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| Residential New Construction Impact Evaluation ReportEnergy Efficiency Plan: Program Year 2024 (1/1/2024-12/31/2024) |
| Prepared for: Nicor Gas CompanyDRAFTMarch 17, 2025 |
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# Introduction

This report presents the results of the impact evaluation of the Nicor Gas 2024 Residential New Construction (RNC) program. A summary of the energy impacts for the total program and relevant measures and program structure details. The appendix presents the impact analysis methodology and Illinois total resource cost (TRC) inputs. Program year 2024 covers January 1, 2024, through December 31, 2024.

# Program Description

The RNC program's objective is to obtain energy savings by increasing the energy efficiency of new construction single-family detached homes and townhomes. The program provides participating new home builders a financial incentive to either a) exceed state and local building code requirements regarding duct and air sealing, along with the installation of specific high-efficiency equipment, or b) install prescriptive high-efficiency equipment only.

The RNC program had 1,609 participants with 5,971 measures in 2024, as shown in Table 1.

Table 1. 2024 Volumetric Findings Detail

|  |  |  |
| --- | --- | --- |
| Participation | Residential New Construction | Total |
| Participants \* | 1,609 | 1,609 |
| Installed Measures † | 5,971 | 5,971 |

\* Participants are defined as

† Installed Projects are defined as

Source: Nicor Gas tracking data and evaluation team analysis.

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

Table 2. 2024 Installed Measure Quantities

|  |  |  |  |
| --- | --- | --- | --- |
| Program Category | Measure | Quantity Unit | Installed Quantity |
| Residential New Construction | Advanced Thermostat  | Unit | 1,553 |
| Air Sealing | Project | 809 |
| Duct Insulation and Sealing | Project | 809 |
| Gas High Efficiency Furnace >92% AFUE\* | Unit | 117 |
| Gas High Efficiency Furnace >95% AFUE\* | Unit | 1,493 |
| On Demand Water Heater | Unit | 673 |
| Storage Water Heater | Unit | 518 |
| **Total** |   |   | **5,971** |

Source: Nicor Gas tracking data and evaluation team analysis.

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# Program Savings Detail

Table 3 3‑1 summarizes the energy savings the RNC Program achieved by path in 2024.

Table 3. 2024 Annual Energy Savings Summary

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Program Category | Program Path |  Ex Ante Gross Savings (Therms)  | Verified Gross RR\* |  Verified Gross Savings (Therms)  |  NTG†  |  NSPO‡  |  Verified Net Savings (Therms)  |
| Residential | Residential New Construction | 507,686 | 100% | 507,424 | 0.80/0.90‡ | 1.048 | 437,046 |
| **Total** | **507,686** | **100%** | **507,424** |  |  | **437,046** |

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

† NTG, Net to Gross is the deemed value available on the SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2024/>. Disadvantaged communities (DAC) designated sites based on census tract have an NTG of 1.00. *The program did not have DAC designated sites in 2024.*

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

Source: Evaluation team analysis.

# Program Savings by Measure

The program includes seven measures as shown in Table 4. The Advanced Thermostat and Gas High Efficiency Furnace measures contributed the most savings.

Table 4. 2024 Annual Energy Savings by Measure

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| End-Use | Savings Category |  Ex Ante Gross Savings (Therms)  | Verified Gross RR\* |  Verified Gross Savings (Therms)  |  NTG†  |  NSPO‡  |  Verified Net Savings (Therms)  |
| HVAC | Advanced Thermostat | 110,884 | 100% | 110,884 | 0.90 | 1.048 | 104,586 |
| Shell | Air Sealing | 62,401 | 100% | 62,401 | 0.80 | 1.048 | 52,317 |
| HVAC | Duct Insulation and Sealing | 50,215 | 100% | 50,215 | 0.80 | 1.048 | 42,101 |
| HVAC | Gas High Efficiency Furnace >92% AFUE | 10,747 | 100% | 10,747 | 0.80 | 1.048 | 9,010 |
| HVAC | Gas High Efficiency Furnace >95% AFUE | 207,785 | 100% | 207,668 | 0.80 | 1.048 | 174,109 |
| Hot Water | On Demand Water Heater | 49,991 | 100% | 49,992 | 0.80 | 1.048 | 41,913 |
| Hot Water | Storage Water Heater | 15,663 | 99% | 15,517 | 0.80 | 1.048 | 13,010 |
| **Total** | **507,686** | **100%** | **507,424** |  |  | **437,046** |

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

† NTG, Net to Gross is the deemed value available on the SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2024/>.

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

Source: Evaluation team analysis.

# Impact Analysis Findings and Recommendations

## Impact Parameter Estimates

Table 5 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 ex ante savings. Following the table, we provide findings and recommendations, including discussion of all measures with realization rates above or below 100%. Appendix A provides a description of the impact analysis methodology. Appendix B shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing this impact evaluation report.

Table 5. Verified Gross Savings Parameters

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Measure | Unit Basis |  Ex Ante Gross (therms/unit)  |  Verified Gross (therms/unit)  | Realization Rate | Data Source(s) |
| Advanced Thermostat  | Unit |  71.40  | 71.40 | 100% | Illinois TRM v12.0 (TRM)† – Section 5.3.16 |
| Air Sealing | Project |  77.13  | 77.13 | 100% | TRM v12.0 – Section 5.6.1; Illinois Energy Conservation Code‡ |
| Duct Insulation and Sealing | Project |  62.07  | 62.07 | 100% | TRM v12.0 – Section 5.3.4; Illinois Energy Conservation Code |
| Gas High Efficiency Furnace >92% AFUE | Unit |  91.85  | 91.85 | 100% | TRM v12.0 – Section 5.3.7 |
| Gas High Efficiency Furnace >95% AFUE | Unit |  139.17  | 139.09 | 100% | TRM v12.0 – Section 5.3.7 |
| On Demand Water Heater | Unit |  74.28  | 74.28 | 100% | TRM v12.0 – Sections 5.4.2 and 4.3.1 |
| Storage Water Heater | Unit |  30.24  | 29.96 | 99% | TRM v12.0 – Sections 5.4.2 and 4.3.1 |

\* Program Tracking Data (PTD) provided by Nicor Gas, extract dated January 30, 2025.

† State of Illinois Technical Reference Manual version 12.0 from <http://www.ilsag.info/technical-reference-manual.html>.

‡ Project files and monthly billing data provided by Nicor Gas. Where conducted, on-site or telephone interview data collected by Guidehouse.

## Findings and Recommendations

**5.2.1 Gas Storage Water Heaters**

**Finding 1a.** Three projects with the project IDs 242567, 242691, and 249370 have ex ante savings of zero in the participant report. The verified savings were set to zero with no savings realization rates.

**Finding 1b.** Two projects with the project IDs 235920 and 271179 have negative verified savings and evaluation set the verified savings to zero with no savings realization rates.

**Finding 1c.** Five projects with the project IDs 240534, 240538, 240749, 240767, and 241123 have a realization rate of 50.8%. Guidehouse could not duplicate the savings despite the baseline UEFs used in the ex ante savings and verified savings calculation being 0.5922. The verified savings calculations are based on the Illinois Statewide Technical Reference Manual (IL-TRM) version 12.0 and Nicor Gas RNC program tracking data.

**Finding 1d.** Twenty-two projects with the project IDs 242418, 242692, 243045, 246726, 246910, 247648, 247665, 247975, 248120, 248179, 249549, 249584, 259740, 262852, 264298, 264771, 265218, 265409, 265757, 267934, 269682, and 269934 have a realization rate of 98.7%, and one project with project ID 238648 has a realization rate of 103.2%. Guidehouse could not duplicate the savings despite the baseline UEFs used in the ex ante savings and verified savings calculation being 0.5922. The verified savings calculations are based on the Illinois Statewide Technical Reference Manual (IL-TRM) version 12.0 and Nicor Gas RNC program tracking data.

Overall, the storage water heater measure had a gross realization rate of 99%.

**Recommendation 1a.** Review measures with zero ex ante savings and confirm if savings should be claimed in the final participation data.

**Recommendation 1b.** Review the Capacity New Equipment and Thermal Regain Factors values for the two projects, as both values are reported as zero in the participant report. Given that the projects have a reported UEF baseline efficiency of 0.5922 in the participant report, these values shouldn’t be zero.

**Recommendation 1c.** Review the measure quantity values for the five projects, as the savings should be the same considering the consistent ex ante and verified savings calculation baseline UEF of 0.5922.

**Recommendation 1d.** Improve quality control of the input values used in the ex ante savings calculation for storage water heater and ensure they are consistent with the savings reported in the participation data.

##### Impact Analysis Methodology

Guidehouse followed algorithms outlined in the Illinois Technical Reference Manual (TRM) v12.0 to calculate verified gross savings for residential programs. The evaluation team verified that these algorithms and appropriate deemed input parameters were correctly applied and validated custom parameters that were used. Baseline assumptions were derived from the Illinois Energy Conservation Code[[1]](#footnote-2) or the TRM.

Guidehouse calculated verified net savings by multiplying verified gross savings by a net-to-gross (NTG) of 0.90 for advanced thermostats and 0.80 for all other measures, and a residential non-participant spillover multiplier of 1.048 as deemed by the Illinois Stakeholder Advisory Group (SAG) for 2024.

##### 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. Verified Cost Effectiveness Inputs

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **End-Use** | **Savings Category** | **Units** |  **Quantity**  |  **Effective Useful Life**  |  **Ex Ante Gross Savings (Therms)**  |  **Verified Gross Savings (Therms)**  |  **Verified Net Savings (Therms)**  |
| HVAC | Advanced Thermostat  | Unit | 1,553 | 11 | 110,884 | 110,884 | 104,586 |
| Shell | Air Sealing | Project | 809 | 20 | 62,401 | 62,401 | 52,317 |
| HVAC | Duct Insulation and Sealing | Project | 809 | 20 | 50,215 | 50,215 | 42,101 |
| HVAC | Gas High Efficiency Furnace >92% AFUE | Unit | 117 | 20 | 10,747 | 10,747 | 9,010 |
| HVAC | Gas High Efficiency Furnace >95% AFUE | Unit | 1,492 | 20 | 207,785 | 207,668 | 174,109 |
| Hot Water | On Demand Water Heater | Unit | 673 | 13 | 49,991 | 49,992 | 41,913 |
| *Hot Water* | *Storage Water Heater* | Unit | 518 | *13* | 15,663 | 15,517 | 13,010 |
| **Total** |  | **5,971** | **17.1** | **507,686** | **507,424** | **437,046** |

Note: The total for the Effective Useful Life is the weighted average.

*Source: Evaluation team analysis.*

1. Illinois Energy Conservation Code, July 1, 2018. https://www2.illinois.gov/cdb/business/codes/IllinoisAccessibilityCode/Documents/2018%20Illinois%20Specific%20Amendments%20with%20Modifications%20Shown.pdf [↑](#footnote-ref-2)