



Small Business Program Evaluation Report

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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Prepared by:

**Paul Higgins, Charles Ampong, Sharon Mullen, and Argene McDowell
Navigant**

www.navigant.com

**Submitted to:**

Peoples Gas
North Shore Gas
200 East Randolph Street
Chicago, IL 60601

Submitted by:

Navigant
30 S. Wacker Drive, Suite 3100
Chicago, IL 60606

Contact:

Randy Gunn, Managing Director
312.583.5714
Randy.Gunn@Navigant.com

Kevin Grabner, Associate Director
608.497.2323
kevin.grabner@navigant.com

Robert Neumann, Associate Director
312.583.2176
rob.neumann@navigant.com

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E. EXECUTIVE SUMMARY

This report presents a summary of the findings and results from the impact and process evaluation of the Peoples Gas (PGL) and North Shore Gas (NSG) Small Business (SB) Programs in their fifth year of operation, identified as gas program year 5 (GPY5).¹

The SB Programs assist qualified PGL and NSG non-residential customers² to achieve natural gas energy savings by educating them about energy efficiency (EE) opportunities through three SB program delivery paths: The Energy Assessment and Direct Install path, which provides installation of no-cost direct-install (DI) measures³ to small businesses through on-site assessments conducted by the implementation contractor's Energy Advisors; the Prescriptive Rebate path, which provides small business customers with direct financial incentives for installation of retrofit measures recommended through the Energy Assessment; and the Custom path, which provides technical services and custom rebates for non-standard building improvement upgrades.

PGL and NSG both offered new measures through their SB program in GPY5, including rebates for laundromat water heaters, direct-fired heaters, and dock door seals.⁴ Franklin Energy was the primary implementation contractor (IC) for the PGL and NSG Small Business Programs in GPY5.

The GPY5 SB Programs gross impact evaluation approach relied on two sources of information: the Illinois Statewide Technical Reference Manual (TRM)⁵ for verification of gross savings for deemed measures, and secondary evaluation research for verification of savings from measures with custom savings variables. The GPY5 verified net impact evaluation approach applied the deemed net-to-gross ratio (NTGR) approved through the Illinois Energy Efficiency Stakeholders Advisory Group (SAG) consensus process.⁶ The evaluation also included a process evaluation and focused research to investigate net-to-gross for future use.

¹ The GPY5 program year began June 1, 2015 and ended May 31, 2016.

² To qualify, participants must be a PGL or NSG commercial or industrial customer that uses less than 60,000 therms per year.

³ No-cost direct-install measures include low-flow showerheads and faucet aerators, pre-rinse spray valves, programmable/ reprogram thermostats, and Domestic Hot Water (DHW) pipe insulation.

⁴ The PGL SB Program has developed a new mid-stream incentive pilot to be rolled out in PY6 to deliver incentives in the form of instant rebates to PGL customers to drive the adoption of energy-efficient kitchen equipment in commercial kitchens within the City of Chicago.

⁵ Illinois Statewide Technical Reference Manual for Energy Efficiency Version 4.0, available at: <http://www.ilsag.info/technical-reference-manual.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

⁶ See <http://www.ilsag.info/> for more information.

E.1 Program Savings

Table E-1 summarizes the natural gas savings from the PGL Small Business Program.

Table E-1. GPY5 Peoples Gas Small Business Program Natural Gas Savings

Path	Ex Ante Gross Savings ⁷ (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR ⁸	Verified Gross Savings (Therms)	NTGR ⁹	Verified Net Savings ¹⁰ (Therms)
Direct Install	8,990	8,360	1.00	8,996	0.93	8,366
Prescriptive Rebate	417,171	387,969	1.00	416,104	0.93	386,977
Custom	56,441	52,490	0.81	45,717	0.93	42,517
Total	482,602	448,819	0.98	470,817	0.93	437,860

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

Table E-2 summarizes the natural gas savings from the GPY5 North Shore Gas Small Business Program.

Table E-2. GPY5 North Shore Gas Small Business Program Natural Gas Savings

Path	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Direct Install	941	875	1.00	942	0.93	876
Prescriptive Rebate	31,909	29,675	1.00	31,892	0.93	29,660
Custom	11,034	10,262	1.00	11,034	0.93	10,262
Total	43,884	40,812	1.00	43,868	0.93	40,798

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

E.2 Program Savings by End-use

Table E-3 shows the natural gas savings from the PGL SB Program by end-use category. The PGL Program's verified gross realization rate is 98 percent, due to an evaluation adjustment of the claimed savings from custom measures and minor adjustments to savings from thermostats, boiler tune-ups and pipe insulation.

⁷ 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".

⁸ Verified Gross Realization Rate (RR) = Verified Gross Savings/Ex Ante Gross Savings.

Verified Gross Savings = RR * Ex Ante Gross Savings

⁹ 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

¹⁰ Verified Net Savings = NTGR * Verified Gross Savings

Table E-3. GPY5 Peoples Gas Small Business Program Natural Gas Savings

End-use Category	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
HVAC Equipment	97,283	90,473	0.99	96,795	0.93	90,019
Pipe Insulation	302,543	281,365	1.00	302,124	0.93	280,975
Hot Water Device	8,772	8,158	1.00	8,781	0.93	8,166
Programmable Thermostat	14,751	13,718	0.99	14,588	0.93	13,568
Food Service Equipment	2,812	2,615	1.00	2,812	0.93	2,615
Custom	56,441	52,490	0.81	45,717	0.93	42,517
Total	482,602	448,819	0.98	470,817	0.93	437,860

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

Table E-4 shows the natural gas savings from the GPY5 NSG SB Program by end-use category. The NSG program's verified gross realization rate is 100 percent, with minor adjustment to certain measures such as thermostats and pipe insulations.

Table E-4. GPY5 North Shore Gas Small Business Program Natural Gas Savings

End-use Category	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
HVAC Equipment	8,764	8,151	1.00	8,766	0.93	8,153
Pipe Insulation	21,377	19,880	1.00	21,361	0.93	19,865
Hot Water Device	600	558	1.00	600	0.93	558
Programmable Thermostat	252	234	0.99	249	0.93	232
Food Service Equipment	1,857	1,727	1.00	1,858	0.93	1,728
Custom	11,034	10,262	1.00	11,034	0.93	10,262
Total	43,884	40,812	1.00	43,868	0.93	40,798

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

E.3 Impact Estimate Parameters for Future Use

In the course of our GPY5 evaluation, we conducted free ridership and spillover research and analysis from participating customers, based on the Illinois Statewide NTG Methodologies document (IL-NTG Methods).¹¹ These parameters may be considered for deeming for future program years. The NTG Methodologies document instructs evaluators to calculate free ridership by two methods, report both, and select one of the options for future use. The evaluation team recommends the free ridership results Option One, below, be considered for future use for the participant components of the NTGR. This free ridership value is arrived at when the algorithm considers only the maximum program factors for program component scores, consistent with historical practice and also proactive, incorporating the removal of non-program factors anticipated in the upcoming version 6.0 of the TRM. Option Two retains the non-program factors in the algorithm. Parameters developed following Options One and Option Two are shown in Table E-5. The research methods and results are provided in Section 7.1.

Table E-5. Impact Estimate Parameters for Future Use

Parameter	Option 1 Value	Option 2 Value	Data Source
Participant Free Ridership (FR)	0.15	0.33	GPY5 Evaluation Research. Based on IL-NTG Methods in TRM v5.0
Participant Spillover (PSO)	0.01	0.01	

Source: Evaluation Analysis.

E.4 Program Volumetric Detail

Table E-6 and Table E-7 present GPY5 program participation reported by the Program Administrator Franklin Energy for the PGL and NSG SB 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 Small Business Program Primary Participation Detail

Participation	Direct Install	Standard Incentive	Custom	Program Total*
Participants	63	126	10	173
Total Measures ¹²	810	1,038	10	1,858
Installed Projects	73	181	10	258

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

* Program totals exclude duplicate participants or projects with both direct install and prescriptive measures.

¹¹ IL-TRM_Effective_060116_v5.0_Vol_4_X-Cutting_Measures_and_Attach._021116_Final.pdf

¹² For evaluation reporting purpose, if a measure quantity is reported in the tracking system in linear feet, MBH, dwelling units or in square feet, Navigant treated each row entry of such measure as one measure quantity in this table.

Table E-7. GPY5 North Shore Gas Small Business Program Primary Participation Detail

Participation	Direct Install	Standard Incentive	Custom	Program Total*
Participants	10	23	5	33
Total Measures	45	75	5	125
Installed Projects	10	26	5	38

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

* Program total exclude duplicate participants or projects with both direct install and prescriptive measures.

E.5 Findings and Recommendations

The following provides insight into key program findings and recommendations.¹³

Verified Gross Impacts and Realization Rate

Finding 1. The GPY5 Peoples Gas Small Business Program reported ex ante gross energy savings of 482,602 therms (including savings from direct install, prescriptive and custom measures). Evaluation adjustments resulted in verified gross energy savings of 470,817 therms, reflecting the program's gross realization rate of 98 percent. Evaluation adjustments were made to savings from custom measures and HVAC measures. The North Shore Gas Small Business Program reported 43,884 therms ex ante savings and achieved 43,868 therms verified gross energy savings, reflecting verified gross realization rate of 100 percent.

Recommendation 1: Check and if needed update the tracking system input assumptions for pipe insulation, boiler tune-ups and programmable thermostats to match Franklin Energy's "Master Measure Database" spreadsheet (MMDB)¹⁴ for the current program year.

Finding 2: Some custom projects involving space-heating were finished in the spring with insufficient post-installation billing data for verification. Evaluation relied on secondary research or compared with TRM-approved methods to estimate the verified savings. Some of the ex post analyses with variance from ex ante estimates involve measures of this type.

Recommendation 2: Beginning with GPY6, the program year will end December 31, allowing nine program months prior to a heating season. If possible, prioritize processing and implementing weather-dependent custom projects so that they are complete in the first three quarters of the program year so that there will be sufficient post-installation billing data from the heating season to analyze the energy savings. If possible, Franklin Energy should identify in mid-year the weather-dependent custom projects that are likely to complete in the fourth quarter, because it may be possible to design the custom M&V sample to reduce or eliminate the need to select projects that will not have sufficient billing data.

Finding 3: Some custom projects involved changes in system capacity, i.e. upgrades were coincident with expansion. When new equipment is installed in these situations, we found that the assumed ex ante baseline has been existing equipment of the same capacity, that is

¹³ The Executive Summary presents the most important of the Section 6 Findings and Recommendations. Findings and Recommendations in the Executive Summary are numbered to match Section 6 for consistent reference to individual findings and recommendations. Therefore, gaps in numbering may occur in the Executive Summary.

¹⁴ PG&NSG MMDB PY5 - 04122016, produced by Franklin Energy

operational. Selection of this baseline in this situation will overestimate savings that can be claimed for the program.

Recommendation 3: When production capacity is increased, the existing equipment baseline should only be applied to the pre-existing a similar production capacity. Additional capacity created through the upgrade should have a code-compliant and/or industry standard practice baseline, which is likely more efficient than the existing equipment.

Finding 4: Evaluation reviewed a custom project with a controls system upgrade that did not appear to be commissioned adequately to ensure savings, or perhaps set points were changed to achieve greater comfort, possibly causing take-back effects.

Recommendation 4: To reduce the risk of downward evaluation adjustments on controls system upgrades, the program should require submission of post-installation functional tests (e.g. temperature logging data) that demonstrate sequences of operation (commissioning) that conform to savings estimates. If those functional tests require the heating season, withhold whole or partial incentives until the tests prove the controls work as intended.

TRM Recommendations

Finding 5. The evaluation team identified certain pipe insulation and steam trap projects in the tracking system which were described as “prescriptive change.” Franklin Energy clarified that using the TRM assumptions for these projects produced more savings than was consistent with the nature of the projects. Franklin Energy capped the savings at 20 percent of the accounts’ annual gas usage.

Recommendation 5. The TRM Technical Advisory Committee should examine whether input assumptions for pipe insulation and steam traps are appropriate for small businesses. For example, hours of operation in the TRM may be more appropriate for larger businesses with longer operating hours than small businesses or houses of worship.

Process Evaluation

Finding 6. Small Business Programs’ customers most frequently hear about the program from their contractors or trade ally. They would prefer to receive program information through email.

Recommendation 6. The PGL and NSG Small Business Programs should consider sponsoring a joint e-newsletter, which could provide a vehicle for collecting email addresses from current and potential participants, as well as for delivering program information and low-cost marketing.

Finding 7. The Small Business Program influences over 70% of small business customers to improve their opinion of the utility.

Finding 8. Participant data included a significant amount of incorrect telephone contact information. These participants represented nine percent of our sample.

Recommendation 7. The implementer should stress with trade allies the importance of gathering accurate and complete participant contact information, including telephone numbers, names, and emails.

1. INTRODUCTION

1.1 Program Description

The Small Business (SB) Programs assist qualified Peoples Gas (PGL) and North Shore Gas (NSG) non-residential customers¹⁵ to achieve natural gas energy savings by educating them about energy efficiency (EE) opportunities through three SB program delivery paths:

- The Energy Assessment and Direct Install path, which provides installation of no-cost direct-install (DI) measures¹⁶ to small business owners or tenants through on-site assessments conducted by the implementation contractor's Energy Advisors. The energy assessment identifies additional retrofit energy efficiency upgrades.
- The Prescriptive Rebate path, which provides small business owners or tenants with direct financial incentives for installation of retrofit measures recommended through the Energy Assessment. Customers receive rebates covering 30 to 100 percent of the project cost based on the size and efficiency of the equipment installed or on a per unit basis.
- The Custom path, which provides technical services and custom rebates for non-standard building improvement upgrades.

PGL and NSG both offered new measures through their SB program in gas program year 5 (GPY5), including rebates for laundromat water heaters, direct-fired heaters, and dock door seals.¹⁷ Franklin Energy was the primary implementation contractor (IC) for the PGL and NSG Small Business Programs in GPY5.

1.2 Evaluation Objectives

The evaluation team identified the following key researchable impact questions and process topics for GPY5:

1.2.1 Impact Evaluation

1. What are the programs' verified gross savings?
2. What are the programs' verified net savings?
3. What is the researched value for net-to-gross (NTG) ratio?
4. What updates are recommended for the Illinois Technical Reference Manual (TRM)?

¹⁵ To qualify, must be a PGL or NSG commercial or industrial customer that uses less than 60,000 therms per year.

¹⁶ No-cost direct-install measures include low-flow showerheads and faucet aerators, pre-rinse spray valves, programmable/ reprogram thermostats, and Domestic Hot Water (DHW) pipe insulation.

¹⁷ The PGL SB Program developed a new mid-stream kitchen equipment incentive pilot for PY6 to deliver incentives in the form of instant rebates to customers to drive the adoption of energy-efficient commercial kitchen equipment. Instant rebates were given at point of sale from distributor and subtracted from customer invoice. Rebates are to be paid to distributor.

1.2.2 Process Evaluation

1. Effectiveness of the Programs' delivery
2. Customer satisfaction with the Programs and major program components
3. Opportunities to improve the Programs

2. EVALUATION APPROACH

This section provides an overview of the data collection methods, gross and net impact evaluation approaches, and process evaluation approaches that were employed for the GPY5 evaluation.

2.1 Overview of Data Collection Activities

The core data collection activities included in-depth interviews with program managers, engineering and project file reviews of program tracking data, and a telephone survey with participating customers. The primary data collection activities are shown in the following table.

Table 2-1. Core Data Collection Activities and Samples in GPY5

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
Custom Project File Reviews	Participating Customers	8	Mar – Nov 2016	Review project files for 8 of 15 completed custom projects
Telephone Survey	Participating Customers	44	Sept – Oct 2016	Process and NTG research

2.2 Source: Navigant Verified Savings Parameters

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 measures¹⁸, and evaluation research for non-deemed measures. Table 2-2 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.

¹⁸ Because the Illinois TRM provides multiple options for selecting input assumptions, Franklin Energy 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

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
Commercial HVAC measure savings assumptions	Illinois TRM, version 4.0, section 4.4*	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
Commercial food service equipment savings assumptions	Illinois TRM, version 4.0, section 4.2*	Deemed
Commercial pipe insulation savings assumptions	Illinois TRM, version 4.0, section 4.4.14*	Deemed
Programmable thermostat savings assumptions	Illinois TRM, version 4.0, section 4.2.16*	Deemed
Commercial Water Heaters savings assumptions	Illinois TRM, version 4.0, section 4.3*	Deemed
Custom Analysis and Measures	Engineering Project File Review	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.

Navigant initially found 12 custom projects for PGL and five custom projects for NSG in the GPY5 tracking data, indicating that a total of 17 custom projects were completed. The evaluation team randomly sampled 10 custom projects, but later found that two of the custom PGL projects should be excluded from GPY5, leaving 10 completed projects for PGL and five for NSG, for a total of 15 completed projects and eight projects in the engineering review sample. Navigant performed engineering file reviews and analysis of the claimed savings, including billing analysis for some projects. The engineering review of the algorithms used by the program to calculate energy savings, and the assumptions that feed into those algorithms, were assessed and the savings evaluation approach were classified into one of two categories, 1) reasonable and acceptable, or 2) needs revision based on evaluation findings.

An in-depth application review was performed for each sampled custom project to assess the engineering methods, parameters and assumptions used to generate all ex ante impact estimates. For each measure in the sampled project, Navigant engineers estimated ex post gross savings based on their review of documentation and engineering analysis. Franklin Energy provided project documentation in electronic format for each sampled 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), monthly billing data, and calculation spreadsheets.

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 NTGR estimates used to calculate the verified net savings were deemed based on past evaluation research and approved through a consensus process

managed through the Illinois Energy Efficiency Stakeholder Advisory Group (SAG)¹⁹. Table 2-3 presents the deemed NTGR by program path.

Table 2-3. Net-to-Gross Ratios for Evaluation of the GPY5 Small Business Programs

Program Path/Measure	Utility	GPY5 Deemed NTG Value
Assessment/Direct Install	PGL & NSG	0.93
Prescriptive Rebates	PGL & NSG	0.93
Custom Incentives	PGL & NSG	0.93

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

2.2.3 Free ridership and Spillover Research Approach for Future Use

As part of the GPY5 evaluation, the evaluation team conducted free ridership and spillover research with data collected from 44 participating small business customers representing 20 percent of the GPY5 total energy savings. For data collection, Navigant conducted a Computer Assisted Telephone Interview (CATI) survey with customers to research questions pertaining to NTG and process. Details of the research methods are described in Appendix 7.1. The participant survey instrument is included in Appendix 7.2.

Free ridership was assessed using a customer self-report approach following the Illinois Statewide NTG Methodologies document (IL-NTG Methods).²⁰ The core nonresidential free ridership algorithm adopted from the Illinois NTG Methods consists of two scores that represent different ways of characterizing program influence or free ridership: the Program Components Score (two alternative specifications that reflect the influence of the most important of various program and non-program related elements in the customer's decision to select the specific program measure) and the No Program Score (captures the likelihood of various actions the customer might have taken at this time and in the future had program not been available).

The evidence of spillover from the participant survey for the Small Business Programs was assessed based on certain spillover attribution conditions outlined in the IL NTG Methods.

2.3 Process Evaluation

Navigant's GPY5 process research activities for the PGL and NSG SB Programs included interviews with program management to verify our understanding of the program design, administration, marketing, and delivery. The evaluation team also included process research questions in the CATI survey with 44 participating customers to collect process research and NTG data in a single interview.

¹⁹ 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

²⁰ Illinois Statewide Technical Reference Manual for Energy Efficiency, Version 5.0, Volume 4: Cross-Cutting Measures and Attachments, effective June 1st, 2016.

Process research addressed the following topics:

1. Effectiveness of program delivery
2. Customer satisfaction with the programs and major program components
3. Opportunities for program improvement

3. GROSS IMPACT EVALUATION

This section presents detailed analysis and findings from the file reviews and tracking system review of the measures installed and gross savings by program path and delivery channels. Overall, the GPY5 Peoples Gas SB Program reported ex ante gross energy savings of 482,602 therms (including savings from direct install, prescriptive and custom measures). Evaluation adjustments resulted in verified gross energy savings of 470,817 therms, reflecting a verified gross realization rate of 98 percent. Evaluation adjustments were mainly to custom measures, with minor adjustments to pipe insulation and thermostat deemed measure savings. The North Shore Gas SB Program reported 43,884 therms ex ante savings and achieved 43,868 therms verified gross energy savings, reflecting a verified gross realization rate of 100 percent.

3.1 Program Tracking Data Review

Navigant downloaded the final tracking data for the Small Business Programs evaluation from Franklin Energy's Efficiency Manager²¹ 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 Franklin Energy's "Master Measure Database" spreadsheet (MMDB)²² 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 ex ante savings estimate for programmable thermostats were based on the TRM, but averaged across building types. The evaluation team corrected an error in the savings assumptions and made a minor adjustment to the unit savings from 126.1 therms to 124.7 therms per thermostat. We also adjusted the boiler tune-up unit savings from 0.366 therm/MBH to 0.359 therms/MBH to align with what we found in the Franklin Energy MMDB, which was consistent with the TRM (v4.0). Details of the verified per unit savings are provided in Table 3-5.
- b. The evaluation team found that the PY5 Franklin Energy MMDB spreadsheet contained duplicate savings calculations for steam pipe insulation feeding into the tracking system. Franklin Energy clarified that the tracking system pulled both GPY4 and GPY5 default savings estimates from the Franklin Energy 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 420 therms reduction for PGL and 16 therms reduction for NSG. The adjustment did not greatly affect the measure gross realization rate, which remained at 100 percent. Details of the verified per unit savings are provided in Table 3-5.
- c. The evaluation team identified certain pipe insulation and steam trap projects in the tracking system which were described as "prescriptive change." Franklin Energy clarified that using the TRM assumptions for these projects produced more savings than was consistent with the nature of the projects. Franklin Energy capped the savings at 20 percent of the accounts' annual gas usage. We reviewed the custom assumptions and the savings inputs, and agreed that the

²¹ Franklin Energy and Navigant formerly referred to the program tracking system as Bensight.

²² PG&NSG MMDB PY5 - 04122016, produced by Franklin Energy

savings cap was reasonable. We did not adjust the savings any further, and maintained a 100 percent gross realization rate.

- d. Navigant initially found 12 custom projects for PGL and five custom projects for NSG in the GPY5 tracking data, indicating that a total of 17 custom projects were completed. The evaluation team randomly sampled 10 custom projects, but later found that two of the custom PGL projects should be excluded from GPY5, leaving 10 completed projects for PGL and five for NSG, for a total of 15 completed projects and eight projects in the engineering review sample. Navigant performed engineering file reviews and analysis of the claimed savings, including billing analysis for some projects. The PGL custom sample had a weighted gross realization rate of 81 percent, and NSG had 100 percent realization rate. Further discussion of custom project verification is provided in Section 7.1.1, and findings are summarized below:
 - Two PGL projects were found to be incomplete and did not realize savings in GPY5. Upon further discussion with Franklin Energy, one of the projects was moved to GPY6 and the other was disqualified from the GPY5 savings. The project that was moved to GPY6 was installed but then disabled because a new building engineer was not operating the Building Automation System (BAS) correctly. The program is engaging with the customer and contractor to retrain staff and reprogram the system for inclusion in GPY6. The project that was disqualified was due to the customer cutting in large louvres in the attic. Louvres were to be covered during the winter months, but this was not done. Navigant considered these projects as outliers in the sample, and, therefore, they did not affect our targeted 90/10 sample confidence and precision levels.
 - Four PGL projects had realization rates below 100 percent.
 - Two projects (#1150270 and #1160324) involving space heating were completed in the spring with insufficient post-installation billing data for verification. On project #1150270, ex ante savings was based on minimal heating data, and evaluation engineers were not able to independently verify control settings used in the ex ante analysis. We judged a revised calculation that reduced savings to be reasonable. On project #1160324, evaluation engineers used TRM assumptions to estimate the savings, reducing the project savings.
 - On project #978322 at a laundromat, billing data showed an increase in usage due to a number of factors outside of the control of the implementer. Washer and dryer capacity were increased and further investigation found that customer demand increased as well after the upgrades. The estimate of verified savings reflects an evaluator-prescribed dual baseline reflecting the pre-existing conditions and expanded capacity of the post-installation conditions, given the information available.
 - Savings were reduced on project #953996 after billing analysis verified lower savings. Various undetermined factors can reduce the verified savings estimated through a billing analysis, including factors beyond the control of the implementer.
 - Four projects had realization rates above 100 percent based on results from billing analysis. This included two NSG sample projects.

3.2 Program Volumetric Findings

As shown in Table 3-1 and Table 3-2, the PGL SB Program reported 173 participants in GPY5 and implemented 258 projects and 1,858 measures. The NSG SB Program reported 33 participants in GPY5 and implemented 38 projects and 125 measures.

Table 3-1. GPY5 Peoples Gas Small Business Program Primary Participation Detail

Participation	Direct Install	Standard Incentive	Custom	Program Total*
Participants	63	126	10	173
Total Measures ²³	810	1,038	10	1,858
Installed Projects	73	181	10	258

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

* Program total are unique totals excluding duplicate participants or projects with both direct install and prescriptive measures.

Table 3-2. GPY5 North Shore Gas Small Business Program Primary Participation Detail

Participation	Direct Install	Standard Incentive	Custom	Program Total*
Participants	10	23	5	33
Total Measures	45	75	5	125
Installed Projects	10	26	5	38

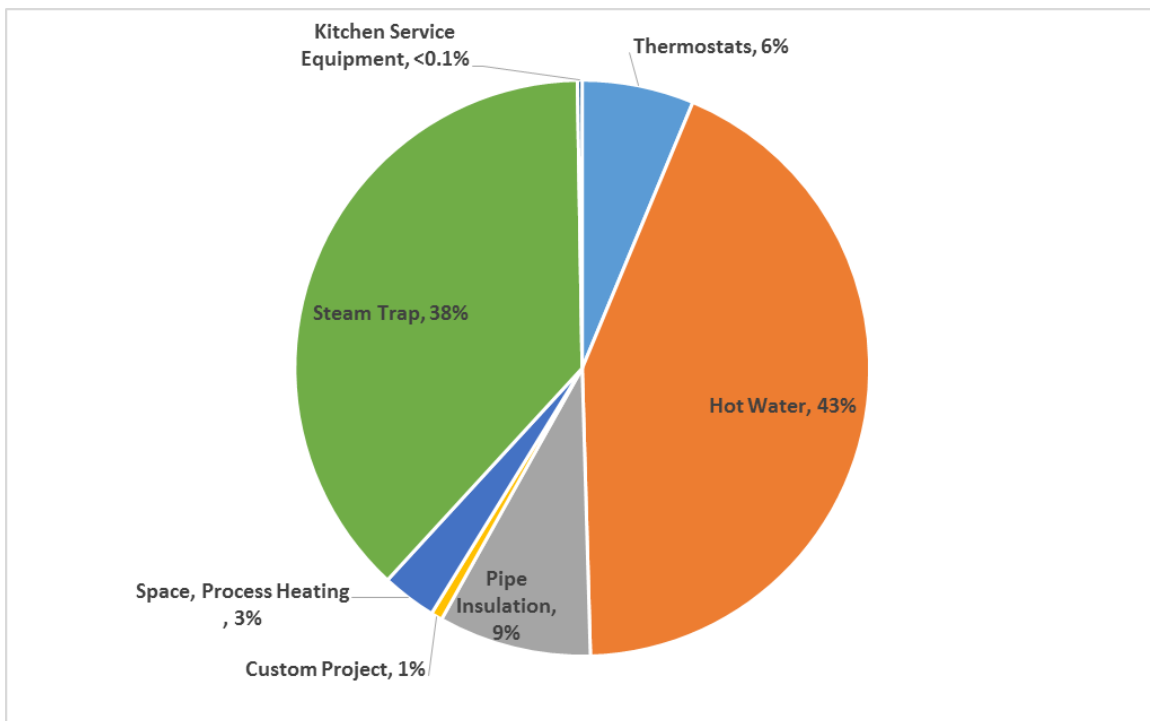
Source: Navigant analysis of GPY5 program tracking data (July 19, 2016 data extract).

* Program total are unique totals excluding duplicate participants or projects with both direct install and prescriptive measures.

Figure 3-1 and Figure 3-2 disaggregate the measure mix by end-use type. Hot water measures including faucet aerators, showerheads and water heaters constituted 43 percent of the measure quantity in GPY5 for PGL. Steam traps contributed 38 percent of measures, pipe insulation 9 percent and programmable thermostats 6 percent. For NSG, hot water measures contributed 37 percent, steam traps 35 percent and pipe insulation 17 percent.

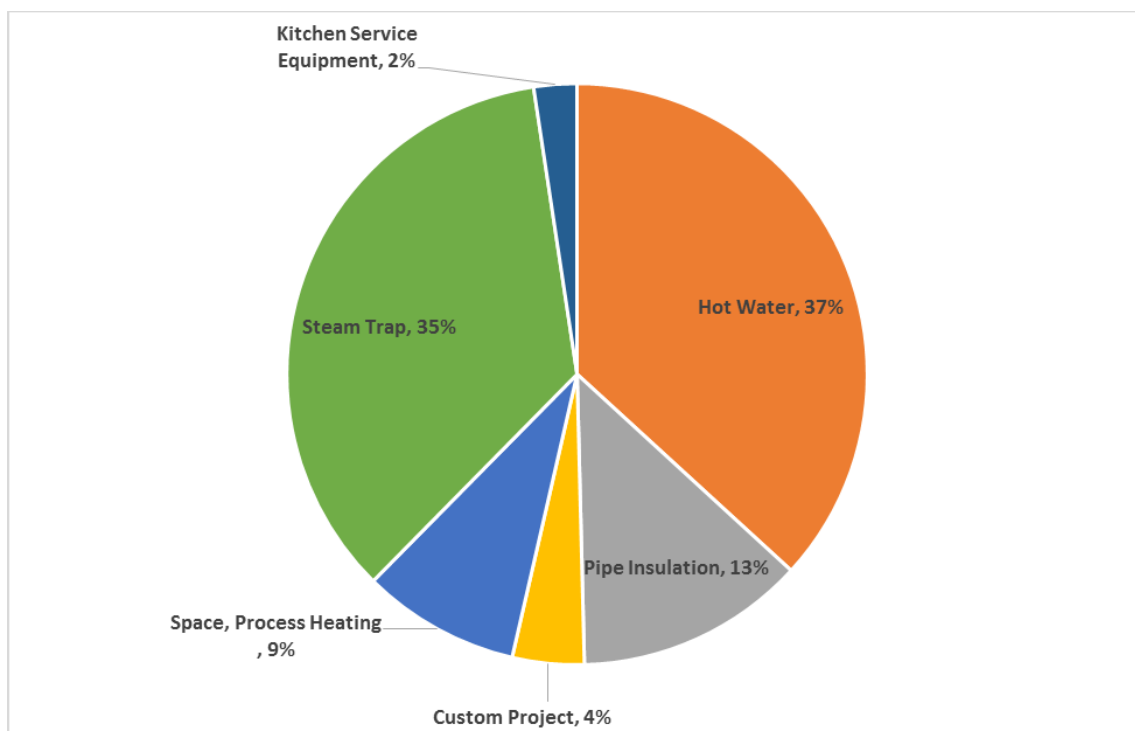
²³ For evaluation reporting purpose, if a measure quantity is reported in the tracking system in linear feet, MBH, dwelling units or in square feet, Navigant treated each row entry of such measure as one measure quantity in this table.

Figure 3-1. Peoples Gas: Number of Measures Installed by Type



Source: Navigant Analysis

Figure 3-2. North Shore Gas: Number of Measures Installed by Type



Source: Navigant Analysis

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

Table 3-3. Peoples Gas GPY5 Small Business Program Measure Count

Measure	Unit	Install Type	Ex Ante Measure Count	Verified Measure Count
Bathroom Faucet Aerator	Each	DI	621	621
Kitchen Faucet Aerator	Each	DI	29	29
Pre Rinse Sprayer	Each	DI	8	8
Showerhead	Each	DI	145	145
Boiler Tune Up - Process	MBH	Standard Incentive	3,911	3,911
Boiler Tune Up - Space Heating	MBH	Standard Incentive	89,363	89,363
Custom Project	Each	Standard Incentive	12	12
Energy Star Convection Oven	Each	Standard Incentive	4	4
Energy Star Fryer	Each	Standard Incentive	1	1
High Efficiency Boiler	MBH	Standard Incentive	18,740	18,740
High Efficiency Furnace	Each	Standard Incentive	6	6
Infrared Heater	Each	Standard Incentive	1	1
Pipe Insulation (DHW/Steam/HW Boiler)	Linear Foot	Standard Incentive	10,212	10,212
Steam Trap - HAVC & Dry Cleaner	Each	Standard Incentive	705	705
Programmable Thermostat	Each	Standard Incentive	117	117
Water Heater 88% TE - Laundromat	MBH	Standard Incentive	999	999

Source: Navigant analysis of program tracking data.

Table 3-4. North Shore Gas GPY5 Small Business Program Measure Count

Measure	Unit	Install Type	Ex Ante Measure Count	Verified Measure Count
Bathroom Faucet Aerator	Each	DI	33	33
Showerhead	Each	DI	8	8
Pre Rinse Sprayer	Each	DI	4	4
Custom Project	Each	Standard Incentive	5	5
Storage Water Heater	MBH	Standard Incentive	200	200
High Efficiency Furnace	Each	Standard Incentive	7	7
Energy Star Fryer	Each	Standard Incentive	2	2
Programmable Thermostat	Each	Standard Incentive	2	2
Energy Star Convection Oven	Each	Standard Incentive	1	1
High Efficiency Boiler	MBH	Standard Incentive	1200	1200
Pipe Insulation (DHW/Steam/HW Boiler)	Each	Standard Incentive	1176	1176
Steam Trap - HAVC & Dry Cleaner	Each	Standard Incentive	44	44

Source: Navigant analysis of program tracking data.

Key findings include:

1. The PGL Program installed fewer direct install faucet aerators and showerheads compared to the previous year. Overall the PGL Program implemented fewer measure types compared to the previous year.
2. The NSG Program implemented fewer measure types and lower quantity compared to the previous year. NSG implemented five custom type measures. This was a new addition to the program measure mix from the previous year.

3.3 Gross Program Impact Parameter Estimates

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

Navigant made adjustments to the default unit savings for the steam pipe insulation, consisting primarily of fittings and valve insulations. Other adjustments addressed thermostat unit savings and infrared heaters, which were updated to be consistent with the TRM (v4.0).

Table 3-5. GPY5 Small Business 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/Kitchen Faucet Aerator	6.86	6.86	Deemed	Sections 4.3
Showerhead	21.73	21.73	Deemed	
Storage Water Heater	1.004	1.004	Deemed	
Water Heater 88% TE - Laundromat	1.057	1.057	Evaluated	Franklin Energy MMDB
Boiler Tune Up - Process	0.84	0.84	Deemed	Sections 4.4
Boiler Tune Up - Space Heating	0.366	0.359	Deemed	
High Efficiency Boiler >=82% TE	0.58	0.58	Deemed	
High Efficiency Boiler >88% TE	1.54	1.54	Deemed	
High Efficiency Furnace >95% AFUE	274	274	Deemed	
Infrared Heater	572	451	Deemed	Sections 4.2
Energy Star Convection Oven	306	306	Deemed	
Energy Star Fryer	505	505	Deemed	
Pre Rinse Sprayer - medium	135.35	135.35	Deemed	Sections 4.4.18
Programmable Thermostat	126.1	124.7	Deemed	
Pipe Insulation	Vary	Vary. Adjusted	Deemed	Sections 4.4.14 & 4.4.24
HVAC Steam Traps (audited)	327.60	327.61	Deemed	Sections 4.4.16
HVAC Steam Traps (unaudited)	88.46	88.46		
HVAC Steam Traps (Dry Cleaner)	509.50	509.50		
Custom Measures	Vary	Vary	Evaluated	Billing Analysis, Secondary Research

Source: Navigant analysis of program tracking data and Franklin Energy documents. 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 PGL SB Program reported ex ante gross energy savings of 482,602 therms from direct install, prescriptive and custom measures. Evaluation adjustments resulted in verified gross energy savings of 470,817 therms, reflecting the program's gross realization rate of 98 percent.

Table 3-6. GPY5 Peoples Gas Small Business 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 Faucet Aerator	Each	621	4,254	1.00	4,259†
Kitchen Faucet Aerator	Each	29	199	1.00	199
Pre Rinse Sprayer - medium	Each	8	1,083	1.00	1,083
Showerhead	Each	145	3,151	1.00	3,151
Pipe Insulation - DHW	Linear Foot	188	304	1.00	304
<i>Direct Install Subtotal</i>			8,990	1.00	8,996
Prescriptive Rebate Measures					
Boiler Tune Up - Process	MBH	3,911	3,280	1.00	3,278
Boiler Tune Up - Space Heating	MBH	89,363	32,670	0.98	32,120
Energy Star Convection Oven	Each	4	1,224	1.00	1,224
Energy Star Fryer	Each	1	505	1.00	505
High Efficiency Boiler	MBH	18,740	13,429	1.00	13,493
High Efficiency Furnace	Each	6	1,644	1.00	1,644
Infrared Heater	Each	1	572	0.79	451
Pipe Insulation - HW/Steam	Each	10,024	80,748	1.00	80,446
Steam Traps	Each	705	221,036	1.00	221,039
Programmable Thermostat	Each	117	14,751	0.99	14,588
Water Heater 88% TE - Laundromat	MBH	999	1,053	1.00	1,056
Other*		29	46,260	1.00	46,260
<i>Retrofit Incentive Subtotal</i>			417,171	1.00	416,104
Custom Incentive					
Custom Measures	Vary	10	56,441	0.81	45,717
PGL GPY5 Total			482,602	0.98	470,817

Sources: Program tracking data and Navigant analysis

* Other measures described as "prescriptive change" in the tracking system. Mix of pipe insulation, steam traps and boiler tune-ups with savings capped at 20 percent of usage.

† Minor differences in savings due to rounding may occur and are not considered errors.

As shown in Table 3-7, the GPY5 NSG SB Program reported ex ante gross energy savings of 43,884 therms and 43,868 therms verified gross energy savings, reflecting verified gross realization rate of 100 percent.

Table 3-7. GPY5 North Shore Gas Small Business Program Impact Results

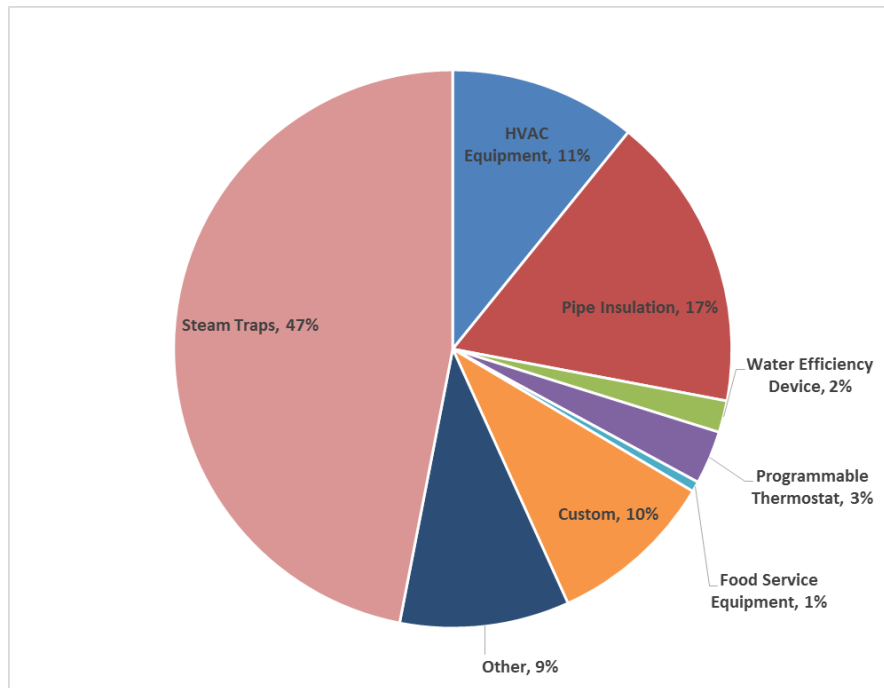
Measure Category	Quantity Unit	Verified Measure Quantity	Ex Ante Gross Savings (therms)	Verified Gross Realization Rate	Verified Gross Savings (therms)
Direct Install Measures					
Bathroom Faucet Aerator	Each	621	248	1.00	248
Pre Rinse Sprayer - medium	Each	8	541	1.00	541
Showerhead	Each	145	152	1.00	152
<i>Direct Install Subtotal</i>			941	1.00	942†
Prescriptive Rebate Measures					
Energy Star Convection Oven	Each	4	306	1.00	306
Energy Star Fryer	Each	1	1,010	1.00	1,010
High Efficiency Boiler	MBH	18,740	1,845	1.00	1,847
High Efficiency Furnace	Each	6	1,917	1.00	1,918
Pipe Insulation - HW/Steam	Each	10,212	5,509	1.00	5,490
Steam Traps	Each	705	15,867	1.00	15,870
Programmable Thermostat	Each	117	252	1.00	249
Water Heater 88% TE - Laundromat	MBH	999	200	1.00	200
Other		10	5,002	1.00	5,002
<i>Retrofit Incentive Subtotal</i>			31,909	1.00	31,892
Custom Incentive					
Custom Measures	Vary	5	11,034	1.00	11,034
NSG GPY5 Total			43,884	1.00	43,868

Source: Program tracking data and Navigant analysis

† Minor differences in savings due to rounding may occur and are not considered errors.

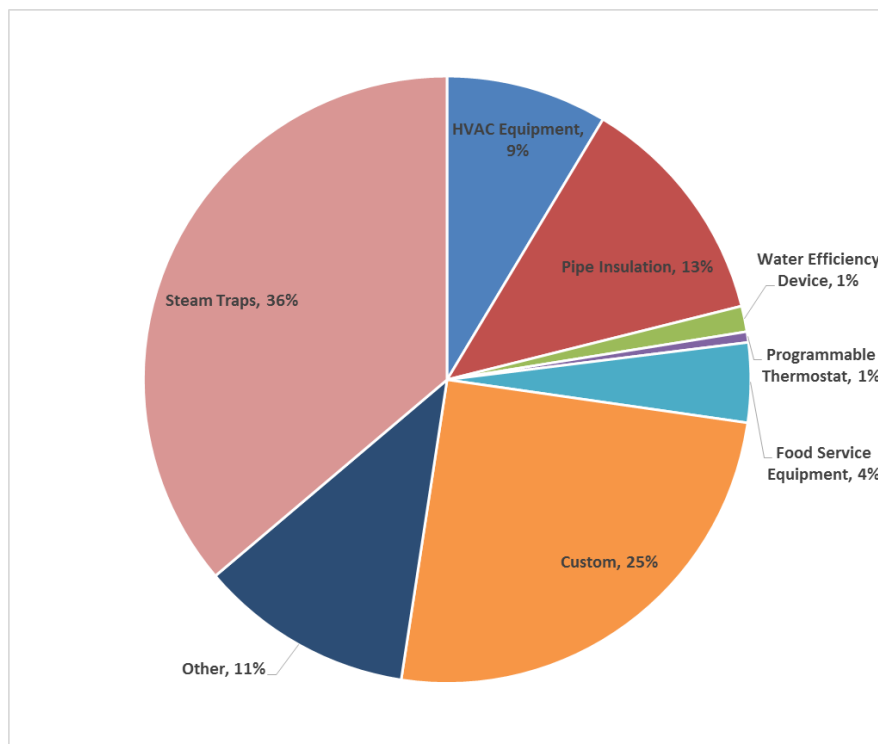
Figure 3-3 and Figure 3-4 disaggregate the savings by measure type. Savings from steam traps produced the bulk of the GPY5 savings for PGL and NSG (47 and 36 percent respectively). Custom measures produced 10 percent of the savings for PGL and 25 percent for NSG. Other measures comprise of projects with mix of pipe insulation, steam traps and boiler tune-ups with savings capped at 20 percent of usage. These projects contributed 9 percent and 11 percent respectively for PGL and NSG. PGL

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

4.1 GPY5 Net Savings Estimates

Verified net energy savings were calculated by multiplying the verified gross savings estimates by a net-to-gross ratio (NTGR) that was deemed prior to the start of the program year. As noted in Section 2, the NTGR used to calculate the net verified savings for the GPY5 Programs 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 combined an additional adjustment factor with the NTGR. The additional factor accounted for potential gross realization rate adjustments, and was based on the previous year's 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 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	GPY5 RR Source*	GPY5 Deemed NTGR	NTGR Source†
Assessment/Direct Install	1.00	Navigant GPY5 Evaluation	0.93	SAG
Prescriptive Rebate	1.00	Navigant GPY5 Evaluation	0.93	SAG
Custom Incentive	1.00	Navigant GPY5 Evaluation	0.93	SAG

Source: Navigant Analysis

* Navigant evaluation report for the GPY4 Small Business Program is available at <http://www.ilsag.info/evaluation-documents.html>.

† Deemed Net-to-Gross Ratios (as well as historical Realization Rates) are available from:

[http://ilsagfiles.org/SAG_files/NTG/2015 NTG Meetings/Final 2015 Documents/Peoples Gas and North Shore Gas NTG Summary GPY 1-5 2015-03-01 Final.pdf](http://ilsagfiles.org/SAG_files/NTG/2015%20NTG%20Meetings/Final%202015%20Documents/Peoples%20Gas%20and%20North%20Shore%20Gas%20NTG%20Summary%20GPY%201-5%202015-03-01%20Final.pdf)

Table 4-2, below, shows the natural gas savings from the GPY5 PGL SB Program by end-use category.

Table 4-2. GPY5 Peoples Gas Small Business Program Natural Gas Savings

End-use Category	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
HVAC Equipment	97,283	90,473	0.99	96,795	0.93	90,019
Pipe Insulation	302,543	281,365	1.00	302,124	0.93	280,975
Hot Water Device	8,772	8,158	1.00	8,781	0.93	8,166
Programmable Thermostat	14,751	13,718	0.99	14,588	0.93	13,568
Food Service Equipment	2,812	2,615	1.00	2,812	0.93	2,615
Custom	56,441	52,490	0.81	45,717	0.93	42,517
Total	482,602	448,819	0.98	470,817	0.93	437,860

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

Table 4-3 shows the natural gas savings from the GPY5 NSG SB Program by end-use category.

Table 4-3. GPY5 North Shore Gas Small Business Program Natural Gas Savings

End-use Category	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
HVAC Equipment	8,764	8,151	1.00	8,766	0.93	8,153
Pipe Insulation	21,377	19,880	1.00	21,361	0.93	19,865
Hot Water Device	600	558	1.00	600	0.93	558
Programmable Thermostat	252	234	0.99	249	0.93	232
Food Service Equipment	1,857	1,727	1.00	1,858	0.93	1,728
Custom	11,034	10,262	1.00	11,034	0.93	10,262
Total	43,884	40,812	1.00	43,868	0.93	40,798

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

5. PROCESS EVALUATION

Navigant's GPY5 process research activities for the PGL and NSG SB 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 participating customers to research questions pertaining to NTG and process. Process research addressed the following topics:

1. Effectiveness of Programs delivery
2. Customer satisfaction with the Programs and major program components
3. Opportunities for Programs improvement

The evaluation team completed a NTG and process interview with 44 participants from a sample of 135 representing unique account names within the sample of 207 participants with unique contact numbers. Of these participants, nine percent included incorrect contact data and 15 percent refused to be surveyed, as shown in Table 5-1.

Table 5-1. Participant Survey Disposition

Status	Instances	Percentage
Wrong Number/Fax Number/Changed Number	12	9%
No Answer/Busy/No Response/Unreachable	12	9%
Refusal/Hostile Interrupt/Added to Do Not Call List	20	15%
Not Available Permanently*	3	2%
Screened Ineligible†	2	1%
Language Barrier	3	2%
Left Voicemail	25	19%
General or Scheduled Callback, not complete	14	10%
Completes	44	33%
Total	135	100%

Source: Evaluation Analysis.

* Survey subjects identified as "not available permanently" are those who are unavailable and will not be available while the survey is open.

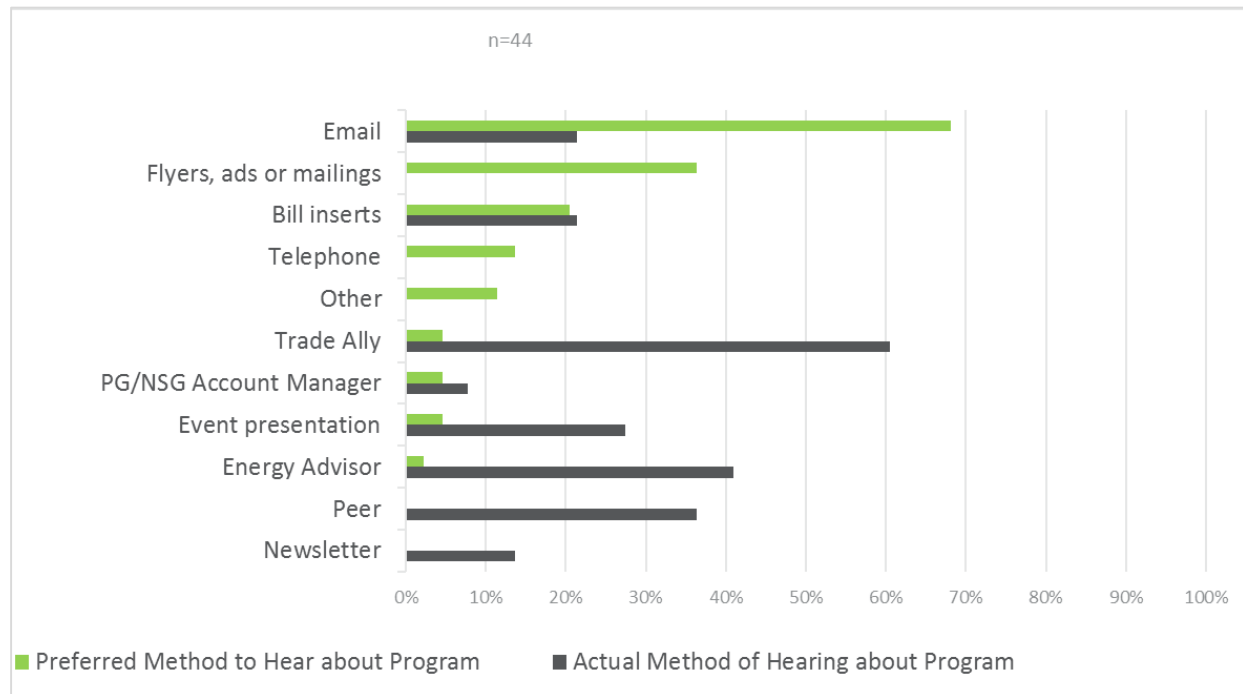
† Survey subjects identified as "screened ineligible" are those who are disqualified from participating in the survey because they do not recall, or reported they did not participate in, the program being researched.

5.1 Program Delivery

The evaluation team asked participants how they recalled hearing about the program. Sixty percent of surveyed participants reported hearing about the program through a Trade Ally (TA), followed by an Energy Advisor (EA), or peer, as shown in Figure 5-1. However, when we asked participants how they would prefer to receive future communication about opportunities like those available through this

program, 68 percent of participants said they would prefer email, followed by flyers, ads or mailings. Only five percent preferred to continue hearing about the opportunities through TAs.

Figure 5-1. Preferred Methods Compared to Actual Methods of Promoting the Program



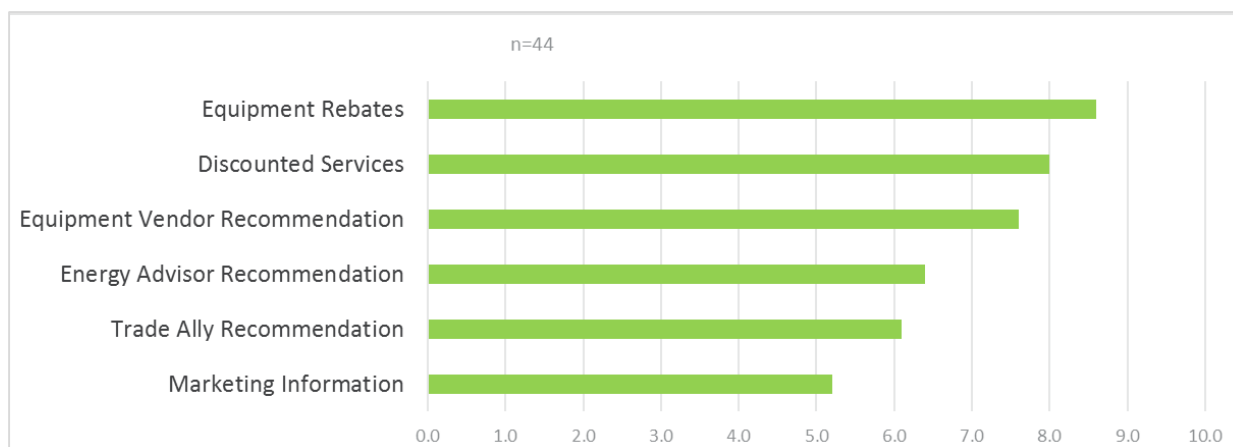
Source: Evaluation analysis.

Participants were motivated to enroll in the program for two primary reasons: 1) savings, available through equipment rebates and discounted services, and 2) recommendations from equipment vendors and their EA. Participants were asked to rate the motivation attributable to various program elements on a scale of 0-10, where zero means “not at all motivating” and ten means “extremely motivating,” with results shown in Figure 5-2.

Participants expanded on their motivation to enroll in the program, including:

- “Knowing that there was a product discount [motivated me], because there was no way we could afford something like that.”
- “The contractor who explain[ed] what needed to be done and how it would benefit the school [motivated me].”
- “We were trying to become cleaner as a company, and we found that it was a step in the right direction. We’re becoming more environmentally friendly, and [we have] savings on bills.”
- “[Understanding] why we had such uneven heating through the building [motivated me]. We were using more energy because of a malfunctioning system. The [TA] showed me the components and how they worked, and that motivated me even more.”

Figure 5-2. Motivations for Participating in the Program



Source: Evaluation analysis.

A participant commented that their motivation to enroll was impacted by program requirements, saying, “It can be difficult and challenging for a lay person to understand the scheduling of the varied components that fall under this program from Peoples’ Gas. It’s easy enough for me to understand how my furnace works at home, but with this big system there are deadlines for piping, then steam traps and this and that. To comply with the program you can’t always do insulation of piping, or other phases if you’re waiting to install the furnace.”

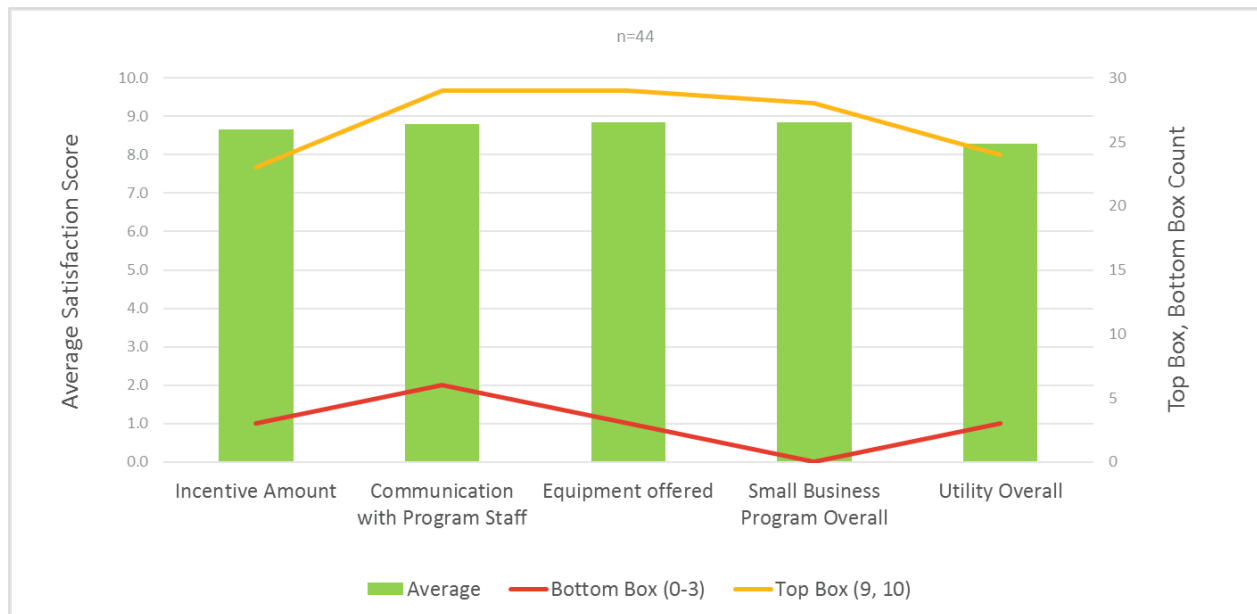
5.2 Program Satisfaction

The Navigant evaluation team asked participants about their satisfaction with various aspects of the programs, requesting that they rate their satisfaction on a scale of 0-10, where zero means “very dissatisfied” and ten means “very satisfied.” The results of this research are offered in Figure 5-3, including the number of top box ratings of nine or ten and the bottom box ratings of zero through three.

Participants expanded on their satisfaction with the program, including:

- “The energy program is very beneficial, it has saved us money, and as long as they continue with energy savings programs we are willing to participate.”
- “I’m satisfied with how Peoples Gas communicated with our business, and I think they need to ... offer more information to all small businesses by email, phone calls or personal visits.”
- “You all, Peoples Gas, have been really friendly when you reached out to us, and I really appreciate that.”

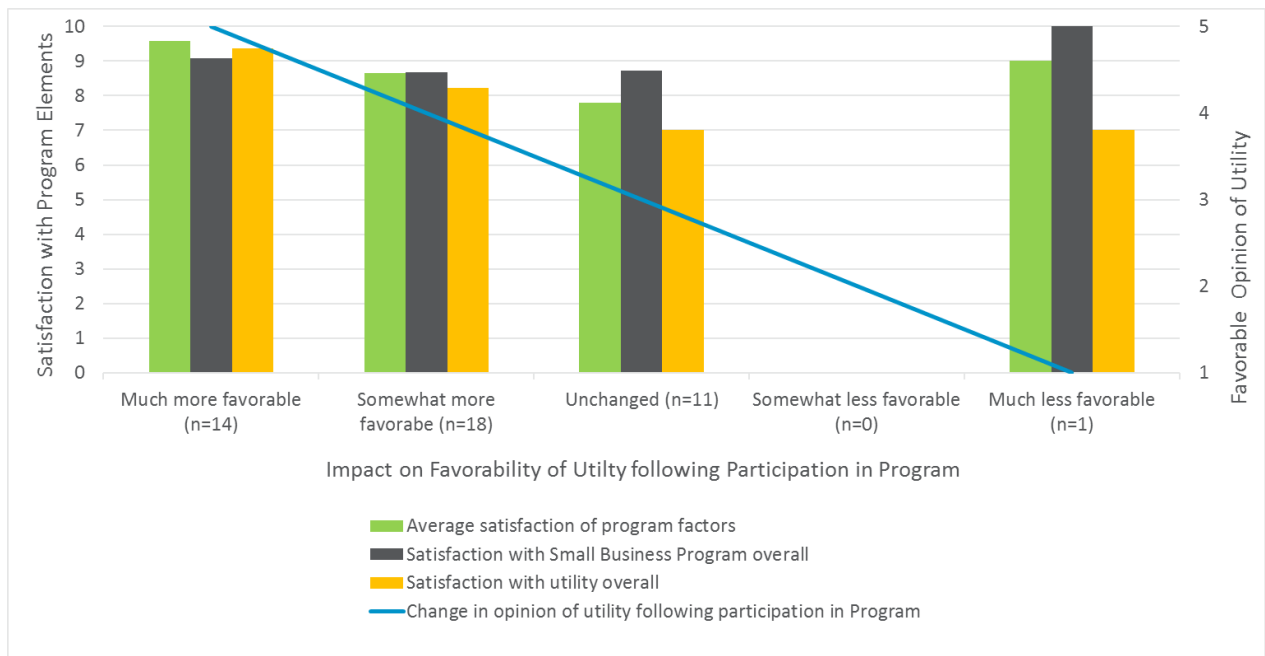
Figure 5-3. Satisfaction with the Small Business Program



Source: Evaluation analysis.

The evaluation team also asked if participants' experience in the program altered the favorability with which they viewed their utility. Asked to rate any changes resulting from their participation from "much more favorable" to "much less favorable" with two moderate and a neutral option, 73 percent of participants reported viewing their utility much more or somewhat more favorably. Yet, as shown in Figure 5-4, both averaged satisfaction ratings of program elements and satisfaction with the Small Business Programs had less impact on the favorability rating than did satisfaction with the utility.

Figure 5-4. Program Impact on Satisfaction with the Utility

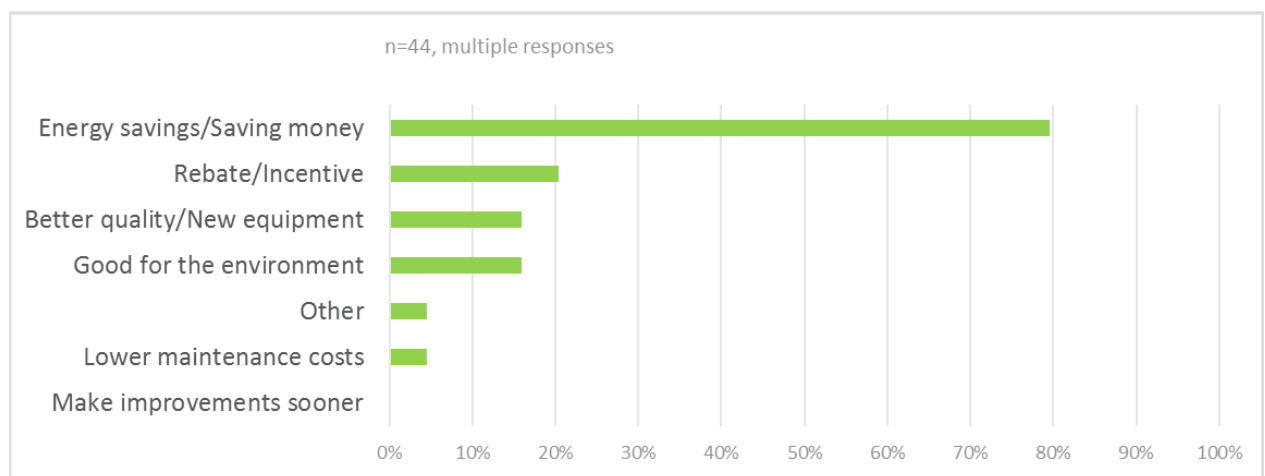


Source: Evaluation analysis.

5.3 Program Benefits and Recommended Improvements

As shown in Figure 5-5, program participants reported the Small Business Programs offer several benefits, primarily related to savings: saving energy, saving money, receiving rebates or incentives and lowering maintenance costs. One participant added that this program “helps out the small guy.”

Figure 5-5. Program Benefits as Perceived by Participants

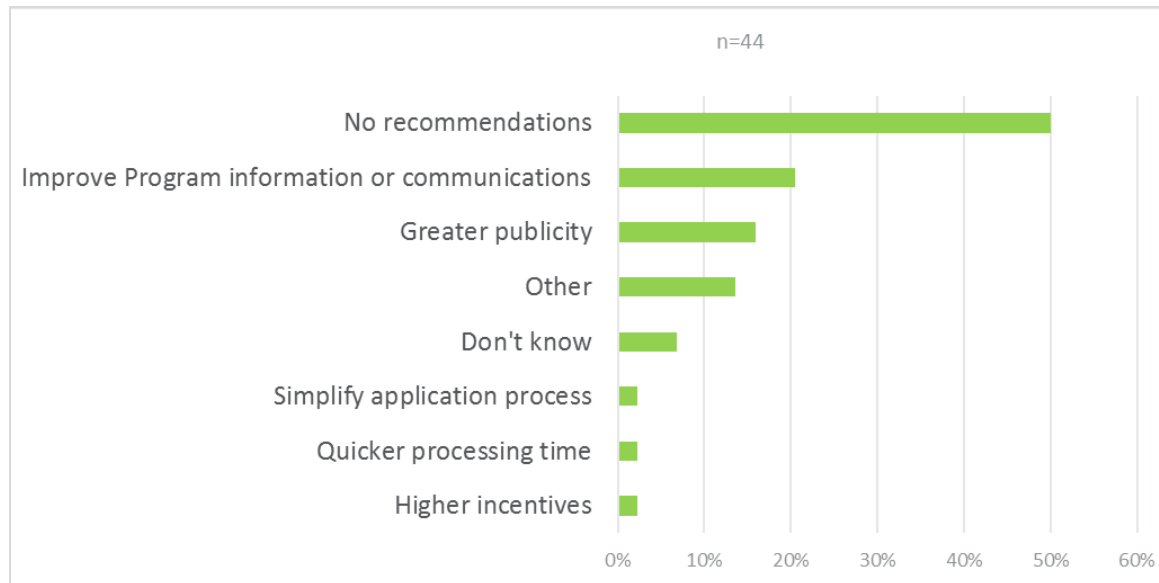


Source: Evaluation analysis.

Fully half of the participants could offer no recommendations to improve the program, as shown in Figure 5-6. Two participants offered recommendations that suggest a concern about persistence:

- “Follow up after installation to assess what was done and how it was done.”
- “Come out to check periodically on what's going on, check the insulation on the pipes and whatever is going on that concerns the gas.”

Figure 5-6. Recommended Improvements as Perceived by Participants



Source: Evaluation analysis.

6. FINDINGS AND RECOMMENDATIONS

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

Verified Gross Impacts and Realization Rate

Finding 1. The GPY5 Peoples Gas Small Business Program reported ex ante gross energy savings of 482,602 therms (including savings from direct install, prescriptive and custom measures). Evaluation adjustments resulted in verified gross energy savings of 470,817 therms, reflecting the program's gross realization rate of 98 percent. Evaluation adjustments were made to savings from custom measures and HVAC measures. The North Shore Gas Small Business Program reported 43,884 therms ex ante savings and achieved 43,868 therms verified gross energy savings, reflecting verified gross realization rate of 100 percent.

Recommendation 1: Check and if needed update the tracking system input assumptions for pipe insulation, boiler tune-ups and programmable thermostats to match Franklin's "Master Measure Database" spreadsheet (MMDB)²⁴ for the current program year.

Finding 2: Some custom projects involving space-heating were finished in the spring with insufficient post-installation billing data for verification. Evaluation relied on secondary research or compared with TRM-approved methods to estimate the verified savings. Some of the ex post analyses with variance from ex ante estimates involve measures of this type.

Recommendation 2: Beginning with GPY6, the program year will end December 31, allowing nine program months prior to a heating season. If possible, prioritize processing and implementing weather-dependent custom projects so that they are complete in the first three quarters of the program year so that there will be sufficient post-installation billing data from the heating season to analyze the energy savings. If possible, Franklin should identify in mid-year the weather-dependent custom projects that are likely to complete in the fourth quarter, because it may be possible to design the custom M&V sample to reduce or eliminate the need to select projects that will not have sufficient billing data.

Finding 3: Some custom projects involved changes in system capacity, i.e. upgrades were coincident with expansion. When new equipment is installed in these situations, we found that the assumed ex ante baseline has been existing equipment, of the same capacity, that is operational. Selection of this baseline in this situation will overestimate savings that can be claimed for the program.

Recommendation 3: When production capacity is increased, the existing equipment baseline should only be applied to the pre-existing production capacity. Additional capacity created through the upgrade should have a code-compliant and/or industry standard practice baseline, which is likely more efficient than the existing equipment.

Finding 4: Evaluation reviewed a custom project with a controls system upgrade that did not appear to be commissioned adequately to ensure savings, or perhaps set points were changed to achieve greater comfort, possibly causing take-back effects.

Recommendation 4: To reduce the risk of downward evaluation adjustments on controls system upgrades, the program should require submission of post-installation functional tests (e.g. temperature trend logging data) that demonstrate sequences of operation (commissioning)

24 PG&NSG MMDB PY5 - 04122016, produced by Franklin Energy

that conform to savings estimates. If those functional tests require the heating season, withhold whole or partial incentives until the tests prove the controls work as intended.

TRM Recommendations

Finding 5. The evaluation team identified certain pipe insulation and steam trap projects in the tracking system which were described as “prescriptive change.” Franklin clarified that using the TRM assumptions for these projects produced more savings than was consistent with the nature of the projects. Franklin capped the savings at 20 percent of the accounts’ annual gas usage.

Recommendation 5. The TRM Technical Advisory Committee should examine whether input assumptions for pipe insulation and steam traps are appropriate for small businesses. For example, hours of operation in the TRM may be more appropriate for larger businesses with longer operating hours than small businesses or houses of worship.

Process Evaluation

Finding 6. Small Business Programs’ customers most frequently hear about the program from their contractors or trade ally. They would prefer to receive program information through email.

Recommendation 6. The PGL and NSG Small Business Programs should consider sponsoring a joint e-newsletter, which could provide a vehicle for collecting email addresses from current and potential participants, as well as for delivering program information and low-cost marketing.

Finding 7. The Small Business Program influences over 70% of small business customers to improve their opinion of the utility.

Finding 8. Participant data included a significant amount of incorrect telephone contact information. These participants represented nine percent of our sample.

Recommendation 7. The implementer should stress with trade allies the importance of gathering accurate and complete participant contact information, including telephone numbers, names, and emails.

Finding 9. Some participants in the program were not open to taking the NTG and Process survey, as indicated by 15 percent of the sample who refused to participate.

Recommendation 8. 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 Small Business 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 for Custom Projects

Navigant initially found 12 custom projects for PGL and five custom projects for NSG in the GPY5 tracking data, indicating that a total of 17 custom projects were completed. The evaluation team randomly sampled 10 projects, but later found that two of the custom PGL projects should be excluded from GPY5, leaving 10 completed projects for PGL and five for NSG, for a total of 15 completed projects and eight projects in the engineering review sample. The relative precision of the sample was ± 6 percent at a 90 percent confidence level. A profile of the custom sample selection and summary of adjustments are provided in Table 7-1.

Table 7-1. PGL and NSG GPY5 SB Program Custom Sample

Project ID	Utility	Measure Description	Ex Ante Gross (Therms)	Unweighted Verified Gross (Therms)	Unweighted Gross RR	Summary of Adjustment
909531	PGL	Air Turn-over Units	8,642	13,350	155%	Billing analysis captures heat recovery aspects
953939*	PGL	Ceiling Insulation	1,939	0	Excluded from GPY5	Billing analysis shows no savings due to customer error. Franklin Energy confirmed that customer made modifications from the original scope which negated any savings
960363*	PGL	BAS	5,872	-3,850	Excluded from GPY5	Billing data show increase in usage. Further investigation found project was installed but then disabled in GPY5 and project was moved to GPY6.
953966	PGL	HE DWH	2,047	1,724	84%	Billing analysis correctly calculates HW load separate from dryer load. Various undetermined factors can reduce the verified savings estimated through a billing analysis, including factors beyond the control of the implementer. Upgraded equipment may have resulted in an increase in customer demand at the laundromat.
978322	PGL	Washers and Dryers	15,409	5,204	33%	Billing data show clear increase in usage due to a number of factors outside of the control of the implementer. Washer and dryer capacity were increased and further investigation found that customer demand increased as well. The estimate of verified savings reflects an evaluator-prescribed dual baseline reflecting the pre-existing conditions and expanded capacity of the post-installation conditions, given the information available.
997264	PGL	Pipe Insulation	5,699	6,513	114%	Using TRM deemed assumptions (thermal regain factor) produced higher therms savings.
1066210	NSG	BAS	5,461	5,461	100%	Billing analysis lacks sufficient post-installation data, however assumptions are verified to be reasonable.
1091059	NSG	HE Laundromat Washers	1,350	1,350	100%	Billing analysis lacks sufficient post-installation data, however assumptions are verified to be reasonable.
1150270	PGL	Boiler Control and Thermostat	14,054	10,500	75%	Billing analysis lacks sufficient post-installation data. Extensive post-installation billing data were not available at time of evaluation. Evaluation found settings used in the ex ante analysis were not independently verifiable. Revised calculation was reasonable.
1160324	PGL	Pipe Insulation	8,472	5,433	64%	Billing analysis lacks sufficient post-installation data. Extensive post-installation billing data were not available at time of evaluation. Evaluation used TRM deemed assumptions to adjust the savings.

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

* Excluded from the GPY5 analysis.

For each selected project, an in-depth application review was performed to assess the engineering methods, parameters and assumptions used to generate all ex ante impact estimates. For each measure in the sampled project, Navigant engineers estimated ex post gross savings based on their review of documentation and engineering analysis. Franklin provided project documentation in electronic format for each sampled 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), monthly billing data, inspection reports and photos (where available), and calculation spreadsheets. In some cases, Navigant received additional information from Franklin engineers and had further discussions to reach a conclusion on our verified savings estimate.

Table 7-2 presents the research findings for the six sampled PGL custom file review projects (two of the eight originally sampled projects were either moved to GPY6 or disqualified from the program, and therefore excluded as outliers from the PGL GPY5 analysis) and two NSG projects. The mean verified gross realization rate for the PGL custom sample was 81 percent. The NSG had a 100 percent gross realization rate.

Table 7-2. GPY5 Summary of Custom Sample File M&V Results

Program	Strata	Sample Size (n)	Population (N)	Sample Ex Ante Gross Savings (Therms)	Population Ex Ante Gross Savings (Therms)	Weighted Sample-Based Research Findings Gross Realization Rate	Weighted Population Research Findings Gross Savings (Therms)
PGL	Large	2	2	29,463	29,463	0.53	15,525
	Medium	2	2	16,418	16,418	1.14	18,783
	Small	2	6	7,746	10,560	1.06	11,229
	Total	6	10	53,627	56,441	0.81	45,717
NSG	Total	2	5	6,811	11,034	1.00	11,034

Source: Utility tracking data and Navigant analysis.

7.1.2 Net Impact Findings

Free Ridership Scoring Algorithm and Specifications

Free ridership research was conducted following a customer self-report approach through a CATI survey with 44 out of 207 unique small business participants, representing 20 percent of the energy savings realized through the PGL and NSG GPY5 Small Business Programs.

The free ridership approach was based on the Illinois Statewide NTG Methodologies document (IL-NTG Methods).²⁵ The core nonresidential free ridership algorithm adopted from the Illinois NTG Methods consists of two scores that represent different ways of characterizing program influence or free ridership:

²⁵ Illinois Statewide Technical Reference Manual for Energy Efficiency, Version 5.0, Volume 4: Cross-Cutting Measures and Attachments, effective June 1st, 2016.

the Program Components Score and the No Program Score (a third component, Program Influence Score, is dropped from the Small Business free ridership algorithm to reduce the burden on participants).

The Program Components Score input has two alternative specifications that reflect the influence of the most important of various program and non-program related elements in the customer's decision to select the specific program measure at this time. The alternative Program Components Score specifications are:

Option 1: $PCS1 = 1 - ([\text{Maximum Program Factor Score}]/10)$

Option 2: $PCS2 = 1 - ([\text{Maximum Program Factor Score}]/([\text{Maximum Program Factor Score}] + [\text{Maximum Non-Program Factor Score}]])$

The No-Program score 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. This score accounts for deferred free ridership by incorporating the likelihood that the customer would have installed program-qualifying measures at a later date if the program had not been available (applying Timing Adjustment option 1 as described in the IL NTG Methods).

The Likelihood Score is determined through a series of questions asking the participant to rate on a scale of 0-10 how likely they would have been to install any standard or efficient equipment on their own. Those answering with a likelihood of one or more were then asked how likely they would have been to install the same equipment they received through the program. The No-Program Score is calculated as the Likelihood Score divided by ten:

$\text{No-Program Score} = \text{Likelihood Score}/10$

The evaluation team asked those with any likelihood of installing the same equipment when they would have done so on their own to arrive at a Timing Adjustment Factor. Navigant used the Number of Months Expedited variable to account for deferred free ridership:

$\text{Timing Adjustment Factor} = 1 - (\text{Number of Months Expedited} - 6)/42$

Based on the combination of the two scores and the timing adjustment factors, Navigant calculated free ridership results in the following two ways:

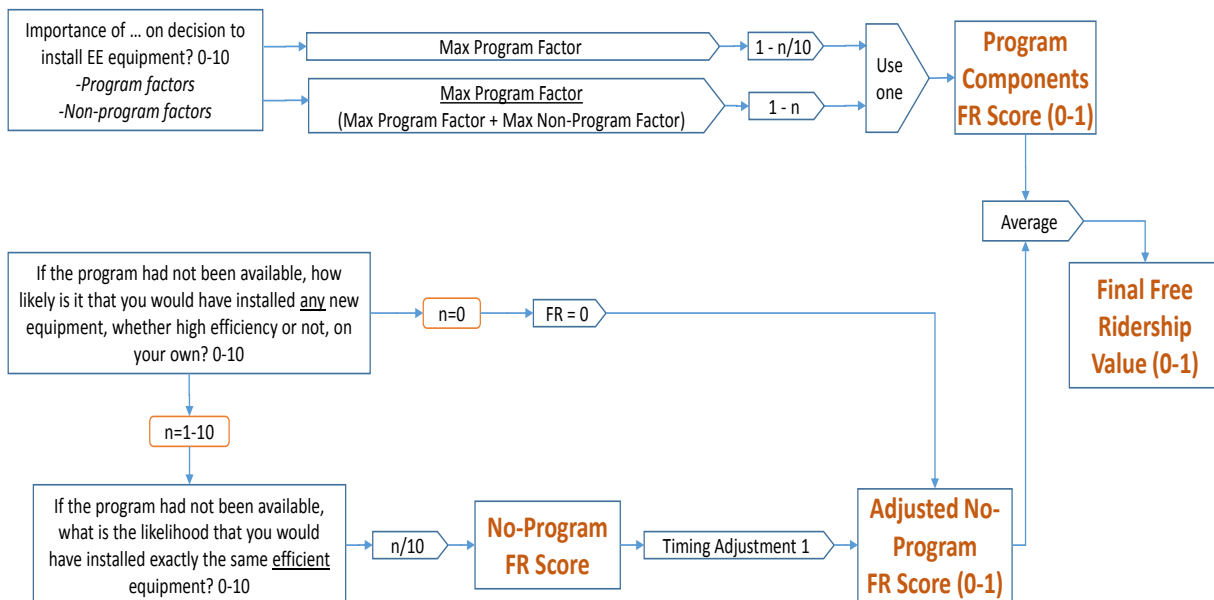
Option 1: $FR1 = \text{Average}([PCS1], [\text{No Program Score} * \text{Timing Adjustment Factor}])$

Option 2: $FR2 = \text{Average}([PCS2], [\text{No Program Score} * \text{Timing Adjustment Factor}])$

The Small Business free ridership algorithm is shown below. The net-to-gross scoring approach is summarized in Figure 7-1.

Figure 7-1. Small Business Free Ridership

$(\text{Program Components FR Score} + (\text{No-Program FR Score} * \text{Timing Adjustment 1})) / 2$



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

Table 7-3 describes the calculation steps.

Table 7-3. Small Business Net-to-Gross Scoring Algorithm (FR-only) from IL-NTG Methods

Scoring Element	Calculation
Program Components Score: The maximum score (scale of 0 to 10 where 0 equals not at all influential and 10 equals very influential) among the self-reported influence level the program had for: A. Availability of discounted services B. Availability of project rebates C. Information from program marketing materials D. Recommendation from a Trade Ally or PTA E. Recommendation from an equipment vendor or contractor F. Recommendation from a utility Energy Advisor G. Motivation rate by other program offering	Program Factor: Maximum of A, B, C, and F Non-Program Factor: Maximum of D, E, and G <i>Two different ways of calculating Program Component Score are shown above.</i>
No-Program Score: “Using a likelihood scale from 0 to 10, where 0 is “Not at all likely” and 10 is “Extremely likely,” if the utility program had not been available, what is the likelihood that you would have purchased/installed ANY measure, whether high or standard efficiency, on your own? If the likelihood score is between 1-10, then a follow up question for determining No-Program score is “Using a likelihood scale from 0 to 10, where 0 is “Not at all likely” and 10 is “Extremely likely,” if the utility program had not been available, what is the likelihood that you would have installed exactly the same equipment within one year or at a later date?” The NTG algorithm computes the Likelihood Score as 10 minus the respondent’s answer (e.g., the likelihood score will be 0 if extremely likely to install exactly the same equipment if the program had not been available). Adjustments to “Likelihood score” are made for timing: “Without the program, when do you think you would have installed this equipment?” Free-ridership diminishes as the timing of the installation without the program moves further into the future.	If the likelihood score is zero, then the No Program score equals the Likelihood Score. The No Program Score equals 10 (no free-ridership). If the likelihood score is between 1-10, then interpolate between Likelihood Score and 10 to obtain the No-Program score, where If “At the same time” or within 6 months then the No Program score equals the Likelihood Score, and if 48 months later then the No Program Score equals 10 (no free-ridership) <i>The timing adjustment factor for calculating No-Program Score is shown above.</i>
Project-level Free-ridership (ranges from 0.00 to 1.00)	1 – Sum of scores (Program Components, No-Program) * <i>Adjustment Factor</i>
Project level Net-to-Gross Ratio (free-ridership only)	1 – Project level Free-ridership

Source: Evaluation team

Our findings from the free ridership research show that free ridership is lower (0.15) when the algorithm considers only the maximum program factors for program component scores in determining free ridership, compared to 0.33 when the algorithm considers an average of the maximum program factors and the non-program factors. Navigant recommends using the 0.15 free ridership for future program years because this approach is both consistent with the historical practice and proactive, incorporating the removal of non-program factors anticipated in the sixth version of the TRM.

Spillover Attribution Algorithm Specifications

The evidence of spillover from the CATI participant survey for the Small Business Programs is presented in Table 7-4. 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 participate 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 Small Business Program if the following condition is met: the average of Attribution Score 1 and (10 - Attribution Score 2) must exceed 5.0.²⁶

Spillover rate was calculated at the project level or at the program level using the following formula:

$$\text{Spillover Rate} = (\text{ISO} + \text{OSO}) / (\text{Ex Post Gross Impacts})$$

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).

²⁶ The Illinois NTG Methods (TRM 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. Navigant examined spillover using 5.0 and 7.0, but proactively uses an average score exceeding 5.0 for the spillover reporting.

Table 7-4. Small Business Program Spillover Evidence from the Participant Telephone Survey

Spillover Question	Evidence of Spillover
Since participating in the PGL/NSG Small Business Program, have you taken any additional actions to reduce the energy consumption at your property?	Of the 44 survey respondents, 20 (45%) said “Yes” 14 of the 20 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 14 remaining candidates is as follows: (1) “Don’t Know” (4) Rating of 0 to 3 (3) Rating of 4 to 7 (6) 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 14 respondents is as follows: (1) “Don’t Know” (0) Rating of 0 to 3 (3) Rating of 4 to 7 (10) 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)	5 participants from the 14 respondents had attribution condition greater than 5 when Attribution Scores 1 and 2 are paired for specific measure designation. Only 2 installed gas equipment with quantifiable savings. One candidate installed 9 faucet aerators, and the other performed water heating energy temperature setback.
Of the 2 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 you purchased this equipment without an incentive, if it was available, the two spillover candidates responded that the program incentive was not available.
Spillover Rate	Sample Spillover Savings/(Sample Ex Post Gross Impacts) Estimated 0.006 spillover rate. Since NTG components are reported at the two-digit level, we attributed a 1 percent spillover rate (0.01) to the programs.

Source: Evaluation analysis

The evaluation identified five potential spillover candidates based on the spillover attribution condition greater than 5. Navigant determined that only two of the candidates installed equipment with quantifiable gas savings (others installed lighting equipment). When asked why each candidate purchased the equipment without an incentive, if it was available, the two gas spillover candidates responded that the program incentive was not available. Navigant estimated 0.006 spillover for the two candidates who installed faucet aerators and performed water heater temperature setbacks. Since NTG components are reported at the two-digit level, we attributed a 1 percent spillover rate (0.01) to the programs.

Free Ridership and Spillover Research Summary Findings

Table 7-5 presents the NTG parameters recommended for future use by the evaluation team, based on GPY5 Small Business Program participant research.

Table 7-5. Participating SB Customer Free Ridership and Spillover Research Findings

Parameter	Program Component Score 1	Program Component Score 2	Data Source
Free Ridership (FR)	0.15	0.33	GPY5 Evaluation Research. Based on IL-NTG Methods
Participant Spillover (SO)	0.01	0.01	
Net-to-Gross Ratio (NTGR=1-FR+SO)	0.86	0.68	
Relative Precision @90% CI	6%		
Sample (n)	44		
Population (N)	207 unique contacts		

Source: Evaluation Analysis.

7.2 Survey Instrument

PEOPLES GAS AND NORTH SHORE GAS SMALL BUSINESS PROGRAM PARTICIPANT SURVEY GUIDE - FINAL Navigant August 31, 2016

Table 1: Small Business Program Survey Topics

Topics	Research Questions
Other Program Participation Marketing Module	<ul style="list-style-type: none"> • Previous Participation in EE Programs • Marketing and Outreach
Comprehensive Module NTG	<ul style="list-style-type: none"> • Program Components Score • No-Program Score • “Timing Adjustment 1” to No Program Score
Spillover Module	<ul style="list-style-type: none"> • Eligible for a rebate but did not receive one • Importance of Program in Decision to Install EE equipment
Process Module	<ul style="list-style-type: none"> • Satisfaction • Benefits and Barriers • Feedback and Recommendations
Firmographics Model	<ul style="list-style-type: none"> • Ownership • Number of locations • HVAC ownership • Age • Number of employees

INTRODUCTION

[READ IF CONTACT=1]

Hello, this is _____ from Blackstone calling on behalf of Peoples Gas/North Shore Gas. ***This is not a sales call.*** May I please speak with **<CONTACTNAME>**?

Our records show that **<COMPANY>** implemented energy saving **<MEASURE1, MEASURE2, MEASURE3>** through the Small Business Program sponsored by <Peoples Gas/North Shore Gas>. We are calling to do a follow-up study about **<COMPANY>**'s participation in this incentive program. I was told you're the person most knowledgeable about this project. Is this correct? **[IF NOT, ASK TO BE TRANSFERRED TO MOST KNOWLEDGEABLE PERSON OR RECORD NAME & NUMBER.]**

This survey will take about 15 minutes. Is now a good time? **[If no, schedule call-back]**

[READ IF CONTACT=0]

Hello, this is _____ from Blackstone calling on behalf of <Peoples Gas/North Shore Gas>. I would like to speak with the person most knowledgeable about the recent assessment and energy saving improvements to heating and other natural gas equipment for your firm at this location.

[IF NEEDED] Our records show that **<COMPANY>** implemented energy saving **<MEASURE1, MEASURE2, MEASURE3>** and you or your contractor received an incentive from <Peoples Gas/North Shore Gas>. We are calling to do a follow-up study about your firm's participation in this incentive program, which is called the Small Business Program. This information will be used by Peoples Gas/North Shore Gas to improve the Program in the future. I was told you're the person most

knowledgeable about this project. Is that correct? **[IF NOT, ASK TO BE TRANSFERRED TO MOST KNOWLEDGEABLE PERSON OR RECORD NAME & NUMBER.]**

This survey will take about 15 minutes. Is now a good time? **[If no, schedule call-back]**

SCREENING QUESTIONS

A1. Just to confirm, did **< COMPANY >** recently participate in the Small Business Program offered by **<Peoples Gas/North Shore Gas>** at **<ADDRESS>**?

IF MORE EXPLANATION IS NEEDED: This is a program where your business may have received a free energy assessment, an offer of free energy savings products, and a report. Or program incentives were paid directly to your contractor who implemented one or more energy saving capital improvement projects or equipment improvements.

- 1 Yes, participated as described
- 2 Yes, participated but at another location
- 3 NO, did NOT participate in program **[if this is answered, go to A2]**
- 97 OTHER, SPECIFY **[if this is answered, go to A2]**
- 98 DON'T KNOW **[if this is answered, go to A2]**
- 99 REFUSED **[if this is answered, go to A2]**

[SKIP A2 IF A1=1, 2]

A2. Is it possible that someone else dealt with the energy-efficient product installation?

- 1 YES, SOMEONE ELSE DEALT WITH IT
- 2 NO
- 97 OTHER, SPECIFY
- 98 DON'T KNOW
- 99 REFUSED

[IF A2=1, ask to be transferred to that person. If not available, thank and terminate. If available, go back to A1]

[IF A1=2,3, 97,98,99: Thank and terminate. Record disposition as "Could not confirm participation".]

Before we begin, I want to emphasize that this survey will only be about the energy saving products and services received through the Small Business Program at **<ADDRESS>**.

PROCESS MODULE

MK0 I'm now going to ask you about several specific ways in which you might have seen or heard information about the Small Business Program. Have you ever... [1=Yes, 2=No, 8=(Don't know), 9=(Refused) **RANDOMIZE ORDER OF ATTRIBUTES.**

a. Received information about the program in your monthly utility bill?	YES	No	DK/Refused
b. Attended a <Peoples Gas/North Shore Gas> customer event where the program was discussed?			
c. Discussed the program with a <Peoples Gas/North Shore Gas> Account Manager?			
d. Discussed the program with a Contactor or Trade Ally?			
e. Seen information about the program on the Peoples Gas/North Shore Gas' Website?			
f. Received information about the program in an Email?			
g. Heard about the program from a colleague, friend or family member?			
h. Attended a meeting, seminar or workshop where the program was presented?			
i. Attended a webinar where the program was discussed?			
j. Read about the program in a <Peoples Gas/North Shore Gas> Newsletter?			
k. Been directly contacted by a Small Business Program energy advisor?			

PROGRAM AWARENESS

OP1 Are you aware of any other <Peoples Gas/North Shore Gas> efficiency programs?

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

[IF '2', '98', '99' AT OP1, SKIP TO MK1a; ELSE CONTINUE]

OP2 Which program or programs are you aware of? [DO NOT READ, ACCEPT ALL; PROBE WITH "ANY OTHERS?"]

- 1 COMMERCIAL AND INDUSTRIAL CUSTOM PROGRAM
- 2 COMMERCIAL AND INDUSTRIAL ENERGY JUMP START PROGRAM
- 3 COMMERCIAL AND INDUSTRIAL PRESCRIPTIVE PROGRAM
- 4 GAS OPTIMIZATION STUDY PROGRAM
- 5 RETRO-COMMISSIONING PROGRAM
- 97OTHER – RECORD
- 96None
- 98DON'T KNOW
- 99 REFUSED

[IF '96', '98', '99' AT OP2, SKIP TO MK1a; ELSE CONTINUE]

OP3 Has your firm participated in any other <Peoples Gas/North Shore Gas> efficiency programs?

- 1 YES
- 2 NO
- 98 DON'T KNOW
- 99 REFUSED

[ASK IF OP3 = 1, ELSE SKIP TO MK1a]

OP4 Which program or programs did your firm participate in? MULTIPLE RESPONSE [READ LIST]

- 1 Commercial and Industrial Custom Program
- 2 Commercial and Industrial Energy Jump Start Program
- 3 Commercial and Industrial Prescriptive Program
- 4 Gas Optimization Study Program
- 5 Retro-Commissioning Program
- 97OTHER – RECORD

- 96None (GO TO MK1A)
- 98 DON'T KNOW (GO TO MK1A)
- 99 REFUSED (GO TO MK1A)

[IF '96', '98', '99' AT OP3, SKIP TO MK1a; ELSE CONTINUE]

OP5 On a scale of 0-10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the <RESPONSE FROM OP4> influence your decision to participate in this <Peoples Gas/North Shore Gas> Small Business efficiency program?
[SCALE 0-10; 98=Don't know, 99=Refused]

MARKETING THE PROGRAM

MK1a Had you received any Small Business marketing materials from <PEOPLES GAS; NORTH SHORE GAS> before you participated in the program?

- 1 Yes [ASK MK1B AND MK1C]
- 2 No [GO TO MK2]
- 98 DON'T KNOW [GO TO MK2]
- 99 REFUSED [GO TO MK2]

MK1b How useful were the program's marketing materials in learning more about the program? Would you say they were...

- 1. Very useful
- 2. Somewhat useful
- 3. Not very useful
- 4. Not at all useful
- 5. DID NOT SEE MARKETING MATERIALS
- 98. DON'T KNOW
- 99. REFUSED

[ASK MK1c IF MK1b=3, 4]

MK1c What, if anything, would have made the materials more useful to you? [DO NOT READ, CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

- 1. MORE DETAILED INFORMATION
- 2. WHERE TO GET ADDITIONAL INFORMATION
- 96. OTHER, SPECIFY
- 97. NO CHANGES WOULD HAVE MADE A DIFFERENCE
- 98. DON'T KNOW
- 99. REFUSED

[ASK ALL PARTICIPANTS]

MK2 In general, what are the best ways of reaching companies like yours to provide you with details about opportunities like the Small Business Program? [Record/answer UP TO 3] [DO NOT READ, CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

- 1. BILL INSERTS
- 2. FLYERS/ ADS/ MAILINGS

- 3. E-MAIL
- 4. TELEPHONE
- 5. PGL/NSG ACCOUNT MANAGER
- 6. ENERGY ADVISOR
- 8. TRADE ALLIES/ CONTRACTORS
- 9. PRESENTATION BY <PG, NSG> AT AN EVENT
- 97. OTHER, SPECIFY
- 98. DON'T KNOW
- 99. REFUSED

PARTICIPANT FREE RIDERSHIP

The following questions are about the energy saving improvements and equipment that you installed through the Small Business Program at (SITE ADDRESS).

COMPREHENSIVE MEASURES FREE RIDERSHIP (ASK ABOUT ONE TO THREE COMPREHENSIVE MEASURES)

[ASK IF COMP=1; READ-IN COMP_DESC]

(Replace "purchase and install" or "install" with "perform" IF COMP_DESC = "boiler tune-up")

COMPREHENSIVE MEASURES: Program Components Score

COMP_FR1. Thinking back to when you first heard about the Small Business Program, we are interested in what motivated you to participate in the program?

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.

[FOR 2a-hh, 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 ORDER 2a-2g]

(READ SCALE IF NEEDED) ASK 2a and 2b only if the Path was Direct Install.

- 2a. The Free Energy Assessment of your property by an energy advisor from the Jumpstart offer of the Small Business Program.
- 2b. The opportunity for installation of Free Energy Saving Products such as showerheads, aerators, and thermostats available from the Jumpstart portion of the Small Business program.
- 2c1. The availability of Discounted Services for equipment from the Comprehensive Module of the Program.
- 2c2. The availability of Project Rebates for equipment from the Comprehensive Module of the Program.
- 2d. Information from program marketing materials
- 2e. Recommendation from a Trade Ally or Partner 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. Recommendation from a utility Energy Advisor
- 2h. Were there any other program offerings we haven't discussed that were influential in your decision to <install/perform> the energy saving [COMP_DESC]? **[SEE APPENDIX A FOR WHICH WORD "INSTALL" OR "PERFORM" TO USE FOR EACH]**

- 00 [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 motivating and 10 means extremely motivating, how would you rate this additional program offering (IF NEEDED: <3H_OpenEnd>)? [RECORD 0 to 10; 98=Don't Know; 99=Refused]

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

COMP_FR2. What was the one most motivating reason, if any, that motivated you to participate in the program?

COMPREHENSIVE MEASURES: Program Influence Score (As allowed by the Illinois Statewide Net-to-Gross Methodologies, Effective June 1, 2016, the Program Influence Score will be dropped from the Small Business FR algorithm)

COMPREHENSIVE MEASURES: No Program Score

COMP_FR3. On a 0 to 10 scale, with 0 being not at all likely and 10 being very likely, how likely is it that you would have <purchased or installed/performed> **ANY** [COMP_DESC], whether high or standard efficiency, on your own? (ADJUSTED) [SEE APPENDIX A FOR WHICH WORD "INSTALLED" OR "PERFORMED" TO USE FOR EACH]

INTERVIEWER NOTE: DO NOT SAY WORD "EFFICIENT" OR "ENERGY STAR" IF IT APPEARS IN THE MEASURE ABOVE

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

If COMP_FR3 = 0, Skip to SPILL1.

COMP_FR4. On a 0 to 10 scale, with 0 not at all likely and 10 being very likely, how likely is it that you would have <installed/performed> the exact same [COMP_DESC] if you had not received them through the program? (ADJUSTED) [SEE APPENDIX A FOR WHICH WORD "INSTALLED" OR "PERFORMED" TO USE FOR EACH]

INTERVIEWER NOTE: PLEASE READ MEASURE AS WRITTEN ABOVE

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

COMPREHENSIVE "Timing Adjustment 1" to No Program Score

COMP_FR5. When do you think you would have <installed/performed> the exact same [COMP_DESC] if the utility program had not been available? [SEE APPENDIX A FOR WHICH WORD "INSTALLED" OR "PERFORMED" TO USE FOR EACH] [DO NOT READ, CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

- 0 (At the same time you did)
- 1 (up to 6 months later)
- 2 (7 months to 1 year later)

- 3 (more than 1 year up to 2 years later)
- 4 (more than 2 years up to 3 years later)
- 5 (more than 3 years up to 4 years later)
- 6 (more than 4 years later)
- 96 (never)
- 97 (Other, specify)
- 98 (Don't know)
- 99 (Refused)

@@

END OF COMPREHENSIVE PROGRAM

PARTICIPANT SPILLOVER FOR ALL MEASURES - BOTH DIRECT INSTALL AND COMPREHENSIVE-- ASK ONCE

SPILL1. Since participating in the Small Business Program, have you taken any additional actions to reduce the energy consumption at your property?

- 1. YES
- 11. NO **(SKIP TO S11)**
- 98. (DON'T KNOW) **(SKIP ~~OP4~~ S11)**
- 99. (REFUSED) **(SKIP S11)**

SPILL2. **[ASK IF SPILL1=1]** Did you or your trade ally 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)

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 DO NOT READ LIST. IF RESPONSE IS GENERAL, PROBE FOR SPECIFIC MEASURE. PROBE FROM LIST, IF NECESSARY.] PROGRAM AS TWO STEPS. ASK ABOUT SPACE HEATING, WATER HEATING, ETC. IF THE ANSWER IS POSITIVE, ASK ABOUT TYPE OF SPACE HEATING,

- 1. (Space Heating: Efficient Gas Furnace)
- 2. (Space Heating: Efficient Gas Boiler)
- 3. (Water Heating: Water Gas Heater)
- 4. (Space Heating: Infrared Heater)
- 5. **(Space Heating: Boiler Tune-up)**
- 6. (Space Heating: Steam Trap Repair/Replacement)
- 7. (Space Heating: Boiler Controls)
- 8. **(Process: Boiler Tune-up)**
- 9. (Process: Dry Cleaner Steam Trap Replacement)
- 10. (Faucet Aerators in common area bathroom(s))
- 11. (Faucet Aerators in common area kitchen(s))
- 12. (Water Efficient Showerheads in common area(s))
- 13. (Programmable Thermostats)

14. (Hot Water/Steam Pipe Insulation)
15. (Appliances: Energy Star Fryer)
16. (Appliances: Energy Star Convention Oven)
17. (Space Heating: Air Sealing)
18. (Space Heating: Attic Insulation)
19. (Space Heating: Windows)
20. (Operational: reduce operating hours)
21. (Operational: lower temperatures to heating energy use)
22. (Behavioral: turn off when not in use)
- 97 (Other, specify, note gas or electric)
- 96 (Didn't install any additional equipment)
- 98 (Don't know)
- 99 (Refused)

[MULTIPLE RESPONSE]

ASK IF SPILL3=1-4, 6, 7, 9-14, 17-19, 97

SPILL4. What was the quantity of the new equipment installed? [0-1000, DK, REF]

ASK IF SPILL3=1-4, 18, 19, 97

SPILL5. What was the efficiency rating of the new equipment installed? [0-100 AFUE/Thermal Efficiency, DK, REF]

ASK IF SPILL6=1-4, 6, 7, 9-14, 17-19, 97

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]

[DO NOT READ, CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

- 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

ASK IF SPILL7=1-4, 6, 7, 9-14, 17-19, 97

SPILL7. How influential 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 influential and 10 is extremely influential? [0-10, DK, REF]

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

ASK IF SPILL8=1-4, 6, 7, 9-14, 17-19, 97

SPILL8. If you had not participated in the <Peoples Gas'/North Shore Gas'> Small Business program, how likely is it that you would have installed this equipment, using a 0 to 10 scale, where 0 means you definitely would not

have installed this equipment and 10 means you definitely would have installed this equipment? [0-10, DK, REF]

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

ASK IF SPILL9=1-4, 6, 7, 9-14, 17-19, 97

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

ASK IF SPILL10=1-4, 6, 7, 9-14, 17-19, 97

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

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

Process Questions: Satisfaction With Program Attributes

[ASK OF ALL RESPONDENTS. RANDOMIZE S11a through S11e]

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

S11 Could you please use a 0-10 scale, where 0 means "very dissatisfied" and 10 means you were "very satisfied"? [SCALE 0-10; 96=not applicable, 98=Don't know, 99=Refused] (RANDOMIZE)

- a. The incentive amount
- b. The communication you had with the program staff
- c. The equipment offered by the program (If needed: this is the equipment that is eligible for an incentive under the program)
- d. The Small Business Program overall
- e. <People Gas/North Shore Gas> overall

S11aa. Thinking about your experience with the Small Business Program, has your opinion of <Peoples/North Shore Gas> overall become more favorable or less favorable or unchanged?

[INTERVIEWER: ALLOW RESPONDENT TO ANSWER.]

- IF 'UNCHANGED', ENTER '3' AND CONTINUE

- IF 'MORE FAVORABLE', FOLLOW UP WITH "Are you much more or somewhat more favorable?"

- IF 'LESS FAVORABLE', FOLLOW UP WITH "Are you much less or somewhat less favorable?"

1. **Much more favorable**
2. **Somewhat more favorable**
3. **Unchanged**
4. **Somewhat less favorable**
5. **Much less favorable**

[ASK S12d IF S11d<4]

S12d You indicated some dissatisfaction with the Program overall, why did you rate it this way? [RECORD ALL THAT APPLY] (DO NOT READ) [CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

1. NOT AS EASY AS OTHER UTILITIES/ STATES
2. NO CLEAR GUIDANCE
3. THE EQUIPMENT IS NOT WORKING PROPERLY
97. OTHER, SPECIFY
98. DON'T KNOW
99. REFUSED

[ASK S12e IF S11e<4]

S12e You indicated some dissatisfaction with <People Gas/North Shore Gas> overall, why did you rate the utility this way? [RECORD ALL THAT APPLY] (DO NOT READ) [CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

1. RATES ARE TOO HIGH
2. IT TOOK TOO LONG TO GET REBATE
3. POOR CUSTOMER SERVICE
4. POOR POWER SUPPLY/ SERVICE
97. OTHER, SPECIFY
98. DON'T KNOW
99. REFUSED

Benefits and Barriers

B1a What do you see as the main benefit or benefits to participating in the Small Business Program? [Record/answer UP TO 3] (DO NOT READ) [CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

1. ENERGY SAVINGS/ SAVING MONEY
2. GOOD FOR THE ENVIRONMENT
3. LOWER MAINTENANCE COSTS
4. BETTER QUALITY/ NEW EQUIPMENT
5. REBATE/ INCENTIVE
9. ABLE TO MAKE IMPROVEMENTS SOONER
97. OTHER, SPECIFY
98. DON'T KNOW
99. REFUSED

B1b What do you see as the drawback or drawbacks to participating in the program? [Record/answer UP TO 3] (DO NOT READ) [CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

1. PAPERWORK TOO BURDENSOME
2. INCENTIVES NOT HIGH ENOUGH/ NOT WORTH THE EFFORT
3. PROGRAM IS TOO COMPLICATED

- 4. COST OF EQUIPMENT
- 5. NO DRAWBACKS [EXCLUSIVE]
- 97. OTHER, SPECIFY
- 98. DON'T KNOW
- 99. REFUSED

Feedback and Recommendations

R2 How would you improve the Small Business Program? [*Record/answer UP TO 4*] (DO NOT READ)
[CLARIFY AS NECESSARY; PROBE WITH "ANYTHING ELSE?"]

- 1. HIGHER INCENTIVES
- 2. MORE MEASURES
- 3. GREATER PUBLICITY
- 4. BETTER COMMUNICATION/ IMPROVE PROGRAM INFORMATION
- 8. SIMPLIFY APPLICATION PROCESS
- 11. QUICKER PROCESSING TIMES
- 97. OTHER, SPECIFY
- 96. NO RECOMMENDATIONS
- 98. DON'T KNOW
- 99. REFUSED

Firmographics

I only have a few general questions left.

F2 Which of the following best describes the ownership of this location?

- 1. <COMPANY> owns and occupies this location
- 2. <COMPANY> owns this facility but it is rented or / leased to someone else
- 3. <COMPANY> rents or leases this facility
- 98. DON'T KNOW
- 99. REFUSED

F3 And which of the following best describes the location? This location is...

- 1. <COMPANY>'s only location
- 2. One of several locations owned by <COMPANY>
- 3. The headquarters location of <COMPANY> with several locations
- 98. DON'T KNOW
- 99. REFUSED

F4 And which of the following best describes the ownership of the HVAC system in this building?

- 1. My company owns the HVAC system
- 2. The owner of the building owns the HVAC system
- 97. OTHER _SPECIFY

- 98. DON'T KNOW
- 99. REFUSED

F5 How old is this facility? RECORD IN YEARS [NUMERIC OPEN END, 0 TO 150; 998=Don't know, 999=Refused]

F6 How many employees, full plus part-time, are employed at this facility? [NUMERIC OPEN END, 0 TO 2000; 9998=Don't know, 9999=Refused]

F7 What final comments, if any, would you like to add?

That brings us to the end of my questions for you. 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. [Require only one field (either phone or email)]]