



Home Energy Rebate Program Impact Evaluation Report

Energy Efficiency Plan: Program Year 2022
(1/1/2022-12/31/2022)

Prepared for:

Peoples Gas and North Shore Gas

FINAL

May 9, 2023

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Table of Contents

1. Introduction	1
2. Program Description	1
3. Program Savings Detail	4
4. Program Savings by Measure	6
5. Impact Analysis Findings and Recommendations	8
5.1 Impact Parameter Estimates	8
5.2 Findings and Recommendations	10
5.3 Historical RR and NTG Values	10
Appendix A. Impact Analysis Methodology	A-1
Appendix B. Program Specific Inputs for the Illinois TRC	B-1

List of Tables and Figures

Table 2-1. 2022 Volumetric Summary for PGL	1
Table 2-2. 2022 Installed Measure Quantities for PGL	2
Table 2-3. 2022 Volumetric Summary for NSG	3
Table 2-4. 2022 Installed Measure Quantities for NSG	3
Table 3-1. 2022 Annual Energy Savings Summary for PGL	4
Table 3-2. 2022 Annual Energy Savings Summary for NSG	5
Table 4-1. 2022 Annual Energy Savings by Measure for PGL	6
Table 4-2. 2022 Annual Energy Savings by Measure for NSG	7
Table 5-1. Verified Gross Savings Parameters	8
Table 5-2. Historical RR and NTG Values	11
Table B-1. Verified Cost-Effectiveness Inputs – PGL	B-1
Table B-2. Verified Cost-Effectiveness Inputs – NSG	B-2

1. Introduction

This report presents the results of the impact evaluation of the Peoples Gas (PGL) and North Shore Gas (NSG) 2022 Home Energy Rebate (HER) program. The report presents a summary of the energy impacts for the total program and is broken out by relevant measure and program structure details. The appendix presents the impact analysis methodology and cost-effectiveness input summary. Program year 2022 covers January 1, 2022 through December 31, 2022.

2. Program Description

The Home Energy Rebate Program provides rebates to PGL and NSG residential customers who make certain energy-saving improvements to their homes. The program is composed of two distinct offerings: 1) replacement of HVAC and other equipment and 2) weatherization improvements. The HVAC and other equipment offering incentivizes customer-installed or contractor-installed energy efficient furnaces, boilers, and water heaters, as well as customer-installed programmable thermostats. The weatherization offering incentivizes trade ally-installed home insulation measures, such as air sealing and duct sealing. In 2022, ComEd processed rebates for advanced thermostats, and PGL and NSG reimbursed ComEd for the gas portion (“ComEd Marketplace”), removing the need for participants to complete separate rebate applications for natural gas and electricity. The PGL program had 8,546 unique participants in 2022 and completed 8,596 projects as Table 2-1 shows.

Table 2-1. 2022 Volumetric Summary for PGL

Participation	HVAC	Weatherization	ComEd Marketplace	Total
Participants *	1,204	164	7,178	8,546
Installed Projects †	1,230	165	7,201	8,596

* Participants are defined as the number of distinct account numbers with realized gas savings.

† Installed projects are defined as the number of distinct measure IDs with realized gas savings.

Source: Peoples Gas tracking data and Guidehouse evaluation team analysis

Table 2-2 summarizes the installed measure quantities that are the basis for verified energy savings.

Table 2-2. 2022 Installed Measure Quantities for PGL

Program Path	Measure	Quantity Unit	Installed Quantity
HVAC	Advanced Thermostats	Each	357
	Gas High Efficiency Furnace	Each	847
	Gas Water Heater	Each	96
	Gas High Efficiency Boiler - HW	MBH	4,468
	Programmable Thermostats - Boiler	Each	3
	Gas High Efficiency Boiler - Two-in-One	Each	30
	Gas High Efficiency Boiler - Steam	MBH	1,266
	Programmable Thermostats - Furnace	Each	16
Weatherization	Air Sealing	CFM	151,976
	Air Sealing with Attic Insulation	CFM	152,924
	Ceiling/Attic Insulation	Sq. Ft.	285,238
	Duct Insulation and Sealing	CFM	4,108
	Foundation Wall Insulation	Sq. Ft.	260
	Wall Insulation	Sq. Ft.	11,270
ComEd Marketplace	Advanced Thermostats	Each	7,205

Source: Peoples Gas tracking data and Guidehouse evaluation team analysis

Table 2-2a breaks down the weatherization project count by measure for People’s Gas.

Table 2-3a. 2022 Installed Weatherization Project Quantities for PGL

Measure	Project Quantity
Air Sealing	12
Air Sealing with Attic Insulation	145
Ceiling/Attic Insulation	146
Duct Insulation and Sealing	8
Foundation Wall Insulation	1
Wall Insulation	8

Source: Peoples Gas tracking data and Guidehouse evaluation team analysis

The NSG program had 2,264 participants in 2022 and completed 2,292 projects as Table 2-4 shows.

Table 2-4. 2022 Volumetric Summary for NSG

Participation	HVAC	Weatherization	ComEd Marketplace	Total
Participants *	773	66	1,425	2,264
Installed Projects †	795	68	1,429	2,292

* Participants are defined as the number of distinct account numbers with realized gas savings.

† Installed projects are defined as the number of distinct measure IDs with realized gas savings.

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

Table 2-5 summarizes the installed measure quantities that are the basis for verified energy savings.

Table 2-5. 2022 Installed Measure Quantities for NSG

Program Path	Measure	Quantity Unit	Installed Quantity
HVAC	Advanced Thermostats	Each	170
	Gas High Efficiency Furnace	Each	689
	Gas Water Heater	Each	38
	Gas High Efficiency Boiler - HW	MBH	1,693
	Programmable Thermostats - Boiler	Each	1
	Gas High Efficiency Boiler - Two-in-One	Each	11
	Gas High Efficiency Boiler - Steam	MBH	128
	Programmable Thermostats - Furnace	Each	4
Weatherization	Air Sealing	CFM	71,773
	Air Sealing with Attic Insulation	CFM	59,577
	Ceiling/Attic Insulation	Sq. Ft.	144,601
	Foundation Wall Insulation	Sq. Ft.	2,062
	Wall Insulation	Sq. Ft.	10,146
ComEd Marketplace	Advanced Thermostats	Each	1,430

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

Table 2-4a breaks down the weatherization project count by measure for North Shore Gas.

Table 2-4a. 2022 Installed Weatherization Project Quantities for NSG

Measure	Project Quantity
Air Sealing	10
Air Sealing with Attic Insulation	58
Ceiling/Attic Insulation	60
Foundation Wall Insulation	7
Wall Insulation	12

Source: Peoples Gas tracking data and Guidehouse evaluation team analysis

3. Program Savings Detail

Table 3-1 summarizes the energy savings the PGL HER program achieved by path in 2022.

Table 3-1. 2022 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)
HVAC	229,037	100%	229,045	Equipment = 0.74 Smart Thermostat = 0.90 Programmable Thermostat = 0.88	173,500
Weatherization	31,286	100%	31,176	Air Sealing with Attic Insulation = 0.88 Air Sealing = 0.77 Attic Insulation = 0.89 Duct Sealing = 0.87 Other Insulation = 0.79	27,347
ComEd Marketplace	557,973	100%	557,972	Smart Thermostat = 0.90	502,174
Total or Weighted Average	818,296	100%	818,193		703,021

* Realization rate (RR) is the ratio of verified gross savings to ex ante gross savings based on evaluation research findings.

† Net-to-gross (NTG): A deemed value. Available on the Stakeholder Advisory Group (SAG) website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022>

Source: Peoples Gas tracking data and Guidehouse evaluation team analysis.

Table 3-2 summarizes the energy savings the NSG HER program achieved by path in 2022.

Table 3-2. 2022 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)
HVAC	168,133	100%	168,138	Equipment = 0.74 Smart Thermostat = 0.90 Programmable Thermostat = 0.88	126,330
Weatherization	13,111	99%	12,976	Air Sealing with Attic Insulation = 0.88 Air Sealing = 0.77 Attic Insulation = 0.89 Duct Sealing = 0.87 Other Insulation = 0.79	11,277
ComEd Marketplace	116,863	100%	116,862	Smart Thermostat = 0.90	105,176
Total or Weighted Average	298,107	100%	297,976		242,783

* RR is the ratio of verified gross savings to ex ante gross savings based on evaluation research findings.

† A deemed value. Available on the SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022>.

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

4. Program Savings by Measure

The PGL program includes 13 measures as Table 4-1 shows. The advanced thermostats and high efficiency furnaces contributed the most savings.

Table 4-1. 2022 Annual Energy Savings by Measure for PGL

Program Path	Savings Category	Ex Ante Gross Savings (therms)	Verified Gross RR*	Verified Gross Savings (therms)	NTG†	Verified Net Savings (therms)
HVAC	Advanced Thermostats	24,254	100%	24,254	0.90	21,829
	Gas High Efficiency Furnace	181,647	100%	181,653	0.74	134,423
	Gas Water Heater	6,897	100%	6,897	0.74	5,104
	Gas High Efficiency Boiler - HW	6,694	100%	6,697	0.74	4,956
	Programmable Thermostats - Boiler	277	100%	277	0.88	243
	Gas High Efficiency Boiler - Two-in-One	8,489	100%	8,489	0.74	6,282
	Gas High Efficiency Boiler - Steam	156	100%	156	0.74	115
	Programmable Thermostats - Furnace	623	100%	623	0.88	548
	HVAC Subtotal	229,037	100%	229,045		173,500
Weatherization	Air Sealing	1,106	100%	1,106	0.77	852
	Air Sealing with Attic Insulation	9,608	100%	9,608	0.88	8,455
	Ceiling/Attic Insulation	15,309	100%	15,308	0.89	13,624
	Duct Insulation and Sealing	4,298	100%	4,297	0.87	3,739
	Foundation Wall Insulation	107	89%	95	0.79	75
	Wall Insulation	858	89%	762	0.79	602
Weatherization Subtotal	31,286	100%	31,176		27,347	
ComEd Marketplace	Advanced Thermostats	557,973	100%	557,972	0.90	502,174
	Marketplace Subtotal	557,973	100%	557,972		502,174
Total or Weighted Average		818,296	100%	818,193		703,021

Note: Subtotals may not sum due to rounding.

* RR is the ratio of verified gross savings to ex ante gross savings based on evaluation research findings.

† A deemed value. Available on the SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022>.

Source: Peoples Gas tracking data and Guidehouse evaluation team analysis

The NSG program includes 12 measures as Table 4-2 shows. The advanced thermostats and high efficiency furnaces measures contributed the most savings.

Table 4-2. 2022 Annual Energy Savings by Measure for NSG

Program Category	Savings Category	Ex Ante Gross Savings (therms)	Verified Gross RR*	Verified Gross Savings (therms)	NTG†	Verified Net Savings (therms)
HVAC	Advanced Thermostats	11,707	100%	11,707	0.90	10,536
	Gas High Efficiency Furnace	147,763	100%	147,767	0.74	109,348
	Gas Water Heater	2,746	100%	2,746	0.74	2,032
	Gas High Efficiency Boiler - HW	2,540	100%	2,541	0.74	1,880
	Gas High Efficiency Boiler - Two-in-One	3,113	100%	3,113	0.74	2,303
	Gas High Efficiency Boiler - Steam	16	100%	16	0.74	12
	Programmable Thermostats - Furnace	249	100%	249	0.88	219
	HVAC subtotal	168,133	100%	168,138		126,330
Weatherization	Air Sealing	1,067	100%	1,067	0.77	822
	Air Sealing with Attic Insulation	3,743	100%	3,743	0.88	3,294
	Ceiling/Attic Insulation	7,102	100%	7,102	0.89	6,321
	Foundation Wall Insulation	520	89%	461	0.79	364
	Wall Insulation	679	89%	603	0.79	476
	Weatherization Subtotal	13,111	99%	12,976		11,277
ComEd Marketplace	Advanced Thermostats	116,863	100%	116,862	0.90	105,176
	Marketplace Subtotal	116,863	100%	116,862		105,176
Total or Weighted Average		298,107	100%	297,976		242,783

Note: Subtotals may not sum due to rounding.

* RR is the ratio of verified gross savings to ex ante gross savings based on evaluation research findings.

† A deemed value. Available on the SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022>.

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 the unit therms savings and realization rate (RR) findings by measure from the evaluation team’s review. The RR is the ratio of the verified savings to the ex ante savings. Following Table 5-1 are findings and recommendations, including discussion of all measures with an RR above or below 100%. 5.3 Appendix A provides a description of the impact analysis methodology.

Table 5-1. Verified Gross Savings Parameters

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	RR	Data Source(s)
Advanced Thermostat - Base Manual (Condo)	Each	66.63	66.63	100%	Illinois TRM, v10.0,† Section 5.3.16, MMDB
Advanced Thermostat - Base Manual (SF)	Each	102.51	102.51	100%	Illinois TRM, v10.0, Section 5.3.16, MMDB
Advanced Thermostat - Base Programmable (Condo)	Each	46.38	46.38	100%	Illinois TRM, v10.0, Section 5.3.16, MMDB
Advanced Thermostat - Base Programmable (SF)	Each	71.36	71.36	100%	Illinois TRM, v10.0, Section 5.3.16, MMDB
Advanced Thermostat - Base Unknown (Condo)	Each	55.52	55.53	100%	Illinois TRM, v10.0, Section 5.3.16, MMDB
Advanced Thermostat - Base Unknown (SF)	Each	85.42	85.43	100%	Illinois TRM, v10.0, Section 5.3.16, MMDB
Gas High Efficiency Boiler - HW	MBH	1.51	1.51	100%	Illinois TRM, v10.0, Section 5.3.6, MMDB
Gas High Efficiency Boiler - Steam	MBH	0.12	0.12	100%	Illinois TRM, v10.0, Section 5.3.6, MMDB
Gas High Efficiency Boiler - Two-in-One	Each	282.97	282.97	100%	Illinois TRM, v10.0, Section 5.3.17, MMDB
Gas High Efficiency Furnace	Each	214.46	214.47	100%	Illinois TRM, v10.0, Section 5.3.7, MMDB
Gas Water Heater - Indirect	Each	65.18	65.17	100%	Illinois TRM, v10.0, Section 5.4.2, MMDB
Gas Water Heater - Tankless	Each	72.45	72.45	100%	Illinois TRM, v10.0, Section 5.4.2, MMDB
Programmable Thermostats - Boiler	Each	92.20	92.19	100%	Illinois TRM, v10.0, Section 5.3.11, MMDB
Programmable	Each	62.31	62.31	100%	Illinois TRM, v10.0,

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	RR	Data Source(s)
Thermostats - Furnace					Section 5.3.11, MMDB
Air Sealing	CFM	0.09	0.09	100%	Illinois TRM, v10.0, Section 5.6.1, MMDB
Air Sealing with Attic Insulation	CFM	0.06	0.06	100%	Illinois TRM, v10.0, Section 5.6.1, MMDB
Attic Insulation - Existing R-0 - Final R-49+	Sq. Ft.	0.36	0.36	100%	Illinois TRM, v10.0, Section 5.6.5, MMDB
Attic Insulation - Existing R-1-3 - Final R-49+	Sq. Ft.	0.18	0.18	100%	Illinois TRM, v10.0, Section 5.6.5, MMDB
Attic Insulation - Existing R-4-6 - Final R-49+	Sq. Ft.	0.11	0.11	100%	Illinois TRM, v10.0, Section 5.6.5, MMDB
Attic Insulation - Existing R-7-10 - Final R-49+	Sq. Ft.	0.08	0.08	100%	Illinois TRM, v10.0, Section 5.6.5, MMDB
Attic Insulation - Existing R-11-14 - Final R-49+	Sq. Ft.	0.06	0.06	100%	Illinois TRM, v10.0, Section 5.6.5, MMDB
Attic Insulation - Existing R-15-19 - Final R-49+	Sq. Ft.	0.03	0.03	100%	Illinois TRM, v10.0, Section 5.6.5, MMDB
Foundation Insulation- Existing R-0 - Final R-13-15	Sq. Ft.	0.81	0.72	89%	Illinois TRM, v10.0, Section 5.6.3, MMDB
Foundation Insulation- Existing R-1-3 - Final R-13-15	Sq. Ft.	0.25	0.23	89%	Illinois TRM, v10.0, Section 5.6.3, MMDB
Foundation Insulation- Existing R-4-5 - Final R-13-15	Sq. Ft.	0.10	0.09	89%	Illinois TRM, v10.0, Section 5.6.3, MMDB
Duct Sealing - Unconditioned	CFM	1.71	1.71	100%	Illinois TRM, v10.0, Section 5.6.4, MMDB
Wall Insulation - Existing R-0 - Final R-13-15	Sq. Ft.	0.13	0.12	89%	Illinois TRM, v10.0, Section 5.6.4, MMDB
Wall Insulation - Existing R-0 - Final R-19+	Sq. Ft.	0.14	0.13	89%	Illinois TRM, v10.0, Section 5.6.4, MMDB
Wall Insulation -	Sq.	0.05	0.04	89%	Illinois TRM, v10.0,

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	RR	Data Source(s)
Existing R-4-5 - Final R-13-15	Ft.				Section 5.6.4, MMDB
Wall Insulation - Existing R-4-5 - Final R-16-18	Sq. Ft.	0.06	0.05	89%	Illinois TRM, v10.0, Section 5.6.4, MMDB
Wall Insulation - Existing R-4-5 - Final R-19+	Sq. Ft.	0.06	0.06	89%	Illinois TRM, v10.0, Section 5.6.4, MMDB

Note: MMDB – Master Measure Database (which is the measure calculator received from program administrator).

* Program tracking data (PTD) provided by PGL and NSG, extracted on January 30, 2022.

† Illinois Statewide Technical Reference Manual (IL-TRM) version 10.0 from <http://www.ilsag.info/technical-reference-manual.html>.

Source: Guidehouse evaluation team analysis

5.2 Findings and Recommendations

Finding 1. For Wall and Foundation Insulation, the evaluation team found discrepancy between the ex ante savings and the assumptions provided in the MMDB calculator, which the evaluation verified savings were consistent with. Verified gross savings produced 89% realization rate for these measures. It appears the discrepancy may be due to incorrect application of NTG values to estimate the net savings reported in the tracking data. While the Master Measure Database (MMDB) and technical reference manual (TRM) deemed NTG value from 2021 program did not change for these measures, ex ante net savings per unit increased from 2021.

Recommendation 1a. Review the measure-level NTG value for wall and foundation insulation and update appropriately for the tracking data ex ante savings calculation.

Recommendation 1b. Track pre- and post-installation R-values. Refer to “21 – Foundation Wall Insulation” cells G29:G37 and “22 – Wall Insulation” cells H29:H37 in the MMDB 2022 for correct average values.

5.3 Historical RR and NTG Values

Table 5-2. shows the historical gross RR and NTG values for the HER program. Beginning in 2018, 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 RR and NTG Values

Program Year	PGL Verified Gross RR	NSG Verified Gross RR	PGL NTG	NSG NTG
2018	101%	102%	0.92	0.86
2019	100%	100%	0.90	0.77
2020	101%	100%	0.68	0.67
2021	106%	102%	0.85	0.81
2022	100%	100%	0.77	0.81

Note: NTG are weighted averages from various measure level NTG values
 Source: Guidehouse evaluation research

Appendix A. Impact Analysis Methodology

Guidehouse verified unit savings by using the impact algorithms in IL-TRM v10.0.¹ We reviewed the ex ante savings calculation approach from the MMDB file². In most cases, the TRM algorithms were correctly applied in the MMDB, but where evaluation found the need to adjust, we did so according to the TRM guidelines.

Guidehouse calculated verified net energy savings by multiplying the verified gross savings estimates by the NTG ratio. In 2022, the NTG estimates used to calculate the net verified savings were based on past evaluation research and defined by a consensus process through the Illinois Stakeholder Advisory Group (SAG).

¹ Illinois Statewide Technical Reference Manual (IL-TRM) version 10.0 from <http://www.ilsag.info/technical-reference-manual.html>

² Franklin Energy Master Measure Database, Excel file 2022 MMDB - Res and MF, provided February 08, 2022.

Appendix B. Program Specific Inputs for the Illinois TRC

Table B-1 and Table B-2 show the TRC cost-effectiveness analysis inputs available at the time of producing this impact evaluation report. Currently, additional required cost data (e.g., measure costs, program-level incentive- and non-incentive costs) are not included in these tables and will be provided to the evaluation team later. Guidehouse will include annual and lifetime water savings and greenhouse gas reductions in the end of year summary report.

Table B-1. Verified Cost-Effectiveness Inputs – PGL

Program Path	Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (therms)	Verified Gross Savings (therms)	Verified Net Savings (therms)
HVAC	Advanced Thermostats	Each	357	11.0	24,254	24,254	21,829
	Gas High Efficiency Furnace	Each	847	20.0	181,647	181,653	134,423
	Gas Water Heater	Each	96	13.0	6,897	6,897	5,104
	Gas High Efficiency Boiler - HW	MBH	4,468	25.0	6,694	6,697	4,956
	Programmable Thermostats - Boiler	Each	3	16.0	277	277	243
	Gas High Efficiency Boiler - Two-in-One	Each	30	21.5	8,489	8,489	6,282
	Gas High Efficiency Boiler - Steam	MBH	1,266	25.0	156	156	115
	Programmable Thermostats - Furnace	Each	16	16.0	623	623	548
Weatherization	Air Sealing	CFM	151,976	20.0	1,106	1,106	852
	Air Sealing with Attic Insulation	CFM	152,924	20.0	9,608	9,608	8,455
	Ceiling/Attic Insulation	Sq. Ft.	285,238	20.0	15,309	15,308	13,624
	Duct Insulation and Sealing	CFM	4,108	20.0	4,298	4,297	3,739
	Foundation Wall Insulation	Sq. Ft.	260	20.0	107	95	75
ComEd Marketplace	Wall Insulation	Sq. Ft.	11,270	20.0	858	762	602
	Advanced Thermostats	Each	7,205	11.0	557,973	557,972	502,174
Total or Weighted Average				19.9	818,296	818,193	703,021

Source: Peoples Gas tracking data and Guidehouse evaluation team analysis

Table B-2. Verified Cost-Effectiveness Inputs – NSG

Program Path	Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (therms)	Verified Gross Savings (therms)	Verified Net Savings (therms)
HVAC	Advanced Thermostats	Each	170	11.0	11,707	11,707	10,536
	Gas High Efficiency Furnace	Each	689	20.0	147,763	147,767	109,348
	Gas Water Heater	Each	38	13.0	2,746	2,746	2,032
	Gas High Efficiency Boiler - HW	MBH	1,693	25.0	2,540	2,541	1,880
	Gas High Efficiency Boiler - Two-in-One	Each	11	21.5	3,113	3,113	2,303
	Gas High Efficiency Boiler - Steam	MBH	128	25.0	16	16	12
	Programmable Thermostats - Furnace	Each	4	16.0	249	249	219
Weatherization	Air Sealing	CFM	71,773	20.0	1,067	1,067	822
	Air Sealing with Attic Insulation	CFM	59,577	20.0	3,743	3,743	3,294
	Ceiling/Attic Insulation	Sq. Ft.	144,601	20.0	7,102	7,102	6,321
	Foundation Wall Insulation	Sq. Ft.	2,062	20.0	520	461	364
	Wall Insulation	Sq. Ft.	10,146	20.0	679	603	476
ComEd Marketplace	Advanced Thermostats	Each	1,430	11.0	116,863	116,862	105,176
Total or Weighted Average				20.0	298,107	297,976	242,783

Note: Totals may not sum due to rounding.

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