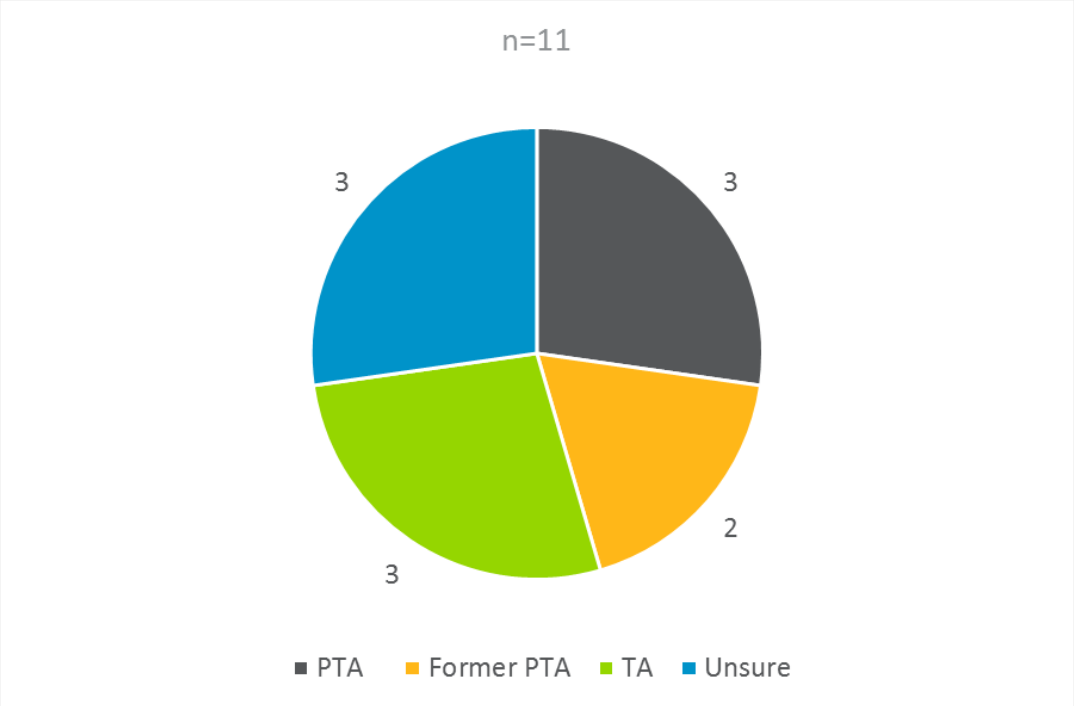
Disposition	Direct Install		Custom		DI+Incentives+PTA		Incentives		PTA		Totals	
	Instances	%	Instances	%	Instances	%	Instances	%	Instances	%	Instances	%
Wrong Number/Fax Number/Changed Number	27	9%	1	8%	1	8%	3	5%	4	6%	36	8%
No Answer/Busy/No Response/Unreachable	35	12%	1	8%	3	25%	16	25%	13	20%	68	15%
Refusal/Hostile Interrupt/Added to Do Not Call List	37	13%	1	8%	3	25%	18	29%	10	15%	69	15%
Not Available Permanently	2	1%	2	15%	0	0%	2	3%	2	3%	8	2%
Language Barrier	2	1%	0	0%	0	0%	0	0%	0	0%	2	0%
Left Voicemail	50	17%	1	8%	0	0%	10	16%	8	12%	69	15%
General or Scheduled Callback, not complete	31	10%	4	31%	2	17%	3	5%	17	26%	57	13%
Over Quota	82	28%	0	0%	0	0%	0	0%	0	0%	82	18%
Completes	30	10%	3	23%	3	25%	11	17%	12	18%	59	13%
Total	296	100%	13	100%	12	100%	63	100%	66	100%	450	100%

Sources: Navigant analysis

5.1 Trade Ally Participation

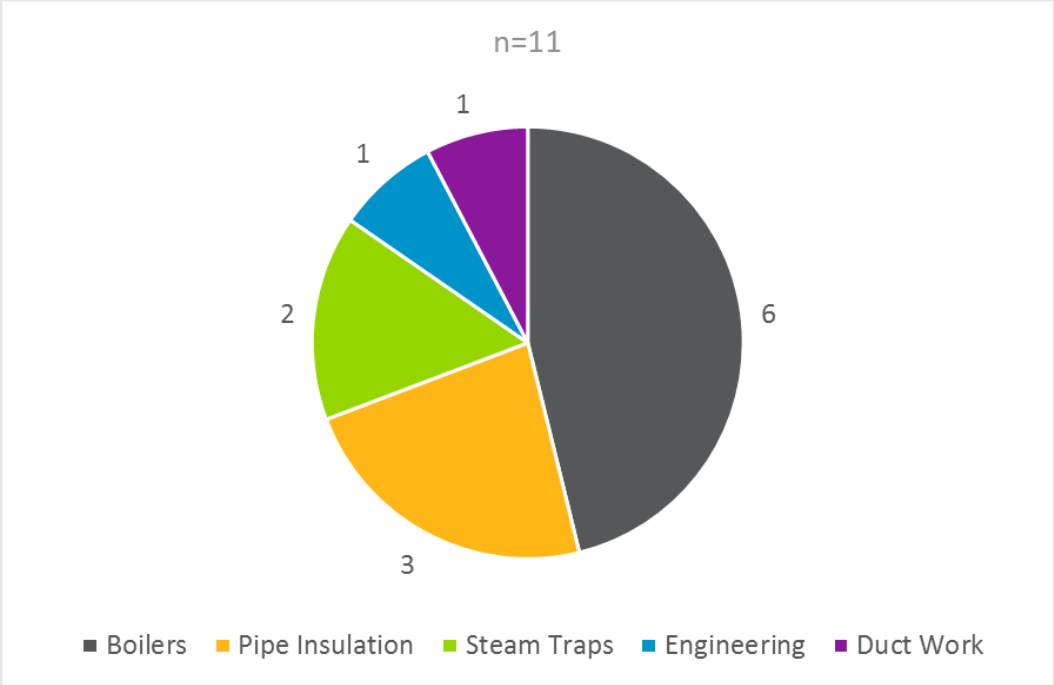
The program is designed in part around trade allies, with a "partner trade ally" (PTA) level that offers higher incentive amounts and the ability to apply rebates directly to the bill, saving customers the rebate up front. Navigant interviews with trade allies covered the topics of their participation experience and barriers to participation. Figure 5-1 shows the breakdown of interviewed trade allies by status. Typical of the three TAs who were unsure of their status, one said, "I am not sure if we are a PTA, I don't know the difference between that and just a TA." Service areas for the interviewed trade allies are shown in Figure 5.2.

Figure 5-1. Interviewed Trade Ally Status



Sources: Navigant analysis

Figure 5-2. Service Areas of Interviewed Trade Allies



Sources: Navigant analysis

Among the requirements to become a PTA is developing 200 direct install leads each year for the implementer, where each living unit counts as one lead. The business models for some of these trade allies – specialists in pipe insulation, boilers and steam traps – do not always accommodate the prerequisites to join the PTA-level trade ally program. The required 200 direct install referrals to the program's implementer was particularly challenging, as one former PTA said:

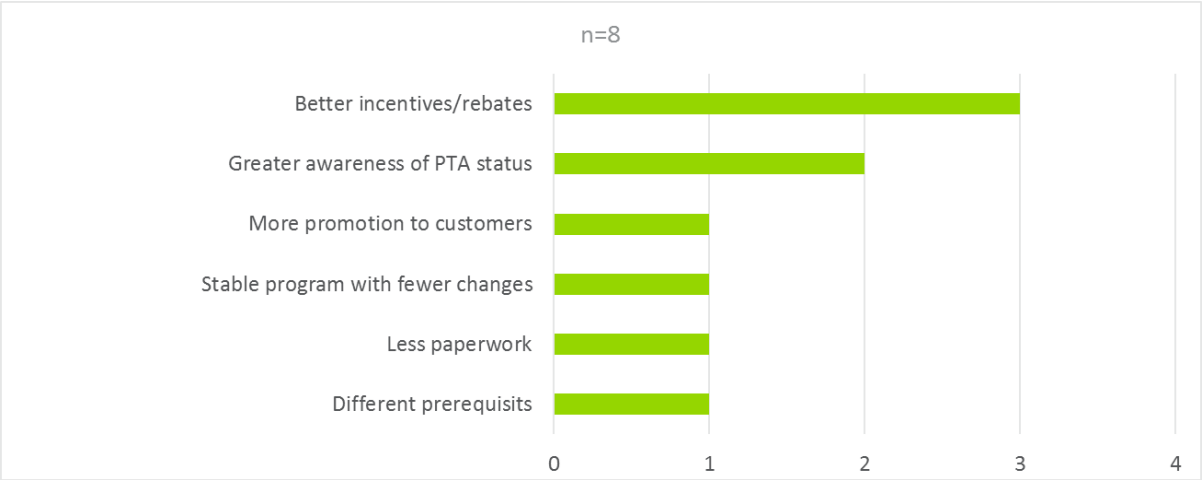
> "*It is very hard to stay a PTA, especially since we are working with these large boilers. We are in the mechanical room so we can't get into the individual apartments to look at the showerheads. It is a tough requirement, and it has knocked us out of the PTA for a few years now.*"

The three PTAs reported that the greatest benefit of the program was that they receive "preference for the better price levels for certain rebates," and one affirmed that they "really felt like a partner this year."

Trade allies suggested various inducements to becoming PTAs, shown in Figure 5-3. Trade ally comments about the barriers preventing them from PTA status included:

- "Too much paperwork and too many changes right now for some Trade Allies to become Partner Trade Allies."
- Low incentives and rebates, saying "Better incentives and better rebates would encourage [TAs to become PTAs]."

Figure 5-3. Recommendations to Encourage TAs to Become PTAs

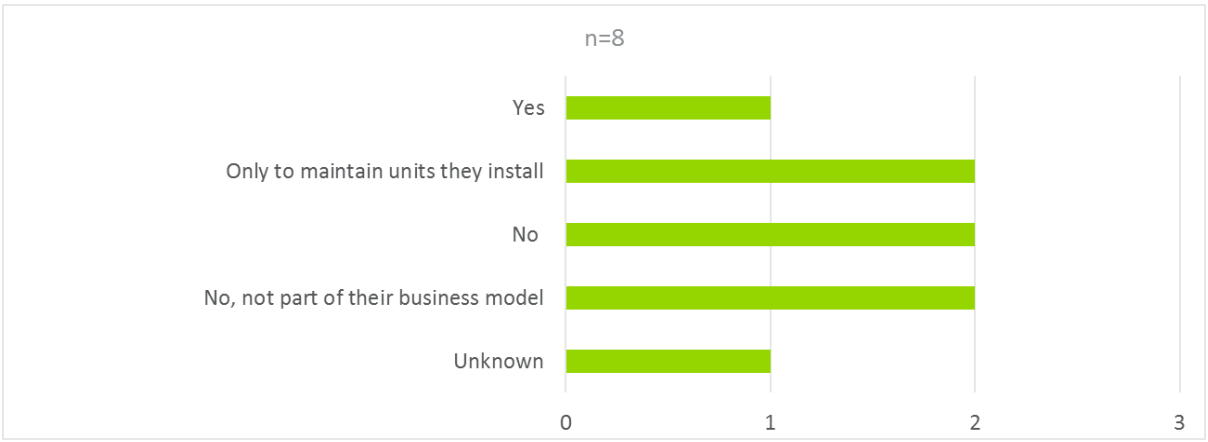


Sources: Navigant analysis

5.2 Graduation from Direct Install to Comprehensive Measures

The evaluation team asked TAs if they promote the comprehensive offerings to DI or Jumpstart customers. Fifty percent do not, another 25 percent would do so only to maintain the equipment they installed, as shown in Figure 5-4.

Figure 5-4. Will TAs Promote Comprehensive Paths to DI and Jumpstart Customers?



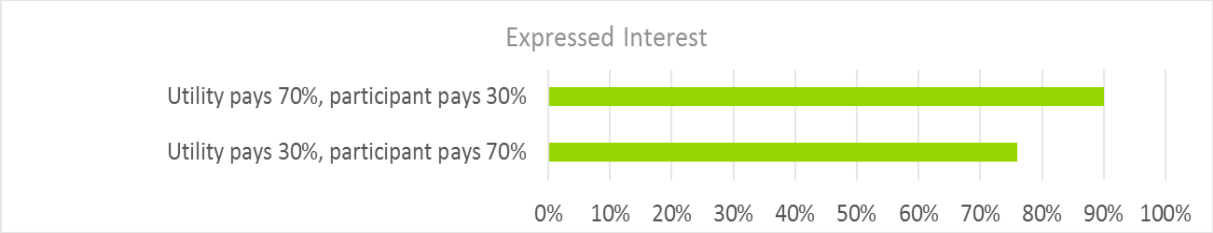
Sources: Navigant analysis

The evaluation team asked DI customer participants what their requirements were to install additional energy efficiency projects, and graduate from the DI path to rebates and optimization assessments. Ninety percent of the participants said that their only requirement was financial. One participant said that the only additional requirement was “getting the permits and using a contractor.” Another reported that, “[projects are considered] on an as needed basis, depending on how badly the upgrade needs to take place.”

To better understand the range of financial incentive required for participants to consider future projects, we asked if they would be interested in an energy efficient project where the utility pays a 30 percent

rebate for upgrades, and then asked about projects where the utility pays a 70 percent rebate. In both scenarios the participant was responsible for the remaining portion. As shown in Figure 5-5, 75 percent of participants expressed interest in a project with a 30 percent rebate. Interest rises another 15 percent when the utility rebates 70 percent of the project cost.

Figure 5-5. Impact of Utility Incentives on Interest in Projects

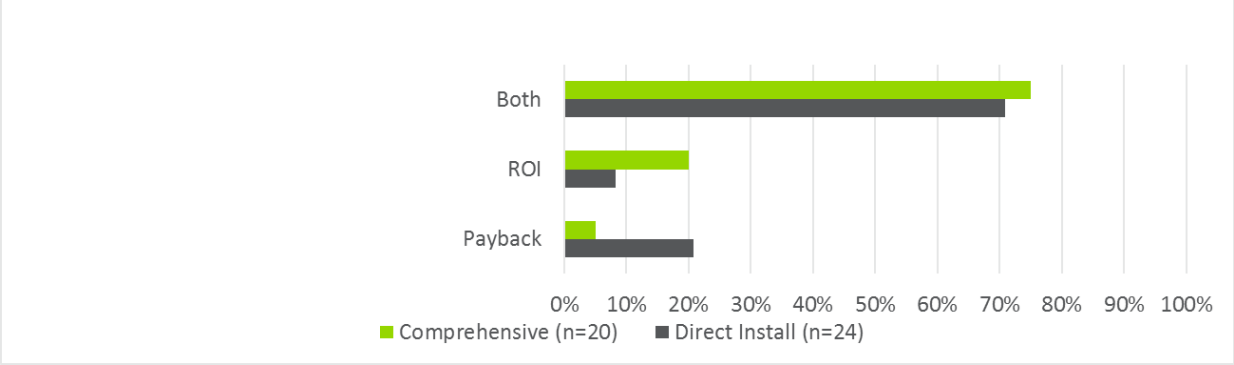


Sources: Navigant analysis

Conversely, TAs report that their customers require the difference between standard equipment and high efficiency upgrades to be covered with an incentive for the customer to consider the efficient product.

The evaluation team asked both Direct Install and rebate participants what financial criteria they use to evaluate energy efficiency projects. As shown in Figure 5-6, a significant majority reported that they consider both return on investment (ROI) and payback period. However, when asked to identify a typical required ROI for an energy efficiency project, 42 percent of participants cited a unit of time, rather than the appropriate percentage unit of measure, suggesting greater interest in the time it takes to recuperate energy efficient project expenses (payback) rather than considering these projects an investment (ROI).

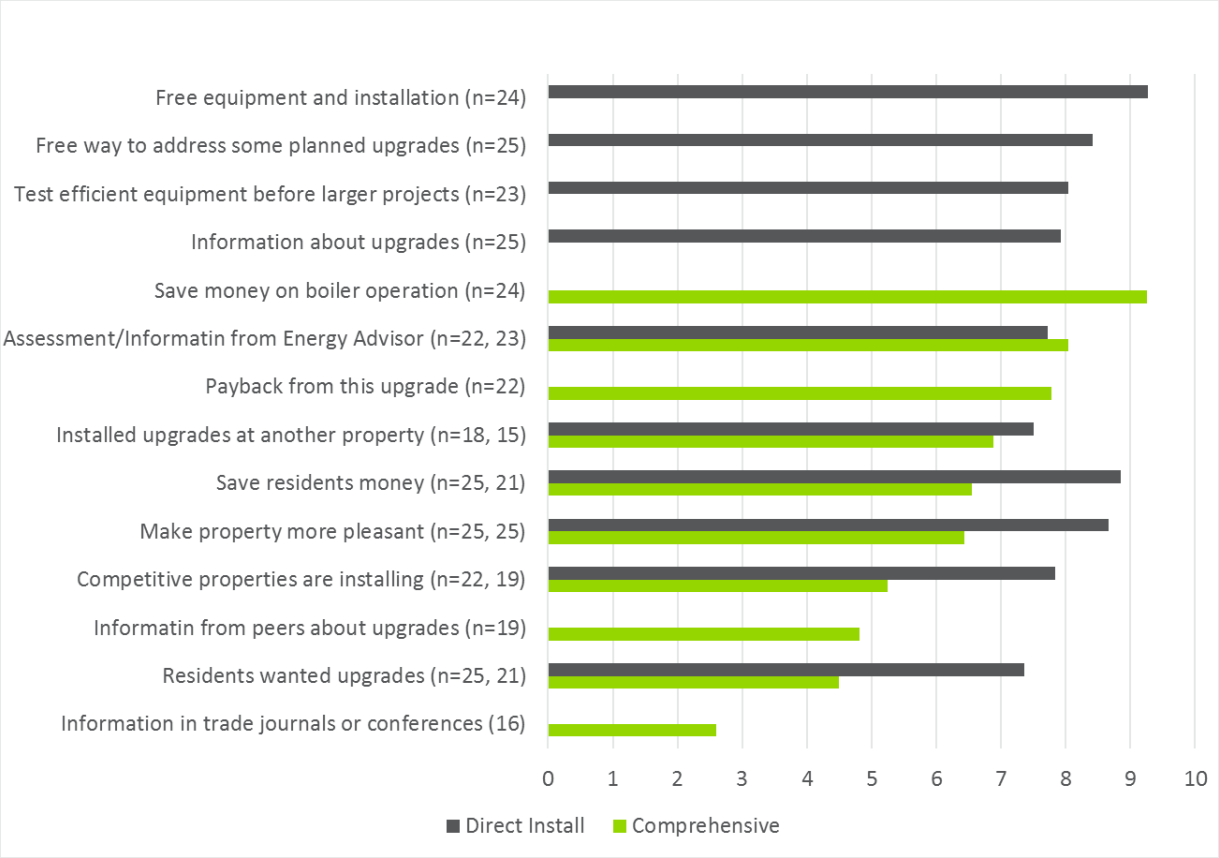
Figure 5-6. Financial Criteria Used to Evaluate Energy Efficiency Projects



Sources: Navigant analysis

The evaluation team expanded questions on motivating factors, asking participants to rate several possible motivators on a scale of 0-10, where 0 means not at all motivating and 10 means extremely motivating. As shown in Figure 5-7, the strongest motivators for both direct install and rebate participants are financial in nature.

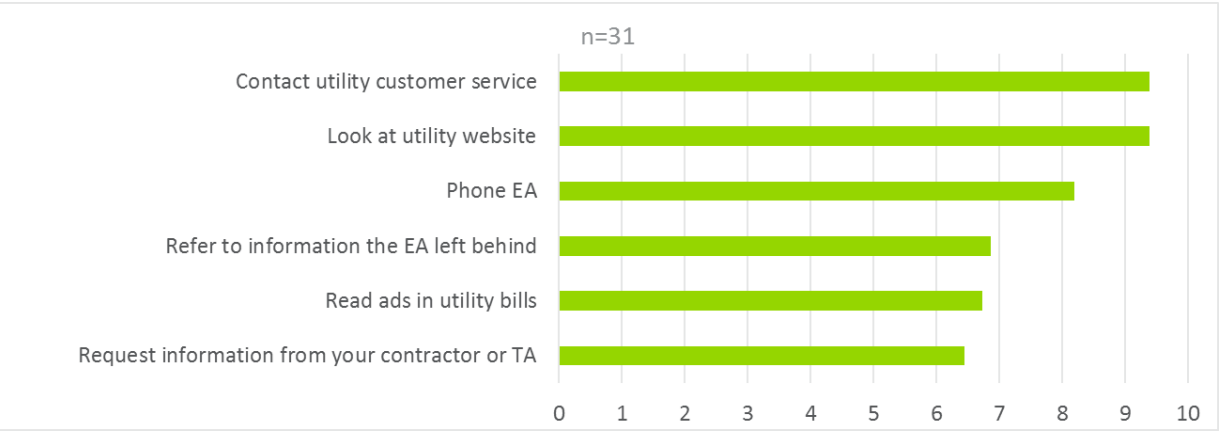
Figure 5-7. Motivators for Participation by Direct Install and Comprehensive Participants



Sources: Navigant analysis

The evaluation team also asked the DI participants where they would turn for information on a possible future energy efficiency project, as shown in Figure 5-8. While the program design is TA driven, the TA is the least likely place that participants would turn for information.

Figure 5-8. Preferred Information Sources for Future Energy Efficiency Projects

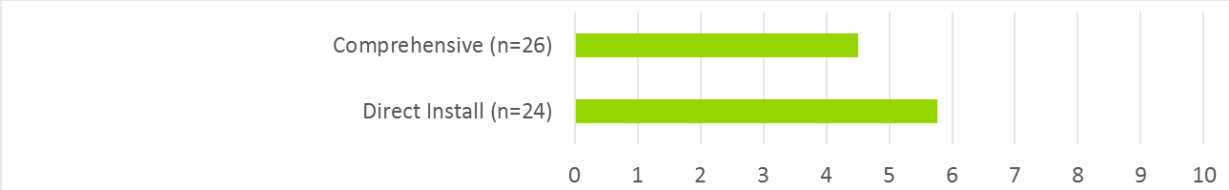


Sources: Navigant analysis

Neither the DI nor the Comprehensive participants expressed strong interest in Building Operator Certification training that focused on energy efficiency building operations and preventative maintenance.

Their average interest level, shown in Figure 5-9, was rated on a scale of 0-10, where 0 meant not at all interested and 10 meant extremely interested.

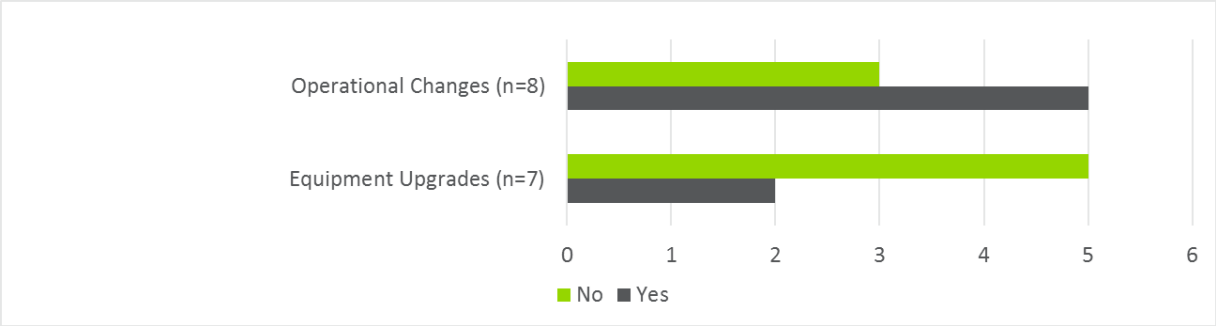
Figure 5-9. Participant Interest in Building Operator Training



Sources: Navigant analysis

The evaluation team asked TAs if they encourage their customers to make operational changes or install equipment upgrades to improve energy efficiency without the benefit of an incentive. Five of eight, or 63 percent, encourage operational changes, while only two of seven, or 29 percent, encourage equipment upgrades without incentives, as shown in Figure 5-10.

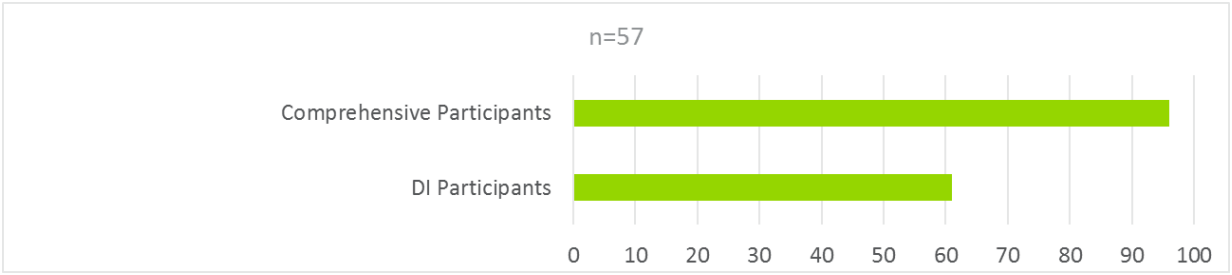
Figure 5-10. Will Trade Allies Encourage Energy Efficiency Improvements without Incentives



Sources: Navigant analysis

The evaluation team asked participants if their facilities were master metered, or individually metered to each apartment. Ninety six percent of the comprehensive participants have master metered facilities, compared to 61 percent of the DI participants, as shown in Figure 5-11.

Figure 5-11 Percent of Master Metered Facilities by Path



Sources: Navigant analysis

5.3 Barriers to Customer Program Participation

Trade allies reported that barriers preventing customers from engaging in this program are primarily financial in nature:

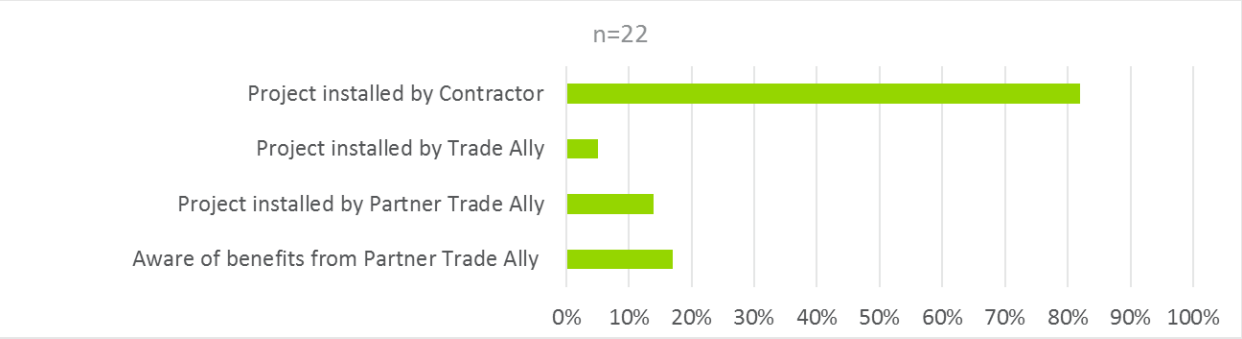
- Lack of funds or resources, cited by five TAs
  - "The price gap between the energy efficient and standard equipment may be too large even with the rebate."
  - "Lack of funds due to all their other work they need to do. Rebates essentially help the customers pay for an upgrade."
- Insufficient incentives, cited by three TAs
  - "The rebate amount is a barrier to customers on high efficiency water heaters and high efficiency condensing boilers."

Additional barriers include a lack of familiarity with the program that prevents skeptical people from participating because they "think it sounds too good to be true."

5.4 Marketing and Program Awareness

Rebate participants are marginally aware of trade ally status. Seventeen percent said that they were aware that a partner trade ally could offer a higher rebate with the option of taking the rebate amount directly off the bill. When asked if a partner trade ally, trade ally or contractor installed the most recent energy efficiency project, 82 percent of the rebate participants responded that a contractor served them, as shown in Figure 5-12.

Figure 5-12. Participant Awareness of Trade Ally Status

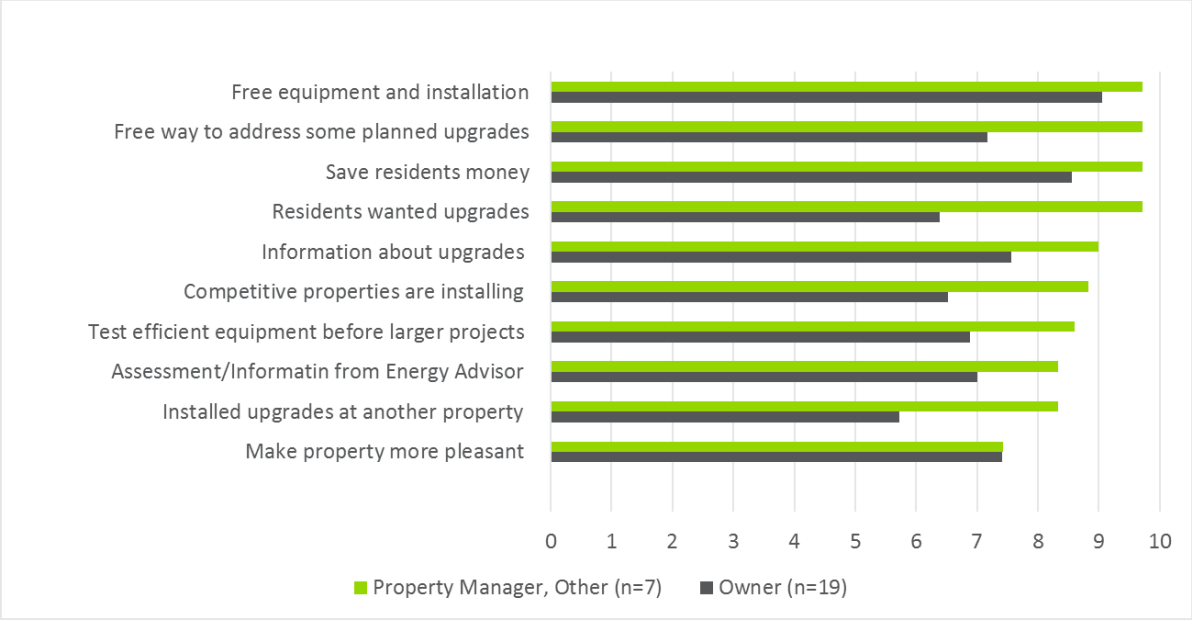


Sources: Navigant analysis

5.5 Property Managers' and Owners' Motivations

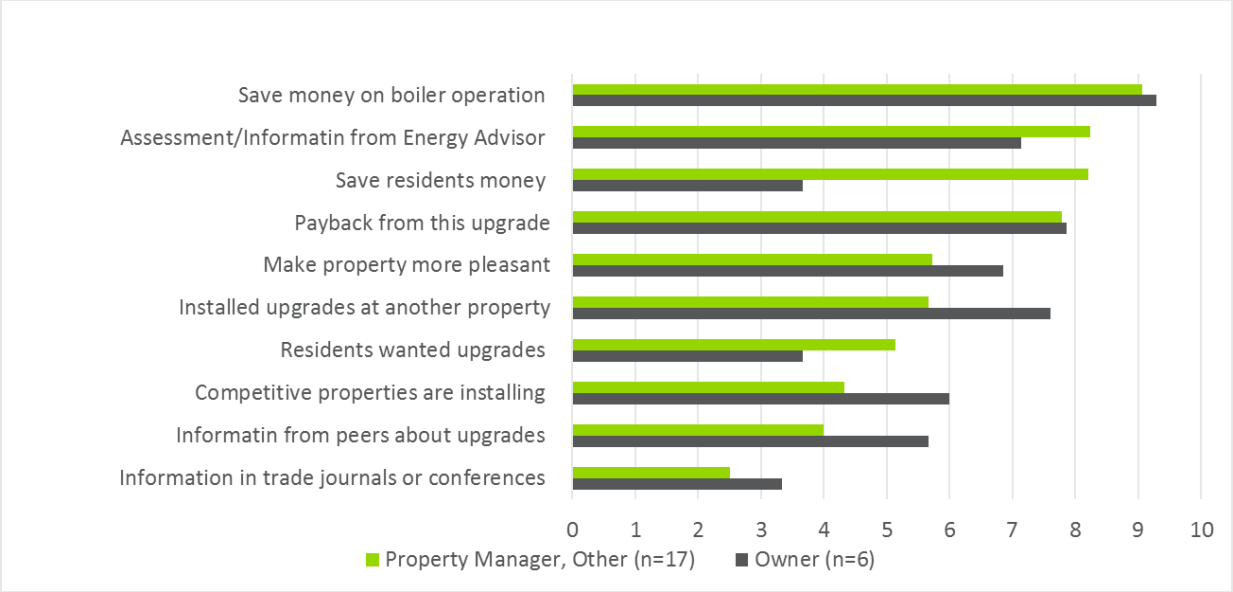
The evaluation team addressed the question of possible differences in the way that multi-family complex owners and property managers may make decisions about energy efficiency projects, and how they would proceed with a project. Survey respondents were asked to rate the factors that may motivate participation in a project on a scale of 0-10, where 0 meant "not at all motivating" and 10 meant "extremely motivating." We further divided the participants into a direct install cohort and a rebate cohort, as shown in Figure 5-13 and Figure 5-14.

Figure 5-13. Motivating Factors for Direct Install Participants, Property Manager and Owner



Sources: Navigant analysis

Figure 5-14. Motivating Factors for Rebate and Custom Participants, Property Manager and Owner



Sources: Navigant analysis

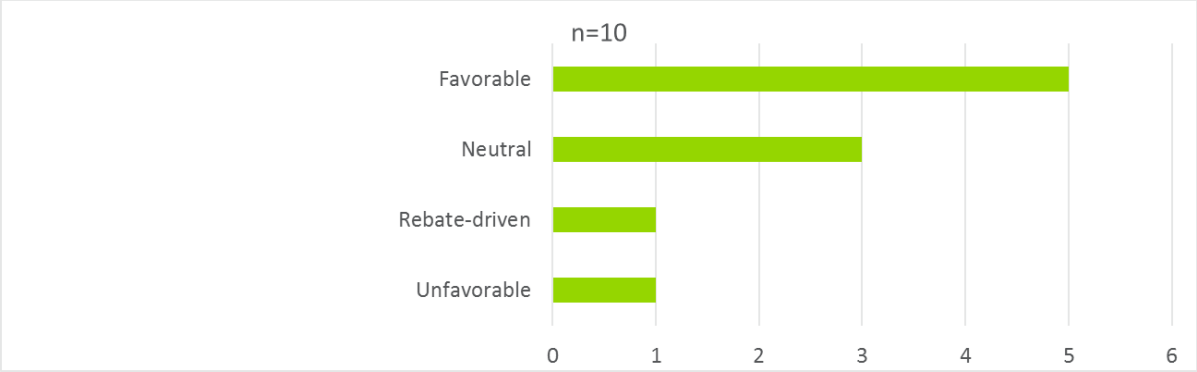
Trade allies report that the approach they take with an owner is different from a property manager or chief engineer. Though no one position is more approachable with energy efficiency projects, each has their own perspective which must be addressed. Working with a Board can be more challenging for TAs than individuals: “[It was] really nice when it used to be one owner who had 5 buildings, but now it is usually one building with 30 owners, and you have to deal with the condo board” and “we couldn’t get the board of the multifamily condo association to agree on anything.”

5.6 Satisfaction with the Program and Major Components

Trade allies rated their satisfaction at an average 8.45 with the program on a scale of 0-10, where 0 meant not at all satisfied, and 10 meant very satisfied. Three TAs rated the program a ten. When asked how other TAs perceived the program, half the responding TAs reported a favorable perception, as shown in Figure 5-15. Comments from trade allies include:

- "I would just say Franklin Energy have been really supportive and helpful. Have dealt with any questions we have."
- "It is helpful to close business, and also gives a sense of validity to the energy savings. A third-party coming up with a calculation on energy savings can be helpful for credibility."
- "Very satisfied with boilers. But for the rest, like steam traps and certain requirements, it is just not worth my time."
- "If I could change one thing, it would be this scheduling problem. We had to ask for extensions on projects when it wasn't possible for us to do the project in the allotted time frame to begin with."

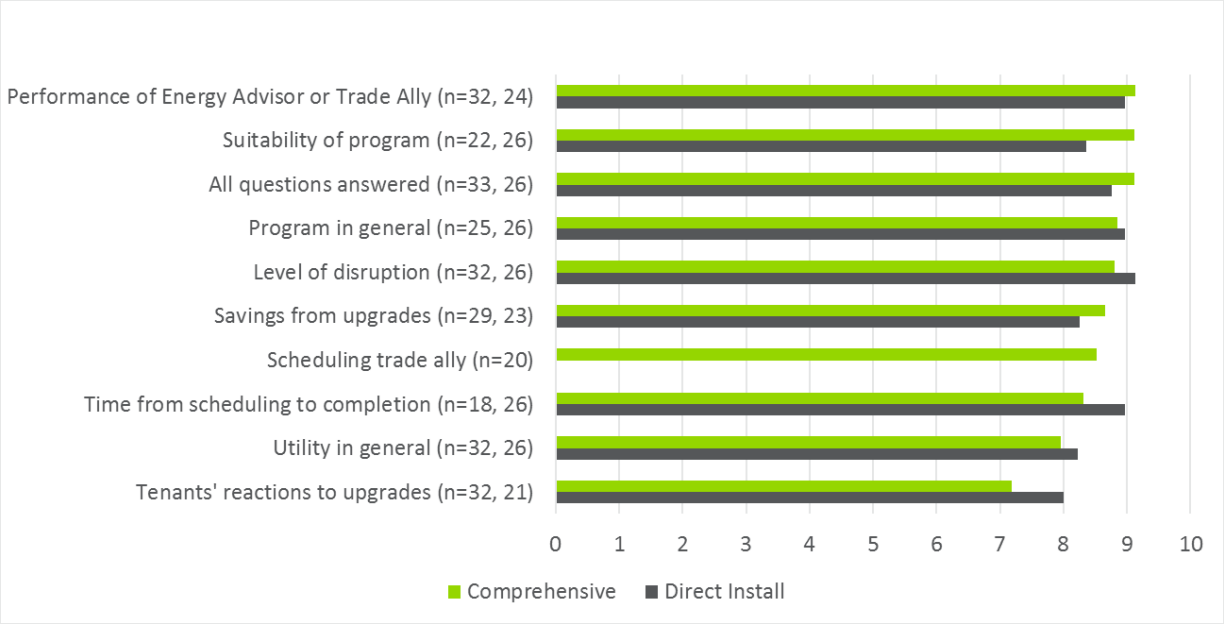
Figure 5-15. Perception of the Program by Trade Allies



Sources: Navigant analysis

The evaluation team asked participants about their satisfaction with various elements of the program and the program as a whole. Participants were asked to rate their satisfaction on a scale of 0-10, where 0 meant "not at all satisfied" and 10 meant "very satisfied," with results shown in Figure 5-16. Satisfaction was high for participants in the rebate paths, with all elements rated over an eight other than the tenants' reactions to the upgrades and the utility in general. Direct Install participants rated all elements at or over eight.

Figure 5-16. Participant Satisfaction by Direct Install and Comprehensive Paths



Sources: Navigant analysis

Recommendations to improve the program from the Comprehensive participants centered around rebates and communication:

- Rebate amounts
  - "*The program should give fewer grants and make the incentive larger*."
- Communication about rebate availability
  - "*More consistent rebates … because every year it's different and … you can't prepare*."
- Communication about the program process
  - "*You're never sure if you're going to get the rebate. There always seemed to be something else you need, or the contractor isn't absolutely sure*."

DI participant recommendations to improve the program centered around creating greater awareness for the program, with a participant stating, "they need to make people more aware of the program and energy efficient upgrades."

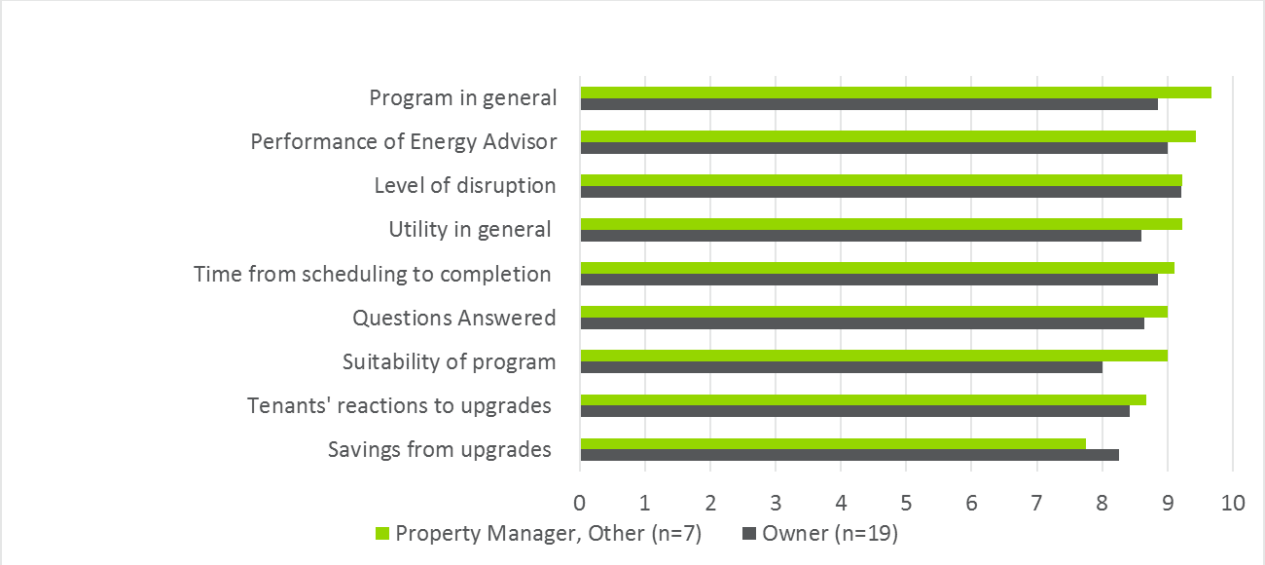
Three trade ally recommendations to improve the program centered around rebates and marketing:

- Rebates
  - *"Close the price gap on the high efficiency hot water heaters because they are very expensive, as well as close the gap on high efficiency condensing boilers*."
- Marketing the Program
  - "*Marketing from Peoples Gas would make this program much more believable to the management companies because they don't believe us when we tell them they can get something for nothing*."

As part of our consideration of differences between the owners and property managers participating in the DI and rebate paths, the evaluation team segmented these groups, as shown in Figure 5-17 and Figure 5-18.

Property managers participating in the direct install path were more satisfied than the owners on all program elements other than savings from the upgrades.

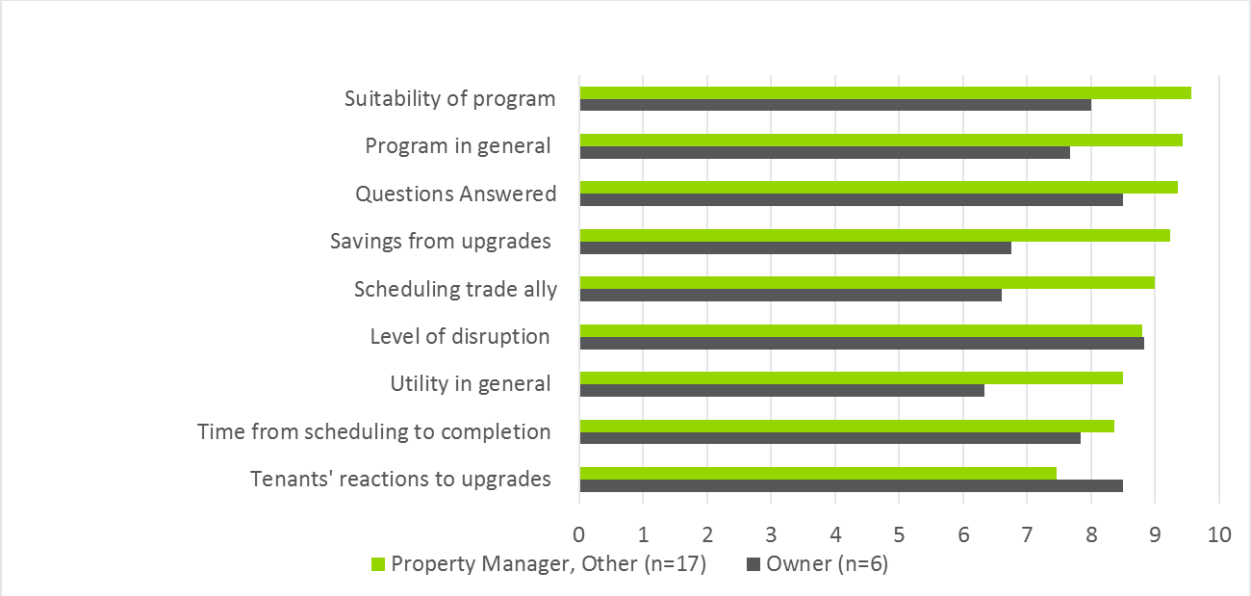
Figure 5-17. Direct Install Participant Satisfaction by Property Manager and Owner



Sources: Navigant analysis

Differences between the property manager and owners' responses were more pronounced within the rebate path, with property managers reporting higher satisfaction of over two points than owners in scheduling the trade ally, savings from the upgrades, and the utility in general.

Figure 5-18. Comprehensive Participant Satisfaction by Property Manager and Owner



Sources: Navigant analysis

6. FINDINGS AND RECOMMENDATIONS

The following provides insight into key program findings and recommendations.

Verified Gross Impacts and Realization Rate

Finding 1. Navigant estimated 2,008,007 therms as the overall verified gross savings for the GPY5 Peoples Gas Multi-Family Program from the five program delivery paths. This translates to a 103 percent gross realization rate compared to the ex ante gross savings derived from the program tracking system. The North Shore Gas Program achieved 30,596 therms verified gross savings at a 100 percent gross realization rate.

Finding 2: Navigant adjusted the custom savings for five of the 10 custom and gas optimization projects in the PGL Program. Overall, the PGL custom measures achieved 103 percent realization rate, based on findings from usage and billing analysis and engineering verification of savings input assumptions. We also adjusted the savings for the TRM deemed measures including savings from steam pipe insulation and boiler measures and controls due to adjustment of the input assumptions. We identified some custom calculation errors that require attention.

Recommendation 1. Hours of operation used in the custom analysis calculations for space heating measures should be based on specific schedules or categorized appropriately with the period of the HVAC use. Adding boiler operation hours in the summer overestimates savings, as we found from the review of one custom project.

Recommendation 2. Additional quality control of the custom calculation workbooks could prevent small errors we observed, such as switching minimum and maximum input values, or sign changes in referenced equations leading to inaccurate heating cooling loads and savings claimed.

Recommendation 3. Include set point temperatures in documentation or calculation workbooks that are helpful in accurately recreating savings with billing analysis. Additionally, separating billing data to only include those projects being evaluated would be helpful to accurately recreate savings.

Verified Net Impacts

Finding 3. Navigant found that the ex ante net savings from direct install and prescriptive paths reported in the tracking system were derived from GPY4 deemed NTG values which were lower than the GPY5 deemed values. Using the corrected values and others deemed for the PTA and custom paths, Navigant estimated 1,909,484 therms overall verified net savings for the PGL program, and 29,003 therms for the North Shore Gas Program. If undetected, the error would have reduced the PGL verified net savings by 16,532 therms and NSG verified net savings by 267 therms.

Recommendation 4. Ensure that the deemed NTG input values in the tracking system used to estimate ex ante net savings are appropriately linked to the corresponding program year they were approved for. Navigant derives the measure level ex ante gross savings from net savings reported in the tracking system and compares that with verified gross savings. A wrong input of NTG values could affect Navigant's estimate of ex ante gross savings and gross realization rates.

Tracking System Review

Finding 4. We verified the tracking system was collecting the necessary information for calculating the program savings. We found certain measures where savings algorithm inputs were inconsistent with the Illinois TRM (4.0) or Franklin Energy's "Master Measure Database" spreadsheet (MMDB)[31] that documents their approach to compliance with the TRM. Our adjustments reduced the savings from programmable thermostats for boiler systems. Steam pipe insulation savings went up after removing duplicate input parameters. Other boiler measures and controls had minor adjustments.

Recommendation 5. Ensure the algorithm inputs for programmable thermostats for boiler systems are correctly applying multi-family factors, not single-family inputs, and revise the boiler system efficiency input from 61.6 percent to 81.9 percent. Update the default MMDB workbook to remove duplicate algorithm inputs and savings calculation for pipe insulation.

Recommendation 6. For projects with savings estimates capped at 20 percent of the facility annual energy usage, the program should create a supplemental database or revise the tracking system to provide detailed information of the projects annual energy usage, types of measures installed and custom savings inputs, if different from deemed TRM inputs.

Program Volumetric Findings

Finding 5. The Peoples Gas GPY5 Multi-Family Program involved 1,259 decision maker accounts who implemented 9,658 projects and 26,528 measures. The North Shore Gas program reported 129 decision maker account with 329 projects from 1,022 measures. Overall, both PGL and NSG Programs reported fewer measures and projects compared with the previous year, partly due to Franklin Energy's mid-year adjustment of net savings goal and participation.[32]

Process Findings

Finding 6. Trade allies and participants were satisfied with the program. When asked to rate their satisfaction with the program on a scale of 0-10, TAs averaged 8.45 and participants averaged 8.9. When asked how other TAs perceived the program, half the responding TAs reported a favorable perception.

Finding 7. Forty five percent of all Customers rated receiving information about the Programs through the utility's website and/or customer service as Top Box, or an 8-10. They were least interested in receiving the information from TAs, with only 16 percent rating TAs as a Top Box source of information. The program is structured to depend on TAs for promotion.

Recommendation 7. Consider enhancements to the information on the programs posted on the utility websites to meet customer interest and demand. Examples include offering sections of the "Rebates & Programs" section of the utility website directed to multi-family owners and managers and linking to that section from the Property Managers page under the "Partners" section. The program would be thoroughly described within the proposed section, and offer contact information, testimonials and links to applications.

Finding 8. Trade allies' business models do not easily accommodate the PTA requirements, including that of offering DI leads to the implementer. The TAs work with the Comprehensive customers where a significant majority of the surveyed facilities are master metered, and

[31] PG&NSG MMDB PY5 - 04122016, produced by Franklin Energy

[32] Reviews from Q1 and Q2 EE Results and program supplemental information

seldom have the opportunity to develop leads while working on boilers, pipes and steam traps.

Recommendation 8. Consider restructuring the PTA requirements and benefits to encourage more of the existing TAs to participate.

Finding 9. Participant data included a significant amount of incorrect contact information, representing nine percent of our sample. Without correct contact information, we were not able to include these participants in evaluation research. The implementer may likewise have difficulty including this group in future outreach efforts.

Recommendation 9. The implementer should exert greater quality control over collecting participant information.

Finding 10. Some participants in the program were not open to taking the NTG and Process survey, as indicated by up to 29 percent of the Incentives path sample who refused to participate.

Recommendation 10. Participants should be made more aware that they may be surveyed as part of this program. Increasing awareness level may be coordinated with the evaluation planning schedule that typically targets a program year population for NTG surveys once each triennial (e.g., GPY5 Multi-family participants). Methods to increase their awareness may include mention in printed program material, applications, on-line information, as well as conveyance from the Energy Advisors and Trade Allies to the participants.

7. APPENDIX

7.1 Detailed Impact Approaches and Findings

7.1.1 Gross Impact Findings

Most of the GPY5 PGL and NSG MF Program measures and savings were deemed through the TRM (v4.0). The PGL program completed seven custom and three gas optimization projects, and the NSG program completed one custom project. The evaluation team performed engineering file reviews and analysis of the claimed savings for all 11 projects, including billing analysis for some projects. FES provided project documentation in electronic format for each project. Documentation included some or all of scanned files of hardcopy application forms and supporting documentation from the applicant (invoices, measure specification sheets, and vendor proposals), inspection reports and photos (where available), and calculation spreadsheets.

The engineering review of the algorithms used by the programs to calculate energy savings, and the assumptions that feed into those algorithms, were assessed and the savings evaluation approaches were classified into one of two categories, 1) reasonable and acceptable, or 2) needs revision based on evaluation findings. Further discussion took place with Franklin Energy staff to clarify the application information and other input data. The profile of the custom and gas optimization projects and summary of adjustments are provided in Table 7-1

Table 7-1. PGL and NSG GPY5 Multi-Family Custom and Gas Optimization Projects

Project ID	Utility	Measure Description	Ex Ante Gross (Therms)	Unweighted Verified Gross (Therms)	Unweighted Gross RR	Summary of Adjustment
812913	PGL	Boiler Replacement	4,628	4,073	88%	Thermal or overall efficiency doesn't line up in comparison analysis combustion. Additionally, the workbook uses the % total heating usage for the primary rather than secondary boiler.
917903	PGL	Garage DCV	21,602	24,881	115%	Billing analysis produces more savings.
999235	PGL	Economizer	7,067	7,067	100%	OK
1107927	PGL	Boiler Replacement	17,583	16,628	95%	Billing analysis adjustment
1180989	PGL	Tank Insulation	460	460	100%	OK
940358	PGL	Steam System Upgrades & Insulation	18,122	17,468	96%	The equation used was adjusted to subtract the first and second term of EL_base and EL_efficient. This slightly reduced savings by increasing the existing thermal efficiency.
958644	PGL	Linkageless Control	3,465	3,995	115%	Evaluation adjusted the min and max percentage of O2 controlled-they were switched. This changed the percentage excess O2 forecasted and increased the proposed combustion efficiency and increased savings.
942666	PGL	Building Heating Optimization	5,853	5,853	100%	OK
945566	PGL	Building Heating Optimization	7,729	7,729	100%	OK
967243	PGL	Boiler Sequence Controls Optimization	7,421	7,422	100%	OK
1119531	NSG	Tank Insulation	1,706	1,706	100%	OK

Source: Evaluation analysis of GPY5 program tracking data (July 19, 2016 data extract).

7.1.2 Net Impact Research Methods and Findings

Free Ridership and Spillover Research in GPY5

As part of the GPY5 evaluation, the evaluation team conducted free ridership and spillover research with 59 participating multi-family decision makers including property owners and managers, representing approximately ten percent of the GPY5 total program energy savings. The counts for completed interviews and sample design are outlined in Table 7-2. The participant survey instrument is included in Appendix 7.2.

Table 7-2. Net-to-Gross Research Decision Maker Survey Disposition

Free Ridership Stratum	NTG Interviews	NTG Sample Design	Population Decision Makers (w/unique contacts)
Direct Installation (DI)	30	40	296
Custom	3	3	13
Prescriptive (P)	11	12	63
Trade Ally (PTA)	12	13	66
DI+P+PTA	3	3*	12
TOTAL	**59**	**68**	**450**

Source: Evaluation analysis of programs data
* The NTG sample for the 3 respondents were analyzed under the DI, P or PTA categories

The evaluation assessed free ridership using a customer self-report approach following the Multi-Family free ridership algorithm for property managers (non-CFL method) adopted from the Illinois Statewide NTG Methodologies document (IL NTG Methods), presented in Illinois TRM V6.0.[33] We assessed the evidence of participant spillover based on certain spillover attribution conditions outlined in the IL NTG Methods. Attempts were made to quantify spillover using survey self-report data for measure description and quantities, while per unit savings values were drawn from the Illinois TRM and measure research.

In addition to the survey with multi-family property decision makers, the GPY5 research included interviews with 11 participating trade allies to learn about their experience with the program and gather evidence of spillover. We analyzed the TA responses to identify spillover savings attributable to the Multi-Family Program. The trade ally interview guide is included in Appendix 7.2.

The NTG ratio for each program path were calculated using the following algorithm.

NTG = 1 – Participant Free Ridership + Participant Spillover + Trade Ally Spillover

[33] Illinois TRM Version 6.0.

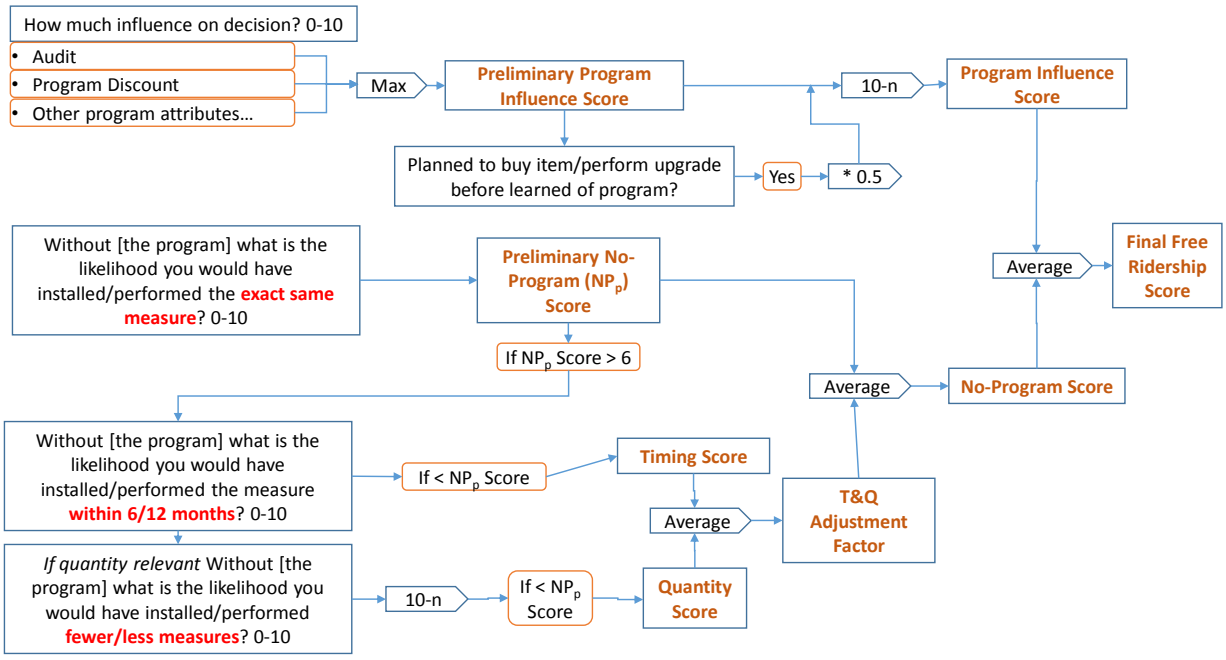
Free Ridership Scoring Algorithm and Specifications

The evaluation free ridership approach was based on the Illinois SAG Statewide NTG Methodologies document (IL NTG Methods), presented in Illinois TRM V6.0.[34] The core free ridership algorithm adopted from the Illinois IL NTG Methods consists of two scores that represent different ways of characterizing program influence or free ridership: the Program Components Score and the No Program Score. Program Influence component is assessed by asking respondents, on a scale from 0 (not at all important) to 10 (extremely important), how important they found various program elements, including the discount/rebate, audit or Trade Ally involvement, in their decision to carry out the energy-efficient project. The No-Program component captures the likelihood of various actions the customer might have taken at this time and in the future if the program had not been available.

Free Ridership Score = Average (Program Influence Score, No-Program Score)

Navigant compared the free ridership approach in the IL NTG Methods (TRM V6.0) with the algorithm in the TRM V5.0 protocol.[35] The key differences in TRM V6.0 are changes to how the program influence score is computed, and the replacement of the conditional Timing and Quantity Adjustment Factor with a straightforward No-Program score based on timing, efficiency, and quantity (if relevant). Figure 7-1 and Figure 7-2 below provide a flow diagram of the algorithms for determining the free ridership.

Figure 7-1. Multifamily Free Ridership for Property Managers—Non-CFL Measures TRM V5.0

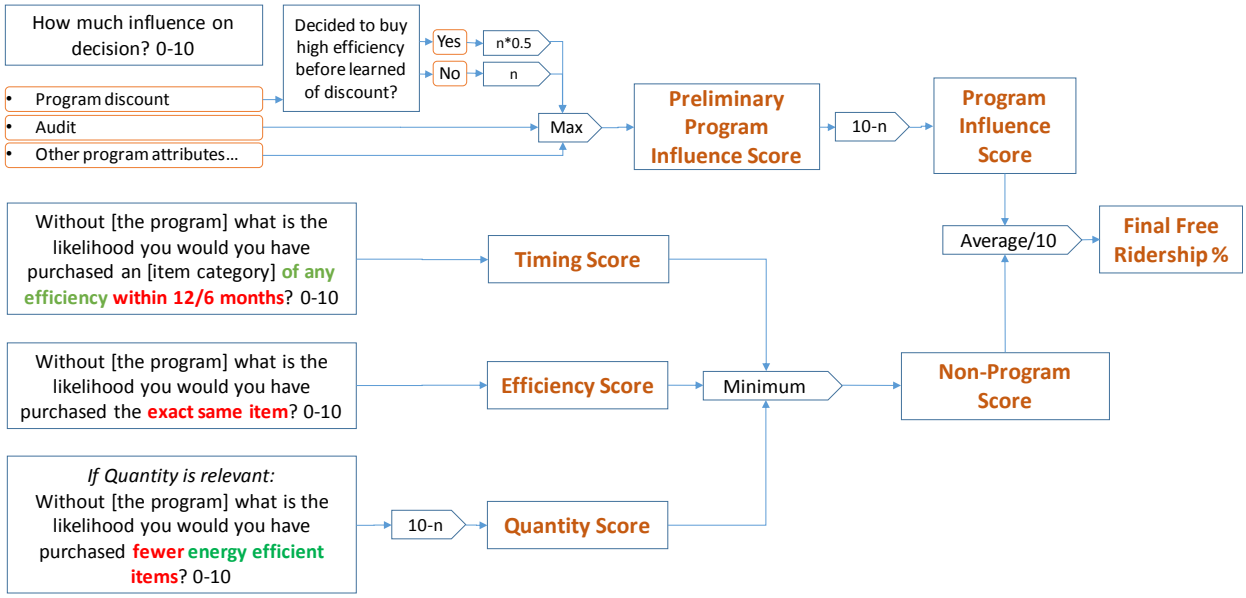


Source: IL TRM v5.0 Volume 4, February 11. 2016

[34] Navigant assessed free ridership using the NTG protocols outlined in the Illinois TRM Version 6.0.

[35] Illinois Statewide Technical Reference Manual for Energy Efficiency, Version 5.0, Volume 4: Cross-Cutting Measures and Attachments, effective June 1st, 2016

Figure 7-2. Multifamily Free Ridership for Property Managers—Non-CFL Measures TRM v6.0



Source: IL TRM v6.0 Vol. 4

Spillover Attribution Algorithm Specifications

The respondent decision makers were asked if they have taken any additional action to reduce the energy consumption at their property, since participating in the Multi-Family Program. Respondents were also asked since participating in the program if they have taken any additional action to reduce the energy consumption at other properties under their management.

Two key attribution scores are considered for spillover estimation based on the following questions.

> **Attribution Score 1**: How important was participants' experience in the program in their decision to implement this measure, using a scale of 0 to 10, where 0 is not at all important and 10 is extremely important?
>
> **Attribution Score 2:** If participant did not participated in the program, how likely is it that the participant would still have implemented this measure, using a 0 to 10 scale, where 0 means definitely would not have implemented this measure and 10 means you definitely would have implemented this measure?

Spillover was considered to be attributable to the Multi-Family Program if the following condition is met: the average of Attribution Score 1 and (10 - Attribution Score 2) must exceed 5.0.[36]

Navigant included questions to identify spillover candidates and measures, paraphrased below:

1. Since participating in the Multi-Family Program, have you taken any additional action to reduce the energy consumption at your property?

[36] Threshold criteria was based on Illinois TRM Version 6.0 NTG protocols. The Illinois NTG Methods (V5.0) provides that the average attribution score should exceed 7.0. This value has been revised to 5.0 in the TRM V6.0 protocol. Navigant agrees with the Illinois NTG Working Groups' recommendation for TRM V6.0 that 5.0 should be used as the threshold. Comparison of the spillover potential using the V5.0 and V6.0 did not produce any significant difference. Although using the V6.0 threshold enabled qualification of two more respondents, their spillover impact was minimal.

2. Please describe the energy efficiency upgrades at your property. Which types of additional energy efficiency upgrades did you install at your property? (NOTE TO INTERVIEWER: ASK FOR MAKE, MODEL AND EFFICIENCY RATING. IF RESPONSE IS GENERAL, E.G., "HEATING EQUIPMENT", PROBE FOR SPECIFIC MEASURE. PROBE FROM LIST, IF NECESSARY.)
3. What was the quantity of the new equipment installed?
4. What is the fuel source of the new equipment installed?

With the measures described and quantified, and based on the satisfaction of the attribution conditions, a spillover rate was calculated at the project level or at the program level using the following formula:

Spillover Rate = (ISO + OSO)/(Ex Post Gross Impacts)

where:

ISO = Inside Participant Spillover (additional program-induced EE measures that are eligible for, but did not receive, an incentive at a program project site).

OSO = Outside Participant Spillover (program-induced EE measures at sites within PGL/NSG's service territory at which program project measures were not implemented).

The evidence of spillover from the CATI participant survey is presented in Table 7-3.

Table 7-3. Multi-Family Program Spillover Evidence from the Participant Telephone Survey

Spillover Question	Evidence of Spillover
Since participating in the PG/NSG Multi-Family Program, have you taken any additional actions to reduce the energy consumption at your property (including other properties)?	Of the 59 survey respondents, 38 (45%) said "Yes" 32 of the 38 did not or their trade allies did not receive a utility rebate for this additional action. The respondents were asked further questions for spillover analysis
How important was your experience in the <PROGRAM> in your decision to implement this measure, using a scale of 0 to 10, where 0 is not at all important and 10 is extremely important? **This is Measure Attribution Score 1.**	Scoring for the 32 remaining candidates is as follows: (8) "Don't Know" (7) Rating of 0 to 3 (8) Rating of 4 to 7 (9) Rating of 8 to 10s
If you had not participated in the <PROGRAM>, how likely is it that your organization would still have implemented this measure, using a 0 to 10 scale, where 0 means you definitely WOULD NOT have implemented this measure and 10 means you definitely WOULD have implemented this measure? **This is Measure Attribution Score 2.**	Scoring for the 32 respondents is as follows: (10) "Don't Know" (3) Rating of 0 to 3 (4) Rating of 4 to 7 (15) Rating of 8 to 10s
Spillover Attribution Condition	The average of the Measure Attribution Score 1 and (10 – Measure Attribution Score 2) must exceed 5.0.
Spillover Candidates (influence greater than 5 from Attribution Score 1 and 2)	15 participants from the 32 respondents had attribution condition greater than 5 when Attribution Scores 1 and 2 are paired for specific measure designation. These participants installed 12 different types of gas equipment with quantifiable savings.
Of the 15 spillover candidates, evaluation reviewed additional responses to confirm candidate understood the question and may have had gas energy saving spillover projects in PGL and NSG territory.	When asked why did you purchase this equipment without an incentive, if it was available, the responses included: No time to participate, Needed equipment immediately; The equipment did not qualify; Did not know the program incentive was available; and other reasons.
Spillover Rate	Sample Spillover Savings/(Sample Ex Post Gross Impacts) Estimated 0.03 spillover rate. Navigant determined that the sample spillover rate is 0.03 when rolled to the population, and should be attributed to the programs.

Source: Evaluation analysis

Trade Ally Spillover Attribution Findings

From interviews with eleven Trade Allies, Navigant identified three who responded with a percentage of their sales that were potential spillover. To determine whether the sales were spillover, Navigant analyzed responses from additional questions including:

- approximate percentage of TA total sales of equipment that qualified for a Multi-Family Program rebate,
- what percentage did customers receive a rebate,
- how many of the TAs projects last year were eligible for a Multi-Family Program rebate but did not receive a rebate, and
- other questions detailed in the Interview Guide attached (Section 7.2).

Navigant determined that no spillover can be attributed to the program from the TA interviews and thus assigned a zero TA spillover.

Summary of Findings from Free Ridership and Spillover Research

In Table 7-4, Navigant presents a summary of the research findings from the free ridership and spillover analysis from participant decision makers of property managers and owners, and trade allies. Our estimates show a slight difference between the free ridership results of TRM V5.0 and TRM V6.
We also estimated participant a program-level spillover rate of 0.03 and applied that to respective NTG estimates for the various program paths. Navigant analysis of eleven trade ally spillover interview responses did not find any spillover attribution from trade allies.

Table 7-4. GPY5 NTG and Spillover Results by Program Path

NTG Methods	Program Path	Free Ridership (FR)	Participant Spillover (SO)	Trade Ally Spillover	Mean NTGR	NTG Sample	Relative Precision @90% CI
TRM (v5.0)							
	DI	0.16	0.03	0	0.87	40	15%
	Custom	0.40	0.03	0	0.63	3	7%
	Prescriptive (P)	0.18	0.03	0	0.85	12	10%
	Trade Ally (PTA)	0.23	0.03	0	0.80	13	13%
	Comprehensive Roll-up (P+PTA+Custom)	0.23	0.03	0	0.80		12%
TRM (v6.0)							
	DI	0.18	0.03	0	0.85	40	13%
	Custom	0.31	0.03	0	0.72	3	13%
	Prescriptive (P)	0.27	0.03	0	0.76	12	10%
	Trade Ally (PTA)	0.15	0.03	0	0.88	13	8%
	Comprehensive Roll-up (P+PTA+Custom)	0.19	0.03	0	0.84		11%

Source: Evaluation analysis

Navigant recommends that the free ridership and participant spillover results based on IL TRM V6.0 methodology be applied for future use. The Illinois NTG Working Group has reviewed IL TRM V5.0 and concluded the approach needed the modifications recommended in Illinois TRM V6.0.

7.2 Survey Instruments

7.2.1 Decision Maker Survey Instrument

Peoples Gas and North Shore Gas MULTI-FAMILY ENERGY SAVINGS PROGRAM (MESP) GPY5 PARTICIPATING DECISION MAKER SURVEY

Sept 7, 2016 Final

Purpose of this Survey Guide (not to be read to Participants)

The purpose of this survey guide is to collect information from participating customers in the Peoples Gas and North Shore Gas Multi-Family Energy Savings Program. Questions in this survey guide are designed to ask participating multi-family property managers or other decision-makers about their experience with the program. The table below outlines the sections, topics and questions of the interview guide to cross-reference them with the goals and objectives of the Multi-Family Energy Savings Program.

Survey Guide: Topics and Corresponding Questions

Section	Topics	Questions
Introduction and Screening Questions	Verification respondent is People Gas/North Shore Gas customer and measures in the tracking system were installed. Respondent status (owner or manager).	INTR1-INTR5; DI-CSR1-CSR3;
Sources of Program Awareness	How did the property manager learn about the program? What were the primary motivations for participating?	DI-SR1-SR2 C-SR1-SR2
Programmable Thermostat Free ridership	Free ridership of Programmable Thermostat Installation. How significant was participating in the Multi-Family Program on the decision-maker's choice to install the programmable thermostats?	PT_FR1-PT_FR6
Water Saving Product Skip Question	Question FR_SKIP1 allows the survey to skip free ridership questions for showerheads and faucet aerators if the program was similarly influential as for programmable thermostats	FR_SKIP1
Water Saving Product Free ridership	Free ridership of water saving products installation. How significant was participating in the Multi-Family Program on the decision-maker's choice to install the water saving products?	WSP_FR1-WSP_FR6
Hot water Pipe Insulation Free ridership	Free ridership of hot water pipe installation by PTA. How significant was participating in the Multi-Family Program on the decision-maker's choice to install the hot water pipe insulation?	PIPE1-PIPE6
Comprehensive Measure Free ridership	Free ridership of Comprehensive Measure installation/Implementation. How significant was participating in the Multi-Family Program on the decision-maker's choice to implement the comprehensive measure(s)?	COMP1-COMP6
Participant Spillover & Other Properties	Did the property manager implement energy efficiency measures at the property that did not receive a rebate? Did the property manager/management company adopt new measures or practices at other properties under management (that did not receive a rebate) after participating in the Multi-Family program?	SPILL 1-10 OP1-OP8
Process -- Delivery Path	Are property owners/managers aware of the different TA levels? How would they find a contractor/TA?	DI-DP1-DP6 C-DP1-DP4
Process – Graduation to Comprehensive	Are owners/managers interested in comprehensive programs? What payback would they require? When would they schedule it?	G1-G4
Customer Satisfaction	How satisfied are participating property owners/managers with aspects of the program? What opportunities exist to improve program processes to increase customer satisfaction?	DI-CS1-CS4
Firmographics	Is subject property master metered or individually metered? Do residents own or rent?	F1-F2

See the spreadsheet for lists of measures by Path.

Sample: Direct Install Survey Variables and Descriptions

Variable	Description
Primary_Project_Contact_Phone	Phone number of contact name
Account_Name_Phone	Phone number of account
Primary_Project_Contact_Email	Email of primary Contact
Site_Street.x; Site_City	Property Location (Address, City)
Retrofit1 Retrofit2 Retrofit3 Retrofit4	Programmable Thermostats Showerheads Faucet Aerators Pipe Insulation
COMP	Installed Comprehensive Measure
COMP_DESC	Read-in Description of Comprehensive Measure

INTRODUCTION AND SCREEN

[NOTE TO INTERVIEWER: Cross-reference names from program tracking database to ensure you indicate the property utilities.]

INTR1. Hello, this is **[INTERVIEWER'S NAME]** calling from the Blackstone Group on behalf of your local natural gas utility [INSERT PEOPLES GAS OR NORTH SHORE GAS]. ***This is not a sales call.*** We are contacting people who have participated in the Multi-Family Energy Savings Program.
As a thank you for your time and insights, you will receive a $15 gift card if you qualify for and complete our survey.

INTR2. The purpose of this call is to ask you about your satisfaction with the Multi-Family Energy Savings Program as it pertains to your property at **[Site_Street.x]**. We are conducting an independent study to evaluate the Program and would like to include your opinions. Your answers will be confidential and included with answers from other program participants. Your feedback will be used to help evaluate the effectiveness of the program and to design future programs. *We would be grateful for your participation in our research.*

[IF NEEDED: MESP provides a comprehensive one-stop shop to multi-family property managers and owners. A number of energy saving equipment are installed at no cost to participants including lighting in common areas, and in residential dwelling units, equipment such as water efficient faucet aerators and showerheads, programmable thermostats and pipe insulation. In addition, participants may receive rebates for installing energy efficiency improvements such as lighting, space heating, and/or water heating systems.**]**

Are you the person who is most familiar with your participation in this program?

1. YES [GO TO INTR5]
2. NO [GO TO INTR3]
3. REQUESTS MORE INFORMATION [GO TO INTR4]

98. DON'T KNOW [GO TO INTR3]
99. REFUSED [GO TO INTR3]

INTR3. Is there someone who may be more knowledgeable about the upgrades that I could speak with?

1. YES AND AVAILABLE [GO BACK TO INTR1]

2. YES AND BUSY [SCHEDULE CALLBACK]

3. YES AND BUSY [SCHEDULE GENERAL CALLBACK]

4. NO [TERMINATE – REFUSAL]

99. DON'T KNOW/REFUSED [TERMINATE]

INTR4. Your local gas and electric utilities sponsor the Multi-Family Energy Savings Program. The Illinois Commerce Commission (ICC) requires certain utilities to submit an evaluation report each year. These utilities hired our firm to prepare an independent evaluation of their energy efficiency programs. The information that we gather will help the ICC determine if existing programs should continue while assisting in the design of future programs.

1. SATISFIED WITH INFORMATION – CONTINUE [GO TO INTR5]

2. WANTS TO VERIFY STUDY [SCHEDULE CALLBACK]

3. WANTS TO VERIFY STUDY [GENERAL CALLBACK]

99. REFUSED [TERMINATE]

INTR5. In this survey, I will refer to the property at [Site address] as the "property."

(**IF NEEDED:** It will take about 20-25 minutes.)

[For the Screening and Process Module, ask DI questions for those participants in the Direct Install free ridership and spillover survey, and C questions for those participating in the Comprehensive free ridership and spillover survey. Ask DI-C questions for both DI Only and DI and Comprehensive participants.]

SCREENING QUESTIONS

DI-CSR1. The program records indicate that <Peoples Gas/North Shore Gas> provides natural gas service to your property at [site street.x], is this correct? If not, who provides your natural gas service? [**(RECORD UTILITY ANSWER AND FOLLOW SKIP LOGIC ACCORDINGLY)**

1. NORTH SHORE GAS

2. PEOPLES GAS

3. NICOR GAS [THANK & TERMINATE]

97. ANOTHER UTILITY: [SPECIFY_____] [THANK & TERMINATE]
98. DON'T KNOW [THANK & TERMINATE]
99. REFUSED [THANK & TERMINATE]

DI-CSR2. Are you the owner, or property manager, or do you have another role at this property?

1. Owner

2. Property Manager

3. Other Role (specify)

99. Refused

DI-CSR3. The program records show that during the visit to your property a field technician installed the following equipment. Please confirm that this is correct. Did you receive….**(READ ANSWERS FROM INSTALLATION LIST ON CUSTOMER RECORD)**

a. [IF Retrofit1, Retrofit2, Retrofit3 or Retrofit4] = Faucet aerators?

b. [IF Retrofit1, Retrofit2, Retrofit3 or Retrofit4] = Showerhead?

c. [IF Retrofit1, Retrofit2, Retrofit3 or Retrofit4] = Programmable thermostats?

d. [IF Retrofit1, Retrofit2, Retrofit3 or Retrofit4] = Pipe insulation?

1. Yes
2. No
98. DON'T KNOW
99. REFUSED

SOURCE OF PROGRAM AWARENESS

Direct Install Customers Only

DI-SR1 Thinking back to when you first heard about the Multi-Family Energy Savings Program, what motivated you to participate in the program? I'm going to list a few possible options:

Please rate each of the following options on a scale from 0 to 10, with 0 being not at all motivating and 10 being extremely motivating.

00 Not at all motivating
11 1
12 2
03 3
04 4
05 5
06 6
07 7
08 8
09 9
10 Extremely motivating
Don't Know
Ref
Not Applicable

[RANDOMIZE A-J]

A. The free equipment and installation?
B. The assessment from the Energy Advisor? (IF NECESSARY: Where someone walks through your property and provides a report with recommendations on how to save energy)
C. The information about possible energy efficiency upgrade projects for your facility?
D. You installed energy efficient upgrades at another property?
E. An easy way to test some energy efficiency before starting larger projects
F. A free way to take care of some the energy efficiency upgrades you were planning
G. Your residents wanted energy efficient upgrades?
H. You thought they might save your residents money?
I. You thought they might make the property more pleasant to live in?
J. Other properties like yours are installing energy efficient upgrades?
K. Something else [detail]

if any attribute in DI-SR1 is a score of 03,04,05,06,07,08,09,10. DI-SR2 What was the one most significant reason, if any, that interested you in this program? [Select from the above list]

DI + COMP OR COMP ONLY

C-SR1 Thinking back to when you were considering this project, what motivated you to participate in the program? I'm going to list a few possible options:

Please rate each of the following options on a scale from 0 to 10, with 0 being not at all motivating and 10 being extremely motivating.

00 Not at all motivating

11 1

12 2

03 3

04 4

05 5

06 6

07 7

08 8

09 9

10 Extremely motivating

Don't Know

Ref

Not Applicable

[RANDOMIZE A-I]

A. DI + COMP OR COMP ONLY The information from the Energy Advisor?
B. DI + COMP OR COMP ONLY You installed energy efficient upgrades at another property?
C. DI + COMP OR COMP ONLY Information from peers about similar projects?
D. DI + COMP OR COMP ONLY Information in trade journals or conferences about energy efficiency upgrades?
E. DI + COMP OR COMP ONLY The payback from this upgrade?
F. DI + COMP OR COMP ONLY Your residents wanted energy efficient upgrades?
G. DI + COMP OR COMP ONLY You thought they might save your residents money?
H. DI + COMP OR COMP ONLY You thought they might make the property more pleasant to live in?
I. DI + COMP OR COMP ONLY Other properties like yours are installing energy efficient upgrades?
DI + COMP OR COMP ONLY K.To save money on the boiler operation
J. DI + COMP OR COMP ONLY Something else [detail]

if any attribute in C-SR1 is a score of 03,04,05,06,07,08,09,10. C-SR2 What was the one most significant reason, if any, that most interested you in this program? [Select from the above list]

NET-TO-GROSS MODULE

PARTICIPANT FREE RIDERSHIP

The following questions are about the equipment that you installed through the Program at the property.

PROGRAMMABLE THERMOSTATS FREE RIDERSHIP

[ASK IF DI-CSR3C=01 (Programmable Thermostat)]

Program Influence Score (PI)

PT_FR1. Did you have specific plans to purchase and install PROGRAMMABLE THERMOSTATS in tenant units before learning about the program?

1. (YES)
2. (NO)
98. (DON'T KNOW)
99. (REFUSED)

PT_FR2 Next, I'm going to ask you to rate how important various program elements of the Program were in your decision to install the PROGRAMMABLE THERMOSTATS. Please use a scale from 0 to 10, where 0 means not at all important and 10 means extremely important.

[FOR 2a-d, RECORD 0 to 10; 96=Not Applicable; 98=Don't Know; 99=Refused]

(Prompt for a numeric rating if not given, for example "So what rating would that be on a 0 to 10 scale?"... If respondent says "We would not have done it", prompt with "So would you rate that a 0 on a 0 to 10 scale?")

[RANDOMIZE 2a – 2d] (READ SCALE IF NEEDED)

2a. The Free Energy Assessment of your property by an energy advisor from the Multi-Family Energy Jumpstart Program.

2b. The opportunity for installation of Free Energy Saving Products such programmable thermostats available from the Multi-Family Energy Jumpstart Program.

2c. The availability of Discounted Services and Project Rebates for equipment other than the free Jumpstart products.

2d. Information from the Program marketing materials

2h. Were there any other program elements we haven't discussed that were influential in your decision to install the PROGRAMMABLE THERMOSTATS?

[Record verbatim]

96 (Nothing else influential)

98 (Don't Know)

99 (Refused)

[ASK 2hh IF 2h=00]

2hh. Using the same zero to 10 scale, where 0 means not at all important and 10 means extremely important, how would you rate the influence of this factor (IF NEEDED: <2H_OpenEnd>)? [RECORD 0 to 10; 98=Don't Know; 99=Refused]

PT_FR3 In your own words, please tell me the influence the program had on your decision to install the PROGRAMMABLE THERMOSTAT.
[RECORD OPEN END]
No Program Score

PT_FR4. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have installed the exact same PROGRAMMABLE THERMOSTATS if you had not received them through the program? (ADJUSTED)

Not at all likely										Very likely	
0	1	2	3	4	5	6	7	8	9	10	DK

IF PT_FR4 > 6 ASK PT_FR5 AND PT_FR6

Timing and Quantity Adjustment Factors to No Program Score

PT_FR5. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have purchased and installed the same number of PROGRAMMABLE THERMOSTATS within 12 months if you had not received them through the program? (ADJUSTED)

Not at all likely likely										Extremely	
0	1	2	3	4	5	6	7	8	9	10	DK

PT_FR6. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have purchased and installed ***fewer*** PROGRAMMABLE THERMOSTATS if you had not received them through the program? (ADJUSTED)

Not at all likely likely	Extremely	

NAVIGANT

0	1	2	3	4	5	6	7	8	9	10	DK

@@@

END OF PROGRAMMABLE THERMOSTATS

[NOTE TO REVIEWERS: Question FR_SKIP1 allows the survey to skip free ridership questions for showerheads and faucet aerators if the program was similarly influential as for programmable thermostats]

If the respondent installed **only** a showerhead (and not a faucet aerator), we would not ask FR_SKIP1, and in the WSP_FR1 section we would pipe in only showerhead.

If the respondent installed only faucet aerator (and not a showerhead) we would not ask FR_SKIP1, and in the WSP_FR1 section we would pipe in only faucet aerator.

If the respondent installed a showerhead and faucet aerator, and they answer FR_SKIP1=1 then we can go through the WSP_FR1 section only for one loop and pipe in "showerheads and faucet aerators".

If the respondent installed a showerhead and faucet aerator, and they answer FR_SKIP1=2,98,99 then we can go through the WSP_FR1 section here we go through the loop twice, once piping in showerheads and one loop piping in faucet aerators.

For FR_SKIP1, **if the respondent has a Showerhead AND a faucet aerator in DI-CSR3.**

FR_SKIP1. Our program records indicate that you also installed **[Retrofit1, Retrofit2, Retrofit3, Retrofit4 = "**Showerheads"] and [**Retrofit1, Retrofit2, Retrofit3, Retrofit4 = "**Faucet Aerators**"].** Was the program as influential in your decision to install showerheads as it was in your decision to install faucet aerators or would you say the program influenced one product more than the other? (READ LIST)

1. The program was similarly influential for all free products installed **[SKIP TO WSP_FR4 and ask only one section]**
2. The water saving products involved a unique decision making process **[CONTINUE** and ask both sections.**]**

98. (DON'T KNOW) **[SKIP TO WSP_FR4** and ask both sections.**]**
99. (REFUSED) **[SKIP TO WSP_FR4** and ask both sections.**]**

WATER SAVING PRODUCTS FREE RIDERSHIP:
[ASK IF Retrofit1, Retrofit2, Retrofit3, Retrofit4 = SHOWERHEADS OR AERATORS] ASK SECTION TWICE IF THEY INSTALLED BOTH SHOWERHEADS AND AERATORS. INSERT THE APPROPRIATE MEASURE FROM THE DATABASE.

Program Influence Score (PI)

WSP_FR1. Did you have specific plans to purchase and install energy efficient, water saving <SHOWERHEADS and AERATORS> in tenant units before learning about the program?

1. (YES)
2. (NO)
98. (DON'T KNOW)
99. (REFUSED)

WSP_FR2 Next, I'm going to ask you to rate how important various program elements of the Program were in your decision to install the water saving <SHOWERHEADS/AERATORS>. Please use a scale from 0 to 10, where 0 means not at all important and 10 means extremely important.

[FOR 2a-d, RECORD 0 to 10; 96=Not Applicable; 98=Don't Know; 99=Refused]

(PROMPT FOR A NUMERIC RATING IF NOT GIVEN, FOR EXAMPLE "SO WHAT RATING WOULD THAT BE ON A 0 TO 10 SCALE?"... IF RESPONDENT SAYS "WE WOULD NOT HAVE DONE IT", PROMPT WITH "SO WOULD YOU RATE THAT A 0 ON A 0 TO 10 SCALE?")

[RANDOMIZE 2a – 2d] (READ SCALE IF NEEDED)

2a. The Free Energy Assessment of your property by an energy advisor from the Multi-Family Energy Jumpstart Program.

2b. The opportunity for installation of Free Energy Saving Products such as showerheads, aerators, and programmable thermostats available from the Multi-Family Energy Jumpstart Program.

2c. The availability of Discounted Services and Project Rebates for equipment other than the free Jumpstart products.

2d. Information from the Multi-Family Energy Jumpstart Program marketing materials

2h. Were there any other program elements we haven't discussed that were influential in your decision to install the water saving <SHOWERHEADS/FAUCET AERATORS>?

97 [Record verbatim]

96 (Nothing else influential)

98 (Don't Know)

99 (Refused)

[ASK 2hh IF 2h=00]

2hh. Using the same zero to 10 scale, where 0 means not at all important and 10 means extremely important, how would you rate the influence of this factor (IF NEEDED: <3H_OpenEnd>)? [RECORD 0 to 10; 98=Don't Know; 99=Refused]

WSP_FR3 In your own words, please tell me the influence the program had on your decision to install the <SHOWERHEADS/FAUCET AERATORS>

No Program Score

WSP_FR4. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely, how likely is it that you would have installed the exact same water saving <SHOWERHEADS/AERATORS> if you had not received them through the program? (ADJUSTED)

Not at all likely likely										Extremely	
0	1	2	3	4	5	6	7	8	9	10	DK

Timing and Quantity Adjustment Factors to No Program Score

IF WSP_FR4 > 6 ASK WSP_FR5 AND WSP_FR6

WSP_FR5. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have purchased and installed the same number of <SHOWERHEADS/AERATORS> within 12 months if you had not received them through the program? (ADJUSTED)

Not at all likely Extremely likely											
0	1	2	3	4	5	6	7	8	9	10	DK

WSP_FR6. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have purchased and installed ***fewer*** <SHOWERHEADS/AERATORS> if you had not received them through the program? (ADJUSTED)

Not at all likely Extremely likely	

0	1	2	3	4	5	6	7	8	9	10	DK

@@

END OF WATER SAVING PRODUCTS

[ASK IF DI-CSR3D=01 (Pipe insulation)]

HOT WATER PIPE INSULATION FREE RIDERSHIP SECTION

PIPE1. Did you have any specific plan to purchase and install energy efficient HOT WATER PIPE INSULATION before learning about the program?

1. (YES)
2. (NO)
98. (DON'T KNOW)
99. (REFUSED)

PI_FR2 Next, I'm going to ask you to rate how important various program elements of the Program were in your decision to install the HOT WATER PIPE INSULATION. Please use a scale from 0 to 10, where 0 means not at all important and 10 means extremely important.

[FOR 2a-e, RECORD 0 to 10; 96=Not Applicable; 98=Don't Know; 99=Refused]

(Prompt for a numeric rating if not given, for example "So what rating would that be on a 0 to 10 scale?"... If respondent says "We would not have done it", prompt with "So would you rate that a 0 on a 0 to 10 scale?")

[RANDOMIZE 2a-2e] (READ SCALE IF NEEDED)

2a. The Free Energy Assessment of your property by an energy advisor from the Multi-Family Energy Jumpstart Program.

2b. The opportunity for installation of Free Energy Saving Products such as showerheads, aerators, and programmable thermostats available from the Multi-Family Energy Jumpstart Program

2c. The availability of Discounted Services and Project Rebates for equipment other than the free Jumpstart products.

2d. Information from the Program marketing materials

2e Recommendation from a contractor or Partner Trade Ally that helped you with the choice of the equipment

2f. Were there any other program elements we haven't discussed that were influential in your decision to install the HOT WATER PIPE INSULATION?

97 [Record verbatim]

96 (Nothing else influential)

98 (Don't Know)

99 (Refused)

[ASK 2hh IF 2f=97]

2hh. Using the same zero to 10 scale, where 0 means not at all important and 10 means extremely important, how would you rate the influence of this factor (IF NEEDED: <3H_OpenEnd>)? [RECORD 0 to 10; 98=Don't Know; 99=Refused]

PI_FR3 In your own words, please tell me the influence the program had on your decision to install the HOT WATER PIPE INSULATION.

No Program Score

PI_FR4. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely, how likely is it that you would have installed the exact same PIPE INSULATION if you had not received a rebate through the program?

Not at all likely likely										extremely	
0	1	2	3	4	5	6	7	8	9	10	DK

IF PI_FR4 > 6 ASK PI_FR5 AND PI_FR6

Timing and Quantity Adjustment Factors to No Program Score

PI_FR5. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have purchased and installed the same quantity of PIPE INSULATION within 12 months if you had not received a rebate through the program?

Not at all likely Extremely likely											
0	1	2	3	4	5	6	7	8	9	10	DK

PI_FR6. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have purchased and installed ***less*** PIPE INSULATION if you had not received a rebate through the program? (ADJUSTED)

Not at all likely Extremely likely											
0	1	2	3	4	5	6	7	8	9	10	DK

@@@

END OF PIPE INSULATION

COMPREHENSIVE MEASURES FREE RIDERSHIP

(Replace “purchase and install” or “install” with “perform” IF RETROFIT1, RETROFIT2, RETROFIT3, RETROFIT4 = “boiler tune-up” or “stream system balancing” or boiler upgrade” or ‘furnace upgrade’)

COMPREHENSIVE MEASURES: Program Influence Score

COMP1. Did you have any specific plans to <purchase and install/perform> the energy saving [**Retrofit1**] before learning about the program?

1. (YES)
2. (NO)
98. (DON’T KNOW)
99. (REFUSED)

COMP2 Next, I’m going to ask you to rate the importance of <Peoples Gas/North Shore Gas> Multi-Family Energy Savings Program by asking how important various program elements were in your decision to <install/perform> the energy saving [RETROFIT1, RETROFIT2, RETROFIT3, RETROFIT4]. Please use a scale from 0 to 10, where 0 means not at all important and 10 means extremely important.
[FOR 2a-g, RECORD 0 to 10; 96=Not Applicable; 98=Don’t Know; 99=Refused]

(Prompt for a numeric rating if not given, for example "So what rating would that be on a 0 to 10 scale?"... If respondent says "We would not have done it", prompt with "So would you rate that a 0 on a 0 to 10 scale?")

[RANDOMIZE 2a-2g] (READ SCALE IF NEEDED)

2a. The Free Energy Assessment of your property by an energy advisor from the Jumpstart portion of the Multi-Family Energy Savings Program.

2b. The opportunity for installation of Free Energy Saving Products such as showerheads, aerators, and thermostats available from the Jumpstart portion of the Multi-Family program.

2c. The availability of Discounted Services and Project Rebates for equipment other than the free Jumpstart products.

2d. Information from program marketing materials

2e. Recommendation from a Partner Trade Ally or Trade Ally that helped you with the choice of the equipment

2f. Recommendation from an equipment vendor or contractor that helped you with the choice of the equipment

2g. DI + COMP OR DI ONLY Recommendation from an Energy Advisor

2h. Were there any other program elements we haven't discussed that were influential in your decision to <install/perform> the energy saving [RETROFIT1, RETROFIT2, RETROFIT3, RETROFIT4]?

97 [Record verbatim]

96 (Nothing else influential)

98 (Don't Know)

99 (Refused)

[ASK 2hh IF 2h=97]

2hh. Using the same zero to 10 scale, where 0 means not at all important and 10 means extremely important, how would you rate the influence of this factor (IF NEEDED: <3H_OpenEnd>)? [RECORD 0 to 10; 98=Don't Know; 99=Refused]

COMP3 In your own words, please tell me the influence the program had on your decision to <install/perform> the energy saving [RETROFIT.1, RETROFIT2, RETROFIT3, RETROFIT4].

No Program Score

COMP_FR4. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have <installed/performed> the exact same [RETROFIT1, RETROFIT2, RETROFIT3, RETROFIT4] if you had not received a rebate through the program?

Not at all likely										Extremely likely	
0	1	2	3	4	5	6	7	8	9	10	DK

IF COMP_FR4 > 6 ASK COMP_FR5 AND COMP_FR6

Timing and Quantity Adjustment Factors to No Program Score

COMP_FR5. On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have <purchased and installed/performed> the same number of [RETROFIT1, RETROFIT2, RETROFIT3, RETROFIT4] within 12 months if you had not received a rebate through the program?

Not at all likely Extremely likely											
0	1	2	3	4	5	6	7	8	9	10	DK

COMP_FR6*.* On a 0 to 10 scale, with 0 being not at all likely and 10 being extremely likely, how likely is it that you would have <purchased and installed/performed> ***fewer*** [RETROFIT1, RETROFIT2, RETROFIT3, RETROFIT4] if you had not received a rebate through the program?

Not at all likely Extremely likely											
0	1	2	3	4	5	6	7	8	9	10	DK

@@

END OF COMPREHENSIVE PROGRAM

SPILLOVER MODULE

PARTICIPANT SPILLOVER FOR ALL MEASURES

SPILL1. Since participating in the Multi-Family Energy Savings Program, have you taken any additional action to reduce the energy consumption at your property?

1. YES
11. NO **(SKIP TO OP1)**
98. (DON'T KNOW) **(SKIP OP1)**
99. (REFUSED) **(SKIP OP1)**

SPILL2. **[ASK IF SPILL1=1]** Did you receive a utility rebate for this additional action?

1. Yes **(SKIP TO NEXT SECTION)**
2. No (CONTINUE)
3. Project not yet complete (CONTINUE)

98. (DON'T KNOW) (CONTINUE)
99. (REFUSED) (CONTINUE)

[MULTIPLE RESPONSE, ASK SPILL4-SPILL10 FOR EACH SPILL3 MENTION]

SPILL3. Please describe the energy efficiency upgrades at your property. Which types of additional energy efficiency upgrades did you install at your property? [NOTE TO INTERVIEWER: ASK FOR QUANTITY (SPILL4) AND EFFICIENCY RATING (SPILL5). IF RESPONSE IS GENERAL, PROBE FOR SPECIFIC MEASURE. PROBE FROM LIST, IF NECESSARY.]

1. (Space Heating: Central Gas Furnace)
2. (Space Heating: Individual Unit Gas Furnace)
3. (Space Heating: Central Gas Boiler)
4. (Space Heating: Individual Unit Gas Boiler)
5. (Water Heating: Central Water Gas Heater)
6. (Water Heating: Individual Unit Gas Water Heaters)
7. (Space Heating: Boiler Tune-up)
8. (Space Heating: Furnace Tune-up)
9. (Space Heating: Steam Trap Replacement)
10. (Space Heating: Boiler Controls)
11. (Faucet Aerators: Faucet Aerators in common area bathroom(s))
12. (Faucet Aerators: Faucet Aerators in common area kitchen(s))
13. (Water Efficient Showerheads: Water Efficient Showerheads in common area(s))
14. (Programmable Thermostats)
15. (Hot Water Pipe Insulation Wrap)
16. (Space Heating: Air sealing material)
17. (Space Heating: Attic Insulation)
18. (Space Heating: Windows)

97 (Other, specify, note gas or electric)
96 (Didn't install any additional equipment)
98 (Don't know)
99 (Refused)

[IF SPILL3=1-6 & 8-97 ASK SPILL4]

SPILL4. What was the quantity of the new equipment installed? [0-1000, DK, REF]
[Insert responses from SPILL3, insert 0-1000 for each]
98. DON'T KNOW
99. REFUSED

[IF SPILL3=1-6 & 17-97 ASK SPILL5]

SPILL5. What was the efficiency rating of the new equipment installed? [0-100 AFUE/Thermal Efficiency, DK, REF]
[Insert responses from SPILL3, insert 0-100 for each]
98. DON'T KNOW
99. REFUSED

Skip to NEXT section IF SPILL3=96,98,99

SPILL6. Why did you purchase this equipment without an incentive, if it was available? (If needed, read back measure: <SPILL3 RESPONSE>). [MULTIPLE RESPONSE, UP TO 3] [PROBE FROM LIST, IF NECESSARY]

1 (Takes too long to get approval)
2 (No time to participate, needed equipment immediately)
3 (The equipment did not qualify)
4 (The amount of the incentive wasn't large enough)
5 (Did not know the program was available)
6 (There was no program available)
7 (Had reached the maximum incentive amount)
97 (Other, specify)
98 (Don't know)
99 (Refused)

SPILL7. How important was your experience in the <Peoples Gas'/North Shore Gas'> program in your decision to implement this equipment, using a scale of 0 to 10, where 0 is not at all important and 10 is extremely important? [0-10, DK, REF]

Not at all important										Extremely important	
0	1	2	3	4	5	6	7	8	9	10	DK

SPILL8. If you had not participated in the <Peoples Gas'/North Shore Gas'> program, how likely is it that you would still have installed this equipment? Please use a 0 to 10 scale, where 0 means you definitely would not have installed this equipment without the program and 10 means you definitely would have installed this equipment without the program. [0-10, DK, REF]

Definitely would not installed										Definitely would have installed	
0	1	2	3	4	5	6	7	8	9	10	DK

SPILL9. **[ASK IF SPILL7 > 6]** In your own words, how was the program influential in encouraging you to implement efficiency improvements in your property's [answer to SPILL3]? [OPEN END, DK, REF]

SPILL10. Was this action recommended to you by a representative of the Multi Family Energy Savings Program? (Note to interviewer: could include written or verbal recommendation, formal or informal)

1. Yes
2. No

98.(DON'T KNOW)
99.(REFUSED)

A. OTHER PROPERTIES

OP1. Since participating in the Multi-Family Energy Savings Program, have you taken action to reduce the energy consumption of any of the following systems at other properties under your management? **[RANDOMIZE 1-5] [MULTIPUNCH]**

1. Water Heating
2. Faucet Aerators
3. Water Efficient Showerheads
4. Programmable Thermostats
5. Hot Water Pipe Insulation

97. OTHER, SPECIFY
07. No **(SKIP TO** applicable section**)**
96. **NOT APPLICABLE/NO OTHER PROPERTIES (SKIP TO** applicable section**)**
98. (DON'T KNOW) **(SKIP TO** applicable section**)**
99. (REFUSED) **(SKIP TO** applicable section**)**

OP2. Did you receive a utility rebate for this action?

01 Yes **(SKIP TO** applicable section**)**

02 No (CONTINUE)

03 Received a rebate on some but not others (CONTINUE)

04 Project not yet complete (CONTINUE)

98. (DON'T KNOW) (CONTINUE)
99. (REFUSED) (CONTINUE)

OP3a-e. What was the quantity of the new equipment installed without a rebate? [0-1000, DK, REF]

[Answer for each OP1 response above]

_____

4. Was participating in the program a significant influence in encouraging you to implement efficiency improvements to your other property? Please rate this on a 0 to 10 scale where 0 means not at all significant and 10 means very significant. **[SCALE 0-10, DK, REF]**

Not at all significant										Very significant	
0	1	2	3	4	5	6	7	8	9	10	DK

OP5. Thinking about the measure with the greatest potential for reducing energy consumption, why did you purchase this equipment without an incentive, if it was available? [MULTIPLE RESPONSE, UP TO 3] [PROBE FROM LIST, IF NECESSARY] **[PROMPT IF NECESSARY].**

1 (Takes too long to get approval)
2 (No time to participate, needed equipment immediately)
3 (The equipment did not qualify)
4 (The amount of the incentive wasn't large enough)
5 (Did not know the program was available)
6 (There was no program available)
7 (Had reached the maximum incentive amount)
97 (Other, specify)

OP6. **[ASK IF OP4≥5]** In your own words, how was the program influential in encouraging you to implement efficiency improvements in your property's [first answer to OP1]? [OPEN END, DK, REF]

98 (Don't know)
99 (Refused)

OP7. What type of equipment did you replace? (NOTE TO INTERVIEWER: prompt if needed for the fuel source, make and model of old equipment, or fuel source and approximate age of the old equipment at the location) [OPEN END, DK, REF]

ACCEPT ANSWER IF THEY KNOW OP7B OR OP7C

OP7a. Fuel Source of old equipment [OPEN END, DK, REF]
OP7b. Make and model of old equipment OR [OPEN END, DK, REF]
OP7c. Approximate age of old equipment [OPEN END, DK, REF]

OP8. Where was the project located? (Prompt for: Name of property and address incl. street number, street name, city, state and zip code if possible)
[OPEN END, DK, REF]

PROCESS MODULE

B.

C. **PROGRAM DELIVERY PATHS**

D. DIRECT INSTALL ONLY PROGRAM PARTICIPANTS [NTGPC=1,5]

Now let me ask you about a few questions regarding the Multi-Family Program services.

[Note: The Energy Advisor is the person who installed the free items and conducted an energy assessment of the facility]

DI-DP1. Did the Energy Advisor offer you suggestions on additional upgrades to save energy?

1. Yes
2. No
3. Don't remember

98. DON'T KNOW
99. REFUSED

DI-DP2 [if DI-DP1=yes] On a scale of 0-10, where 0 means not at all helpful and 10 means extremely helpful, how helpful was this information in general [0-10]

DI-DP3 [if DI-DP1=yes] Was the information helpful in:

[RANDOMIZE A-E]

	0 - 10	Don't Know	Refused
A. Informing you about various energy efficiency option upgrades?			
B. Explaining the costs and benefits of energy efficiency upgrades?			
C. Directing you to a list of qualified trade allies			
D. Explaining the difference between rebates available with Partner Trade Allies and regular Trade Allies?			
E. Explaining how to take the next step when you are ready?			

DI-DP4 Let's assume you are thinking about starting a project with a utility rebate, and need information on the next step. Using a 0-10 scale, where 0 means "not at all likely," and 10 means "extremely likely" how likely are you to:
[RANDOMIZE A-E]

	0 - 10	Don't Know	Refused
A. Refer to information the Energy Advisor left behind			
B. Use the <Peoples Gas/North Shore Gas> program website			
C. Phone the <Peoples Gas/North Shore Gas> customer service			
D. Phone the Energy Advisor			
E. Discuss the issue with your contractor			
F. Other (Describe_____			

E. GRADUATION TO COMPREHENSIVE (DI ONLY) [NTGPC=1,5]

Now let me ask you a few questions about other energy efficiency rebate programs offered by <Peoples Gas/North Shore Gas>.

DI-G1 Are you interested in installing energy efficiency projects where <Peoples Gas/North Shore Gas> pays you a 30% rebate for energy efficiency upgrades and you pay 70% of the cost?

1. Yes
2. No
98. DON'T KNOW
99. REFUSED

DI-G1 Are you interested in participating in energy efficiency programs where <Peoples Gas/North Shore Gas> pays you a 70% rebate for energy efficiency upgrades and you pay 30% of the cost?

1. Yes
2. No
98. DON'T KNOW
99. REFUSED

DI-G2 What financial criteria do you use for energy efficiency projects?

1. Payback
2. Return on investment
3. Both

96. Not applicable
4. Other (Specify_____

98 (Don't know)

99 (Refused)

ASK IF DI-G2= 1 or 3; ELSE SKIP QUESTION.

DI-G3 What payback period would you require to approve spending on an energy efficiency project? Numeric drop down for "Years" with range 0-10 and another for '"Months" with range 0-11, Don't know and Refused as other choices.

DI-G4 Other than financial requirements, do you have other requirements to approve spending on an energy efficiency project? [If yes] Can you identify these other requirements? [OPEN END, DK, REF]

DI-G5 If an energy efficiency project meets your financial requirements, are there other barriers that may prevent a project from going forward? [Describe] [For example, lack of staff time, obtaining permits and approvals, competition for capital]
[OPEN END, DK, REF]

F. COMPREHENSIVE PROGRAM PARTICIPANTS – Custom and Comprehensive[NTGPC=2,3,4]

C-G1 What financial criteria do you use for energy efficiency projects?

1. Payback
2. Return on investment
3. Both

96. Not applicable
4. Other (Specify_____

100 (Don't know)

101 (Refused)

ASK IF C-G1= 1 or 3; ELSE SKIP QUESTION.
C-G2 What payback period do you require to approve spending on an energy efficiency project? Numeric drop down for "Years" with range 0-10 and another for '"Months" with range 0-11, Don't know and Refused as other choices.

ASK IF C-G1= 2 or 3; ELSE SKIP QUESTION.
C-G3 What ROI do you require to approve spending on an energy efficiency project? [number/open]

C-DP1 Are you aware that, unlike "Contractors or Trade Allies," 'Partner Trade Allies' can offer you a higher rebate with the option of paying you the rebate money at the start of the project?

1. Yes
2. No

98. DON'T KNOW
99. REFUSED

C-DP2 Did a 'Partner Trade Ally' or a Trade Ally or contractor install your most recent energy efficiency project?

1. Partner Trade Ally
2. Trade Ally
3. Contractor

98. DON'T KNOW
99. REFUSED

DI + COMP ONLY
C-DP3 Let's assume you are thinking about starting a project with a utility rebate, and need information on the next step. Using a 0-10 scale, where 0 means "not at all likely," and 10 means "extremely likely" how likely are you to communicate with: [RANDOMIZE A-C]

	0 - 10	Don't Know	Refused	Not applicable
A. DI + COMP OR COMP ONLY <Peoples Gas North Shore Gas> website				
B. DI + COMP OR COMP ONLY <Peoples Gas/North Shore Gas> customer service				
C. DI + COMP OR DI ONLY The Energy Advisor				
D. DI + COMP OR COMP ONLY Other_____ _____				

DI + COMP ONLY

C-DP4 Let's assume you are thinking about starting a project with a utility rebate, and need information on the next step. Using a 0-10 scale, where 0 means "not at all likely," and 10 means "extremely likely" how likely are you to go to:

[RANDOMIZE A-C]

	0 - 10	Don't Know	Refused	Not applicable
A. DI + COMP OR DI ONLY Information the Energy Advisor left behind				
B. DI + COMP OR COMP ONLY Information from your contractor or trade allie				
C. DI + COMP OR COMP ONLY Ads in the utility bills				
D. DI + COMP OR COMP ONLY Other_____ _____				

G. Customer Satisfaction – Direct Install[NTGPC=1,5]

Now I'm going to ask you a few questions about how satisfied you were with this program.

DI-CS1 Could you please use a 0-10 scale, where 0 means "very unsatisfied" and 10 means you were "very satisfied:" [RANDOMIZE A-H]

	0 - 10	Don't Know	Refused
H. Getting all your questions about the program answered			
I. The suitability of the program for facilities like yours			
J. Level of disruption during the installation			
K. Time that it took from scheduling to completion			
L. Any savings from the upgrades			
M. Tenant's reactions to the upgrades			
N. Overall performance of the Energy Advisor			
O. <Peoples Gas/North Shore Gas> in general			
P. The program in general			

DI-CS2 How do you think the program could be improved? [open]

DI-CS3 Thinking back to your experience with this program, would you recommend this program to a friend or colleague? Why or why not? [OPEN END]

Q. Customer Satisfaction – Comprehensive ask if [NTGPC=2,3,4] otherwise skip to C-CS4

Now I'm going to ask you a few questions about how satisfied you were with this program.

C-CS1 Could you please use a 0-10 scale, where 0 means "very unsatisfied" and 10 means you were "very satisfied:"
[RANDOMIZE A-I]

	0 - 10	Don't Know	Refused
A. Getting all your questions about the program answered			
B. Scheduling a Trade Ally or Partner Trade Ally			
C. The suitability of the program for facilities like yours			
D. Level of disruption during the installation			
E. Time that it took from scheduling to completion			
F. Any savings from the upgrades			
G. Tenant's reactions to the upgrades			
H. Your Trade Ally/Partner Trade Ally in general			
I. <Peoples Gas/North Shore Gas> in general			
J. The program in general			

C-CS2 How do you think the program could be improved? [open]

C-CS3 Thinking back to your experience with this program, would you recommend this program to a friend or colleague? Why or why not? [open]

C-CS4 On a scale of 1 to 10, with 1 being not at all interested, and 10 being extremely interested, what level of interest do you have for enrolling in Builder Operator Certification, also known as BOC, training?

[IF NECESSARY: BOC training focuses on energy efficient building operations and preventative maintenance)

R. FIRMOGRAPHICS

I have just a few questions left for background purposes.

F1. Is the property that we discussed master-metered (e.g. have a central water heating system) or individually metered (e.g. each apartment has its own water heating system)?

1. MASTER-METERED
2. INDIVIDUALLY METERED
97. OTHER (SPECIFY)
98. (DON'T KNOW)
99. (REFUSED)

F2. Do residents at your property own or rent their homes?

1. OWN
2. RENT
97. OTHER (SPECIFY)
98. (DON'T KNOW)
99. (REFUSED)

F3. Finally, please let us know where we can send you your $15 gift card.

First and Last name	**OPEN END**
Email Address	**OPEN END**

OUTRO. Those are all the questions I have. On behalf of the Multi-Family Energy Savings Program, thank you very much for your time.

7.2.2 Trade Ally Interview Guide

Peoples Gas/North Shore Gas
Participating Multi-Family Program Trade Ally Interview Guide

Navigant Final

Section	Topics	Questions
Background	What type of business does the trade ally conduct and what types of experience does this trade representative have?	Q1-Q4
Marketing to TA's and Participation	How did trade ally become aware of this program? Do you participate in the PTA Program? What is the perception of the MF program? How can the Implementer support your program marketing? Is there cooperation among program staff and TA's?	Q5-Q10
TA's Marketing to Customers	How do TA's market to their customers? Is there adequate support from the IC? Is the DI program an intro to other EE programs? Do TA's attempt to convert customers to the Prescriptive Rebate or Gas Optimization programs? How could this conversion be improved?	Q11-15
Program Barriers	What are the barriers to participation encountered by customers and trade allies? How could the program be changed to overcome these? Is there a different approach between approaching property managers and owners?	Q16-19
Overall Satisfaction	How do you rate your overall satisfaction with the Multi-Family Program, on a scale of 0 to 10 where 0 is "not at all satisfied" and 10 is "very satisfied"	Q20
Spillover	About what percentage of customers have installed additional energy efficient equipment without an incentive (spillover)? Have they encouraged customers to implement measures or operational changes for which there is no incentive? If so, do they know if the customers have done so?	SO1-SO10

[Note to Reviewer] The Interview Guide is a tool to guide process evaluation interviews. The guide helps to ensure the interviews include questions concerning the most important issues being investigated in this study. Follow-up questions are a normal part of these types of interviews. Therefore, there will be sets of questions that will be more fully explored with some individuals than with others. The depth of the exploration with any particular respondent will be guided by the role that individual played in the program, i.e., where they have significant experiences for meaningful responses. The interviews will be audio taped and transcribed.

NAVIGANT

Introduction

(Note: the interviewer should change the introduction to match his/her own interviewing style)

Hi, may I please speak with [NAME]?

My name is ___ and I'm calling from Navigant Consulting. We are part of the team hired to conduct an evaluation of the Peoples Gas/North Shore Gas Multi-Family Energy Savings Program. At this time we are interested in asking you some questions about your experiences with the Multi-Family Program. The questions will only take about a half hour. Is this a good time to talk? [IF NOT, SCHEDULE A CALL BACK.]

I want to let you know that this call will be recorded for quality control purposes. Responses will remain confidential and only be reported in aggregate with other responses.

We are evaluating last year's Multi-Family Program that began June 1, 2015 and ended May 31, 2016.

PROCESS QUESTIONS

Screening/Background

1. On a scale from 0 to 10, where zero is not at all familiar and ten is very familiar, how would you rate your familiarity with the Peoples Gas/North Shore Gas Multi-Family Program? [IF UNFAMILIAR (SCORE OF <=1), ASK TO BE TRANSFERRED TO MOST KNOWLEDGABLE PERSON OR RECORD NAME & NUMBER.]

2. Can you tell me what your company does? Who are your primary customers?

3. What do you do for the company?

I would like to ask you about the marketing and promotion of the Multi-Family Program. First I'd like to talk about how the program is promoted to Trade Allies and contractors.

99) Marketing to Trade Allies & Contractors

4. How did you become aware of the Multi-Family Program? **(OPEN-END)**

5. Generally speaking, how is this program perceived among trade allies? **(OPEN-END)**

6. Do you participate in the Partner Trade Ally program?

   7a. [if yes, ask] What are the benefits of being a Partner TA? Does it help promote your business?
   7b. [if no, ask] Have you heard of the program? Are you interested in it? What has prevented you from participating?

7. What is the best way to encourage Trade Allies to become Partner TAs?

8. Do you participate in the Custom, Prescriptive Rebates or Gas Optimization program delivery paths within the Multi-Family Program? [if yes, ask] Do you find it beneficial? Does it help promote your business? [if no, ask] Have you heard of the program? Are you interested in it? What has prevented you from participating?

9. Do you participate in the Custom, Prescriptive Rebates, or Gas Optimization delivery paths within the Multi-Family Program?

   8a. [if yes, ask] Do you find them beneficial? Do they help promote your business?
   8b. [if no, ask] Have you heard of the programs? Are you interested in them? What has prevented you from participating?

10. Is there cooperation between program staff and the trade allies? [if yes or no, ask] How could this be improved? **(OPEN-END)**

100) Trade Ally Marketing to Customers

Now I'd like to ask about how you promote the program to your customers.

11. How do your customers hear about the program?

12. Do you market or promote the Multi-Family Program to your customers? If so, how?

13. Does the program implementer (Franklin Energy) support marketing of the Multi-Family Program to your customers?
    12a. How do they support it?
    12b. What could the implementer do to be more supportive of your efforts?

14. Do you follow up with customers from the Direct Install Jumpstart program to promote the Prescriptive Rebates, Custom or Gas Optimization program delivery channels?

    13a. Why or why not?

15. How do customers respond?

    14a. What interests your customers in the Multi-Family Program?
    14b. What prevents them from participating?
    14c. What would make it easier to convert these customers to install high efficiency upgrades?

101) Program Characteristics and Barriers

I'd like to ask you some questions about the program, first from your perspective as a program partner, and then about the program as your customers experience it.

16. What barriers have you encountered with the Multi-Family Program?

17. What would you like to see added to the program's contractor approved equipment list?
18. Do you approach multi-family property managers any differently than you approach the facility's owner?

19. What is the best way to encourage trade allies to promote the Multi-Family Program to their customers?

102) Satisfaction

20. How would you rate your overall satisfaction with the Multi-Family Program? Please use a scale of 0 to 10 where 0 is "not at all satisfied" and 10 is "very satisfied" **[SHOW 0 to 10 scale]**

19a. What were the reasons that you gave that rating? **(OPEN-END)**

98 DON'T KNOW

99 REFUSED

SPILLOVER QUESTIONS

The next few questions are about the influence of the Peoples Gas and North Shore Gas Multi-Family Program on your business.

SO1. Since you became a Multi-Family Program trade ally, have any of the following aspects changed and if so, by how much? Please provide an answer for each aspect.

		1 - Did not Increase	2 - Increased Somewhat	3 - Increased Greatly	DON'T KNOW	REFUSED
a	Your knowledge of high efficiency options	❍	❍	❍	❍	❍
b	Your comfort level in discussing the benefits of high efficiency with your customers	❍	❍	❍	❍	❍
c	The percentage of sales situations in which you recommend high efficiency equipment	❍	❍	❍	❍	❍
d	The percentage of sales situations in which you sell high efficiency equipment	❍	❍	❍	❍	❍
e	The total volume of high efficiency equipment you sell	❍	❍	❍	❍	❍

[ASK IF ANY IN SO1a-e=2 OR 3, ELSE SKIP TO SO4]

SO2. There could be multiple factors that might have played a role in the increases that you noted, including the Multi-Family Program and other factors.

- *Multi-Family Energy PROGRAM factors might include the free equipment, the program incentive and any training, information, or other support that the program provided.*
- *OTHER, NON-PROGRAM factors might include things as changes in codes and standards, customers requesting specific equipment, increased customer awareness, federal tax rebates and credits, and other factors not related to the Multi-Family Program.*

On a scale of 0 to 10, where 0 is "not at all influential" and 10 is "very influential," please rate the influence of the Multi-Family Program and the influence of other, non-program factors on the increase in… [SHOW ONLY ASPECTS WHERE SO1a-e=2 OR 3]

98 DON'T KNOW
99 REFUSED

		i – Multi-Family Program	ii - Other Non-program Factors
a	Your knowledge of high efficiency options	[0-10]	[0-10]
b	Your comfort level in discussing the benefits of high efficiency with your customers	[0-10]	[0-10]
c	The percentage of sales situations in which you recommend high efficiency equipment	[0-10]	[0-10]
d	The percentage of sales situations in which you sell high efficiency equipment	[0-10]	[0-10]
e	The total volume of high efficiency equipment you sell	[0-10]	[0-10]

SO3a. How was the Multi-Family Program influential in increasing…

a. [ASK IF SO2di=8,9,10] the percentage of sales situations in which you sell high efficiency equipment? [OPEN END]

98 DON'T KNOW
99 REFUSED

b. [ASK IF SO2ei=8,9,10] the total volume of high efficiency equipment you sell? [OPEN END; INCLUDE RADIO BUTTON FOR "SAME"]

98 DON'T KNOW
99 REFUSED

SO3b. What other non-program factors were influential in increasing…

c. [ASK IF SO2dii=8,9,10] the percentage of sales situations in which you sell high efficiency equipment? [OPEN END]

98 DON'T KNOW

99 REFUSED

d. [ASK IF SO2eii=8,9,10] the total volume of high efficiency equipment you sell? [OPEN END; INCLUDE RADIO BUTTON FOR "SAME"]
98 DON'T KNOW
99 REFUSED

SO4. Approximately what percentage of your total sales of equipment (in terms of dollars) qualified for a Multi-Family Program rebate? [0% TO 100%; 998=DON'T KNOW]

[ASK IF SO4<>0]
SO5. And of the equipment that qualified for a Multi-Family Program rebate, for what percentage did customers receive a rebate from Peoples Gas or North Shore Gas? [0% TO 100%; 998=DON'T KNOW]

[ASK IF SO5=998]
SO6a. In the last year, did <u>any</u> of your customers install equipment that was eligible for a Multi-Family Program rebate but that did not receive a rebate?
1. Yes
2. No
98. Don't know

[ASK IF SO6a=1]
SO6b. Approximately, how many of your projects last year were eligible for a Multi-Family Program rebate but did not receive a rebate? [NUMERIC OPEN END; 998=DON'T KNOW][RANGE 0-100]

[IF SO5=100% OR SO6a=2,8 SKIP TO SO8]
SO7a. Compared to projects that do go through the Multi-Family Program, how large, in terms of cost, are the eligible projects that do NOT receive a Multi-Family Program rebate?
1. Smaller than projects that go through the program
2. About the same size as projects that go through the program
3. Larger than projects that go through the program
97. Other [RECORD]
98. (Don't know)

[ASK IF SO7a=1]
SO7b. Approximately, how much smaller would you say are eligible projects that DO NOT receive a Multi-Family Program rebate compared to projects that DO receive a Multi-Family Program rebate?
For example, if the average cost of eligible projects that do NOT go through the Program is $10,000 and the average cost of projects that DO go through the Prescriptive Rebate Program is $20,000, your answer would be $10,000 / $20,000 = 50%, or response category 2.
1. 80% - 99%
2. 60% - 79%
3. 40% - 59%
4. 20% - 39%
5. Less than 20%
98. (Don't know)

[ASK IF SO7a=3]

SO7c. Approximately, how much larger would you say are eligible projects that DO NOT receive a Multi-Family Program rebate compared to projects that DO receive a Multi-Family Program rebate? *For example, if the average cost of eligible projects that do NOT go through the Program is $25,000 and the average cost of projects that DO go through the Program is $20,000, your answer would be $25,000 / $20,000 = 125%, or response category 2.*

1. 101% - 120%
2. 121% - 140%
3. 141% - 160%
4. 161% - 180%
5. 181% - 200%
6. More than 200%
98. (Don't know)

SO8. Have you changed your stocking practices, including equipment that qualifies for a rebate as a result of the Program? By stocking practices I mean the types of equipment you supply and sell in Peoples Gas / North Shore Gas' service territory. **(OPEN-END)**

98 DON'T KNOW
99 REFUSED

SO9. Have you encouraged your customers to install other energy efficiency equipment without an incentive from the program as a result of your participation in the program? **(OPEN-END)**

98 DON'T KNOW
99 REFUSED

SO10. Have you encouraged your customers to implement energy saving behavior or operational changes for which there is no incentive? [Example: changing furnace filters, water heater temperature setback] (**OPEN-END)**

98 DON'T KNOW
99 REFUSED

SO10a. [If yes]: What percent of your customers follow your recommendation?
RECORD PERCENT
98 DON'T KNOW
99 REFUSED

CLOSING SECTION

That brings us to the end of my questions. Is there anything else that you would like to let us know based on the topics we covered today?

On behalf of Peoples Gas/North Shore Gas, we thank you for your time today. If in reviewing my notes, I discover a point I need to clarify, is it all right if I follow-up with you by phone or email? [IF YES, VERIFY PHONE NUMBER OR EMAIL ADDRESS]