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|  | Home Energy Rebates Program Impact Evaluation Report  Energy Efficiency Plan: Program Year 2023  (1/1/2023-12/31/2023) | | | |
|  | Prepared for:  Peoples Gas and North Shore Gas  DRAFT  **April 5, 2024** | | | |
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# Introduction

This report presents the results of the impact evaluation of the Peoples Gas (PGL) and North Shore Gas (NSG) 2023 Home Energy Rebates programs and a summary of the energy impacts for the total program, as well as measure and program structure details. The appendix presents the impact analysis methodology. Program year 2023 covers January 1, 2023 through December 31, 2023.

# 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 and beyond, 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 program had 6,709 participants in 2023 and completed 6,744 projects, as shown in Table 2‑1.

Table 2‑1. 2023 Volumetric Summary for PGL

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Participation | HVAC | Weatherization | ComEd Marketplace | Total |
| Participants \* | 1,038 | 166 | 5,507 | **6,709** |
| Installed Projects † | 1,060 | 168 | 5,516 | **6,744** |
| Measure Types Installed | 12 | 6 | 6 | **20** |

\* Participants are defined as the number of distinct account numbers with realized gas savings. Some participants may have both HVAC and Wx measures.

† Installed Projects are defined as the number of distinct work order 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. 2023 Installed Measure Quantities for PGL

| Program Path | Measure | Quantity Unit | Installed Quantity |
| --- | --- | --- | --- |
| HVAC | Advanced Thermostats | Each | 331 |
| Gas High Efficiency Boiler | MBH | 4,157 |
| Gas High Efficiency Combination Boiler | Each | 40 |
| Gas High Efficiency Furnace | Each | 671 |
| Gas Water Heaters | Each | 70 |
| Programmable Thermostats | Each | 29 |
| Weatherization | Air Sealing | CFM | 9,197 |
| Air Sealing with Attic Insulation | CFM | 158,287 |
| Ceiling/Attic Insulation | Sq. Ft | 146,159 |
| Duct Insulation and Sealing | CFM | 1,341 |
| Foundation Wall Insulation | Sq. Ft | 170 |
| Wall Insulation | Sq. Ft | 4,831 |
| ComEd Marketplace | Advanced Thermostats | Each | 5,516 |

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

The NSG program had 2,087 participants in 2023 and completed 2,114 projects, as shown in Table 2‑3.

Table 2‑3. 2023 Volumetric Summary for NSG

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Participation | HVAC | Weatherization | ComEd Marketplace | Total |
| Participants \* | 807 | 91 | 1,193 | 2,087 |
| Installed Projects † | 827 | 92 | 1,195 | 2,114 |
| Measure Types Installed | 10 | 6 | 6 | 18 |

\* Participants are defined as the number of distinct account numbers with realized gas savings. Some participants may have both HVAC and Wx measures.

† Installed Projects are defined as the number of distinct work order IDs with realized gas savings.

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

Table 2‑4 summarizes the installed measure quantities that are the basis for verified energy savings.

Table 2‑4. 2023 Installed Measure Quantities for NSG

| Program Path | Measure | Quantity Unit | Installed Quantity |
| --- | --- | --- | --- |
| HVAC | Advanced Thermostats | Each | 220 |
| Gas High Efficiency Boiler | MBH | 1,602 |
| Gas High Efficiency Combination Boiler | Each | 4 |
| Gas High Efficiency Furnace | Each | 681 |
| Gas Water Heaters | Each | 27 |
| Programmable Thermostats | Each | 12 |
| Weatherization | Air Sealing | CFM | 13,730 |
| Air Sealing with Attic Insulation | CFM | 75,903 |
| Ceiling/Attic Insulation | Sq. Ft. | 105,763 |
| Duct Insulation and Sealing | CFM | 3,828 |
| Foundation Wall Insulation | Sq. Ft. | 60 |
| Wall Insulation | Sq. Ft. | 600 |
| ComEd Marketplace | Advanced Thermostats | Each | 1,195 |

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

# Program Savings Detail

Table 3‑1 summarizes the energy savings the PGL Home Energy Rebates Program achieved by community and path in 2023. Projects in disadvantaged communities (DAC) designated sites have a verified net-to-gross ratio (NTG) of 1.00.

Table 3‑1. 2023 Annual Energy Savings Summary for PGL

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Program Category | Program Path | Ex Ante  Gross Savings (Therms) | Verified Gross RR\* | Verified  Gross Savings (Therms | NTG† | Verified  Net Savings (Therms) |
| **Disadvantaged Communities** **(DAC)** | |  |  |  |  |  |
|  | HVAC | 43,966 | 94% | 41,118 | 1.00 | 41,118 |
|  | Weatherization | 6,686 | 113% | 7,564 | 1.00 | 7,564 |
|  | ComEd Marketplace | 150,161 | 100% | 150,160 | 1.00 | 150,160 |
| ***DAC Subtotal*** | | ***200,812*** | ***99%*** | ***198,842*** |  | ***198,842*** |
| **Non-Disadvantaged Communities** | |  |  |  |  |  |
|  | HVAC | 158,672 | 94% | 148,685 | 0.74 | 113,057 |
|  | Weatherization | 21,010 | 114% | 23,935 | 0.77 | 21,110 |
|  | ComEd Marketplace | 276,345 | 100% | 276,344 | 0.90 | 248,709 |
| ***Non-DAC Subtotal*** | | ***456,027*** | ***98%*** | ***448,964*** |  | ***382,877*** |
| **Total or Weighted Average** | | **656,839** | **99%** | **647,806** |  | **581,719** |

\* Realization Rate (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 web site: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2023/>. Disadvantaged communities (DAC) designated sites based on census track used a NTG of 1.0.

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

Table 3‑2 summarizes the energy savings the NSG Home Energy Rebates Program achieved by community and path in 2023.

Table 3‑2. 2023 Annual Energy Savings Summary for NSG

| Program Category | Program Path | Ex Ante  Gross Savings (Therms) | Verified Gross RR\* | Verified  Gross Savings (Therms | NTG† | Verified  Net Savings (Therms) |
| --- | --- | --- | --- | --- | --- | --- |
| **Disadvantaged Communities (DAC)** | |  |  |  |  |  |
|  | HVAC | 6,308 | 89% | 5,593 | 1.00 | 5,593 |
|  | ComEd Marketplace | 10,708 | 100% | 10,708 | 1.00 | 10,708 |
| ***DAC Subtotal*** | | ***17,016*** | ***96%*** | ***16,301*** |  | ***16,301*** |
| **Non-Disadvantaged Communities** | |  |  |  |  |  |
|  | HVAC | 172,629 | 94% | 162,363 | 0.74 | 122,617 |
|  | Weatherization | 20,757 | 111% | 23,029 | 0.77 | 20,211 |
|  | ComEd Marketplace | 87,065 | 100% | 87,064 | 0.90 | 78,358 |
| ***Non-DAC Subtotal*** | | ***280,451*** | ***97%*** | ***272,457*** |  | ***221,186*** |
| **Total or Weighted Average** | | **297,467** | **97%** | **288,758** |  | **237,487** |

\* Realization Rate (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 web site: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2023/>. Disadvantaged communities (DAC) designated sites based on census track used a NTG of 1.0.

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

# Program Savings by Measure

The PGL program includes 18 measures in both DAC and non-DAC designated sites, as shown in Table 4‑1. Advanced Thermostats and Furnaces contributed the most savings.

Table 4‑1. 2023 Annual Energy Savings by Measure for PGL

| Program Category | Program Path | Savings Category | Ex Ante Gross Savings (Therms) | Verified Gross RR\* | Verified Gross Savings (Therms) | NTG† | Verified Net Savings (Therms) |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Disadvantaged Communities** | HVAC | Advanced Thermostat - Base Manual (Condo) | 466 | 100% | 466 | 1.00 | 466 |
| Advanced Thermostat - Base Manual (Single Family) | 2,153 | 90% | 1,948 | 1.00 | 1,948 |
| Advanced Thermostat - Base Programmable (Condo) | 649 | 93% | 603 | 1.00 | 603 |
| Advanced Thermostat - Base Programmable (Single Family) | 1,142 | 94% | 1,070 | 1.00 | 1,070 |
| Gas High Efficiency Boiler - HW | 1,553 | 78% | 1,211 | 1.00 | 1,211 |
| Gas High Efficiency Boiler - Steam | 39 | 165% | 64 | 1.00 | 64 |
| Gas High Efficiency Boiler - Two-in-One | 2,891 | 90% | 2,616 | 1.00 | 2,616 |
| Gas High Efficiency Furnace | 33,457 | 94% | 31,527 | 1.00 | 31,527 |
| Programmable Thermostat - Boiler | 217 | 99% | 215 | 1.00 | 215 |
| Programmable Thermostat - Furnace | 312 | 100% | 312 | 1.00 | 312 |
| Tankless Water Heater | 1,087 | 100% | 1,087 | 1.00 | 1,087 |
| Weatherization | Air Sealing | 115 | 100% | 115 | 1.00 | 115 |
| Air Sealing with Attic Insulation | 2,486 | 100% | 2,486 | 1.00 | 2,486 |
| Ceiling/Attic Insulation | 3,933 | 122% | 4,794 | 1.00 | 4,794 |
| Foundation Wall Insulation | 4 | 884% | 36 | 1.00 | 36 |
| Wall Insulation | 149 | 90% | 134 | 1.00 | 134 |
| ComEd Marketplace | Advanced Thermostat - Base Manual (Condo) | 16,458 | 100% | 16,458 | 1.00 | 16,458 |
| Advanced Thermostat - Base Manual (Single Family) | 69,810 | 100% | 69,809 | 1.00 | 69,809 |
| Advanced Thermostat - Base Programmable (Condo) | 8,951 | 100% | 8,951 | 1.00 | 8,951 |
| Advanced Thermostat - Base Programmable (Single Family) | 47,523 | 100% | 47,522 | 1.00 | 47,522 |
| Advanced Thermostat - Base Unknown (Single Family) | 5,809 | 100% | 5,809 | 1.00 | 5,809 |
| Advanced Thermostat - Base Unknown (Condo) | 1,610 | 100% | 1,610 | 1.00 | 1,610 |
| ***DAC Total*** | |  | ***200,812*** | ***99%*** | ***198,842*** |  | ***198,842*** |
| **Non-Disadvantaged Communities** | HVAC | Advanced Thermostat - Base Manual (Condo) | 3,398 | 96% | 3,265 | 0.90 | 2,938 |
| Advanced Thermostat - Base Manual (Single Family) | 6,356 | 97% | 6,151 | 0.90 | 5,536 |
| Advanced Thermostat - Base Programmable (Condo) | 2,644 | 96% | 2,551 | 0.90 | 2,296 |
| Advanced Thermostat - Base Programmable (Single Family) | 6,208 | 93% | 5,780 | 0.90 | 5,202 |
| Gas High Efficiency Boiler - HW | 3,252 | 129% | 4,185 | 0.74 | 3,097 |
| Gas High Efficiency Boiler - Steam | 44 | 100% | 44 | 0.74 | 32 |
| Gas High Efficiency Boiler - Two-in-One | 9,844 | 92% | 9,011 | 0.74 | 6,668 |
| Gas High Efficiency Furnace | 121,605 | 92% | 112,380 | 0.74 | 83,161 |
| Indirect Water Heater | 261 | 100% | 261 | 0.74 | 193 |
| Programmable Thermostat - Boiler | 493 | 100% | 491 | 0.88 | 432 |
| Programmable Thermostat - Furnace | 872 | 100% | 872 | 0.88 | 768 |
| Tankless Water Heater | 3,695 | 100% | 3,695 | 0.74 | 2,734 |
| Weatherization | Air Sealing | 688 | 100% | 688 | 0.77 | 530 |
| Air Sealing with Attic Insulation | 7,456 | 100% | 7,456 | 0.88 | 6,561 |
| Ceiling/Attic Insulation | 10,846 | 127% | 13,744 | 0.89 | 12,232 |
| Duct Insulation and Sealing | 1,789 | 98% | 1,752 | 0.87 | 1,525 |
| Foundation Wall Insulation | 11 | 799% | 88 | 0.89 | 78 |
| Wall Insulation | 221 | 94% | 207 | 0.89 | 184 |
| ComEd Marketplace | Advanced Thermostat - Base Manual (Condo) | 36,648 | 100% | 36,647 | 0.90 | 32,983 |
| Advanced Thermostat - Base Manual (Single Family) | 112,352 | 100% | 112,351 | 0.90 | 101,116 |
| Advanced Thermostat - Base Programmable (Condo) | 27,827 | 100% | 27,828 | 0.90 | 25,046 |
| Advanced Thermostat - Base Programmable (Single Family) | 90,907 | 100% | 90,906 | 0.90 | 81,816 |
| Advanced Thermostat - Base Unknown (Single Family) | 6,834 | 100% | 6,834 | 0.90 | 6,151 |
| Advanced Thermostat - Base Unknown (Condo) | 1,776 | 100% | 1,777 | 0.90 | 1,599 |
| ***Non-DAC Total*** | | | ***456,026*** | ***98%*** | ***448,964*** |  | ***382,877*** |
| **Total or Weighted Average** | |  | **656,838** | **99%** | **647,806** |  | **581,719** |

\* Realization Rate (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 web site: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2023/>. Disadvantaged communities (DAC) designated sites based on census track used a NTG of 1.0.

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

The NSG program includes 16 measures, as shown in Table 4‑2. Advanced Thermostats and Furnaces contributed the most savings.

Table 4‑2. 2023 Annual Energy Savings by Measure for NSG

| Program Category | Program Path | Savings Category | Ex Ante Gross Savings (Therms) | Verified Gross RR\* | Verified Gross Savings (Therms) | NTG† | Verified Net Savings (Therms) |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Disadvantaged Communities** | HVAC | Advanced Thermostat - Base Manual (Condo) | 67 | 100% | 67 | 1.00 | 67 |
| Advanced Thermostat - Base Manual (Single Family) | 103 | 100% | 103 | 1.00 | 103 |
| Advanced Thermostat - Base Programmable (Single Family) | 285 | 75% | 214 | 1.00 | 214 |
| Gas High Efficiency Furnace | 5,791 | 89% | 5,147 | 1.00 | 5,147 |
| Programmable Thermostat - Furnace | 62 | 100% | 62 | 1.00 | 62 |
| ComEd Marketplace | Advanced Thermostat - Base Manual (Condo) | 200 | 100% | 200 | 1.00 | 200 |
| Advanced Thermostat - Base Manual (Single Family) | 5,741 | 100% | 5,741 | 1.00 | 5,741 |
| Advanced Thermostat - Base Programmable (Condo) | 46 | 100% | 46 | 1.00 | 46 |
| Advanced Thermostat - Base Programmable (Single Family) | 3,782 | 100% | 3,782 | 1.00 | 3,782 |
| Advanced Thermostat - Base Unknown (Single Family) | 940 | 100% | 940 | 1.00 | 940 |
| ***DAC Total*** | |  | ***17,016*** | ***96%*** | ***16,301*** |  | ***16,301*** |
| **Non-Disadvantaged Communities** | HVAC | Advanced Thermostat - Base Manual (Condo) | 333 | 100% | 333 | 0.90 | 300 |
| Advanced Thermostat - Base Manual (Single Family) | 6,663 | 94% | 6,253 | 0.90 | 5,628 |
| Advanced Thermostat - Base Programmable (Condo) | 232 | 100% | 232 | 0.90 | 209 |
| Advanced Thermostat - Base Programmable (Single Family) | 8,634 | 93% | 8,063 | 0.90 | 7,257 |
| Gas High Efficiency Boiler - HW | 2,198 | 110% | 2,421 | 0.74 | 1,792 |
| Gas High Efficiency Boiler - Two-in-One | 1,446 | 80% | 1,163 | 0.74 | 860 |
| Gas High Efficiency Furnace | 150,559 | 94% | 141,333 | 0.74 | 104,586 |
| Indirect Water Heater | 130 | 100% | 130 | 0.74 | 96 |
| Programmable Thermostat - Furnace | 623 | 100% | 623 | 0.88 | 548 |
| Tankless Water Heater | 1,811 | 100% | 1,811 | 0.74 | 1,340 |
| Weatherization | Air Sealing | 1,198 | 100% | 1,198 | 0.77 | 922 |
| Air Sealing with Attic Insulation | 4,856 | 98% | 4,767 | 0.88 | 4,195 |
| Ceiling/Attic Insulation | 9,896 | 125% | 12,340 | 0.89 | 10,983 |
| Duct Insulation and Sealing | 4,790 | 98% | 4,680 | 0.87 | 4,071 |
| Foundation Wall Insulation | 5 | 278% | 14 | 0.89 | 12 |
| Wall Insulation | 12 | 259% | 31 | 0.89 | 27 |
| ComEd Marketplace | Advanced Thermostat - Base Manual (Condo) | 3,065 | 100% | 3,065 | 0.90 | 2,759 |
| Advanced Thermostat - Base Manual (Single Family) | 38,544 | 100% | 38,544 | 0.90 | 34,689 |
| Advanced Thermostat - Base Programmable (Condo) | 2,226 | 100% | 2,226 | 0.90 | 2,004 |
| Advanced Thermostat - Base Programmable (Single Family) | 40,530 | 100% | 40,530 | 0.90 | 36,477 |
| Advanced Thermostat - Base Unknown (Single Family) | 2,477 | 100% | 2,477 | 0.90 | 2,230 |
| Advanced Thermostat - Base Unknown (Condo) | 222 | 100% | 222 | 0.90 | 200 |
| ***Non-DAC Total*** | |  | ***280,451*** | ***97%*** | ***272,457*** |  | ***221,186*** |
| **Total or Weighted Average** | |  | **297,467** | **97%** | **288,758** |  | **237,487** |

\* Realization Rate (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 web site: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2023/>. Disadvantaged communities (DAC) designated sites based on census track used a NTG of 1.0.

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

# Impact Analysis Findings and Recommendations

## Impact Parameter Estimates

Table 5‑1 shows the unit therm savings and realization rate findings by measure from our review. The realization rate is the ratio of the verified savings to the gross ex ante savings. Following the table, we provide findings and recommendations, including discussion of all measures with realization rates above or below 100 percent. Appendix 1 provides a description of the impact analysis methodology.

Table 5‑1. 2023 Verified Gross Savings Parameters

| **Measure** | **Unit Basis** | **Ex Ante Gross (therms/unit)** | **Verified Gross (therms/unit)** | **Realization Rate** | **Data Source(s)** |
| --- | --- | --- | --- | --- | --- |
| Advanced Thermostat - Base Unknown (Condo) | Each | 55.53 | 55.52 | 100% | Illinois TRM, v11.0†, Section 5.3.16, PGL/NSG Program Tracking Data (PTD\*), MMDB |
| Advanced Thermostat - Base Manual (Condo) | Each | 66.63 | 66.63 133.27 | 100% | Illinois TRM, v11.0†, Section 5.3.16, PTD, MMDB |
| Advanced Thermostat - Base Manual (Single Family) | Each | 102.51 | 102.51 205.02 | 100% | Illinois TRM, v11.0†, Section 5.3.16, PTD, MMDB |
| Advanced Thermostat - Base Programmable (Condo) | Each | 46.38 | 46.38 92.76 | 100% | Illinois TRM, v11.0†, Section 5.3.16, PTD, MMDB |
| Advanced Thermostat - Base Programmable (Single Family) | Each | 71.35 | 71.35 144.71 | 99% | Illinois TRM, v11.0†, Section 5.3.16, PTD, MMDB |
| Advanced Thermostat - Base Unknown (Single Family) | Each | 85.42 | 85.42 | 100% | Illinois TRM, v11.0†, Section 5.3.16, PTD, MMDB |
| Air Sealing | CFM | 0.09 | 0.09 | 100% | Illinois TRM, v11.0†, Section 5.6.1, PTD, MMDB |
| Air Sealing with Attic Insulation | CFM | 0.06 | 0.06 0.06 0.14 | 99% | Illinois TRM, v11.0†, Section 5.6.1, PTD, MMDB |
| Ceiling/Attic Insulation | Sq. Ft. | Varies | Varies | 125% | Illinois TRM, v11.0†, Section 5.6.5, PTD, MMDB |
| Duct Insulation and Sealing | CFM | 0.68 1.71 | Varies | 98% | Illinois TRM, v11.0†, Section 5.3.4, PTD, MMDB |
| Foundation Wall Insulation | Sq. Ft. | Varies | Varies | 689% | Illinois TRM, v11.0†, Section 5.6.2, PTD, MMDB |
| Gas High Efficiency Boiler - HW | MBH | 1.51 | Varies | 112% | Illinois TRM, v11.0†, Section 5.3.6, PTD, MMDB |
| Gas High Efficiency Boiler - Steam | MBH | 0.18 | 0.11 0.18 | 131% | Illinois TRM, v11.0†, Section 5.3.6, PTD, MMDB |
| Gas High Efficiency Boiler - Two-in-One | Each | 290.68 | 282.97 290.68 573.66 | 90% | Illinois TRM, v11.0†, Section 5.3.17, PTD, MMDB |
| Gas High Efficiency Furnace | Each | 214.47 | 214.47 428.93 | 93% | Illinois TRM, v11.0†, Section 5.3.5, PTD, MMDB |
| Indirect Water Heater | Each | 65.17 | 65.18 | 100% | Illinois TRM, v11.0†, Section 5.4.2, PTD, MMDB |
| Programmable Thermostat - Boiler | Each | 92.21 122.57 | 92.21 124.62 | 99% | Illinois TRM, v11.0†, Section 5.3.11, PTD, MMDB |
| Programmable Thermostat - Furnace | Each | 62.31 | 62.31 | 100% | Illinois TRM, v11.0†, Section 5.3.11, PTD, MMDB |
| Tankless Water Heater | Each | 72.45 | 72.45 | 100% | Illinois TRM, v11.0†, Section 5.4.2, PTD, MMDB |
| Wall Insulation | Sq. Ft. | Varies | Varies | 98% | Illinois TRM, v11.0†, Section 5.3.11, PTD, MMDB |

\* Program Tracking Data (PTD) provided by Peoples Gas and North Shore Gas; extract dated January 30, 2024. MMDD means Master Measure Database, which is a PGL-NSG measure calculator.

† State of Illinois Technical Reference Manual version 11.0 from <http://www.ilsag.info/technical-reference-manual.html>.

‡ Project files and monthly billing data provided by Peoples Gas and North Shore Gas. When conducted, on-site and telephone interview data collected by Guidehouse.

## Findings and Recommendations

**Finding 1.** Three instances of Gas High Efficiency Combination Boilers (WO-4418226, WO-4484085, and WO-4443134) used TRM v10.0 (2022) EUF\_base and EUF\_eff values for the ex ante savings calculation rather than the TRM v11.0 values.

**Recommendation 1.** Update EUF\_base and EUF\_eff from TRM v10.0 (2022) values (0.58 and 0.933) to TRM v11.0 (2023) values (0.536 and 0.954).

**Finding 2.** Five instances of Gas High Efficiency Combination Boilers (WO-5776480, WO-5735918, WO-5671429, WO-5726270, WO-5741850) reported ex ante savings values that were much higher than what is provided in the MMDB. Guidehouse could not isolate a cause for this discrepancy.

**Recommendation 2.** Ensure ex ante savings inputs match values provided in the MMDB: AFUE\_base = 82%, AFUE\_eff = 95%, AFUE\_exist = 61.6%, Capacity Input = 119,666.7, EFLH = 976, EUF\_base = 0.563, EUF\_eff = 0.954, HF = 2.56. Report any actual values in the tracking data.

**Finding 3.** Three instances of Gas High Efficiency Boiler – HW (WO-5776649, WO-5771282, WO-5743690) report a quantity of one in the tracking data, but ex ante gross savings reflect a quantity of two. The evaluation team used a quantity of one for verified savings.

**Recommendation 3.** Ensure quantities provided in tracking data are accurate and reflect what is used to calculate ex ante totals.

**Finding 4.** Thirty-eight (38) instances of Gas High Efficiency Boiler – HW (e.g. WO-5462591, WO-4660392, WO-5221238, WO-5078731, WO-4473752, etc.) report different per unit savings values than what were provided in the MMDB. Guidehouse could not find a singular cause for the discrepancy.

**Recommendation 4.** Ensure ex ante savings inputs use the Early Replacement method and that inputs match values provided in the MMDB: AFUE\_base = 84%, AFUE\_exist = 62%, AFUE\_eff = 95%, Cap Input = 1000, EFLH = 976. Provide any actual or custom values in the tracking data.

**Finding 5.** Two Gas High Efficiency Boilers – Steam (WO-4355660 and WO-4329545) report lower per unit savings values than what is provided in the MMDB.

**Recommendation 5.** Ensure ex ante savings inputs use the Early Replacement method and that inputs match values provided in the MMDB: AFUE\_base = 82%, AFUE\_exist = 75%, AFUE\_eff = 83%, Cap Input = 1000, EFLH = 976. Provide any actual or custom values in the tracking data.

**Finding 6.** Ninety-Nine (99) instances of Gas High Efficiency Furnace (e.g. WO-5765046, WO-5775974, WO-5776424, WO-5745230, WO-5745168, WO-5735798, etc.) report a quantity of one in the tracking data, but ex ante gross savings reflect a quantity of two. One Furnace (WO-4680087) showed a quantity of negative one. The evaluation team used a quantity of positive 1 for these verified savings to align with what is provided in the tracking data and to calculate positive energy savings.

**Recommendation 6.** Ensure quantities provided in tracking data are accurate and reflect what is used to calculate ex ante totals.

**Finding 7.** Twenty-nine (29) instances of Advanced Thermostats from the HVAC program path (e.g. WO-5746032, WO-5727642, WO-5728047, WO-5744365, WO-5765532, etc.) report a quantity of one in the tracking data, but ex ante gross savings reflect a quantity two. The evaluation team used a quantity of one for these verified savings to match the provided values from the tracking data.

**Recommendation 7.** Ensure quantities provided in tracking data are accurate and reflect what is used to calculate ex ante totals.

**Finding 8.** Two instances of Programmable Thermostat – Boiler (WO-5777704 and WO-5777705) report higher per unit savings values than what is provided in the MMDB.

**Recommendation 8.** Ensure ex ante savings inputs match values provided in the MMDB: Gas\_Heating\_Consumption = 1977 and Heating\_Reduction = 6.2%. Provide any actual or custom values in the tracking data.

**Finding 9.** Two instances of Air Sealing with Attic Insulation (WO-5263034 and WO-5776542) report lower per unit savings values than what is provided in the MMDB. The evaluation team could not find a singular cause for this discrepancy.

**Recommendation 9.** Ensure ex ante savings inputs match values provided in the MMDB: CFM50\_existing = 1, CFM50\_new = 0, N\_Heat = 21.1, HDD = 5,113, ƞHeat = 72%, ADJ = 72%. Provide any actual or custom values in the tracking data.

**Finding 10.** Two-hundred and twelve (212) instances of Attic Insulation (e.g. WO-4813517, WO-4407900, WO-5262468, etc.) and six instances of Wall Insulation (WO-4391305, WO-4369837, WO-4455923, WO-4337467, WO-4678254, WO-4353806) yielded verified savings values that differed from ex ante savings. Guidehouse used actual R values provided in the tracking data to calculate verified savings. The evaluation team could not find a singular cause for this discrepancy.

**Recommendation 10.** Ensure ex ante savings inputs match values provided in the TRM and MMDB: Framing\_Factor\_Wall = 25%, Framing\_Factor\_Attic = 7%, HDD = 5,113, ƞHeat = 72%, ADJ\_Wall = 60%, ADJ\_Attic = 72%. Provide any actual or custom values in the tracking data. Ensure reported R values are accurate.

**Finding 11.** Nine instances of Duct Insulation (e.g. WO-5355401, WO-5336741, WO-5773196, etc.) yielded verified savings values that differed from ex ante savings. Guidehouse used actual R values provided in the tracking data to calculate verified savings. The evaluation team could not find a singular cause for this discrepancy.

**Recommendation 11.** Ensure ex ante savings inputs match values provided in the TRM and MMDB: Framing\_Factor\_Wall = 25%, Framing\_Factor\_Attic = 7%, HDD = 5,113, ƞHeat = 72%, ADJ\_Wall = 60%, ADJ\_Attic = 72%. Provide any actual or custom values in the tracking data. Ensure reported R values are accurate.

**Finding 12.** Guidehouse could not reconcile the ex ante savings for the three Foundation Insulation measures. The evaluation team used the R\_existing and R\_new values from the tracking data to reference the savings ranges from the MMDB “Basement Insulation – New” tab.

**Recommendation 12.** Ensure ex ante savings inputs match values provided in the MMDB. Provide H\_basement\_wall\_AG, H\_basement\_wall\_total, L\_basement\_wall\_total, R\_old\_AG, R\_added, R\_old\_BG in tracking data to replicate exact savings rather than the MMDB ranges.

##### Impact Analysis Methodology

Guidehouse verified unit savings by using the impact algorithms in IL-TRM v11.0.[[1]](#footnote-2) and reviewed the ex ante savings calculation approach from the MMDB file.[[2]](#footnote-3) In most cases, the TRM algorithms were correctly applied in the MMDB, but where the evaluation found the need to make adjustments, those were done according to the TRM guidelines.

Guidehouse calculated the verified net energy savings by multiplying the verified gross savings estimates by the NTG ratio. In 2023, 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). Economically-disadvantaged areas (DAC) were identified by 2022 census track and evaluation used NTG of 1.0 for DAC projects, based on Illinois Policy Manual 3.0.[[3]](#footnote-4)

##### Program Specific Inputs for the Illinois TRC

Table C‑1 and Table C‑2 show the Total Resource Cost (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 Table C‑1 and Table C‑2 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: 2023 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 Thermostat - Base Manual (Condo) | Each | 56 | 11.0 | 3,865 | 3,731 | 3,405 |
| Advanced Thermostat - Base Manual (Single Family) | Each | 79 | 11.0 | 8,508 | 8,098 | 7,483 |
| Advanced Thermostat - Base Programmable (Condo) | Each | 68 | 11.0 | 3,293 | 3,154 | 2,899 |
| Advanced Thermostat - Base Programmable (Single Family) | Each | 96 | 11.0 | 7,350 | 6,850 | 6,272 |
| Gas High Efficiency Boiler - HW | MBH | 3,570 | 25.0 | 4,805 | 5,396 | 4,308 |
| Gas High Efficiency Boiler - Steam | MBH | 587 | 25.0 | 82 | 108 | 96 |
| Gas High Efficiency Boiler - Two-in-One | Each | 40 | 21.5 | 12,736 | 11,627 | 9,284 |
| Gas High Efficiency Furnace | Each | 671 | 20.0 | 155,063 | 143,907 | 114,688 |
| Indirect Water Heater | Each | 4 | 13.0 | 261 | 261 | 193 |
| Programmable Thermostat - Boiler | Each | 7 | 16.0 | 710 | 706 | 647 |
| Programmable Thermostat - Furnace | Each | 19 | 16.0 | 1,184 | 1,184 | 1,079 |
| Tankless Water Heater | Each | 66 | 13.0 | 4,781 | 4,781 | 3,821 |
| Weatherization | Air Sealing | CFM | 9,197 | 20.0 | 802 | 802 | 644 |
| Air Sealing with Attic Insulation | CFM | 158,287 | 20.0 | 9,942 | 9,942 | 9,047 |
| Ceiling/Attic Insulation | Sq. Ft. | 146,159 | 20.0 | 14,778 | 18,537 | 17,025 |
| Duct Insulation and Sealing | CFM | 1,341 | 20.0 | 1,789 | 1,752 | 1,525 |
| Foundation Wall Insulation | Sq. Ft. | 170 | 20.0 | 15 | 124 | 114 |
| Wall Insulation | Sq. Ft. | 4,831 | 20.0 | 369 | 341 | 319 |
| ComEd Marketplace | Advanced Thermostat - Base Manual (Condo) | Each | 797 | 11.0 | 53,107 | 53,105 | 49,441 |
| Advanced Thermostat - Base Manual (Single Family) | Each | 1,777 | 11.0 | 182,162 | 182,160 | 170,925 |
| Advanced Thermostat - Base Programmable (Condo) | Each | 793 | 11.0 | 36,778 | 36,780 | 33,997 |
| Advanced Thermostat - Base Programmable (Single Family) | Each | 1,940 | 11.0 | 138,430 | 138,429 | 129,338 |
| Advanced Thermostat - Base Unknown (Single Family) | Each | 148 | 11.0 | 12,642 | 12,643 | 11,960 |
| Advanced Thermostat - Base Unknown (Condo) | Each | 61 | 11.0 | 3,387 | 3,387 | 3,209 |
| **Total or Weighted Average** | |  | **19.9** | | **656,839** | **647,806** | **581,719** |

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

Table B‑2. 2023 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 Thermostat - Base Manual (Condo) | Each | 6 | 11.0 | 400 | 400 | 366 |
| Advanced Thermostat - Base Manual (Single Family) | Each | 62 | 11.0 | 6,766 | 6,356 | 5,730 |
| Advanced Thermostat - Base Programmable (Condo) | Each | 5 | 11.0 | 232 | 232 | 209 |
| Advanced Thermostat - Base Programmable (Single Family) | Each | 116 | 11.0 | 8,919 | 8,277 | 7,471 |
| Gas High Efficiency Boiler - HW | MBH | 1,602 | 25.0 | 2,198 | 2,421 | 1,792 |
| Gas High Efficiency Boiler - Two-in-One | MBH | 4 | 21.5 | 1,446 | 1,163 | 860 |
| Gas High Efficiency Furnace | Each | 681 | 20.0 | 156,350 | 146,480 | 109,734 |
| Indirect Water Heater | Each | 2 | 13.0 | 130 | 130 | 96 |
| Programmable Thermostat - Furnace | Each | 11 | 16.0 | 685 | 685 | 611 |
| Tankless Water Heater | Each | 25 | 13.0 | 1,811 | 1,811 | 1,340 |
| Weatherization | Air Sealing | CFM | 13,730 | 20.0 | 1,198 | 1,198 | 922 |
| Air Sealing with Attic Insulation | CFM | 75,903 | 20.0 | 4,856 | 4,767 | 4,195 |
| Ceiling/Attic Insulation | Sq. Ft. | 105,763 | 20.0 | 9,896 | 12,340 | 10,983 |
| Duct Insulation and Sealing | CFM | 3,828 | 20.0 | 4,790 | 4,680 | 4,071 |
| Foundation Wall Insulation | Sq. Ft. | 60 | 20.0 | 5 | 14 | 12 |
| Wall Insulation | Sq. Ft. | 600 | 20.0 | 12 | 31 | 27 |
| ComEd Marketplace | Advanced Thermostat - Base Manual (Condo) | Each | 49 | 11.0 | 3,265 | 3,265 | 2,958 |
| Advanced Thermostat - Base Manual (Single Family) | Each | 432 | 11.0 | 44,285 | 44,284 | 40,430 |
| Advanced Thermostat - Base Programmable (Condo) | Each | 49 | 11.0 | 2,273 | 2,273 | 2,050 |
| Advanced Thermostat - Base Programmable (Single Family) | Each | 621 | 11.0 | 44,312 | 44,311 | 40,258 |
| Advanced Thermostat - Base Unknown (Single Family) | Each | 40 | 11.0 | 3,417 | 3,417 | 3,169 |
| Advanced Thermostat - Base Unknown (Condo) | Each | 4 | 11.0 | 222 | 222 | 200 |
| **Total or Weighted Average** | |  | **20.0** | | **297,467** | **288,758** | **237,487** |

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

1. Illinois Statewide Technical Reference Manual (IL-TRM) version 11.0 from <http://www.ilsag.info/technical-reference-manual.html> [↑](#footnote-ref-2)
2. Franklin Energy Master Measure Database, Excel file 2023 MMDB - Res and MF, provided February 08, 2023. [↑](#footnote-ref-3)
3. https://www.ilsag.info/wp-content/uploads/IL\_EE\_Policy\_Manual\_Version\_3.0\_Final\_11-3-2023.pdf [↑](#footnote-ref-4)