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| Home Energy Savings Program Impact Evaluation Report  Energy Efficiency Plan: Program Year 2023  (1/1/2023-12/31/2023) | | | | | | | |
| Prepared for:  Nicor Gas Company  DRAFT  March 28, 2024 | | | | | | | |
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# Introduction

This report presents the impact evaluation results of the Nicor Gas 2023 Home Energy Savings (HES) program and a summary of the energy impacts for the total program, as well as relevant measure and program structure details. The appendices present the impact analysis methodology and Illinois total resource cost (TRC) inputs. Program year 2023 covers January 1, 2023, through December 31, 2023.

# Program Description

The HES program includes an assessment and direct install (DI) component jointly implemented by Nicor Gas and ComEd and a rebate component for air sealing, insulation, and duct sealing work completed by approved contractors. This report focuses on natural gas savings achieved by Nicor Gas program participants. Savings from electricity measures are included in a separate evaluation report delivered to ComEd.

The HES program provides a free home energy assessment (HEA) performed by an energy advisor. The energy advisor collects information about the home’s energy use by examining the heating system (e.g., furnace or boiler), cooling system (air conditioner), water heater, and attic (if accessible). The energy advisor provides a customized report with recommendations identifying additional ways the customer can save energy and money. As part of the energy assessment and when appropriate, the energy advisor installs DI measures. The DI measures include showerheads, faucet aerators for bathrooms and kitchen, hot water pipe insulation, and a programmable or advanced thermostat. A Virtual Home Assessment (VHA) option was added in 2020 to adapt to COVID-19 restrictions. Similar to VHA, a Self-Assessment Program (SAP) option was added in PY2023.

In addition to the free HEA and free DI measures, the HES program offers rebates for prescriptive building shell air sealing and insulation (ASI) measures for eligible homes, installed by an approved contractor, including air sealing, attic insulation, duct sealing, basement sidewall insulation, and wall insulation. Air sealing includes sealing gaps and cracks in a wall where air can enter or exit. The contractor performs a blower door test to measure the air leakage in the home. To receive the instant discount for attic insulation, a participant must have air sealing and attic insulation installed at the same time.

Starting in 2022 and continuing in 2023, the HES program included a Smart Thermostat Initiative path, through which Nicor Gas offered Nest-E thermostats to program participants to upgrade their existing thermostats.

The program had 6,269 participants in 2023 and completed 6,485 projects as shown in Table 1-1.

Table 1‑1. 2023 HES Program Volumetric Findings Detail

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Participation | DI | ASI | SAP | STI | VHA | Total |
| Participants \* | 3,073 | 1,768 | 257 | 1,136 | 116 | **6,269** |
| Installed Projects † | 3,080 | 1,785 | 257 | 1,140 | 223 | **6,485** |

\* Participants are defined as the number of distinct building premise IDs with realized gas savings. Some participants may have both DI and ASI, SAP, STI, or VHA measures.

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

Source: Nicor 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 HES Program Installed Measure Quantities

| Program Path | Measure | Quantity  Unit | Installed Quantity |
| --- | --- | --- | --- |
| Direct Install | Advanced Thermostat (DI) - Blended | Each | 21 |
| Advanced Thermostat (DI) - Manual | Each | 361 |
| Advanced Thermostat (DI) - Programmable | Each | 4 |
| Air Filter Replacement | Each | 39 |
| Air Sealing - Door Sweep | Projects | 61 |
| Bathroom Aerator SF (DI) | Each | 1,536 |
| Boiler Pipe Insulation | Linear Feet | 346 |
| DHW Pipe Insulation | Linear Feet | 3,342 |
| Handheld Showerhead (DI) SF | Each | 689 |
| Kitchen Aerator SF (DI) | Each | 431 |
| Programmable Thermostat (DI) | Each | 184 |
| Shower Flow Reducer | Each | 24 |
| Showerhead (DI) SF | Each | 911 |
| Thermostat Education (DI) | Each | 111 |
| Prescriptive | Air Sealing | Projects | 1204 |
| Air Sealing Without Attic Insulation | Projects | 478 |
| Attic Insulation | Square Feet | 1,509,165 |
| Basement/Sidewall Insulation | Square Feet | 26,874 |
| Duct Sealing | Projects | 439 |
| Wall Insulation SF | Square Feet | 45,847 |
| SAP | Advanced Thermostat (DI) - Blended | Each | 38 |
| Air Sealing - Door Sweep | Projects | 349 |
| Bathroom Aerator SF (DI) | Each | 382 |
| Boiler Pipe Insulation | Linear Feet | 165 |
| DHW Pipe Insulation | Linear Feet | 372 |
| Handheld Showerhead (DI) SF | Each | 150 |
| Kitchen Aerator SF (DI) | Each | 133 |
| Programmable Thermostat (DI) | Each | 34 |
| Showerhead (DI) SF | Each | 104 |
| Smart Thermostat Initiative | Advanced Thermostat (DI) - Blended | Each | 7 |
| Advanced Thermostat (DI) - Manual | Each | 882 |
| Advanced Thermostat (DI) - Programmable | Each | 281 |
| Virtual Home Assessment | Advanced Thermostat (DI) - Manual | Each | 6 |
| Air Filter Replacement | Each | 2 |
| Air Sealing - Door Sweep | Projects | 16 |
| Bathroom Aerator SF (DI) | Each | 154 |
| Boiler Pipe Insulation | Linear Feet | 240 |
| DHW Pipe Insulation | Linear Feet | 420 |
| Handheld Showerhead (DI) SF | Each | 94 |
| Kitchen Aerator SF (DI) | Each | 25 |
| Shower Flow Reducer | Each | 7 |
| Showerhead (DI) SF | | 16 |

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

# Program Savings Detail

Table 3‑1 summarizes the energy savings the HES Program achieved by path in 2023.

Table 3‑1. 2023 HES Program Annual Energy Savings Summary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Program Category | Program Path | Ex Ante Gross Savings (Therms) | Verified Gross RR\* | Verified Gross Savings (Therms) | NTG† | NPSO‡ | Verified Net Savings (Therms) |
| **Disadvantaged Communities** |  |  |  |  |  |  |  |
|  | Direct Install | 18,285 | 98% | 17,884 | 1.00 | N/A | 18,056 |
|  | Prescriptive | 43,401 | 100% | 43,401 | 1.00 | N/A | 43,401 |
|  | Self-Assessment Program | 2,062 | 100% | 2,062 | 1.00 | N/A | 2,092 |
|  | Smart Thermostat Initiative | 74,482 | 100% | 74,482 | 1.00 | N/A | 74,482 |
|  | Virtual Home Assessment | 417 | 100% | 417 | 1.00 | N/A | 424 |
| ***DAC Subtotal*** |  | ***138,647*** | ***100%*** | ***138,247*** | ***1.00*** |  | ***138,455*** |
| **Non-Disadvantaged Communities** |  |  |  |  |  |  |  |
|  | Direct Install | 55,533 | 99% | 54,720 | Varies | 1.048 | 52,515 |
|  | Prescriptive | 367,318 | 100% | 367,466 | Varies | 1.048 | 343,125 |
|  | Self-Assessment Program | 7,348 | 100% | 7,348 | Varies | 1.048 | 7,138 |
|  | Smart Thermostat Initiative | 35,786 | 100% | 35,786 | Varies | 1.048 | 33,753 |
|  | Virtual Home Assessment | 1,827 | 100% | 1,827 | Varies | 1.048 | 1,899 |
| ***Non-DAC Subtotal*** |  | ***467,812*** | ***100%*** | ***467,146*** |  |  | ***438,430*** |
| **Total or Weighted Average** | | **606,460** | **100%** | **605,393** |  |  | **576,885** |

\* 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 zip codes used a NTG of 1.0

‡ The market rate net savings were multiplied by a residential non-participant spillover (NPSO) factor of 1.048.

Source: Guidehouse evaluation team analysis.

# Program Savings by Measure

The program includes 41 measures as shown in the Table 4-1. The Advanced Thermostats and Attic Insulation contributed the most savings.

Table 4‑1. 2023 HES Program Annual Energy Savings by Measure

| Program Category | Program Path | Savings Category | Ex Ante Gross Savings (Therms) | Verified Gross RR\* | Verified Gross Savings (Therms) | NTG† | NPSO | Verified Net Savings (Therms) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Disadvantaged Communities | Direct Install | Advanced Thermostat (DI) - Manual | 8,826 | 99% | 8,727 | 1.00 | N/A | 8,727 |
| Air Filter Replacement | 30 | 100% | 30 | 1.00 | N/A | 30 |
| Air Sealing - Door Sweep | 87 | 100% | 87 | 1.00 | N/A | 87 |
| Bathroom Aerator SF (DI) | 271 | 100% | 271 | 1.07 | N/A | 290 |
| Boiler Pipe Insulation | 25 | 100% | 25 | 1.00 | N/A | 25 |
| DHW Pipe Insulation | 1,689 | 100% | 1,689 | 1.00 | N/A | 1,689 |
| Handheld Showerhead (DI) SF | 423 | 100% | 423 | 1.07 | N/A | 452 |
| Kitchen Aerator SF (DI) | 1,258 | 100% | 1,258 | 1.07 | N/A | 1,346 |
| Programmable Thermostat (DI) | 3,552 | 95% | 3,371 | 1.00 | N/A | 3,371 |
| Shower Flow Reducer | 15 | 100% | 15 | 1.07 | N/A | 16 |
| Showerhead (DI) SF | 493 | 100% | 493 | 1.07 | N/A | 527 |
| Thermostat Education (DI) | 1,616 | 93% | 1,495 | 1.00 | N/A | 1,495 |
| Prescriptive | Air Sealing | 5,421 | 100% | 5,421 | 1.00 | N/A | 5,421 |
| Air Sealing Without Attic Insulation | 8,076 | 100% | 8,076 | 1.00 | N/A | 8,076 |
| Attic Insulation | 10,092 | 100% | 10,092 | 1.00 | N/A | 10,092 |
| Basement/Sidewall Insulation | 830 | 100% | 830 | 1.00 | N/A | 830 |
| Duct Sealing | 18,594 | 100% | 18,594 | 1.00 | N/A | 18,594 |
| Wall Insulation SF | 389 | 100% | 389 | 1.00 | N/A | 389 |
| Self-Assessment Program | Advanced Thermostat (DI) - Blended | 839 | 100% | 839 | 1.00 | N/A | 839 |
| Air Sealing - Door Sweep | 265 | 100% | 265 | 1.00 | N/A | 265 |
| Bathroom Aerator SF (DI) | 49 | 100% | 49 | 1.07 | N/A | 53 |
| Boiler Pipe Insulation | 28 | 100% | 28 | 1.00 | N/A | 28 |
| DHW Pipe Insulation | 97 | 100% | 97 | 1.00 | N/A | 97 |
| Handheld Showerhead (DI) SF | 108 | 100% | 108 | 1.07 | N/A | 115 |
| Kitchen Aerator SF (DI) | 189 | 100% | 189 | 1.07 | N/A | 202 |
| Programmable Thermostat (DI) | 418 | 100% | 418 | 1.00 | N/A | 418 |
| Showerhead (DI) SF | 70 | 100% | 70 | 1.07 | N/A | 75 |
| Smart Thermostat Initiative | Advanced Thermostat (DI) - Blended | 85 | 100% | 85 | 1.00 | N/A | 85 |
| Advanced Thermostat (DI) - Manual | 63,246 | 100% | 63,246 | 1.00 | N/A | 63,246 |
| Advanced Thermostat (DI) - Programmable | 11,150 | 100% | 11,150 | 1.00 | N/A | 11,150 |
| Virtual Home Assessment | Advanced Thermostat (DI) - Manual | 210 | 100% | 210 | 1.00 | N/A | 210 |
| Air Filter Replacement | 8 | 100% | 8 | 1.00 | N/A | 8 |
| Air Sealing - Door Sweep | 8 | 100% | 8 | 1.00 | N/A | 8 |
| Bathroom Aerator SF (DI) | 17 | 100% | 17 | 1.07 | N/A | 18 |
| Boiler Pipe Insulation | 3 | 100% | 3 | 1.00 | N/A | 3 |
| DHW Pipe Insulation | 85 | 100% | 85 | 1.00 | N/A | 85 |
| Handheld Showerhead (DI) SF | 45 | 100% | 45 | 1.07 | N/A | 48 |
| Kitchen Aerator SF (DI) | 23 | 100% | 23 | 1.07 | N/A | 24 |
| Showerhead (DI) SF | 19 | 100% | 19 | 1.07 | N/A | 20 |
| ***Disadvantaged Communities Subtotal*** | |  | ***138,647*** | ***100%*** | ***138,247*** |  |  | ***138,455*** |
| Non-Disadvantaged Communities | Direct Install | Advanced Thermostat (DI) - Manual | 28,444 | 100% | 28,345 | 0.90 | 1.048 | 26,735 |
| Advanced Thermostat (DI) - Programmable | 285 | 100% | 285 | 0.90 | 1.048 | 269 |
| Air Filter Replacement | 274 | 100% | 274 | 0.81 | 1.048 | 232 |
| Air Sealing - Door Sweep | 356 | 100% | 356 | 0.81 | 1.048 | 302 |
| Bathroom Aerator SF (DI) | 1,250 | 100% | 1,250 | 1.07 | 1.048 | 1,402 |
| Boiler Pipe Insulation | 221 | 100% | 221 | 0.99 | 1.048 | 230 |
| DHW Pipe Insulation | 5,046 | 100% | 5,046 | 0.99 | 1.048 | 5,235 |
| Handheld Showerhead (DI) SF | 1,667 | 100% | 1,667 | 1.07 | 1.048 | 1,869 |
| Kitchen Aerator SF (DI) | 2,670 | 100% | 2,670 | 1.07 | 1.048 | 2,994 |
| Programmable Thermostat (DI) | 7,702 | 93% | 7,168 | 0.81 | 1.048 | 6,085 |
| Shower Flow Reducer | 56 | 100% | 56 | 1.07 | 1.048 | 63 |
| Showerhead (DI) SF | 2,270 | 100% | 2,270 | 1.07 | 1.048 | 2,545 |
| Thermostat Education (DI) | 5,291 | 97% | 5,110 | 0.85 | 1.048 | 4,552 |
| Prescriptive | Air Sealing | 71,822 | 100% | 71,822 | 0.88 | 1.048 | 66,237 |
| Air Sealing Without Attic Insulation | 36,409 | 100% | 36,509 | 0.83 | 1.048 | 31,757 |
| Attic Insulation | 133,871 | 100% | 133,871 | 0.89 | 1.048 | 124,864 |
| Basement/Sidewall Insulation | 17,102 | 100% | 17,102 | 0.85 | 1.048 | 15,234 |
| Duct Sealing | 103,503 | 100% | 103,553 | 0.93 | 1.048 | 100,927 |
| Wall Insulation SF | 4,612 | 100% | 4,609 | 0.85 | 1.048 | 4,105 |
| Self-Assessment Program | Advanced Thermostat (DI) - Blended | 2,729 | 100% | 2,729 | 0.90 | 1.048 | 2,574 |
| Air Sealing - Door Sweep | 1,163 | 100% | 1,162 | 0.81 | 1.048 | 987 |
| Bathroom Aerator SF (DI) | 264 | 100% | 264 | 1.07 | 1.048 | 297 |
| Boiler Pipe Insulation | 90 | 100% | 90 | 0.99 | 1.048 | 93 |
| DHW Pipe Insulation | 653 | 100% | 653 | 0.99 | 1.048 | 678 |
| Handheld Showerhead (DI) SF | 449 | 100% | 449 | 1.07 | 1.048 | 503 |
| Kitchen Aerator SF (DI) | 815 | 100% | 815 | 1.07 | 1.048 | 914 |
| Programmable Thermostat (DI) | 870 | 100% | 870 | 0.81 | 1.048 | 739 |
| Showerhead (DI) SF | 315 | 100% | 315 | 1.07 | 1.048 | 354 |
| Smart Thermostat Initiative | Advanced Thermostat (DI) - Blended | 256 | 100% | 256 | 0.90 | 1.048 | 242 |
| Advanced Thermostat (DI) - Manual | 27,053 | 100% | 27,053 | 0.90 | 1.048 | 25,516 |
| Advanced Thermostat (DI) - Programmable | 8,477 | 100% | 8,477 | 0.90 | 1.048 | 7,995 |
| Virtual Home Assessment | Advanced Thermostat (DI) - Manual | 410 | 100% | 410 | 0.90 | 1.048 | 387 |
| Air Filter Replacement | 8 | 100% | 8 | 0.81 | 1.048 | 7 |
| Air Sealing - Door Sweep | 57 | 100% | 57 | 0.81 | 1.048 | 49 |
| Bathroom Aerator SF (DI) | 109 | 100% | 109 | 1.07 | 1.048 | 122 |
| Boiler Pipe Insulation | 130 | 100% | 130 | 0.99 | 1.048 | 135 |
| DHW Pipe Insulation | 576 | 100% | 576 | 0.99 | 1.048 | 597 |
| Handheld Showerhead (DI) SF | 304 | 100% | 304 | 1.07 | 1.048 | 341 |
| Kitchen Aerator SF (DI) | 166 | 100% | 166 | 1.07 | 1.048 | 186 |
| Shower Flow Reducer | 26 | 100% | 26 | 1.07 | 1.048 | 29 |
| Showerhead (DI) SF | 41 | 100% | 41 | 1.07 | 1.048 | 46 |
| ***Non-Disadvantaged Communities Subtotal*** | |  | ***467,812*** | ***100%*** | ***467,146*** |  |  | ***438,430*** |
| **Total or Weighted Average** | |  | **606,460** | **100%** | **605,393** |  |  | **576,885** |

\* 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 zip codes used a NTG of 1.0

‡ The market rate net savings were multiplied by a residential non-participant spillover (NPSO) factor of 1.048

Source: Nicor Gas tracking data and Guidehouse evaluation 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 Guidehouse’s review. The realization rate 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 realization rates above or below 100%. Appendix Appendix A provides a description of the impact analysis methodology.

Table 5‑1. 2023 HES Program Verified Gross Savings Parameters

| Measure | Unit Basis | Ex Ante Gross (therms/unit) | Verified Gross (therms/unit) | Realization Rate | Data Source(s) |
| --- | --- | --- | --- | --- | --- |
| Advanced Thermostat (DI) – Blended, Manual or Programmable Baseline | Each | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.3. Illinois TRM, v11.0†, Section 5.3.16 and PTD\* and PTD\* |
| Air Filter Replacement | Each | 6.71 7.84 8.21 | 6.71 7.84 8.22 | 100% | Illinois TRM, v11.0†, Section 5.3.21 and PTD\* |
| Air Sealing | Projects | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.6.1 and PTD\* |
| Air Sealing - Door Sweep (DI) | Projects | 6.33 7.30 | 6.33 7.31 | 100% | Illinois TRM, v11.0†, Section 5.6.1 and PTD\* |
| Air Sealing - Door Sweep (VA) | Projects | 3.55 4.09 4.24 | 3.55 4.09 4.25 | 100% | Illinois TRM, v11.0†, Section 5.6.1 and PTD\* |
| Air Sealing Without Attic Insulation | Projects | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.6.1 and PTD\* |
| Attic Insulation | Square Feet | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.6.5 and PTD\* |
| Basement/Sidewall Insulation | Square Feet | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.6.2 and PTD\* |
| Bathroom Aerator SF (DI) | Each | 0.39 0.78 0.99 | 0.39 0.78 0.99 | 100% | Illinois TRM, v11.0†, Section 5.4.4 and PTD\* |
| Bathroom Aerator SF (VA) | Each | 0.82 | 0.82 | 100% | Illinois TRM, v11.0†, Section 5.4.4 and PTD\* |
| Boiler Pipe Insulation (DI) | Linear Feet | 0.65 0.71 0.77 | 0.65 0.71 0.77 | 100% | Illinois TRM, v11.0†, Section 5.3.2 and PTD\* |
| Boiler Pipe Insulation (VA) | Linear Feet | 0.56 | 0.56 | 100% | Illinois TRM, v11.0†, Section 5.3.2 and PTD\* |
| DHW Pipe Insulation (DI) | Linear Feet | 1.90 2.02 | 1.90 2.02 | 100% | Illinois TRM, v11.0†, Section 5.4.1 and PTD\* |
| DHW Pipe Insulation (VA) | Linear Feet | 1.57 | 1.57 | 100% | Illinois TRM, v11.0†, Section 5.4.1 and PTD\* |
| Duct Sealing | Projects | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.3.4 and PTD\* |
| Handheld Showerhead (DI) SF | Each | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.4.5 and PTD\* |
| Handheld Showerhead (VA) SF | Each | 3.71 | 3.71 | 100% | Illinois TRM, v11.0†, Section 5.4.5 and PTD\* |
| Kitchen Aerator SF (DI) | Each | 9.11 | 9.11 | 100% | Illinois TRM, v11.0†, Section 5.4.4 and PTD\* |
| Kitchen Aerator SF (VA) | Each | 7.54 | 7.54 | 100% | Illinois TRM, v11.0†, Section 5.4.4 and PTD\* |
| Programmable Thermostat (DI) | Each | Varies | Varies | 94% | Illinois TRM, v11.0†, Section 5.3.11 and PTD\* |
| Shower Flow Reducer (DI) | Each | 2.38 3.04 | 2.38 3.04 | 100% | Illinois TRM, v11.0†, Section 5.4.5 and PTD\* |
| Shower Flow Reducer (VA) | Each | 3.71 | 3.71 | 100% | Illinois TRM, v11.0†, Section 5.4.5 and PTD\* |
| Showerhead (DI) SF | Each | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.4.5 and PTD\* |
| Showerhead (VA) SF | Each | 3.71 | 3.71 | 100% | Illinois TRM, v11.0†, Section 5.4.5 and PTD\* |
| Thermostat Education (DI) | Each | Varies | Varies | 96% | Illinois TRM, v11.0†, Section 5.3.11 and PTD\* |
| Wall Insulation SF | Square Feet | Varies | Varies | 100% | Illinois TRM, v11.0†, Section 5.6.4 and PTD\* |

\* Program Tracking Data (PTD) provided by Nicor Gas, extract dated January 30, 2024.

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

## Findings and Recommendations

Discrepancies found by the evaluation team were relatively minor. Program-level Realization Rate remained at 100%.

**Finding 1.** Four instances of Air Sealing Without Attic Insulation used 72% for the adjustment factor for fossil heating in the ex ante calculation: MEA-2023.06.22-551429, MEA-2023.09.06-576923, MEA-2023.09.06-576935, and MEA-2023.12.05-617380. However, the TRM specifies 100% for ADJAirSealingFossilHeat for all instances of Air Sealing installed without Attic Insulation. (Guidehouse confirmed these measure IDs were installed without attic insulation.)

**Recommendation 1.** Update ADJAirSealingFossilHeat to be 100% for all instances of Air Sealing installed without Attic Insulation.

**Finding 2.** Two instances of Advanced Thermostats (Manual) used Boiler values (1,977.3 therms) for the Gas\_Heating\_Consumption (labeled FurnaceHeatingLoad in tracking data) to calculate ex ante savings. However, the TRM specifies Furnace based Advanced Thermostats in climate zone 2 should use a Gas\_Heating\_Consumption of 1,005 therms. Guidehouse confirmed that both measures (MEA-2023.03.24-499278 and MEA-2023.04.13-513001) had a Furnace heating type in the tracking data “System” tab.

**Recommendation 2.** Update the Gas\_Heating\_Consumption to 1,005 therms for furnace heating type ex ante savings calculation.

Finding 3. One instance of Advanced Thermostat (Manual), MEA-2023.02.24-485948, and one instance of Thermostat Education, MEA-2023.04.07-507214, had Boiler heating system types, but the tracking data showed a Furnace Gas\_Heating\_Consumption input. Ex ante savings reflected the correct Gas\_Heating\_Consumption for Boilers (1,977.3 therms). Guidehouse confirmed that both measures had a Boiler heating type in the tracking data “System” tab.

**Recommendation 3.** Update tracking data to accurately reflect Gas\_Heating\_Consumption values based on heating system type. No changes required to ex ante savings algorithm.

**Finding 4.** MEA-2023.03.09-492011, an Advanced Thermostat (Manual) was located in HDD zone 1, but the tracking data showed a Gas\_Heating\_Consumption input of 1,005 therms. Ex ante savings reflected the correct Gas\_Heating\_Consumption (1,052 therms). Guidehouse confirmed this measure was in climate zone 1 based on project zip code and county.

**Recommendation 4.** Update tracking data to accurately reflect Gas\_Heating\_Consumption values based on the climate zone. No changes are required to the ex ante savings algorithm.

**Finding 5.** Twelve Programmable Thermostats (i.e., MEA-2023.02.22-484002, MEA-2023.02.22-484010, MEA-2023.02.22-483958, etc.) and five Thermostat Education (MEA-2023.02.22-479676, MEA-2023.02.22-479688, MEA-2023.03.09-491524, MEA-2023.03.24-500432, and MEA-2023.04.07-509396) measures used Boiler values for Gas\_Heating\_Consumption (1,977.3 therms) in the ex ante savings where the tracking data defined the heating system type as a Furnace. Guidehouse confirmed these measures had a Furnace heating type in the tracking data “System” tab.

**Recommendation 5.** Update Gas\_Heating\_Consumption in the ex ante savings calculation to 1,005 or 861 therms depending on the climate zone for Furnace heating types.

**Finding 6.** 212 instances of DHW Pipe Insulation did not provide R values in the tracking data (e.g. MEA-2024.01.04-634507, MEA-2024.01.04-634521, MEA-2024.01.04-634532, etc.). Guidehouse assumed R3 or R2 for these measures.

**Recommendation 6.** Include R values for each instance of DHW Pipe Insulation in the tracking data.

**Finding 7.** One Door Sweep measure (MEA-2023.12.14-624836) was located in climate zone 2, but ex ante savings reflected climate zone 1. Guidehouse confirmed this measure was located in climate zone 2 based on zip code and county from tracking data.

**Recommendation 7.** Update ex ante savings for the Door Sweep measure to always reflect the correct climate zone.

**Finding 8.** The ISR values for two VHA Bathroom Aerator measures (MEA-2023.03.24-498867 and MEA-2023.03.24-498895) are reported incorrectly in the tracking data. Ex ante savings reflect the correct value.

**Recommendation 8.** Update tracking data to accurately reflect ISR values. VHA Aerators should use an ISR of 0.77, DI should use an ISR of 0.93. No changes are required to the ex ante savings algorithm.

**Finding 9.** The ISR values for two DI Handheld Showerheads (MEA-2023.03.23-497782 and MEA-2023.04.07-505865), one DI Showerhead (MEA-2023.03.23-498115), and two VHA Handheld Showerheads (MEA-2023.03.24-499099 and MEA-2023.03.24-499121) are reported incorrectly in the tracking data. Ex ante savings reflect the correct value.

**Recommendation 9.** Update tracking data to accurately reflect ISR values. VHA Showerheads should use an ISR of 0.803, DI should use an ISR of 0.96. No changes are required to the ex ante savings algorithm.

**Finding 10.** The ISR values for two DI Kitchen Aerators (MEA-2023.04.07-506188 and MEA-2023.04.13-512321) and one VHA Kitchen Aerator (MEA-2023.03.24-499426) are reported incorrectly in the tracking data. Ex ante savings reflect the correct value.

**Recommendation 10.** Update tracking data to accurately reflect ISR values. VHA Aerators should use an ISR of 0.77, DI should use an ISR of 0.93. No changes are required to the ex ante savings algorithm.

**Finding 11.** The GPM values for 65 VHA Showerheads (e.g. MEA-2023.02.22-479548, MEA-2023.02.22-479541, MEA-2023.02.22-475069, etc.) and three DI Showerheads (MEA-2023.04.14-524161, MEA-2023.04.14-524162, and MEA-2023.04.14-524160) are reported incorrectly in the tracking data. Ex ante savings reflect the correct value.

**Recommendation 11.** Update the tracking data to accurately reflect the GPM values. VHA projects should have a GPM value of 2.35, DI should use a GPM of 2.24. No changes are required to the ex ante savings algorithm.

**Finding 12.** Two instances of Duct Sealing did not result in a 100% realization rate: MEA-2023.12.29-632088 and MEA-2023.11.29-612004. Guidehouse confirmed all inputs from the tracking data match the deemed values from the TRM v11.0, but could not determine a singular cause for the discrepancy between ex ante and verified savings.

**Recommendation 12.** Ensure the actual values (Duct Leakage Reduction in CFM25, Input Capacity Heat, Equipment Efficiency, and System Efficiency) reported in the tracking data accurately reflect what was used in the ex ante savings calculations.

##### Impact Analysis Methodology

The evaluation team verified unit savings for each program measure using the impact algorithm sources found in the Illinois Statewide Technical Reference Manual v11.0 (IL-TRM)[[1]](#footnote-2). The evaluation team:

* Validated the savings algorithms were applied correctly.
* Cross-checked per-unit savings values in the program tracking data with the IL-TRM v11.0.
* Multiplying the verified per-unit savings value by the quantity reported in the tracking data. The team calculated verified net savings by multiplying the verified gross savings estimates by a NTG ratio. In 2023, NTG estimates used to calculate the net verified savings were based on past evaluation research and defined by a consensus process through the Illinois SAG.
* For Disadvantaged Areas (DAC) postal codes, a NTG ratio of 1.0 is used for all Nicor Gas programs.

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

Table B‑1 shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing 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. Guidehouse will include annual and lifetime water savings and greenhouse gas reductions in the end of year summary report.

Table B‑1. 2023 HES Program Verified Cost Effectiveness Inputs

| **Program Path** | **Savings Category** | **Units** | **Quantity** | **Effective Useful Life** | **Ex Ante Gross Savings (Therms)** | **Verified Gross Savings (Therms)** | **Verified Net Savings (Therms)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Direct Install | Advanced Thermostat (DI) - Manual | Each | 361 | 11.0 | 37,271 | 37,072 | 35,462 |
| Advanced Thermostat (DI) - Programmable | Each | 4 | 11.0 | 285 | 285 | 269 |
| Air Filter Replacement | Each | 39 | 3.0 | 304 | 304 | 262 |
| Air Sealing - Door Sweep | Projects | 61 | 20.0 | 443 | 443 | 389 |
| Bathroom Aerator SF (DI) | Each | 1,536 | 10.0 | 1,521 | 1,521 | 1,692 |
| Boiler Pipe Insulation | Linear Feet | 346 | 15.0 | 246 | 246 | 255 |
| DHW Pipe Insulation | Linear Feet | 3,342 | 15.0 | 6,735 | 6,735 | 6,925 |
| Handheld Showerhead (DI) SF | Each | 689 | 10.0 | 2,090 | 2,090 | 2,322 |
| Kitchen Aerator SF (DI) | Each | 431 | 10.0 | 3,928 | 3,928 | 4,340 |
| Programmable Thermostat (DI) | Each | 184 | 8.0 | 11,254 | 10,540 | 9,456 |
| Shower Flow Reducer | Each | 24 | 3.0 | 72 | 72 | 80 |
| Showerhead (DI) SF | Each | 911 | 10.0 | 2,763 | 2,763 | 3,073 |
| Thermostat Education (DI) | Each | 111 | 2.0 | 6,907 | 6,606 | 6,048 |
| Prescriptive | Air Sealing | Projects | 1,204 | 20.0 | 77,243 | 77,243 | 71,658 |
| Air Sealing Without Attic Insulation | Projects | 478 | 20.0 | 44,485 | 44,585 | 39,833 |
| Attic Insulation | Square Feet | 1,509,165 | 20.0 | 143,962 | 143,963 | 134,956 |
| Basement/Sidewall Insulation | Square Feet | 26,874 | 20.0 | 17,931 | 17,931 | 16,064 |
| Duct Sealing | Projects | 439 | 18.5 | 122,097 | 122,147 | 119,521 |
| Wall Insulation SF | Square Feet | 45,847 | 20.0 | 5,001 | 4,998 | 4,494 |
| Self-Assessment Program | Advanced Thermostat (DI) - Blended | Each | 38 | 11.0 | 3,568 | 3,568 | 3,413 |
| Air Sealing - Door Sweep | Projects | 349 | 20.0 | 1,428 | 1,427 | 1,252 |
| Bathroom Aerator SF (DI) | Each | 382 | 10.0 | 314 | 314 | 349 |
| Boiler Pipe Insulation | Linear Feet | 165 | 15.0 | 117 | 117 | 121 |
| DHW Pipe Insulation | Linear Feet | 372 | 15.0 | 750 | 750 | 774 |
| Handheld Showerhead (DI) SF | Each | 150 | 10.0 | 557 | 557 | 619 |
| Kitchen Aerator SF (DI) | Each | 133 | 10.0 | 1,003 | 1,003 | 1,116 |
| Programmable Thermostat (DI) | Each | 34 | 8.0 | 1,288 | 1,288 | 1,156 |
| Showerhead (DI) SF | Each | 104 | 10.0 | 386 | 386 | 429 |
| Smart Thermostat Initiative | Advanced Thermostat (DI) - Blended | Each | 7 | 11.0 | 342 | 342 | 327 |
| Advanced Thermostat (DI) - Manual | Each | 882 | 11.0 | 90,299 | 90,299 | 88,762 |
| Advanced Thermostat (DI) - Programmable | Each | 281 | 11.0 | 19,627 | 19,627 | 19,145 |
| Virtual Home Assessment | Advanced Thermostat (DI) - Manual | Each | 6 | 11.0 | 620 | 620 | 597 |
| Air Filter Replacement | Each | 2 | 3.0 | 16 | 16 | 14 |
| Air Sealing - Door Sweep | Projects | 16 | 20.0 | 65 | 65 | 57 |
| Bathroom Aerator SF (DI) | Each | 154 | 10.0 | 126 | 126 | 141 |
| Boiler Pipe Insulation | Linear Feet | 240 | 15.0 | 133 | 133 | 138 |
| DHW Pipe Insulation | Linear Feet | 420 | 15.0 | 660 | 660 | 682 |
| Handheld Showerhead (DI) SF | Each | 94 | 10.0 | 349 | 349 | 389 |
| Kitchen Aerator SF (DI) | Each | 25 | 10.0 | 189 | 189 | 210 |
| Shower Flow Reducer | Each | 7 | 3.0 | 26 | 26 | 29 |
| Showerhead (DI) SF | Each | 16 | 10.0 | 59 | 59 | 66 |
| **Total** | | |  | **19.9** | **606,460** | **605,393** | **576,885** |

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

1. Illinois Statewide Technical Reference Manual version 11.0 from <http://www.ilsag.info/technical-reference-manual.html> [↑](#footnote-ref-2)