C&I and Public Sector Custom Impact Evaluation Report

Energy Efficiency Plan:
Plan Year 2019
(1/1/2019-12/31/2019)

Presented to
Peoples Gas and North Shore Gas

Final

July 22, 2020

Prepared by:

Rick Berry
Guidehouse

Charles Ampong
Guidehouse

Kojo Quaye
Tatjana Gasic
Julie Barstow
Guidehouse

www.guidehouse.com

C&I and Public Sector Custom Impact Evaluation Report

Submitted to:

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

Submitted by:

Guidehouse (which acquired Navigant in 2019)
150 N. Riverside Plaza, Suite 2100
Chicago, IL 60606

Contact:

Randy Gunn
Partner
312.583.5714
randy.gunn@guidehouse.com

Kevin Grabner
Associate Director
608.616.5805
kevin.grabner@guidehouse.com

Robert Neumann
Associate Director
312.583.2176
rob.neumann@guidehouse.com

TABLE OF CONTENTS

1. Introduction 1
2. Program Description 1
3. Savings Summary 2
4. Program Savings by Measure 3
5. Impact Analysis Findings and Recommendations 5
    5.1 Impact Parameter Estimates 5
    5.2 Findings and Recommendations 5
        5.2.1 PGL Projects 5
        5.2.2 NSG Projects 6
    5.3 Historical Realization Rates and NTG Values 8
6. Appendix 1. Impact Analysis Methodology 9
7. Appendix 2. Impact Analysis Supplemental Information 10
8. Appendix 3. Program-Specific Inputs for the Illinois TRC 13

LIST OF TABLES AND FIGURES

Table 2-1. 2019 Volumetric Summary for PGL by Sector 1
Table 2-2. 2019 Volumetric Summary for NSG by Sector 2
Table 3-1. 2019 Annual Energy Savings Summary for PGL 2
Table 3-2. 2019 Annual Energy Savings Summary for NSG 2
Table 4-1. 2019 Annual Energy Savings by Project Size for PGL 3
Table 4-2. 2019 Annual Energy Savings for NSG 4
Table 5-1. 2019 Verified Gross Savings Parameters 5
Table 5-2. Historical Realization Rates and NTG Values 8
Table 6-1. Profile of PGL Gross Impact Sample for Custom Projects 9
Table 6-2. PGL Gross Realization Rates and Relative Precision at 90% Confidence Level 9
Table 7-1. Profile of 2019 PGL Custom Gross Impact Sample 10
Table 7-2. Profile of 2019 NSG Custom Gross Impact Sample 10
Table 7-3. 2019 PGL Summary of Sample M&V Results 11
Table 7-4. 2019 NSG Summary of Sample M&V Results 12
Table 8-1. TRC Inputs for PGL 13
Table 8-2. TRC Inputs for NSG 13

1. Introduction

This report presents the results of the impact evaluation of the Peoples Gas (PGL) and North Shore Gas (NSG) 2019 Custom programs. It presents a summary of the energy impacts for the total program and broken out by relevant measure and program structure details. The appendix presents the impact analysis methodology. Program year 2019 covers January 1, 2019 through December 31, 2019.

2. Program Description

The Custom Rebate path provides private sector commercial and industrial (C&I) and public sector (PS) customers with rebates on a custom basis; these are applications that include measures not covered under the Prescriptive Rebate path. For example, burner replacement measures may fall into the Custom Rebate category. PGL and NSG can also fund Retro-Commissioning and Non-Residential New Construction projects on a $/therm saved basis in coordination with ComEd.[1] New construction projects not participating through the coordinated Non-Residential New Construction program may be treated through the Custom Program. Custom rebates are based on the lesser of a buy down to a one-year payback, 50% of project cost, or $1.00 per therm for projects over 7,500 therms saved ($0.75 per therm for projects under 7,500 therms saved). PGL and NSG may revise eligible measures and incentives as driven by current market conditions, changes to codes and standards, technology, evaluation results, and program management knowledge. Typical market sectors for this program include larger customers in light and heavy manufacturing, steel and metal working, plastics compounding and processing, hospitals, food processing, hotels, commercial laundry and other process heating intensive businesses. The 2019 Custom Program delivery approach did not change from the previous year (2018).

The PGL Custom Program had nine participants in 2019 and completed 19 projects as shown in the following table.

Table 2-1. 2019 Volumetric Summary for PGL by Sector

Participation	Private	Public	Total
Participants*	8	1	9
Completed Projects†	18	1	19

* Participants are defined as unique account names
† Installed Projects are defined as unique project IDs
Source: Peoples Gas tracking data and Guidehouse team analysis.

The NSG Custom Program had five participants in 2019 and completed five projects as shown in the following table.

[1] The net savings for Retro-Commissioning and Non-Residential New Construction projects coordinated with ComEd are tracked and reported separately under those respective program names, not in this Custom Program evaluation report.

Table 2-2. 2019 Volumetric Summary for NSG by Sector

Participation	Private	Public	Total
Participants*	1	4	5
Completed Projects†	1	4	5

* Participants are defined as unique account names
† Installed Projects are defined as unique project IDs
Source: North Shore Gas tracking data and Guidehouse team analysis.

3. SAVINGS SUMMARY

Table 3-1 summarizes the energy savings the PGL Custom Program achieved by sector in 2019.

Table 3-1. 2019 Annual Energy Savings Summary for PGL

Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Private	442,194	99%	435,831	0.69	300,724
Public	14,656	99%	14,445	0.69	9,967
PGL Total	**456,850**	**99%**	**450,276**	**0.69**	**310,691**

* Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.
† Net-to-Gross (NTG) is the ratio of verified net savings to verified gross savings. The NTG is a deemed value. Source: PGL-NSG_NTG_History_and_2019_Recommendations_2018-10-01_Final Faucet Aerator and Showerhead Correction 2019-04-12.xlsx, which is to be found on the Illinois SAG web site: http://ilsag.info/net-to-gross-framework.html.
Source: Peoples Gas tracking data and Guidehouse team analysis.

Table 3-1 summarizes the energy savings the NSG Custom Program achieved by sector in 2019.

Table 3-2. 2019 Annual Energy Savings Summary for NSG

Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Private	26,515	64%	16,992	0.69	11,724
Public	38,146	62%	23,739	0.69	16,380
NSG Total	**64,661**	**63%**	**40,730**	**0.69**	**28,104**

* Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.
† Net-to-Gross (NTG) is the ratio of verified net savings to verified gross savings. The NTG is a deemed value. Source: PGL-NSG_NTG_History_and_2019_Recommendations_2018-10-01_Final Faucet Aerator and Showerhead Correction 2019-04-12.xlsx, which is to be found on the Illinois SAG web site: http://ilsag.info/net-to-gross-framework.html.
Source: North Shore Gas tracking data and Guidehouse team analysis.

4. Program Savings by Measure

The PGL Custom Program results are shown below by project size and type. The PGL Custom Program evaluation treated private and public sector projects as one stratified sample. One very large private sector project was designated as a certainty stratum – a project whose size required that it be sampled. The remaining projects were randomly selected through a stratified sample design at the tracking record level using the population gross therm savings determined from program tracking data. Strata were defined by project size, based on gross energy savings boundaries that placed about one-half of the remaining program-level savings into Strata 1 (medium-size projects) and Strata 2 (smallest projects). Additional details on sampling design for custom projects are discussed in Appendix 1.

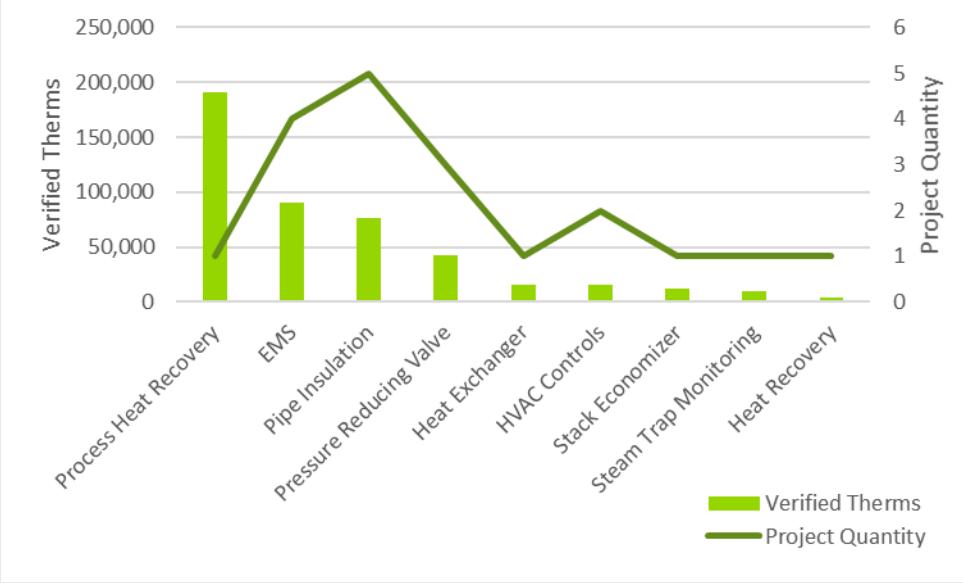
Table 4-1. 2019 Annual Energy Savings by Project Size for PGL

Program Strata	Ex Ante Gross Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTG	Verified Net Savings (Therms)
Certainty Strata	190,688	89%	169,392	0.69	116,881
Strata 1	127,612	100%	127,638	0.69	88,070
Strata 2	138,549	111%	153,246	0.69	105,740
Total	**456,850**	**99%**	**450,276**	**0.69**	**310,691**

Source: Peoples Gas tracking data and Guidehouse team analysis.

Figure 4-1 shows the verified savings by the various project types received by PGL.

Figure 4-1. 2019 Verified Savings by Project Type for PGL



Source: Peoples Gas tracking data and Guidehouse team analysis.

Since the NSG C&I and PS custom projects were few in quantity, Guidehouse treated the NSG Custom Program as a census sample. All five completed NSG Custom projects were selected for verification.

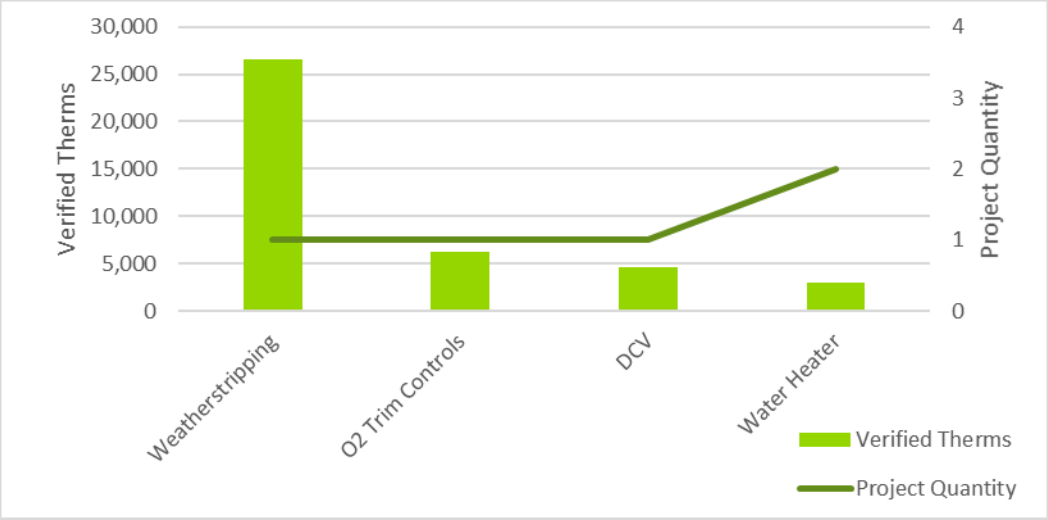
Table 4-2. 2019 Annual Energy Savings for NSG

Program Strata	Ex Ante Gross Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTG	Verified Net Savings (Therms)
Census	64,661	63%	40,730	0.69	28,104
Total	**64,661**	**63%**	**40,730**	**0.69**	**28,104**

Source: North Shore Gas tracking data and Guidehouse team analysis.

Figure 4-2 shows the verified savings by the various project types received by NSG.

Figure 4-2. 2019 Verified Savings by Project Type for NSG



Source: North Shore Gas tracking data and Guidehouse team analysis.

5. Impact Analysis Findings and Recommendations

5.1 Impact Parameter Estimates

Table 5-1 shows that the unit therm savings for custom measures vary, and the overall realization rate for C&I and PS custom projects was 99 and 63 percent for PGL and NSG custom programs, respectively. Following the table, we provide findings and recommendations, including discussion of projects with realization rates above or below 100 percent. Appendix 1 provides a description of the impact analysis methodology.

Table 5-1. 2019 Verified Gross Savings Parameters

Measure	Unit Basis	Ex Ante Gross Savings (therms/unit)	Verified Gross Savings (therms/unit)	Realization Rate	Data Source(s)
Custom	Vary	Vary	Vary	99% (PGL) 63% (NSG)	Project File Review, Monthly Billing Data, On-Site Measurement and Verification*

* Program Tracking Data (PTD) provided by Peoples Gas and North Shore Gas, extract dated January 30, 2020. Project files and monthly billing data provided by Peoples Gas and North Shore Gas. On-site data collected by Guidehouse.

5.2 Findings and Recommendations

The following provides the details of adjustments made to projects with realization rates not equal to 100 percent.

5.2.1 PGL Projects

Project 3104631 involved the installation of a new steam raising cooler to cool the reactor product stream. Prior to the project, plant steam was used to offset the steam that is generated. The previous equipment failed and was decommissioned, resulting in an opportunity to generate energy savings by recovering the condensate.

Guidehouse updated the process feed rate based on a longer time average of the logged data. The ex ante calculation based its average feed rate on data from 4/1/19 to 4/25/19, however, Guidehouse acquired additional data (4/1/19 to 7/21/19) from the customer during our site visit. Guidehouse judged the average feed rate based on additional data to be more representative of typical facility operations. Updating the feed rate values reduced the project's savings realization rate to 89%.

Guidehouse review of Project 1218758 did not yield any adjustments that affected the realization rate. Guidehouse did identify numerous hard-coded values in the calculation for ex ante energy savings, which made it difficult to validate savings as the source of information was not provided.

> **Recommendation 1.** Guidehouse recommends providing supporting documentation or an explanation when hard-coded data points are used to calculate energy savings. This would facilitate reviewing savings calculations for potential errors.

Project 3191695 involved installation of pipe insulation for steam and condensate piping. Guidehouse reviewed ex ante savings calculations and made only one update – to the system operating hours – increasing them from 8,760 to 8,766 per the IL TRM. The effect of this adjustment on the project's realization rate was negligible.

Project 4398690 involved the installation of HVAC controls on an air handler unit. Guidehouse updated the internal heat gains in the verified savings calculation to reflect unoccupied status.

Recommendation 2. Guidehouse recommends that the calculation inputs reflect the stated assumptions and known conditions in the project documentation.

Recommendation 3. The calculation template used in this project is relatively complicated. Guidehouse recommends that a brief summary (i.e., text box) be added to the calculation sheet that explains how that calculation has been adapted to model a given project's parameters.

Project 2449774 involved the installation of pipe insulation. Guidehouse updated the pipe size and length values to reflect the trade ally's quote and invoices.

Recommendation 4. Guidehouse recommends that the calculation inputs be supported by the most current project documentation.

Project 2457024 involved installing an economizer to recover exhaust heat from a boiler. Savings for this project were based on the median estimate from three different savings methodologies. Guidehouse reviewed the three savings methodologies and made three updates that affected the realization rate slightly.

- The run time hours were updated to sum to 100%.
- The boiler efficiency was updated based on customer-supplied combustion tickets.
- We changed the operation hours from 6,656 to 7,488 based on customer feedback.

This project achieved a realization rate of 101% resulting from these adjustments.

Recommendation 5. Guidehouse recommends that ex ante savings calculations use project-specific information such as boiler combustions tickets, when available.

Project 3362420 involved installation of a steam trap monitoring system which detects steam trap failure in real-time. This allows the building engineer to identify and repair the trap quicker, reducing waste from the boiler.

Guidehouse updated the savings calculation to use actual steam trap information from the project, including trap type, typical failure modes based on trap type, and orifice sizes. These additional calculation inputs yielded a 93% realization rate.

Recommendation 6. Guidehouse recommends using actual equipment specifications in calculations instead of assumed values. This would ensure the most accurate savings are attributed to the project.

5.2.2 NSG Projects

Project 3084251 involved installing a building automation system (BAS) for more efficient regulation of heating and cooling. Measures included as part of the BAS programming were discharge air reset, unoccupied setback, demand control ventilation (DCV), and hot water setpoint reset (also known as boiler indoor-outdoor reset control).

Guidehouse reviewed project file information and conducted a site visit to verify this project's savings. Guidehouse calculated a realization rate of 20% for this project, based on the following adjustments.

- The total square footage for DCV was found to be lower than the ex ante calculation indicated.

- The boiler water temperature was found not to be controlled by the BAS, but a local boiler control that was in place prior to the project.

Additionally, Guidehouse found that not all gas account history was available for validation, though this did not affect the project's realization rate.

Recommendation 7. Guidehouse recommends that post-inspections document the details of relevant controls for BAS projects. This may include screenshots or some form of programming report from the BAS. Confirming the BAS details during post-inspection will help avoid significant adjustments during verification.

Recommendation 8. Guidehouse recommends that the implementer identify the different accounts or meters associated with a customer. This avoids ambiguity when apply savings factors directly to annual usage values.

Recommendation 9. Guidehouse recommends that the implementer conduct pre-inspections of all BAS projects. Through evaluation experience with other programs, Guidehouse has found that the baseline conditions are a significant factor that affects the realization rates of BAS projects. If the baseline conditions are assumed and not confirmed, it is likely that the realization rate of the project will be volatile.

Project 2734493 involved the installation of weather-stripping dock seals in a loading dock area. Guidehouse made several adjustments to the verified savings for this project.

- The effective leakage area was updated from 2- and 3-inch gaps to a 1-inch gap, based on pre-inspection notes and photos of the baseline conditions.
- Updated the CFM calculations to use the C&I infiltration algorithms from the IL TRM v7.0, Measure 4.4.33. The ex ante infiltration calculations used residential algorithms from the 2017 ASHRAE Handbook.
- Updated the number of days that the building would realize gas savings based on the portion of time that the building is heated.
- Corrected a unit error in the ex ante calculation.
- Reduced the closed time for the top and side seals time from 168 hours per week to 144.9 hours, to account for the amount time the doors are assumed to be open (3.3 hours/day).

These adjustments reduced the realization rate of this project to 64%.

Recommendation 10. Guidehouse recommends that calculation inputs agree with the pre- and post-inspection findings. If the inputs should disagree, clarifying notes should be added to the calculation to explain the input.

Recommendation 11. Guidehouse recommends that the calculation algorithm and approach reflect the application of the project. For example, commercial infiltration algorithms should be used to calculate infiltration in commercial applications.

Recommendation 12. Guidehouse recommends that calculations reflect savings only during periods where heat is required (or gas is consumed).

Project 3838802 involved the installation of oxygen trim controls on a boiler system. The 235% realization rate is due to the tracking data not reflecting the ex ante calculation. Guidehouse made a negligible adjustment to the stoichiometric coefficients of nitrogen, to reflect the correct temperature range.

Recommendation 13. Guidehouse recommends that the tracking data accurately reflect a project's calculated savings.

Project 3879266 involved the installation of a water heater. The verified savings was adjusted to reflect the AHRI-certified efficiency of the water heater. The efficiency was increased from 94% to 95%. This resulted in a 106% realization rate.

Project 4088104 involved the installation of a water heater. The verified savings was adjusted to reflect the AHRI-certified ratings of the water heater. The efficiency was updated from 95% to 96% and the standby losses were updated from an assumed 1,825 Btu/hr to 1,200 Btu/hr. This resulted in a 122% realization rate.

Recommendation 14. Guidehouse recommends that installed efficiency values and other ratings reflect third party verified values (e.g., AHRI).

5.3 Historical Realization Rates and NTG Values

Table 5-2 below shows the historical gross realization rates and NTG values for the Custom Program. Beginning in GPY4, the NTG values shown are a savings weighted average from the various measures and deemed NTGs that vary by measure and program path.

Table 5-2. Historical Realization Rates and NTG Values

Program Year	PGL Verified Gross RR	NSG Verified Gross RR	PGL NTG	NSG NTG
GPY1	102%	102%	0.68	0.68
GPY2	81%	81%	0.78	0.78
GPY3	96%	99%	0.81	0.81
GPY4	100%	102%	0.68	0.68
GPY5	100%	96%	0.78	0.78
GPY6	97%	108%	0.69	0.69
2018	103%	109%	0.69	0.69
2019	99%	63%	0.69	0.69

Source: Guidehouse evaluation research.

6. Appendix 1. Impact Analysis Methodology

The evaluation team conducted site-specific research to verify project savings that were not based on measures specified in the TRM. Projects were randomly selected through a stratified sample design at the tracking record level using the population gross therm savings determined from program tracking data. Strata were defined by project size, based on gross energy savings boundaries that placed about one-third of program-level savings into each stratum. Table 6-1 shows a profile of the sample selection.

Table 6-1. Profile of PGL Gross Impact Sample for Custom Projects

Population Summary				Sample Summary		
Program	Sampling Strata	Number of Projects (N)	Ex Ante Gross Savings (Therms)	n	Ex Ante Gross Savings (Therms)	Sampled % of Population (% Therms)
Custom	C	1	190,688	1	190,688	100%
	1	5	127,612	5	127,612	100%
	2*	13	138,549	7	98,557	71%
TOTAL		**19**	**456,850**	**13**	**416,858**	**91%**

* The strata design excluded projects that contributed less than 5% to program savings. These projects were treated as Strata 3 projects in the program roll-up.
Source: Guidehouse analysis

Table 6-2. PGL Gross Realization Rates and Relative Precision at 90% Confidence Level

Program	Strata	Relative Precision +or-%	Mean RR	Standard Error
Custom	C	0.00%	89%	0.00
	1	0.00%	100%	0.00
	2	13.21%	111%	0.08
Customer Total RR (90/10)		**4.91%**	**99%**	**0.03**

Engineering Review of Project Files

For each selected project, an in-depth application review is performed to assess the engineering methods, parameters and assumptions used to generate all ex ante impact estimates. For each measure in the sampled project, engineers estimated ex post gross savings based on their review of documentation and engineering analysis.

To support this review, the implementation contractor provided project documentation in electronic format for each sampled project. Documentation included some or all scanned files of hardcopy application forms and supporting documentation from the applicant (invoices, measure specification sheets, and vendor proposals), pre-inspection reports and photos, post inspection reports and photos, and calculation spreadsheets.

7. Appendix 2. Impact Analysis Supplemental Information

Table 7-1 provides a summary of the sample selection and M&V approach for PGL.

Table 7-1. Profile of 2019 PGL Custom Gross Impact Sample

Project ID	Utility	Ex Ante Gross	Strata	M&V Approach	Measure
3104631	PGL	190,688	C	Site Visit	Process Heat Recovery
3191695	PGL	37,158	1	File Review	Pipe Insulation
3807377	PGL	22,746	1	File Review	EMS
3807360	PGL	22,634	1	File Review	EMS
3807392	PGL	22,629	1	File Review	EMS
3807369	PGL	22,446	1	File Review	EMS
3623146	PGL	20,070	2	File Review	Pressure Reducing Valve
1218758	PGL	16,024	2	File Review	Heat Exchanger
4398690	PGL	15,612	2	File Review	HVAC Controls
2449774	PGL	14,656	2	File Review	Pipe Insulation
2457024	PGL	12,369	2	Site Visit	Stack Economizer
4133947	PGL	10,153	2	File Review	Pipe Insulation
3362420	PGL	9,675	2	File Review	Steam Trap Monitoring

Source: Evaluation analysis of program data.

Table 7-2 provides a summary of the sample selection and M&V approach for NSG.

Table 7-2. Profile of 2019 NSG Custom Gross Impact Sample

Project ID	Utility	Ex Ante Gross	M&V Approach	Measure
3084251	NSG	18,814	Site Visit	DCV, BAS
2734493	NSG	26,515	File Review	Weather-stripping
3838802	NSG	6,268	File Review	O_2 Trim Controls
3879266	NSG	2,409	File Review	Water Heater
4088104	NSG	564	File Review	Water Heater

Source: Evaluation analysis of program data.

Table 7-3 provides a summary of M&V results and adjustments for the PGL sampled projects.

Table 7-3. 2019 PGL Summary of Sample M&V Results

Project ID	Measure Description	Gross Realization Rate	Summary of Adjustment
3104631	Process Heat Recovery	89%	Updated the logged data (feed rate, Tin, Tout) to reflect the 4/1/19 - 7/21/19 (previously 4/1/19 - 4/25/19).
3191695	Pipe Insulation	100%	Updated hours value from 8,760 to 8,766 per IL TRM v7.0, 4.4.14.
3807377	EMS	100%	Ok
3807360	EMS	100%	Ok
3807392	EMS	100%	Ok
3807369	EMS	100%	Ok
3623146	Pressure Reducing Valve	100%	Ok
1218758	Heat Exchanger	100%	Ok
4398690	HVAC Controls	97%	Updated the internal heat gains in the unoccupied tab to reflect unoccupied status. Updated heating mode setpoint to 70°F, to reflect project documentation.
2449774	Pipe Insulation	179%	Updated the operating temperature from 235°F to 225°F for the condensate piping to acknowledge that the temperature would be less than the process steam temperature of 235°F. Updated nominal pipe size and equivalent length multiplier, per the quote. Included the additional insulation quantities found on quote and invoices.
2457024	Stack Economizer	101%	Updated boiler efficiency based on customer-supplied combustion tickets from 2019-02-05. Updated hours from 6,656 to 7,488, based on conversation with customer. He stated that facility operates 24/6.
4133947	Pipe Insulation	100%	Updated hours value from 8,760 to 8,766 per IL TRM v7.0, 4.4.14.
3362420	Steam Trap Monitoring	93%	Updated analysis to account for (3) of (23) traps not being inverted bucket traps. Used actual trap orifice diameters, where available. Updated hours per year from 8,760 to 8,766 to be consistent with prior recommendations.

Source: Evaluation analysis of program data.

Table 7-4 provides a summary of M&V results and adjustments for the NSG sampled projects.

Table 7-4. 2019 NSG Summary of Sample M&V Results

Project ID	Measure Description	Gross Realization Rate	Summary of Adjustment
3084251	DCV	20%	The square footage has been reduced and boiler water reset control has been removed from calculation, to reflect site visit findings.
2734493	Weather-stripping	64%	Updated effective leakage area assuming gaps were 1" based on the pre-inspection notes and pictures. Updated CFM calculations using C&I infiltration algorithms from the IL TRM v7.0, Measure 4.4.33. Updated the number of days that the building would realize gas savings based on the portion of time that the building is heated. Corrected a unit error in the ex ante calculation.
3838802	O_2 Trim Controls	235%	The ex ante savings in the tracking data was 6,268 therms, while the ex ante calculation had 14,740 therms.
3879266	Water Heater	106%	The installed efficiency was updated to reflect the AHRI certificate for the installed model.
4088104	Water Heater	122%	Updated efficiency and standby losses based on the AHRI certificate for the installed model. Updated the set temperature to 120°F, and rated flow capacity 119 gallons.

Source: Evaluation analysis of program data.

8. Appendix 3. Program-Specific Inputs for the Illinois TRC

Table 8-1 and Table 8-2 shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of drafting this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to the evaluation team later.

Table 8-1. TRC Inputs for PGL

Project Type	Units	Quantity	Effective Useful Life (years)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Process Heat Recovery	Project	1	13.0	190,688	169,392	116,881
EMS	Project	4	15.0	90,455	90,473	62,426
Pipe Insulation	Project	5	15.0	76,100	80,239	55,365
Pressure Reducing Valve	Project	3	13.0	42,206	46,683	32,211
Heat Exchanger	Project	1	13.0	16,024	17,724	12,230
HVAC Controls	Project	2	13.0	15,922	17,611	12,152
Stack Economizer	Project	1	15.0	12,369	13,681	9,440
Steam Trap Monitoring	Project	1	15.0	9,675	10,701	7,384
Heat Recovery	Project	1	13.0	3,411	3,773	2,603
Total		**19**	**13.9**	**456,850**	**450,276**	**310,691**

Source: Peoples Gas tracking data and Guidehouse team analysis.

Table 8-2. TRC Inputs for NSG

Project Type	Units	Quantity	Effective Useful Life (years)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
DCV	Project	1	10.0	28,905	5,757	3,972
Weatherstripping	Project	1	10.0	26,515	16,992	11,724
O2 Trim Controls	Project	1	18.0	6,268	14,740	10,171
Water Heater	Project	2	15.0	2,973	3,241	2,237
Total		**5**	**13.3**	**64,661**	**40,730**	**28,104**

Source: North Shore Gas tracking data and Guidehouse team analysis.