NAVIGANT

BUSINESS PROGRAMS
Evaluation Report
C&I Prescriptive Rebate Program
C&I Energy Jumpstart Program

FINAL

Energy Efficiency Plan:
Gas Plan Year 4
(6/1/2014-5/31/2015)

Presented to
Peoples Gas and North Shore Gas

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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 (PG) and North Shore Gas (NSG) C&I Prescriptive Rebate Program and C&I Energy Jumpstart Program, which are part of the comprehensive Business Program.[1] This report covers evaluation activities for measures installed and natural gas savings realized through the Standard Incentives path[2] and the Direct Install path[3] which together are referred to as the C&I Prescriptive Program in this report (participants with projects from either or both paths). The program is in its fourth year of implementation (GPY4), [4] and it is implemented by Franklin Energy Services LLC., (Franklin Energy), with trade ally engagement and technical support for program delivery and marketing.

The Standard Incentives path provides standardized incentives for existing customers and new construction where applicable. Standard incentives are based on approximately 50 percent of incremental costs. These incentives focus on heating systems, water heating systems, pipe insulation, steam traps, various boiler controls, and food service equipment. The direct installation measures are provide at no cost to the customers, including the direct installation of low flow showerheads, kitchen and faucet aerators, and pre-rinse spray valves for appropriate businesses. The Direct Install path and the Engineering Assistance path (no-cost services) provide a high-level assessment of other opportunities that the customer or building owner can implement. The Illinois General Assembly enacted regulations that placed a cap on energy efficiency spending that is the limiting factor on the amount spent on programs delivered in GPY4 through GPY6. During the second quarter of GPY4, Peoples Gas and North Shore Gas adjusted incentive levels and service offerings in an effort to keep all programs open for market consistency and abide by the spending cap.

The gross impact evaluation approach for the PG and NSG C&I Prescriptive Program relied on the Illinois Statewide Technical Reference Manual (TRM)[5] for verification of deemed gross savings for program measures. Navigant based the GPY4 verified net impact evaluation approach on the deemed Net-to-Gross (NTG) ratios approved through the Illinois Stakeholder Advisory Group (SAG) consensus process. The GPY4 evaluation conducted NTG research through interviews with program participant customers and trade allies to determine free ridership and spillover to inform NTG recommendations for GPY6 and beyond. The NTG survey included additional process questions to provide feedback on participants' satisfaction and suggestions for program improvement.

[1] The comprehensive Business Program bundles existing programs into paths, and allows all eligible customers to access any of the five paths as a one-stop-shop based on the customer's needs – the paths are: Direct Install, Engineering Assistance, Standard Incentives, Custom Incentives, and Gas Optimization (source: PG & NSG Energy Efficiency Plan for the Second Triennial Plan period of June 1, 2014 – May 31, 2017 —Plan 2).
[2] Delivered as the C&I Prescriptive Rebate Program.
[3] Delivered as the C&I Energy Jumpstart Program.
[4] The GPY4 program year began June 1, 2014 and ended May 31, 2015.
[5] Illinois Statewide Technical Reference Manual for Energy Efficiency Version 3.0, available at: http://www.ilsag.info/technical-reference-manual.html

E.1. Program Savings

Table E-1 summarizes the natural gas savings from the GPY4 Peoples Gas C&I Prescriptive Program. Navigant verified program net savings of 527,746 therms.

Table E-1. GPY4 Peoples Gas C&I Prescriptive Program Natural Gas Savings

Program/Path	Ex Ante Gross Savings[6] (Therms)	Ex Ante Net Savings[7] (Therms)	Verified Gross RR[8]	Verified Gross Savings (Therms)	NTGR[9]	Verified Net Savings[10] (Therms)
Direct Install	10,918	8,843	1.00	10,921	0.81	8,846
Standard Incentive	895,142	519,182	1.00	894,654	0.58	518,900
GPY4 Total	**906,060**	**528,026**	**1.00**	**905,576**		**527,746**

Source: Evaluation analysis of GPY4 program tracking data and Illinois Statewide Technical Reference Manuals.

Table E-2 summarizes the natural gas savings from the GPY4 North Shore Gas C&I Prescriptive Program. Navigant verified program net savings of 112,400 therms.

Table E-2. GPY4 North Shore Gas C&I Prescriptive Program Natural Gas Savings

Program/Path	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Direct Install	-	-	-	-	0.81	-
Standard Incentive	193,887	112,454	1.00	193,793	0.58	112,400
GPY4 Total	**193,887**	**112,454**	**1.00**	**193,793**		**112,400**

Source: Evaluation analysis of GPY4 program tracking data and Illinois Statewide Technical Reference Manuals.

E.2 Program Savings by Measure End-use

Table E-3 summarizes the natural gas savings from the Peoples Gas C&I Prescriptive Program by measure end-use.

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

[7] GPY4 Ex Ante Net = Values reported in the GPY4 program tracking data
GPY4 Ex Ante Net = (GPY4 Ex Ante Gross * GPY3 Verified Gross RR) * GPY4 Deemed NTGR
GPY4 Ex Ante Gross = GPY4 Ex Ante Net / (GPY3 Verified Gross RR * GPY4 Deemed NTGR)

[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 Stakeholders 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. GPY4 Peoples Gas C&I Prescriptive Program Natural Gas Savings

Measure	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Hot Water Efficiency	10,918	8,843	1.00	10,921	0.81	8,846
Space Heating	101,837	59,065	1.00	101,784	0.58	59,035
Steam Trap	710,864	412,301	1.00	710,440	0.58	412,055
Water Heater	933	541	1.00	934	0.58	542
ERV & DCV-Kitchen	81,508	47,275	1.00	81,497	0.58	47,268
Total	**906,060**	**528,026**	**1.00**	**905,576**		**527,746**

Source: Evaluation analysis of GPY4 program tracking data.

Table E-4 summarizes the natural gas savings from the GPY4 North Shore Gas C&I Prescriptive Program by measure end-use.

Table E-4. GPY4 North Shore Gas C&I Prescriptive Program Natural Gas Savings

Measure	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Steam Trap	109,021	63,232	1.00	108,931	0.58	63,180
Pipe Insulation	62,866	36,462	1.00	62,866	0.58	36,462
DCV - Kitchen	22,000	12,760	1.00	21,996	0.58	12,758
Total	**193,887**	**112,454**	**1.00**	**193,793**	**0.58**	**112,400**

Source: Evaluation analysis of GPY4 program tracking data.

E.3 Impact Estimate Parameters for Future Use

The evaluation team did not conduct any additional research on impact savings parameters for deeming in future versions of the Illinois TRM as a part of the GPY4 Prescriptive Program evaluation. The net-to-gross (NTG) value for gas savings was deemed for the GPY4 program year, based on the Illinois Stakeholder Advisory Group's (IL SAG) consensus process and from previous evaluation research. The GPY4 evaluation included a customer participant survey to estimate free ridership and spillover values that can be used for deeming in the future. Navigant also interviewed trade allies to obtain their estimate of spillover. Those values are presented in the following table.

Table E-5. Impact Estimate Parameters for Future Use

Parameter	Description	Value	Data Source
NTG	Prescriptive Projects	0.79	Evaluation NTG Research
Free Ridership	Prescriptive Projects	0.23	GPY4 Participating Customer Survey
Participant Spillover	Prescriptive Projects	0.00	GPY4 Participating Customer Survey and Participating Trade Ally Survey
Non-Participant Spillover	Prescriptive Projects	0.02	GPY2 Non-Participating Trade Ally Survey

Source: Navigant Research and Analysis.

E.4. Program Volumetric Detail

Table E-6 and Table E-7 below present GPY4 program participation reported by the Program Administrator Franklin Energy Services (FES) for the Peoples Gas and North Shore Gas programs. This report provides a detailed volumetric breakdown of the measure type and savings quantity at the program-level in Section 3.

Table E-6. GPY4 Peoples Gas C&I Prescriptive Program Primary Participation Detail

Participation	Direct Install	Standard Incentive	Program Total
Participants[11]	7	40	45
Completed Projects	361	49	410
Total Measures[12]	546	1,522	2,068

Source: Navigant analysis of GPY4 program tracking data.
Note: Two (2) participants installed both direct install and standard incentive measures

Table E-7. GPY4 North Shore Gas C&I Prescriptive Program Primary Participation Detail

Participation	Direct Install	Standard Incentive	Program Total
Participants	-	4	4
Completed Projects	-	6	6
Total Measures	-	219	219

Source: Navigant analysis of GPY4 program tracking data.

E.5. Findings and Recommendations

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

Verified Net Impact

Finding 1. The GPY4 Peoples Gas C&I Prescriptive Program achieved verified net energy savings of 527,746 therms. This is 82 percent of the program goal of 643,966 therms.[14] The North Shore Gas program achieved verified net energy savings of 112,400 therms. This is 128 percent of the program goal of 87,584 therms. Due to a cap on portfolio expenditures, budgeted dollars for individual program paths are periodically shifted to other programs to meet portfolio-level results. Navigant will assess final performance toward goal at the "Business Programs" and portfolio level when all GPY4 results are verified.

[11] Participants are defined based on the project site address and number of accounts.
[12] For evaluation reporting purpose, if a measure quantity is reported in the tracking system in linear feet, MBH, or square feet, Navigant treated each row entry of such measure as one measure quantity in this table.
[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 Realized Savings_091515.xlsx. The goals referred to here are the C&I Prescriptive Program goals, not the overall Business Program goals.

Verified Gross Savings and Realization Rate

Finding 2. The GPY4 Peoples Gas C&I Prescriptive Program achieved verified gross energy savings of 905,576 therms. This produced a program verified gross realization rate of 100 percent. The North Shore Gas C&I Prescriptive Program achieved verified gross energy savings of 193,793 therms with an overall verified gross realization rate of 100 percent. The Standard Incentive path contributed 99 percent and the Direct Install path contributed one percent respectively to the verified gross savings for the Peoples Gas program in GPY4. In terms of measures, the Peoples Gas program savings from steam traps accounted for 78 percent of the verified gross savings, followed by space heating boilers and furnaces with 11 percent. The North Shore Gas Standard Incentive path contributed 100 percent of the GPY4 verified gross savings. Savings from steam traps accounted for 56 percent of the verified gross savings, followed by pipe insulation with 32 percent.

Program Tracking Data Review

Finding 3. The program is accurately tracking gross savings for the deemed measures, with only minor evaluation adjustments required for verified savings. The ex ante savings algorithm for efficient furnace was inconsistent with the TRM. The evaluation used the TRM (v3.0) input assumption and algorithm for the verified savings calculation.

Recommendation 1. Although the evaluation adjustments to savings input assumptions were minor, the program implementation contractor (IC) should review the approved or effective version of the Illinois TRM and update the program tracking default unit savings value for the furnace measure.

Finding 4. The tracking system input field for quantity of industrial steam traps were actually tracking the aggregate gross ex ante savings from various sizes of industrial steam traps, instead tracking the actual unit quantity of the various types of industrial steam traps installed. The evaluation team referred to the Bensight tracking system and verified the actual unit count of industrial steam traps installed through the program

Recommendation 2. The implementation contractor should create a separate field for tracking program gross ex ante savings, and track the various types of industrial steam traps (pressure psig) and unit quantity of each type of trap installed.

Program Volumetric Findings

Finding 5. The Peoples Gas GPY4 program involved 45 participants who implemented 2,068 measures and 410 projects. The North Shore Gas program had four participants who implemented 219 measures and six projects. The Peoples Gas program participation by measure and project count was below target. The North Shore Gas program had three measure types installed, with no direct install measures, however the program achieved 128 percent of the net savings goal due to large savings from steam traps and pipe insulation. Steam traps dominated savings for both utilities.

Recommendation 3: Given portfolio spending limits, the IC may need to limit the program resources directed to steam users to balance the benefits of participation to other customers and measure types. The implementation contractor should consider marketing and outreach strategies to target other customer groups or measure types.

Process Findings

Finding 9: The program participants reported very high overall levels of satisfaction with the program, where the average score given was 9.3 out of 10. The trade allies reported a slightly lower level of satisfaction than the participants did, with an average satisfaction rating of 7.4.

Finding 10. Uncertainty about the future of the program and decreasing rebate levels are creating a barrier to participation. Both participants and trade allies reported instances where their projects

received lower rebates than anticipated due to depleted program funding, causing decreased satisfaction.

Recommendation 4: The IC should consider expanding awareness and training on the Efficiency Navigator System. Although we only received feedback on the system from two people, both reported positive experiences.

Recommendation 5. Consider maintaining a consistent rebate level throughout the program cycle and stop accepting applications if the program funding becomes depleted instead of offering lower rebates. Alternately, consider setting initial rebate levels at the lower level to ensure that funding is available throughout the program.

Finding 11. The participants were asked a series of questions to determine what program aspects and other factors influenced their decision to purchase the rebated measures. The influencing factor with the highest score was the payback on the investment *with the incentive.* The average importance score was a 9.4, and all but one of the participants rated the importance at an eight or above. The program incentive itself received an average importance score of 7.8, and received a lower average score than several other program aspects, including the recommendation from a Peoples Gas or North Shore Gas representative or account manager and information provided by the program or any other Peoples Gas or North Shore Gas marketing materials, which both received an average importance score of 8.1.

Finding 12. The program participants were asked a series of questions to determine their level of awareness of other Peoples Gas and North Shore Gas efficiency programs. Slightly less than half of the participants (47 percent, n = 21) reported that they were aware of other Peoples Gas or North Shore Gas programs. When the ten respondents were asked what programs they were aware of, the most common response was the Commercial and Industrial Custom Program. Most of the participants, however, were not able to name the program(s) that they were aware of. They mainly described the program or the measures rebated under that program. These findings suggest participants place more importance on specific measures and the payback with the incentive than on the incentive alone, or specific program names.

Recommendation 6. Awareness of other PG and NSG programs was low, but that may not be a barrier to repeat participation if participants receive recommendations from vendors and program staff that are responsive to the participant's focus on specific measures and payback with incentives.

1 Introduction

1.1 Program Description

The Second Triennial Plan[15] of the Peoples Gas (PG) and North Shore Gas (NSG) comprehensive Business Program bundles existing programs into paths, and allows all eligible customers to access any of the five paths as a one-stop-shop based on the customer's needs. The paths are Direct Install, Engineering Assistance, Standard Incentives, Custom Incentives, and Gas Optimization. Franklin Energy Services (FES) implements the comprehensive Business Program with trade ally engagement and technical support for program delivery and marketing. This report covers our evaluation of the Standard Incentives path, delivered as the C&I Prescriptive Rebate Program, and the Direct Install path, delivered as the C&I Energy Jumpstart Program, which together are referred in this report as the "C&I Prescriptive Program" (participants with projects from either or both paths).

The Standard Incentives path provides standardized incentives for existing customers and new construction where applicable. These incentives focus on heating systems, water heating systems, pipe insulation, steam traps, various boiler controls, and food service equipment. The direct installation measures are provided at no cost to the customers, including the direct installation of low flow showerheads, kitchen and faucet aerators, and pre-rinse spray valves for appropriate businesses. The Direct Install path and the Engineering Assistance path (no-cost services) provide a high-level assessment of other opportunities that the customer or building owner can implement.

1.2 Evaluation Objectives

The Evaluation Team identified the following set of researchable questions for the C&I Prescriptive Program.

Impact Questions

1. What are the program's verified gross savings? What caused the realization rate (RR) adjustments?
2. What are the program's verified net savings?
3. What is the researched value for Net-to-Gross (NTG) ratio?
4. What updates are recommended for the Illinois Technical Reference Manual (TRM)?

Process Questions

1. Has the program been successful in recruiting additional participants? In what ways can the program increase customer participation? Are customers satisfied with the program?
2. How can the program outreach and marketing strategies be improved to increase program participation from the middle-sized market or customers (60K to 500K therms)?
3. Did participants know about efficiency options before the program? Why did they select the option they did?
4. How successful was the program in converting direct install to prescriptive rebate recipients? If there was no conversion, why not? What can the program do to improve the conversion rate?

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

5. Are trade allies satisfied with the program? In what ways can the program increase trade ally participation? How can training opportunities (e.g. Focus Groups discussion) be better to increase trade ally participation?

Process question (2) above was not addressed in GPY4. It can be added to the evaluation plan for GPY5 or GPY6, if there is interest.

2 Evaluation Approach

This section provides an overview of the data collection methods, gross and net impact evaluation approaches, and process evaluation approaches that occurred for the GPY4 evaluation.

2.1 *Overview of Data Collection Activities*

The gross impact evaluation approach for the PG and NSG C&I Prescriptive Program relied on the Illinois Statewide Technical Reference Manual (TRM)[16] for verification of deemed gross savings for program measures. Navigant based the GPY4 verified net impact evaluation approach on deemed Net-to-Gross (NTG) ratios approved through the Illinois State Advisory Group (SAG) consensus process. The GPY4 evaluation conducted NTG research through interviews with program participant customers and trade allies to determine free ridership and spillover to inform NTG recommendations for GPY6 and beyond. The NTG survey included additional process questions to provide feedback on participants' satisfaction and suggestions for program improvement.

Table 2-1 below summarizes data collection methods, data sources, timing, and completed sample sizes to answer the evaluation research questions.

Table 2-1. Primary Data Collection Activities and Samples

What	Who	Target Completes	When	Comments
Tracking System & Engineering Review	Participating Customers	All	September 2015	Gross savings verification using IL-TRM or through research
Project File Reviews	Participating Customers	All	September 2015	Review projects files with custom inputs where applicable
Telephone Survey	Participating Customers	21	September - October 2015	FR, SO, Process
Telephone Survey	Trade Ally	8	September - October 2015	SO and Process

Source: Navigant evaluation team.

2.2 *Verified Savings Parameters*

Verified Gross Savings Analysis Approach

Navigant estimated verified per-unit savings for each program measure using impact algorithms and input assumptions defined by the Illinois TRM for deemed measures.[17] Table 2-2 below presents the sources for parameters that were used in verified gross savings analysis, indicating which were examined through GPY4 evaluation research and which were deemed.

[16] Illinois Statewide Technical Reference Manual for Energy Efficiency Version 3.0, available at: http://www.ilsag.info/technical-reference-manual.html

[17] Because the Illinois TRM provides multiple options for selecting input assumptions, Franklin Energy Services produces a "Master Measure Database" spreadsheet that documents their approach to compliance with the Illinois TRM. The spreadsheet is Integrys MMDB PY4 -052915, produced by Franklin Energy

Table 2-2. GPY4 Verified Gross Savings Parameter Data Sources

What	Who	Completions Achieved
Measure Quantity Installed	Program tracking system	Evaluated
Verified Gross Realization Rate	Program tracking data, TRM, Navigant	Evaluated
Commercial Boilers/Furnace measure savings assumptions	Illinois TRM, version 3.0, section 4.4‡	Deemed
Commercial hot water measure savings assumptions	Illinois TRM, version 3.0, section 4.3.2‡ and 4.3.3‡	Deemed
Steam traps savings assumptions	Illinois TRM, version 3.0, section 4.4.16‡	Deemed
Commercial food service equipment savings assumptions	Illinois TRM, version 3.0, section 4.2.16‡	Deemed
Commercial pipe insulation savings assumptions	Illinois TRM, version 3.0, section 4.4‡	Deemed
Commercial Gas Water Heater savings assumptions	Illinois TRM, version 3.0, section 4.3.1‡	Deemed
Commercial Kitchen Demand Control Ventilation (DCV)	Illinois TRM, version 3.0, section 4.4.19‡	Deemed
Commercial Exhaust Energy Recovery (ERV)	Research	Evaluated

Source: Evaluation analysis of programs data and Illinois TRM documents.
‡ Source: State of Illinois Technical Reference Manuals. Integrys MMDB PY4 -052915, produced by Franklin Energy.

Verified Net 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 GPY4, the NTGR estimates used to calculate the verified net savings were based on past evaluation research and approved through a consensus process managed through the Illinois Energy Efficiency Stakeholders Advisory Group (SAG).[18]

Franklin Energy combines an additional adjustment factor with the net-to-gross ratio when converting ex ante gross to ex ante net savings for tracking and reporting. The additional factor accounts for potential gross realization rate adjustments, and is based on the previous year realization rate. This factor must be accounted for when converting ex ante net savings reported in the tracking system to ex ante gross savings. The equations for GPY4 are:

GPY4 Ex Ante Net = Values reported in the GPY4 program tracking data
GPY4 Ex Ante Net = (GPY4 Ex Ante Gross * GPY3 Verified Gross RR) * GPY4 Deemed NTGR
GPY4 Ex Ante Gross = GPY4 Ex Ante Net / (GPY3 Verified Gross RR * GPY4 Deemed NTGR)

Table 2-3 presents the realization rate and NTGRs used to calculate the program-level net savings.

[18] Source: Deemed NTGR values are available on the Illinois SAG 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

Table 2-3. Net-to-Gross Ratios for Evaluation of the GPY4 C&I Prescriptive Program

Program Path/Measure	Embedded GPY3 RR Adjustment Factors†	Utility	GPY4 Deemed NTG Value	NTGR Source
Direct Install	1.00	PG & NSG	0.81	SAG‡
Standard Incentive	1.00	PG & NSG	0.58	

Source: †Navigant evaluation report for the GPY3 [ ] 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_GPY1-5_2015-03-01_Final.pdf

GPY4 NTG Research Approach

The evaluation team conducted NTG research through interviews with GPY4 program participant customers and trade allies to determine free ridership and spillover to inform NTG recommendations for GPY6 and beyond. The research provided an adjustment for free ridership (the portion of impact that would have occurred even without the program) and spillover (the portion of impact that occurred outside of the program, but would not have occurred in the absence of the program).

Navigant calculated participant free ridership using an algorithm approach based on survey self-report data. The analysis relied on interview results from 21 participant customers who installed measures across the Standard Incentives and Direct Install paths of the C&I Prescriptive Program. Navigant attempted to contact all participants in the gross impact sample. Strata were defined by project size, based on ex-ante gross energy savings boundaries that place about one-third of program-level savings into large, medium and small stratum. Project-level free ridership values were combined into the various paths of the project results by weighting with the ex ante gross annual therm savings sampled for each project path, targeting a 90/10 level of confidence and relative precision for each path. Participant customer spillover was quantified using survey research self-report data for measure description and quantities. Navigant drew per unit savings values from the Illinois TRM and measure research.

Navigant examined the existence of participating trade ally spillover using survey self-report data. The evaluation team attempted a census survey on all trade ally participants in the gross impact sample and completed interviews with eight respondents. The trade allies and other contractors were asked about their total sales of equipment. The Navigant team used these numbers to calculate an overall increase in the sales of program qualified measures. Navigant calculated spillover savings from the sales of qualifying equipment that does not receive an incentive from PG or NSG multiplied by the program influence scoring from the survey responses. The evaluation team determined program influence on participating customers through interviews with trade allies in GPY4 when triggered by customer NTG responses for the largest projects, or with contacts identified for multiple smaller projects.

Navigant calculated the NTG ratio for each program path (Standard Incentives and Direct Install paths) using the following algorithm.

$$\boldsymbol{NTGR} = 1 - \textit{Participant Free Ridership} + \textit{Participant Spillover} + \textit{Trade Ally Spillover}$$

2.3 *Process Evaluation*

The GPY4 process evaluation activities for the C&I Prescriptive Program involved interviews with program staff and the implementation contractor staff to gather information about marketing and outreach strategies made in GPY4 that impacted customer and trade ally participation and satisfaction. The NTG research survey conducted for GPY4 included a set of process questions to provide feedback from participant customers and trade allies about satisfaction with the program, program and program component awareness, and influences on decision-making.

3 Gross Impact Evaluation

This section provides detailed analysis and findings from the file reviews and tracking system review of the measures installed and gross savings by program path and delivery channel. Overall, the Peoples Gas GPY4 C&I Prescriptive Program achieved 905,576 therms verified gross savings, representing 100 percent gross realization rate. The North Shore Gas program achieved 193,793 therms verified gross savings, representing 100 percent gross realization rate. The evaluation team made some minor adjustments to the savings input assumptions used to calculate the measures ex ante savings. The sections below provide details of the findings.

3.1 Program Tracking Data Review

The evaluation team downloaded the final data for the C&I Prescriptive Program impact evaluation from the Franklin Energy's Bensight Data Management platform. 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)[19] that documents their approach to compliance with the Illinois TRM. We verified that the program tracking system was accurately recording measure counts, but found that some measures need updates of the savings input assumptions for consistency with the approved version of the TRM for the GPY4 program.

Key findings include:

a. The savings algorithm and default unit savings for efficient furnaces in the MMDB and tracking system were inconsistent with the TRM (v3.0). The evaluation team used the appropriate input assumptions and algorithm from the TRM and adjusted the furnace ex ante unit savings value from 224.1 therms to 171.3 therms.
b. The evaluation team applied minor rounding adjustments to the tracking default unit savings value for HVAC steam traps (if audited from 331.03 therms to 330.47 therms).
c. The tracking system input field for quantity of industrial steam traps were showing the aggregate gross ex ante savings from various sizes of industrial steam traps installed, instead of tracking the actual unit quantity of the various types of industrial steam traps installed. The evaluation team referred to the tracking system and verified from the projects documentation the actual unit count of industrial steam traps installed through the program. The implementation contractor should create a separate field for tracking program gross ex ante savings, and track the various types of industrial steam traps (pressure psig) and unit quantity of each trap size separately.

3.2 Program Volumetric Findings

As shown in Table 3-1 and Table 3-2, the Peoples Gas C&I Prescriptive Program had 45 participants and 410 projects in GPY4 and installed 2,068 measures from Direct Install and Standard Incentive program

[19] Integrys MMDB PY4 -052915, produced by Franklin Energy

paths. The North Shore Gas C&I Prescriptive Program had four participants and six projects in GPY4 and installed 219 measures through the Standard Incentive path.

Table 3-1. GPY4 Peoples Gas C&I Prescriptive Program Primary Participation Detail

Participation	Direct Install	Standard Incentive	Program Total
Participants[20]	7	40	45
Total Measures[21]	546	1,522	2,068
Completed Projects	361	49	410

Source: Navigant analysis of GPY4 program tracking data.
Note: Two (2) participants installed both direct install and standard incentive measures

Table 3-2. GPY4 North Shore Gas Prescriptive Program Primary Participation Detail

Participation	Direct Install	Standard Incentive	Program Total
Participants	-	4	4
Total Measures	-	219	219
Completed Projects	-	6	6

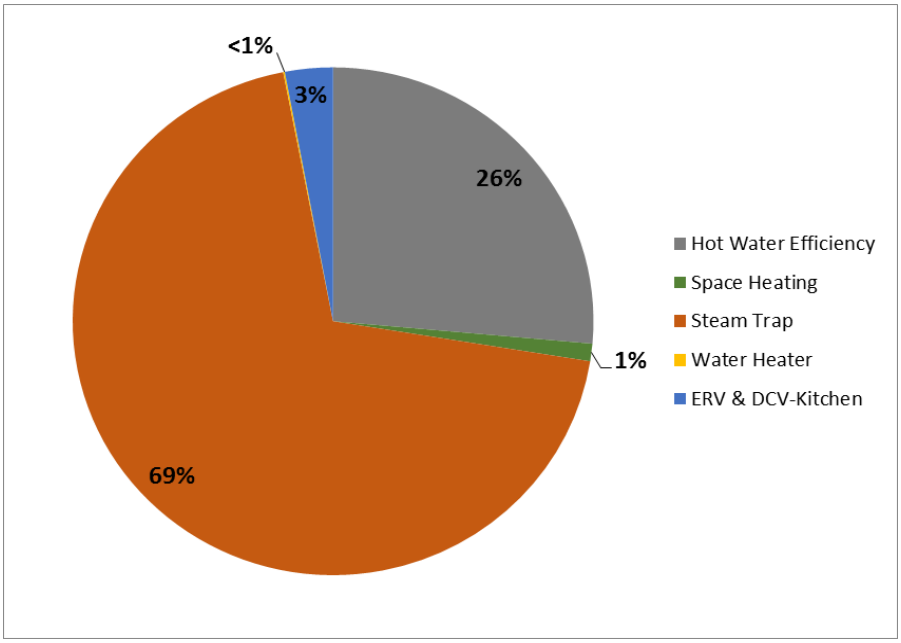
Source: Navigant analysis of GPY4 program tracking data.

The Peoples Gas program participation was below the GPY4 target and achieved 82 percent of the GPY4 net savings goal. The North Shore Gas program had three measure types installed, with no direct install measures, and most savings coming from steam traps and pipe insulation. The North Shore Gas program was able to achieve 128 percent of the net savings goal despite the limited participation of a few measures types and four participants.

Figure 3-1 and Figure 3-2 disaggregate the measure count volume by end-use type. For Peoples Gas, the Direct Install path comprised of hot water efficiency measures including bathroom and kitchen aerators, showerheads and pre-rinse sprayers, which together were 26 percent of the measure volume. The Standard Incentive path accounted for 74 percent of the measure volume (comprised of steam traps with 69%, space heating measures such as boilers and furnace 3%, kitchen-DCV 1%, and large gas water heaters with less than 1% percent of the measure volume). Steam traps included both audited and unaudited steam traps with HVAC applications, and industrial steam traps.

[20] Participants are defined based on the project site address and number of accounts.
[21] For evaluation reporting purpose, if a measure quantity is reported in the tracking system in linear feet or MBH, Navigant treated each row entry of such measure as one measure quantity in this table.

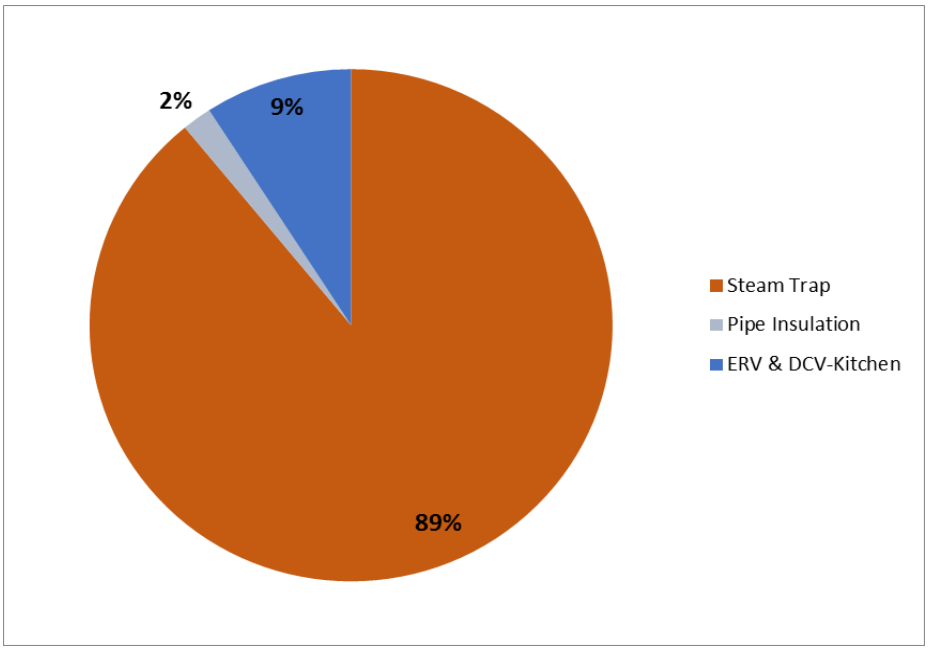
Figure 3-1. Peoples Gas: Number of Measures Installed by End-use Type



Source: Navigant Analysis

For the North Shore Gas program, steam traps accounted for 89% of the measure count volume, kitchen-DCV accounted for 9%, and pipe insulation 2%.

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



Source: Navigant Analysis

Table 3-3 and Table 3-4 below provide additional measure details with install types included.

Table 3-3. Peoples Gas GPY4 C&I Prescriptive Program Measure Count

Measure	Unit	Install Type	Ex Ante Measure Count	Verified Measure Count
Kitchen Aerator	Each	Direct Install	54	54
Bathroom Aerator	Each	Direct Install	110	110
Showerhead	Each	Direct Install	376	376
Pre Rinse Sprayer	Each	Direct Install	6	6
Steam Trap	Each	Standard Incentive	1,435	1,435
DCV - Kitchen	HP	Standard Incentive	57	57
Exhaust Energy Recovery (ERV)	CFM	Standard Incentive	23,550	23,550
Boiler Tune Up	MBH	Standard Incentive	450,399	450,399
High Efficiency Boiler	MBH	Standard Incentive	16,533	16,533
Large Gas Water Heater	MBH	Standard Incentive	930	930
Energy Star Fryer	Each	Standard Incentive	4	4
High Efficiency Furnace	Each	Standard Incentive	1	1

Source: Navigant analysis of program tracking data.

Table 3-4. North Shore Gas GPY4 C&I Prescriptive Program Measure Count

Measure	Unit	Install Type	Ex Ante Measure Count	Verified Measure Count
Steam Trap	Each	Standard Incentive	195	195
Pipe Insulation	Linear Foot	Standard Incentive	6,888	6,888
DCV - Kitchen	HP	Standard Incentive	20	20

Source: Navigant analysis of program tracking data.

3.3 Gross Program Impact Parameter Estimates

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

Table 3-5. GPY4 C&I Prescriptive Program Ex Ante and Verified Gross Savings Parameters

Measure	Unit	Ex Ante Gross Unit Savings	Verified Gross Unit Savings	Method	Data Source
Bathroom Aerators	Each	6.86	6.86	Deemed	Sections 4.3.2 TRM V3.0
Kitchen Aerators	Each	6.86	6.86	Deemed	Sections 4.3.2 TRM V3.0
Showerheads	Each	21.73	21.74	Deemed	Sections 4.3.3 TRM V3.0
Boiler Tune-up	MBH	0.19	0.19	Deemed	Sections 4.4.3 TRM V3.0
DCV-Kitchen	HP	1,100.00	1,099.80	Deemed	Sections 4.4.19 TRM V3.0
HW Boiler >=300MBtu, >88% TE Steam Boiler >=300MBtu, >82% TE	MBH	1.16 0.67	1.16 0.67	Deemed	Sections 4.4.10 TRM V3.0
High Efficient Furnace	Each	224.14	171.25	Deemed	Sections 4.4.11TRM V3.0
Energy Star Fryer	Each	505.05	505	Deemed	Sections 4.2.7 TRM V3.0
Large Gas Water Heater	MBH	1.00	1.00	Deemed	Sections 4.3.1 TRM V3.0
Steam Pipe Insulation	Ln. Ft	Vary	Vary. Verified as reasonable	Deemed	Sections 4.4.14 TRM V3.0
Pre Rinse Sprayer	Each	270.37	270.37	Deemed	Sections 4.2.11 TRM V3.0
HVAC Steam Traps (audited) HVAC Steam Traps (unaudited) Industrial Steam Trap	Each	331.03 89.23 Vary	330.47 89.23 Verified	Deemed	Sections 4.4.16 TRM V3.0
ERV	CFM	0.74	0.74	Research	Research

Source: Navigant analysis of program tracking data and Franklin Energy Services documents. Deemed values are from Illinois TRM V3.0, available at http://www.ilsag.info/technical-reference-manual.html.

3.4 Verified Gross Program Impact Results

As shown in Table 3-6 the GPY4 Peoples Gas C&I Prescriptive Program reported ex ante gross energy savings of 906,060 therms. Evaluation adjustments resulted in verified gross energy savings of 905,576 therms, reflecting the program's gross realization rate of 100 percent. The Standard Incentive path of the Peoples Gas program contributed 99 percent of the verified gross savings in GPY4, and the Direct Install measures contributed one percent (1%).

Table 3-6. GPY4 Peoples Gas C&I Prescriptive Program Impact Results

Measure Category	Quantity Unit	Verified Measure Quantity	Ex Ante Gross Savings (Therms)	Verified Gross Realization Rate	Verified Gross Savings (Therms)
Standard Incentive					
Steam Trap	HP	1,435	710,864	1.00	710,440
DCV - Kitchen	CFM	57	62,150	1.00	62,139
Exhaust Energy Recovery (ERV)	MBH	23,550	17,338	1.00	17,338
Boiler Tune Up	MBH	450,399	83,867	1.00	83,867
High Efficiency Boiler	MBH	16,533	17,745	1.00	17,745
Large Gas Water Heater	Each	930	933	1.00	934
Energy Star Fryer	Each	4	2,021	1.00	2,021
High Efficiency Furnace	HP	1	224	0.76	171
Standard Incentive Subtotal			*895,142*	*1.00*	*894,654*
Direct Install					
Kitchen Aerator	Each	54	371	1.00	371
Bathroom Aerator	Each	110	755	1.00	755
Showerhead	Each	376	8,170	1.00	8,173
Pre Rinse Sprayer	Each	6	1,622	1.00	1,622
Direct Install Subtotal			*10,918*	*1.00*	*10,921*
PG GPY4 Total			**906,060**	**1.00**	**905,576**

Sources: Program tracking data and Navigant analysis

As shown in Table 3-7 the GPY4 North Shore Gas C&I Prescriptive Program reported ex ante gross energy savings of 193,887 therms. Evaluation adjustments resulted in verified gross energy savings of 193,793 therms, reflecting the program's gross realization rate of 100 percent.

Table 3-7. GPY4 North Shore Gas C&I Prescriptive Program Impact Results

Measure Category	Quantity Unit	Verified Measure Quantity	Ex Ante Gross Savings (therms)	Verified Gross Realization Rate	Verified Gross Savings (therms)
Standard Incentive					
Steam Trap	Each	195	109,021	1.00	108,931
Pipe Insulation	Linear Foot	6,888	62,866	1.00	62,866
DCV - Kitchen	HP	20	22,000	1.00	21,996
NSG GPY4 Total			**193,887**	**1.00**	**193,793**

Source: Program tracking data and Navigant analysis.

4 Net Impact Evaluation

The evaluation team calculated verified net energy savings by multiplying the verified gross savings estimates by a net-to-gross ratio. As noted in Section 2, the NTGR used to calculate the net verified savings for the GPY4 C&I Prescriptive Program was deemed through a consensus process managed by the Illinois SAG.

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

Table 4-1. Peoples Gas and North Shore Gas GPY4 Program NTGR Values

Program Path/Measure	Utility	GPY4 Deemed NTG Value	NTGR Source
Direct Install	PG & NSG	0.81	SAG‡
Standard Incentive	PG & NSG	0.58	

Source: †Navigant evaluation report for the GPY3 [ ] 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_GPY1-5_2015-03-01_Final.pdf

Table 4-2 summarizes the natural gas savings from the GPY4 Peoples Gas C&I Prescriptive Program by measure end-use.

Table 4-2. GPY4 Peoples Gas C&I Prescriptive Program Natural Gas Savings

Measure	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Hot Water Efficiency	10,918	8,843	1.00	10,921	0.81	8,846
Space Heating	101,837	59,065	1.00	101,784	0.58	59,035
Steam Trap	710,864	412,301	1.00	710,440	0.58	412,055
Water Heater	933	541	1.00	934	0.58	542
ERV & DCV-Kitchen	81,508	47,275	1.00	81,497	0.58	47,268
Total	**906,060**	**528,026**	**1.00**	**905,576**		**527,746**

Source: Evaluation analysis of GPY4 program tracking data.

Table 4-3 summarizes the natural gas savings from the GPY4 North Shore Gas C&I Prescriptive Program by measure end-use.

Table 4-3. GPY4 North Shore Gas C&I Prescriptive Program Natural Gas Savings

Measure	Ex Ante Gross Savings (Therms)	Ex Ante Net Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Steam Trap	109,021	63,232	1.00	108,931	0.58	63,180
Pipe Insulation	62,866	36,462	1.00	62,866	0.58	36,462
DCV - Kitchen	22,000	12,760	1.00	21,996	0.58	12,758
Total	**193,887**	**112,454**	**1.00**	**193,793**	**0.58**	**112,400**

Source: Evaluation analysis of GPY4 program tracking data.

Peoples Gas verified net energy savings of 495,591 therms is 82 percent of the program goal of 643,966 therms.[22] The North Shore Gas program verified net energy savings of 112,400 therms is 128 percent of the program goal of 87,584 therms.

[22] PG-NSG Realized Savings_091515.xlsx

5 Process Evaluation

The process component of the Prescriptive Program evaluation focused on:

- Program Marketing
- Use of the Efficiency Navigator System
- Program Satisfaction

The report below organizes the process evaluation results by the process research questions. The primary data sources for the process evaluation included the telephone survey with 21 program participants and eight participating trade allies.

5.1 Marketing

As part of the trade ally survey, interviewers asked participating trade allies about the program marketing. Of the eight trade allies interviewed, three of the participating contractors reported that they had received marketing materials produced by Peoples Gas or North Shore Gas that they could use to market the program to their customers. All three contractors reported that they do use the materials to promote the program to their customers, typically by handing the materials directly to the customer, or by leaving it with a customer for later review. Three trade allies reported they had not received materials. Five responding trade allies felt that the level of marketing done directly to customers by the Program had been appropriate so far; one trade ally mentioned that a lack of awareness of the program among their customers created a barrier to participation, because the burden to sell the program fell entirely on the trade ally.

When asked about specific promotions that they felt had been especially successful in marketing the program to customers, four responding trade allies could not name a specific marketing effort. However, two of the contractors specifically mentioned the Energy Efficiency Expos as having been particularly effective. They also mentioned networking events with other trade allies, and seminars and trade shows, although it was not clear if these events were intended to promote the program to participants or contractors. When asked about marketing directed at contractors, five stated that they felt that the level of marketing directed at contractors has been appropriate. One of the trade allies felt that there should be an increase in one-on-one interactions between the contractors and the Program staff.

5.2 Efficiency Navigator System

As part of the process evaluation effort, Navigant asked both participants and trade allies about their use of the Efficiency Navigator System. Only one of the surveyed participants reported that they themselves had used the on-line Energy Navigator System during the rebate application process. Another participant reported that his or her contractor has used the System, but could provide no further details.

When the interviewer asked when the participant who had used the System what they used it for, they replied that they used it to apply for the rebate on-line, and to track the progress of their submitted project. When asked to rate their level of satisfaction with the System, using a scale of zero to ten, where zero means “not at all satisfied” and ten means “very satisfied”, the participant rated their overall

satisfaction with the System at an eight. The participant was unable to offer any suggestions for improvement.

The survey also asked trade allies about their use of the Efficiency Navigator System. One trade ally reported that they had recently been introduced to the System by a Program staff member, but had not yet used it. However, the trade ally expressed a very favorable impression of the System, and was reportedly looking forward to using the System, stating that it would "definitely be a big help".

5.3 Program Satisfaction

The program participants reported very high overall levels of satisfaction with the program. When asked to rate their overall satisfaction levels using a scale from zero to ten, where zero means "not at all satisfied" and ten means "very satisfied", the average score given was a 9.3. Seventy-one percent (n = 21) of participants reported that they were "very satisfied" with the program, giving it a rating of ten.

When asked what they would do to improve the program, most participants had no suggestions, but two participants mentioned that they would like to know what the rebate dollar amounts would be earlier in the program process. One participant stated that their expected rebate was approximately nine thousand dollars, but their actual rebate was slightly more than two thousand dollars. The participant stated that the rebate level decreased due to the pool of funding for the program being depleted.

Interviewers also asked the surveyed trade allies about their overall satisfaction with the program, using the same zero to ten scale as the participants. The trade allies reported a slightly lower level of satisfaction than the participants did, with an average satisfaction rating of 7.4. One quarter (25 percent, n = 8) of the trade allies rated the program at a ten on the satisfaction scale, while only one trade ally rated the program at less than a three. The survey also asked trade allies a series of questions about what they specifically liked and did not like about the program. Three of the trade allies specifically mentioned that they liked working with the staff at Franklin Energy, and that the staff was very responsive and helpful. The trade allies also reported that they liked being able to offer rebates to their customers.

When asked what they did not like about the program, half of the trade allies expressed displeasure with the uncertainty about the program and the program rebates. The trade allies mentioned that the rebate levels had decreased over time due to the depleted pool of funding, making it difficult for the trade allies to promote the program and sell higher efficiency technology to their customers. The trade allies also reported that by not knowing the rebate amount in advance of submitting the project was also a barrier to increased participation. One trade ally explained that after quoting a rebate amount to a customer based on his previous experience with the program, he later had to go back and re-quote a lower rebate amount, causing the customer to become displeased with the program. Five of the surveyed trade allies (63 percent) expressed concern about the uncertainty of the future of the program. This uncertainty has caused hesitancy on their part to promote the program to their customers, since they are unsure if any new project that they submit will be approved, and if they are what the final rebate amount will be.

5.4 *Participant Influences and Program Awareness*

The participants were asked a series of questions to determine what program aspects and other factors influenced their decision to purchase the rebated measures. Participants were asked to rate how important each component was on a scale from zero to ten, where zero meant "not at all important" and ten meant "extremely important." Table 5-1 below presents the average importance score and the number of responses given a score of eight or above for each factor. As can be seen in the table below, the influencing factor with the highest score was the payback on the investment *with the incentive.* The average importance score was a 9.4 and all but one of the participants rated the importance at above an eight or above. The program incentive itself received an average importance score of 7.8, and received an lower average score than several other program aspects, including the recommendation from a Peoples Gas or North Shore Gas representative or account manager and information provided by the program or any other Peoples Gas or North Shore Gas marketing materials, which both received an average importance score of 8.1.

Table 5-1. GPY4 Importance of Individual Factors on the Decision to Implement the Project

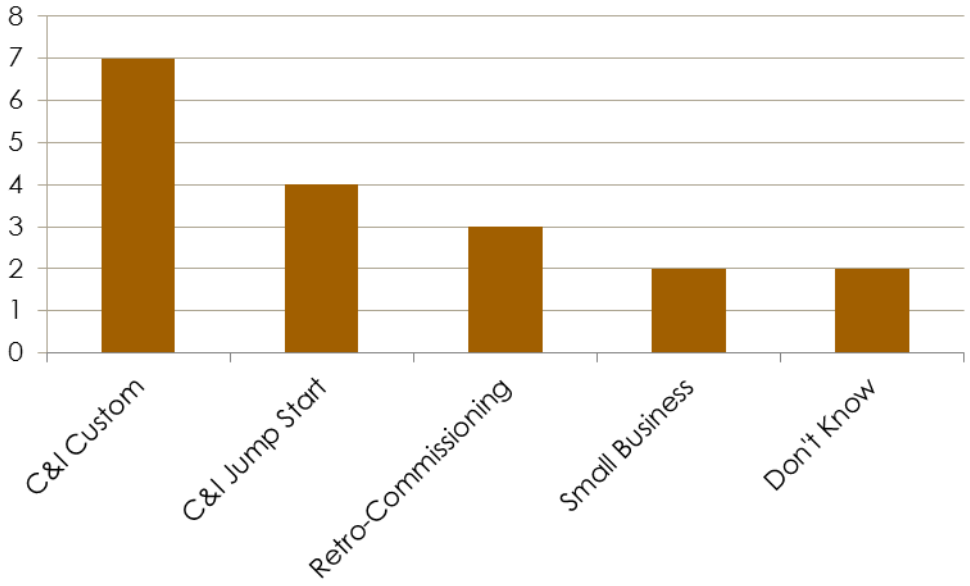
Program and Non-Program Factors	Average Importance Score	Responses > 7		N
Payback with the incentive	9.4	19	95%	20
The standard practice in the business/industry	8.6	15	83%	18
Recommendation from a vendor/contractor	8.3	16	80%	20
PG/NSG energy assessment recommendation	8.2	13	68%	19
Recommendation from a PG/NSG program representative or account manager	8.1	14	74%	19
Information from the program of any PG/NSG marketing materials	8.1	11	61%	18
Availability of the program incentive	7.8	17	81%	21
Previous experience with the measure	7.8	13	68%	19
Recommendation from a design or consulting engineer	7.8	9	56%	16
Corporate policy or guidelines	7.7	14	78%	18

Source: Navigant analysis of participant survey responses

The Prescriptive Rebate Program participants were asked if they were aware of the Prescriptive Rebate Program before or after they finalized the specifications for the measure that they received a rebate for. All but one of the participants (95 percent, n = 22) of the participants stated that they learned about the program *before* finalizing the specifications.

The program participants were asked a series of questions to determine their level of awareness of other Peoples Gas and North Shore Gas efficiency programs. Ten respondents, slightly less than half of the participants (47 percent, n = 21) reported that they were aware of other Peoples Gas or North Shore Gas programs. When the ten respondents were asked what programs they were aware of, the most common response was the Commercial and Industrial Custom Program. Most of the participants, however, were not able to name the program(s) that they were aware of. They mainly described the program or the measures rebated under that program. The only program that was specifically named was the Custom Program.

Figure 5-1. Awareness of Other Program (n = 10)



Source: Navigant analysis of participant survey responses

The Prescriptive Program participants were asked if they had participated in any other Peoples Gas or North Shore Gas energy efficiency programs. Six of the participants reported that they had participated in another program (29 percent, n = 21). However, when the participants were asked what program they had participated in previously, only four of the participants remembered what program they participated in, and none of them could recall the name of the program. The participants mentioned that they had received rebates for insulation, steam traps, and boiler burners, all of which are included in the Prescriptive Rebate Program. None of the participants were able to provide sufficient information to determine what programs they had previously participated in. It is likely that the participants had previously participated in the Prescriptive Program and received a rebate. None of the participants reported that they had participated in the Jump Start Program.

These findings suggest participants place more importance on specific measures and the payback with the incentive than on the incentive alone, or specific program names. Awareness of other PG and NSG programs was low, but that may not be a barrier to repeat participation if participants receive recommendations from vendors and program staff that are responsive to the participant's focus on specific measures and payback with incentives.

6 Findings and Recommendations

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

Verified Net Impact

Finding 1. The GPY4 Peoples Gas C&I Prescriptive Program achieved verified net energy savings of 527,746 therms. This is 82 percent of the program goal of 643,966 therms.[23] The North Shore Gas program achieved verified net energy savings of 112,400 therms. This is 128 percent of the program goal of 87,584 therms. Due to a cap on portfolio expenditures, budgeted dollars for individual program paths are periodically shifted to other programs to meet portfolio-level results. Navigant will assess final performance toward goal at the "Business Programs" and portfolio level when all GPY4 results are verified.

Verified Gross Savings and Realization Rate

Finding 2. The GPY4 Peoples Gas C&I Prescriptive Program achieved verified gross energy savings of 905,576 therms. This produced a program verified gross realization rate of 100 percent. The North Shore Gas Prescriptive Program achieved verified gross energy savings of 193,793 therms, with an overall verified gross realization rate of 100 percent. The Standard Incentive path contributed 99 percent and the Direct Install path contributed one percent respectively to the verified gross savings for the Peoples Gas program in GPY4. In terms of measures, the People Gas program savings from steam traps accounted for 78 percent of the verified gross savings, followed by space heating boilers and furnaces with 11 percent. The North Shore Gas Standard Incentive path contributed 100 percent of the GPY4 verified gross savings. Savings from steam traps accounted for 56 percent of the verified gross savings, followed by pipe insulation with 32 percent.

Program Tracking Data Review

Finding 3. The program is accurately tracking gross savings for the deemed measures, with only minor evaluation adjustments required for verified savings. The ex ante savings algorithm for efficient furnace was inconsistent with the TRM. The evaluation used the TRM (v3.0) input assumptions and algorithms for the verified savings calculation. The evaluation applied minor rounding adjustments to the default unit savings values for HVAC steam traps and large gas water heaters.

Recommendation 1. Although the evaluation adjustments to savings input assumptions were minor, the program implementation contractor (IC) should review the approved or effective version of the Illinois TRM and update the program tracking default unit savings value for the furnace measure.

Finding 4. The tracking system input field for quantity of industrial steam traps were actually tracking the aggregate gross ex ante savings from various sizes of industrial steam traps, instead tracking the actual unit quantity of the various types of industrial steam traps installed. The evaluation team referred to the tracking system and verified from the projects documentation, the actual unit count of industrial steam traps installed through the program.

[23] PG-NSG Realized Savings_091515.xlsx

Recommendation 2. The implementation contractor should create a separate field for tracking program gross ex ante savings, and track the various types of industrial steam traps (pressure psig) and unit quantity of each type of trap installed.

Program Volumetric Findings

Finding 5. The Peoples Gas GPY4 program involved 45 participants who implemented 2,068 measures and 410 projects. The North Shore Gas program had 4 participants who implemented 219 measures and 6 projects. The Peoples Gas program participation by measure and project count was below target. The North Shore Gas program had three measure types installed, with no direct install measures, however the program achieved 128 percent of the net savings goal due to large savings from steam traps and pipe insulation. Steam traps dominated savings for both utilities.

Recommendation 3: Given portfolio spending limits, the IC may need to limit the program resources directed to steam users to balance the benefits of participation to other customers and measure types. The implementation contractor should consider marketing and outreach strategies to target other customer groups or measure types.

Process Findings

Finding 6: While the majority of the trade allies (71 percent) felt that the level of marketing done directly to customers by the Program had been appropriate so far, one trade ally mentioned that a lack of awareness of the program among their customers created a barrier to participation, because the burden of sell the program fell entirely on the trade ally.

Finding 7: When asked about marketing directed at contractors, a majority (71 percent) stated that they felt that the level of marketing directed at contractors has been appropriate. The Energy Efficiency Expos and trade ally networking events were mentioned positively. One of the trade allies felt that there should be an increase in one-on-one interactions between the contractors and the Program staff.

Finding 8: Only one of the surveyed participants reported that they themselves had used the on-line Energy Navigator System during the rebate application process. The participant rated satisfaction with the system as an eight out of ten. One trade ally reported that they had recently been introduced to the System by a Program staff member, but had not yet used it. However, the trade ally expressed a very favorable impression of the System, and was reportedly looking forward to using the System, stating that it would "definitely be a big help".

Recommendation 4: The IC should consider expanding awareness and training on the Efficiency Navigator System. Although we only received feedback on the system from two people, both reported positive experiences.

Finding 9: The program participants reported very high overall levels of satisfaction with the program, where the average score given was 9.3 out of 10. The trade allies reported a slightly lower level of satisfaction than the participants did, with an average satisfaction rating of 7.4.

Finding 10. Uncertainty about the future of the program and decreasing rebate levels are creating a barrier to participation. Both participants and trade allies reported that their projects received lower rebates than anticipated due to depleted program funding, causing decreased satisfaction.

Recommendation 5. Consider maintaining a consistent rebate level throughout the program cycle and stop accepting applications if the program funding becomes depleted instead of offering

lower rebates. Alternately, consider setting initial rebate levels at the lower level to ensure that funding is available throughout the program.

Finding 11. The participants were asked a series of questions to determine what program aspects and other factors influenced their decision to purchase the rebated measures. The influencing factor with the highest score was the payback on the investment *with the incentive.* The average importance score was a 9.4 and all but one of the participants rated the importance at above an eight or above. The program incentive itself received an average importance score of 7.8, and received an lower average score than several other program aspects, including the recommendation from a Peoples Gas or North Shore Gas representative or account manager and information provided by the program or any other Peoples Gas or North Shore Gas marketing materials, which both received an average importance score of 8.1.

Finding 12. The program participants were asked a series of questions to determine their level of awareness of other Peoples Gas and North Shore Gas efficiency programs. Slightly less than half of the participants (47 percent, n = 21) reported that they were aware of other Peoples Gas or North Shore Gas programs. When the ten respondents were asked what programs they were aware of, the most common response was the Commercial and Industrial Custom Program. Most of the participants, however, were not able to name the program(s) that they were aware of. They mainly described the program or the measures rebated under that program. These findings suggest participants place more importance on specific measures and the payback with the incentive than on the incentive alone, or specific program names.

Recommendation 6. Awareness of other PG and NSG programs was low, but that may not be a barrier to repeat participation if participants receive recommendations from vendors and program staff that are responsive to the participant's focus on specific measures and payback with incentives.

7 Appendix

7.1 Net to Gross Research

Navigant conducted NTG and process research with GPY4 participant customers and trade allies with the aim of informing an updated NTG ratio for GPY6.

The primary objective of the net savings analysis for the C&I Prescriptive Program was to determine the program's net effect on customers' natural gas usage. After gross program impacts have been verified, net program impacts are derived by estimating a Net-to-Gross (NTG) ratio that quantifies the percentage of the verified gross program impacts that can be reliably attributed to the program.

The net program impacts were quantified from the estimated level of free ridership and spillover. Quantifying free ridership requires estimating what would have happened in the absence of the program. A customer self-report method, based on data gathered during participant telephone interviews, was used to estimate the free ridership for this evaluation. The existence of participant spillover was quantitatively examined by identifying spillover candidates through questions asked in the participant telephone interviews. If response data provided evidence participant spillover and the participant was willing to have a follow-up interview by an engineer, an attempt was made to estimate the spillover impacts. Trade allies were also asked a set of spillover questions that cover participants and nonparticipants. The final step is to quantify spillover without double counting the customer and trade ally estimates.

Once free ridership and spillover has been estimated the Net-to-Gross (NTG) ratio is calculated as follows:

NTG Ratio = 1 – Free Ridership Rate + Customer Participant Spillover + Trade Ally Estimate of Spillover

7.1.1.1 Participating Customer Net Impact Findings

Basic Rigor Free Ridership Assessment

Free ridership was assessed using a customer self-report approach following a framework that was developed for evaluating net savings of California's 2006-2008 nonresidential energy efficiency programs, and has been the core non-residential approach used in Illinois since 2009. This method calculates free ridership using data collected during participant telephone interviews concerning the following three items:

- A **Timing and Selection** score (more recently called the **Program Components** score in Illinois) that reflected the influence of the most important of various program and program-related elements in the customer's decision to select the specific program measure at this time;
- A **Program Influence** score that captured the perceived importance of the program (whether rebate, recommendation, or other program intervention) relative to non-program factors in

the decision to implement the specific measure that was eventually adopted or installed. This score is cut in half if they learned about the program after they decided to implement the measures; and

- A **No-Program** score that 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 later if the program had not been available.

This approach and scoring algorithm was identical to that used for the previous Peoples Gas and North Shore Gas Prescriptive Program evaluations, and is the core historical approach used when evaluating other Illinois utility prescriptive/standard rebate programs.

Standard Rigor Free Ridership Assessment

Additional survey batteries examine other project decision-making influences including the vendor, standard practice in the industry, corporate policy for efficiency improvements, and so on.

Participant Spillover

For the GPY4 Prescriptive Rebate Program evaluation, a battery of questions was asked to identify spillover candidates and to encourage spillover candidates to participate in a follow-up interview by an engineer to quantify spillover savings. Below are paraphrased versions of the spillover questions that were asked:

1. Since your participation in the C&I Prescriptive Rebate Program, did you implement any ADDITIONAL energy efficiency measures at this facility or at your other facilities within Peoples Gas or North Shore Gas service territory that did NOT receive incentives through any utility or government program?
2. On a scale of 0-10, where 0 means "no influence" and 10 means "greatly influenced," how much did your experience with the C&I Prescriptive Rebate Program influence your decision to install high efficiency equipment on your own?
3. Why do you give the C&I Prescriptive Rebate Program this influence rating?

If the response to question 2 was given a score of 7 or higher, we judged the respondent to be a spillover candidate. Navigant was unable to identify any GPY4 participating customers who experienced spillover as a result of their participation in the program. Three participants indicated that they installed additional measures for which they were expecting to apply for a rebate. The one participant who installed additional measures for which they were not intending to apply for a rebate rated the influence of the Prescriptive Program at a 1 (on the 0-10 influence scale) and therefore was not considered a spillover candidate. In future program evaluations, we will continue to attempt to identify participants who experienced spillover, and will ask spillover candidates the following additional questions:

4. What was the first measure that you implemented?
    a. Why did you purchase this equipment without the incentive available through the C&I Prescriptive Rebate Program?

5. What was the second measure that you implemented?
    a. Why did you purchase this equipment without the incentive available through the C&I Prescriptive Rebate Program?
6. Thank you for sharing this information with us. We may have follow-up questions about the equipment you installed outside of the program. Would you be willing to speak briefly with a member of our team?

All respondents who answer "yes" to question 6 indicate that they would be willing to speak with a member of our team and will be contacted by an engineer. The follow-up engineering interview will attempt to confirm that spillover had occurred and the type of equipment involved, and estimate the energy savings.

Participating Customer Net to Gross Scoring

The scoring approach used to calculate free ridership from data collected through participant telephone survey is summarized in Table 7-1.

Table 7-1. Free Ridership Scoring Algorithm for the GPY4 Prescriptive Program

Scoring Element	Calculation
Timing and Selection (Program Components) score. The maximum score (on a 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 the program incentive B. Technical assistance from utility or program staff C. Recommendation from utility or program staff D. Information from utility or program marketing materials E. Endorsement or recommendation by a utility account rep	Maximum of A, B, C, D, and E
Program Influence score. "If you were given a TOTAL of 100 points that reflect the importance in your decision to implement the <ENDUSE>, and you had to divide those 100 points between: 1) the program and 2) other factors, how many points would you give to the importance of the PROGRAM?"	Points awarded to the program (divided by 10) Divide by 2 if the customer learned about the program AFTER deciding to implement the measure that was installed
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 installed exactly the same equipment?" Adjustments to the "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.	Interpolate between No Program Likelihood Score and 10 where "At the same time" or within 6 months equals No Program score, and 48 months later equals 10 (no free ridership)
Project-level Free Ridership (ranges from 0.00 to 1.00)	1 – Sum of scores (Program Components, Program Influence, No-Program)/30
GPY4 Project level Net-to-Gross Ratio (ranges from 0.00 to 1.00)	1 – Project level Free Ridership + Participant Spillover
Apply score to other end-uses within the same project?	If yes, assign score to other end-uses of the same project
Apply score to other projects of the same end-use?	If yes, assign score to same end-use of the additional projects

Verified net program savings impacts were determined from reviewing 21 participant responses from the CATI survey. Shown in Table 7-2 is the profile of the net impact of the sample of respondents to the Prescriptive Program CATI survey, in comparison with the Prescriptive Program population.

Table 7-2. Profile of GPY4 Net Impact Sample

Population Summary		Participants Interviewed			
Number of Projects	Ex Ante Gross Energy Savings (Therms)	n	Ex Ante Gross Energy Savings (Therms)	Sampled Projects % of Population	Sampled Therms % of Population
49	1,099,947	21	328,589	43%	30%

Source: Navigant analysis of program tracking data.

The relative precision at a 90% confidence level is provided in Table 7-3. A Net-to-Gross ratio of 0.77 was estimated for the C&I Prescriptive Rebate Program at a relative precision of ± 13% at a 90% confidence level.

Table 7-3. NTG Ratio and Relative Precision at 90% Confidence Level

Project Population	NTG Interviews	Relative Precision (± %)	Participating Customer Free Ridership	Participating Customer Spillover	NTGR (Weighted Mean)*
49	21	13%	0.23	0.00	0.77

Source: Navigant analysis of participant telephone survey responses
Note: The NTGR shown here is adjusted only for participating customer responses, and does not include trade ally results or non-participant spillover.

7.1.1.2 Trade Ally Spillover Estimate

Navigant examined the existence of participating trade ally spillover using survey self-report data. The evaluation team attempted a census survey on all trade ally participants in the gross impact sample until we completed the required sample design of eight respondents. The survey asked trade allies and other contractors about their total sales of program-eligible equipment, rebated and non-rebated. Navigant used these responses to calculate an overall increase in the sales of program qualified measures. Spillover results were calculated from the sales of qualifying equipment that does not receive an incentive from PG or NSG if the program influence scoring from the trade ally survey responses exceeded a threshold.

Navigant was unable to identify any GPY4 participating trade allies who experienced spillover as a result of their participation in the program. Only one of the trade allies indicated that they installed any qualifying measures that did not get a rebate, and that trade ally was not able to provide any quantifiable information.

7.1.1.3 Impact Estimate Parameters for Future Use

The GPY4 evaluation included a customer participant survey to estimate free ridership and spillover values that can be used for deeming in the future. Navigant also interviewed trade allies to obtain their estimate of spillover. Those values are presented in the following table.

Table 7-4. Impact Estimate Parameters for Future Use

Parameter	Description	Value	Data Source
NTG	Prescriptive Projects	0.79	Evaluation NTG Research
Free Ridership	Prescriptive Projects	0.23	GPY4 Participating Customer Survey
Participant Spillover	Prescriptive Projects	0.00	GPY4 Participating Customer Survey and Participating Trade Ally Survey
Non-Participant Spillover	Prescriptive Projects	0.02	GPY2 Non-Participating Trade Ally Survey

Source: Navigant Research and Analysis.

7.2 *Survey Instruments*

7.2.1 Participating Customer Survey Instrument

PG_NSG_Participant
Presciptive_NTG Sur

7.2.2 Trade Ally Survey Instrument

PG_NSG
Participating Trade A