



**BUSINESS PROGRAMS**  
**Evaluation Report**  
**C&I Gas Optimization 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 Gas Optimization Program for GPY4, which is part of the comprehensive Business Program.<sup>1</sup> This report covers evaluation activities for measures installed and gas savings realized through the C&I Gas Optimization Program. The C&I Gas Optimization Program achieved energy savings beginning in GPY3, and was evaluated together with the C&I Custom Program in GPY3. The program has been established as a separate path within GPY4 Business Program for existing facilities.<sup>2</sup> Franklin Energy Services LLC., (Franklin Energy) implements the program with trade ally engagement and technical support for program delivery and marketing.

The C&I Gas Optimization Program provides a service where energy advisors and engineers review a commercial or industrial facility for operation and maintenance issues that, if corrected, often provide short payback projects that are very attractive to owners. Examples of issues uncovered from a Gas Optimization Assessment include correcting condensing boiler operating temperatures to ensure condensing operation and therefore savings, and aligning actual facility operating hours and ventilation scheduling.<sup>3</sup>

The GPY4 gross impact evaluation approach for the PG and NSG C&I Gas Optimization Program involved retrospective evaluation adjustments to ex ante gross savings on custom measure variables of all projects installed in GPY4. Franklin Energy provided documentation of project applications and savings, but verified savings were based on engineering review, billing data review, and on-site measurement and verification (M&V) of all program measures to determine eligibility and verified savings. Navigant based the GPY4 verified net impact results on the Net-to-Gross (NTG) ratio approved through the Illinois Energy Efficiency Stakeholder Advisory Group (SAG) consensus process. Navigant’s process evaluation for the GPY4 C&I Gas Optimization Program was limited to interviews with the program implementer and review of program materials to obtain the latest information on program administration, implementation, and outreach.

### E.1. Program Savings

Table E-1 summarizes the natural gas savings from the GPY4 Peoples Gas C&I Gas Optimization Program. Navigant verified program net savings of 487,913 therms.

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<sup>1</sup> 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).

<sup>2</sup> The GPY4 program year began June 1, 2014 and ended May 31, 2015.

<sup>3</sup> Second Triennial EEP Compliance Filing.pdf

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

Program/Path	Ex Ante Gross Savings <sup>4</sup> (Therms)	Ex Ante Net Savings <sup>5</sup> (Therms)	Verified Gross RR <sup>6</sup>	Verified Gross Savings (Therms)	NTGR <sup>7</sup>	Verified Net Savings <sup>8</sup> (Therms)
C&I Gas Opt GPY4 Total	488,926	498,704	98%	478,346	1.02	487,913

Source: Navigant analysis

Table E-2 summarizes the natural gas savings from the GPY4 North Shore Gas C&I Gas Optimization Program. Navigant verified program net savings of 268,432 therms.

**Table E-2. GPY4 North Shore Gas C&I Gas Optimization 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)
C&I Gas Opt GPY4 Total	241,357	246,184	109%	263,168	1.02	268,432

Source: Navigant analysis

## E.2 Impact Estimate Parameters for Future Use

The GPY4 evaluation did not conduct any additional research on net to gross values or impact savings parameters for deeming in future versions of the Illinois TRM.

## E.3 Program Volumetric Detail

Table E-3 and Table E-4 below present GPY4 program participation reported by the program administrator Franklin Energy Services (FES) for the Peoples Gas and North Shore Gas programs. The Peoples Gas program implemented five gas optimization projects, and the North Shore Gas program implemented five gas optimization projects. Gas optimization measures installed in GPY4 included pipe insulations, sealing doors, HVAC and Air Handling Units (AHU) control systems and temperature setbacks.

<sup>4</sup> 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”.

<sup>5</sup> 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)

<sup>6</sup> Verified Gross Realization Rate (RR) = Verified Gross Savings/Ex Ante Gross Savings.  
 Verified Gross Savings = RR \* Ex Ante Gross Savings

<sup>7</sup> 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](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)

<sup>8</sup> Verified Net Savings = NTGR \* Verified Gross Savings

**Table E-3. GPY4 Peoples Gas C&I Gas Optimization Program Primary Participation Detail**

Participation	Program Total
Participants	5
Installed Projects	5

Source: Navigant analysis of GPY4 program tracking data.

**Table E-4. GPY4 North Shore Gas C&I Gas Optimization Program Primary Participation Detail**

Participation	Program Total
Participants	4
Installed Projects	5

Source: Navigant analysis of GPY4 program tracking data.

#### E.4. Findings and Recommendations

The following provides insight into key program findings and recommendations.<sup>9</sup>

##### Verified Net Impact

**Finding 1.** The GPY4 Peoples Gas C&I Gas Optimization Program achieved verified net energy savings of 487,913 therms. This is approximately 65 percent of the program goal of 746,000 therms.<sup>10</sup> The North Shore Gas program achieved verified net energy savings of 268,432 therms. This is approximately 156 percent of the program goal of 172,083 therms. The evaluation team applied the deemed 1.02 NTG ratio approved by the SAG to estimate the C&I Gas Optimization Program verified net savings.

##### Verified Gross Savings and Realization Rate

**Finding 2.** Navigant estimated a verified gross realization rate of 98 percent for the People Gas program and calculated 478,346 therms as the verified gross savings. We estimated a 109 percent gross realization rate for the North Shore Gas program and calculated 263,168 therms as the verified gross savings. Navigant based realization rate estimates on retrospective evaluation adjustments to ex ante gross savings of all program measures. The gross realization rates for each utility were calculated by the ratio of the utility’s program total verified gross savings and the ex ante gross savings.

**Finding 3.** Of the five Peoples Gas projects, Navigant verified four through on-site measurement and verification (M&V) and one through engineering desk review. Three projects had 100 percent realization rates, the fourth had a 109 percent realization rate (we adjusted the summer boiler usage that we concluded was under-estimated) and the fifth project had an 83 percent realization rate (adjustment based on billing analysis and normalization to heating degree days). Navigant verified all five North Shore Gas projects through engineering desk file reviews. Four of the five projects had 100 percent realization rates, and one had a 205 percent realization rate (higher savings due to summer-winter temperature adjustment, using heating degree days and

<sup>9</sup> 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.

<sup>10</sup> PG-NSG Realized Savings\_091515.xlsx

TMY3 data). Navigant found that evaluation adjustments to gross savings were mostly due to using the most up to date information collected from the customers during on-site visits or through telephone conversations.

**Recommendation 1.** Navigant recommends that Franklin Energy should update the custom savings calculation workbooks with the most up-to-date information received from the customer before closing out the project for incentive payment. Additional information about system operations and sources of input assumptions in the workbooks should be documented.

### **Program Tracking Data Review**

**Finding 4.** The tracking system records the project gross ex ante savings in the input field for retrofit total quantity, but not the actual quantity, size or capacity of gas optimization measures installed.

**Recommendation 2.** The implementation contractor should create a separate field for tracking program gross savings, and track the measure description and unit quantity of measures installed (e.g. linear feet of pipe insulation, capacity or units of space heating equipment, etc.).

### **Process Findings**

**Finding 5.** From interviews with the program staff and review of program materials, Navigant found the C&I Gas Optimization Program administration and implementation activities are functioning adequately and raised no issues of concern. The program website provides information on program eligibility and contact information for qualified customers to reach the program staff for more information. The Gas Optimization Application and Agreement Form adequately outline the requirements for submitting an application and conditions for incentive payments. Navigant observed that the Peoples Gas program completed five projects in GPY4 and achieved 65 percent of the program savings goal, but participant volume was well below the 55 target participants. The North Shore Gas program completed five projects which was closer to the program target of eight participants, and achieved 156 percent of the program savings goal.<sup>11</sup>

**Recommendation 3.** Peoples Gas and North Shore Gas program staff could expand the program website content to include brochures and success stories from program participants. This could create more awareness of program benefits and potentially increase the number of program participants.

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<sup>11</sup> Second Triennial EEP Compliance Filing.pdf (Gas Optimization participation goals GPY4-GPY7)  
Peoples Gas and North Shore Gas C&I Gas Optimization Program GPY4 Evaluation Report – Final



## 1 Introduction

### 1.1 Program Description

The C&I Gas Optimization Program provides a service where energy advisors and engineers review a commercial or industrial facility for operation and maintenance issues that, if corrected, often provide short payback projects that are very attractive to owners. Examples of issues uncovered from a Gas Optimization Assessment include correcting condensing boiler operating temperatures to ensure condensing operation and therefore savings and aligning actual facility operating hours and ventilation scheduling.<sup>12</sup> The eligibility criteria for incentives under the C&I Gas Optimization Program are customers who use at least 500,000 therms annually for steam plants and or process heating, and those with buildings 75,000 square feet or larger seeking to optimize central heating plants or air handling systems equipped with building automation systems (preferably direct digital controls systems).

### 1.2 Evaluation Objectives

The evaluation team identified the following key researchable questions for GPY4.

#### 1.2.1 Impact Questions

1. What are the program's verified gross savings, using field measurement and verification (M&V) and engineering research to estimate savings?
2. What are the program's verified net savings?
3. What are the results and findings from field data collection?

#### 1.2.2 Process Questions

Navigant's process evaluation for the GPY4 C&I Gas Optimization Program involved interviews with the program implementer and review of program materials to research the following questions:

1. What is the latest update on GPY4 program administration and implementation? Are there issues of concern for GPY4 that need follow up research?
2. What outreach materials are being used? What changes are suggested?

The GPY4 evaluation plan also identified a research objective to assess marketing and outreach strategies that impacted customer participation and satisfaction. This objective was not completed in GPY4 because we did not conduct participant survey research. We will research this objective in GPY5/6 when we conduct the net-to-gross participant interviews where we ask satisfaction questions.

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<sup>12</sup> Second Triennial EEP Compliance Filing.pdf  
Peoples Gas and North Shore Gas C&I Gas Optimization Program GPY4 Evaluation Report – Final

## 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. The GPY4 gross impact evaluation approach for the PG and NSG C&I Gas Optimization Program involved retrospective evaluation adjustments to ex ante gross savings on custom measure variables of all projects installed in GPY4. Verified savings were based on project documentation, engineering review, billing data review, and on-site measurement and verification (M&V) of all program measures to determine eligibility and verified savings. Navigant based the GPY4 verified net impact evaluation approach on the Net-to-Gross (NTG) ratio approved through the Illinois SAG consensus process. Navigant’s process evaluation for the GPY4 C&I Gas Optimization Program was limited to interviews with the program implementer and review of program materials to obtain the latest information on program administration, implementation, and outreach.

### 2.1 Overview of Data Collection Activities

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	Completes	When	Comments
On-site M&V Audit	Participating Customers	4	June – September 2015	Gross savings verification research
Engineering File Review	Participating Customers	6	June – October 2015	Review sample of projects files with custom inputs
In Depth Interviews	Program Management	2	March 2015	Interview program staff and IC staff

Source: Navigant evaluation team.

### 2.2 Verified Savings Parameters

#### 2.2.1 Research Finding Gross Program Savings Analysis Approach

Navigant conducted on-site M&V and engineering file reviews on all program measures to verify C&I Gas Optimization Program gross savings and gross realization rates. For each project, Navigant performed an in-depth review of the application documentation to assess the engineering methods, parameters and assumptions used to generate all ex ante impact estimates. To support this review, Franklin Energy provided project documentation in electronic format for each project. Documentation included some or all of scanned files of hardcopy application forms and supporting documentation from the applicant (invoices, measure specification sheets, and vendor proposals), pre-inspection reports, post inspection reports, photos (when available), and calculation spreadsheets. Navigant collaborated with Franklin Energy through emails and telephone conversations where clarifications were needed to verify the savings input assumptions of the sampled projects, including collection of trend and billing data.

Navigant completed on-site M&V for four projects and performed engineering desk file reviews for the remaining six projects. The on-site audits included interviews with key customer contacts, visual inspection of the systems and equipment, and spot measurements. Navigant developed an analysis plan for each project selected for on-site data collection. Each plan explains the general gross impact approach used (including measurement plans), provides an analysis of the current inputs (based on the application and other available sources at that time), and identifies sources that were used to verify data or obtain newly identified inputs for the ex post gross impact approach. The on-site audit collected data identified in the analysis plan, including monitoring records such as measured temperatures, data from equipment logs, equipment nameplate data, system operation sequences and operating schedules, and description of site conditions that might contribute to baseline selection. Table 2-2 shows the M&V approach and measure types. Navigant selected the on-site projects based on the project therms savings. Navigant coordinated the on-site visits with a similar exercise conducted for the C&I Custom Program.

**Table 2-2. Profile of GPY4 C&I Gas Optimization Gross Impact Sample**

Project #	Utility	Ex Ante Gross	M&V	Measure
488839	NSG	71,110	File Review	Pipe Insulation
520029	NSG	64,417	File Review	Pipe Insulation
490680	NSG	44,537	File Review	DDC Controls & Insulation
513186	NSG	40,413	File Review	Sealing doors
476128	NSG	20,881	File Review	Sealing doors
884275	PG	177,859	On-site	AHU Controls improvement
343440	PG	154,333	On-site	Temperature Setback
499843	PG	129,078	On-site	Pipe Insulation
252228	PG	24,715	On-site	Temperature Setback
297704	PG	2,941	File Review	Steam Trap

Source: Utility tracking data and project files, and Navigant analysis.

### 2.2.2 Verified Net Program Savings Analysis Approach

Navigant calculated verified net energy savings by multiplying the verified gross savings estimates by a deemed net-to-gross ratio (NTGR) approved through a consensus process managed through the Illinois Energy Efficiency Stakeholders Advisory Group (SAG).<sup>13</sup>

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’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 GPY4 are:

$$\begin{aligned} \text{GPY4 Ex Ante Net} &= \text{Values reported in the GPY4 program tracking data} \\ \text{GPY4 Ex Ante Net} &= (\text{GPY4 Ex Ante Gross} * \text{GPY3 Verified Gross RR}) * \text{GPY4 Deemed NTGR} \end{aligned}$$

<sup>13</sup> Source: Deemed NTGR values are available on the Illinois Energy Efficiency Stakeholders Advisory Group web site. [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_NTG_Meetings/Final_2015_Documents/Peoples_Gas_and_North_Shore_Gas_NTG_Summary_GPY_1-5_2015-03-01_Final.pdf)

$$\text{GPY4 Ex Ante Gross} = \text{GPY4 Ex Ante Net} / (\text{GPY3 Verified Gross RR} * \text{GPY4 Deemed NTGR})$$

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

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

Program Path/Measure	Embedded GPY3 RR Adjustment Factors†	Utility	GPY4 Deemed NTG Value	NTGR Source
C&I Gas Optimization	1.00	PG & NSG	1.02	IL-SAG

Source: †Navigant evaluation report for the GPY3 Custom 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](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)

### 2.3 Process Evaluation

Navigant’s process evaluation for the GPY4 C&I Gas Optimization Program involved interviews with the program implementer and review of program materials to obtain the latest information on program administration, implementation, and outreach.

### 3 Gross Impact Evaluation

This section provides detailed analysis and findings from the on-site M&V and file reviews and tracking system review. Overall, the Peoples Gas GPY4 program achieved 478,346 therms of verified gross savings, representing 98 percent gross realization rate. The North Shore Gas program achieved 263,168 therms of verified gross savings, representing 109 percent gross realization rate. Details of the findings are provided below.

#### 3.1 Program Tracking Data Review

Navigant downloaded the final data for the C&I Gas Optimization Program impact evaluation from Franklin Energy’s Bensight Data Management platform. Navigant 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.

The tracking system records the project gross ex ante savings in the input field for retrofit total quantity, but not the actual unit quantity of custom type measures installed. The implementation contractor should create a separate field for tracking program gross savings, and track the measure description and unit quantity of custom measures installed (e.g. linear feet of pipe insulation, capacity or units of space heating equipment, etc.). Navigant found that the ex ante net savings for project 490680 was tracked as 46,336 therms. Navigant verified from the project files that the ex ante net savings is 45,427 therms, corresponding to 44,536 therms as the ex ante gross savings.

Navigant’s adjustments to verified gross savings were mostly due to using the most up to date information collected from the customers during on-site visits or through telephone conversations. Navigant suggests that Franklin Energy should regularly update savings calculation workbooks with the most up to date information from the customer before projects are finalized. Navigant suggests additional information about system operations and sources of key input assumptions should be documented within the tracked data.

#### 3.2 Program Volumetric Findings

As shown in Table 3-1 and Table 3-2, the Peoples Gas C&I Gas Optimization Program implemented five custom gas optimization projects from five participants. The North Shore Gas program implemented five custom gas optimization projects from four participants. Gas optimization measures installed in GPY4 included pipe insulation, sealing doors, HVAC and Air Handling Units (AHU) control systems and temperature setbacks.

**Table 3-1. GPY4 Peoples Gas C&I Gas Optimization Program Participation**

Participation	Program Total
Participants	5
Installed Projects	5

Source: Navigant analysis of GPY4 program tracking data.

**Table 3-2. GPY4 North Shore Gas C&I Gas Optimization Program Participation**

Participation	Program Total
Participants	4
Installed Projects	5

*Source: Navigant analysis of GPY4 program tracking data.*

The Peoples Gas program completion of five projects in GPY4 was far below the planning target of 55 participants.<sup>14</sup> The North Shore Gas program completed five projects, which was closer to its target of eight participants. Due to a cap on portfolio expenditures, budgeted dollars for individual program paths are periodically shifted to other programs to meet portfolio-level results and maintain market presence. Navigant will assess final performance toward goals at the “Business Program” and portfolio level when all GPY4 results are verified.

### 3.3 Gross Program Impact Parameter Estimates

The evaluation team conducted on-site M&V and engineering project file reviews to verify measure-level gross savings. The verified gross realization rates for the projects were determined as the ratio of the verified gross energy savings to ex-ante gross energy savings from project-level savings reported in the project documentation. The results of the verified gross realization rates for each project are summarized in Table 3-3 for the Peoples Gas and North Shore Gas projects.<sup>15</sup>

<sup>14</sup> Second Triennial EEP Compliance Filing.pdf (Gas Optimization participation goals GPY4-GPY7)

<sup>15</sup> Navigant usually selects a stratified random sample from a combined population of PG and NSG custom projects for M&V and determines a single verified gross realization rate that applies to both PG and NSG programs. In this case for the GPY4 Gas Optimization Program, Navigant conducted a census review of all program measures without sampling or stratification. Hence we determined that separate verified gross realization rates should be calculated for each utility program.

**Table 3-3. Gross Impact Realization Rate Results for the C&I Gas Optimization Program**

Project ID	Utility	Measure Description	Research Finding Gross Realization Rate	Summary of Evaluation Adjustment
488839	NSG	Pipe Insulation	100%	OK
520029	NSG	Pipe Insulation	100%	OK
490680	NSG	DDC Controls & Insulation	100%	OK
513186	NSG	Sealing doors	100%	OK
476128	NSG	Sealing doors	205%	Higher savings due to adjustment of lower winter temperature and higher summer temperature, using heating degree days and TMY3 data.
884275	PG	AHU Controls improvement	109%	Adjusted underestimated summer boiler usage. New controls and burner allow more efficient use of boilers in supplying steam to absorption chillers.
343440	PG	Temperature Setback	83%	Used billing analysis approach and normalized to HDD.
499843	PG	Pipe Insulation	100%	OK
252228	PG	Temperature Setback	100%	OK
297704	PG	Steam Traps	100%	OK

Source: Navigant analysis

### 3.4 Verified Gross Program Impact Results

Navigant summed the verified gross savings for each measure and project to calculate the program level verified gross savings for each utility. As shown in Table 3-4, the evaluation research adjustments resulted in verified gross energy savings of 478,346 therms for the GPY4 Peoples Gas C&I Gas Optimization Program. This results in a verified gross realization rate of 98 percent.

**Table 3-4. Peoples Gas GPY4 Verified Gross Impact Savings Estimates**

Program Delivery	Projects	Energy Savings (Therms)	90/10 Significance?
Ex Ante Gross Savings		488,926	
Verified Gross Realization Rate‡	5	98%	Yes, Census
Verified Gross Savings‡		478,346	

Source: Navigant analysis of GPY4 program tracking data

‡ Based on evaluation research on all GPY4 population of projects from Peoples Gas.

Table 3-5 shows the evaluation research adjustments resulted in verified gross energy savings of 263,168 therms for the GPY4 North Shore Gas C&I Gas Optimization Program. This results in a verified gross realization rate of 109 percent.

**Table 3-5. North Shore Gas GPY4 Verified Gross Impact Savings Estimates**

Program Delivery	Projects	Energy Savings (Therms)	90/10 Significance?
Ex Ante Gross Savings		241,357	
Verified Gross Realization Rate‡	5	109%	Yes, Census
Verified Gross Savings‡		263,168	

*Source: Navigant analysis of GPY4 program tracking data*

‡ Based on evaluation research on all GPY4 population of projects from North Shore Gas.



## 4 Net Impact Evaluation

Navigant calculated verified net energy savings by multiplying the verified gross savings estimates by a deemed net-to-gross ratio. As noted in Section 2, the NTGR used to calculate the net verified savings for the GPY4 C&I Gas Optimization 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
C&I Gas Optimization	PG & NSG	1.02	IL-SAG

‡ 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](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 net natural gas savings from the GPY4 Peoples Gas C&I Gas Optimization Program.

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

Program/Path	Ex Ante Gross Savings <sup>16</sup> (Therms)	Ex Ante Net Savings <sup>17</sup> (Therms)	Verified Gross RR <sup>18</sup>	Verified Gross Savings (Therms)	NTGR <sup>19</sup>	Verified Net Savings <sup>20</sup> (Therms)
C&I Gas Opt GPY4 Total	488,926	498,704	98%	478,346	1.02	487,913

Source: Navigant analysis

<sup>16</sup> 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”.

<sup>17</sup> GPY4 Ex Ante Net = Values reported in the GPY4 program tracking data  
 $GPY4 \text{ Ex Ante Net} = (GPY4 \text{ Ex Ante Gross} * GPY3 \text{ Verified Gross RR}) * GPY4 \text{ Deemed NTGR}$   
 $GPY4 \text{ Ex Ante Gross} = GPY4 \text{ Ex Ante Net} / (GPY3 \text{ Verified Gross RR} * GPY4 \text{ Deemed NTGR})$

<sup>18</sup> Verified Gross Realization Rate (RR) = Verified Gross Savings/Ex Ante Gross Savings.  
 Verified Gross Savings = RR \* Ex Ante Gross Savings

<sup>19</sup> 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](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)

<sup>20</sup> Verified Net Savings = NTGR \* Verified Gross Savings

Table 4-3 summarizes the net natural gas savings from the GPY4 North Shore Gas C&I Gas Optimization Program.

**Table 4-3. GPY4 North Shore Gas C&I Gas Optimization 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)
C&I Gas Opt GPY4 Total	241,357	246,184	109%	263,168	1.02	268,432

Source: Evaluation analysis of GPY4 program tracking data.

Peoples Gas verified net energy savings of 487,913 therms is 65 percent of the program goal of 746,000 therms.<sup>21</sup> The North Shore Gas program verified net energy savings of 268,432 therms is 156 percent of the program goal of 172,083.

<sup>21</sup> PG-NSG Realized Savings\_091515.xlsx

## 5 Process Evaluation

Navigant conducted a limited process review in GPY4, involving interviews with program management in April, 2015 and a review of program materials to verify information about program administration, implementation, and outreach strategies. We also reviewed the program tracking system input fields and the program eligibility requirements and facility assessment procedures as outlined on the program website.

Navigant's findings included:

- From interviews with the program staff and review of program materials, Navigant found the C&I Gas Optimization Program administration and implementation activities are functioning adequately and raised no issues of concern.
- The program website provides information on program eligibility and contact information for qualified customers to reach the program staff for more information. The C&I Gas Optimization Program Application and Agreement Form adequately outline the requirements for submitting an application and conditions for incentive payments.

Peoples Gas and North Shore Gas program staff could expand the program website content to include brochures and success stories from program participants. This could create more awareness of program benefits and potentially increase the number of program participants.

## 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 Gas Optimization Program achieved verified net energy savings of 487,913 therms. This is approximately 65 percent of the program goal of 746,000 therms.<sup>22</sup> The North Shore Gas program achieved verified net energy savings of 268,432 therms. This is approximately 156 percent of the program goal of 172,083 therms. The evaluation team applied the deemed 1.02 NTG ratio approved by the SAG to estimate the C&I Gas Optimization Program verified net savings.

### Verified Gross Savings and Realization Rate

**Finding 2.** Navigant estimated a verified gross realization rate of 98 percent for the People Gas program and calculated 478,346 therms as the verified gross savings. We estimated a 109 percent gross realization rate for the North Shore Gas program and calculated 263,168 therms as the verified gross savings. Navigant based realization rate estimates on retrospective evaluation adjustments to ex ante gross savings of all program measures. The gross realization rates for each utility were calculated by the ratio of the utility's program total verified gross savings and the ex ante gross savings.

**Finding 3.** Of the five Peoples Gas projects, Navigant verified four through on-site measurement and verification (M&V) and one through engineering desk review. Three projects had 100 percent realization rates, the fourth had a 109 percent realization rate (we adjusted the summer boiler usage that we concluded was under-estimated) and the fifth project had an 83 percent realization rate (adjustment based on billing analysis and normalization to heating degree days). Navigant verified all five North Shore Gas projects through engineering desk file reviews. Four of the five projects had 100 percent realization rates, and one had a 205 percent realization rate (higher savings due to summer-winter temperature adjustment, using heating degree days and TMY3 data). Navigant found that evaluation adjustments to gross savings were mostly due to using the most up to date information collected from the customers during on-site visits or through telephone conversations.

**Recommendation 1.** Navigant recommends that Franklin Energy should update the custom savings calculation workbooks with the most up-to-date information received from the customer before closing out the project for incentive payment. Additional information about system operations and sources of input assumptions in the workbooks should be documented.

### Program Tracking Data Review

**Finding 4.** The tracking system records the project gross ex ante savings in the input field for retrofit total quantity, but not the actual quantity, size or capacity of gas optimization measures installed.

**Recommendation 2.** The implementation contractor should create a separate field for tracking program gross savings, and track the measure description and unit quantity of measures

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<sup>22</sup> PG-NSG Realized Savings\_091515.xlsx

installed (e.g. linear feet of pipe insulation, capacity or units of space heating equipment, etc.).

### **Process Findings**

**Finding 5.** From interviews with the program staff and review of program materials, Navigant found the C&I Gas Optimization Program administration and implementation activities are functioning adequately and raised no issues of concern. The program website provides information on program eligibility and contact information for qualified customers to reach the program staff for more information. The C&I Gas Optimization Application and Agreement Form adequately outline the requirements for submitting an application and conditions for incentive payments. Navigant observed that the Peoples Gas program completed five projects in GPY4 and achieved 65 percent of the program savings goal, but participant volume was well below the 55 target participants. The North Shore Gas program completed five projects which was closer to the program target of eight participants, and achieved 156 percent of the program savings goal.<sup>23</sup>

**Recommendation 3.** Peoples Gas and North Shore Gas program staff could expand the program website content to include brochures and success stories from program participants. This could create more awareness of program benefits and potentially increase the number of program participants.

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<sup>23</sup> Second Triennial EEP Compliance Filing.pdf (Gas Optimization participation goals GPY4-GPY7)

## 7 Appendix

### 7.1 Detailed Impact Research Findings and Approaches

#### 7.1.1 Gross Impact Results

Table 7-1 provides the project level research finding gross realization rates and verified gross savings for the GPY4 Peoples Gas C&I Gas Optimization Program.

**Table 7-1. Peoples Gas C&I Gas Optimization Program Gross Impact Savings Results**

Project ID	Measure Description	Gross Ex Ante Savings (therms)	Research Finding Gross Realization Rate	Verified Gross Savings (therms)	Summary of Evaluation Adjustment
884275	AHU Controls improvement	177,859	109%	193,388	Adjusted underestimated summer boiler usage. New controls and burner allow more efficient use of boilers in supplying steam to absorption chillers.
343440	Temperature Setback	154,333	83%	128,224	Used billing analysis approach and normalized to HDD.
499843	Pipe Insulation	129,078	100%	129,078	OK
252228	Temperature Setback	24,715	100%	24,715	OK
297704	Steam Traps	2,941	100%	2,941	OK
<b>PG GPY4 Total</b>		<b>488,926</b>	<b>98%</b>	<b>478,346</b>	

Source: Navigant analysis

Table 7-2 provides the project level research finding gross realization rates and verified gross savings for the GPY4 North Shore Gas C&I Gas Optimization Program.

**Table 7-2. North Shore Gas C&I Gas Optimization Program Gross Impact Savings Results**

Project ID	Measure Description	Gross Ex Ante Savings (therms)	Research Finding Gross Realization Rate	Verified Gross Savings (therms)	Summary of Evaluation Adjustment
488839	Pipe Insulation	71,110	100%	71,005	OK
520029	Pipe Insulation	64,417	100%	64,416	OK
490680	DDC Controls & Insulation	44,537	100%	44,537	OK
513186	Sealing doors	40,413	100%	40,413	OK
476128	Sealing doors	20,881	205%	42,798	Higher savings due to adjustment of lower winter temperature and higher summer temperature, using heating degree days and TMY3 data.
<b>NSG GPY4 Total</b>		<b>241,357</b>	<b>109%</b>	<b>263,168</b>	

Source: Navigant analysis