

Residential New Construction Impact Evaluation Report

**Energy Efficiency Plan: Program Year 2024
(1/1/2024-12/31/2024)**

Prepared for:

Nicor Gas Company

FINAL

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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 8,675 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 †	8,675	8,675

* Participants are defined as

† Installed Projects are defined as

Source: Nicor Gas tracking data and evaluation team analysis.

Table 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	2,126
	Air Sealing	Project	1,377
	Duct Insulation and Sealing	Project	1,377
	Gas High Efficiency Furnace >92% AFUE*	Unit	117
	Gas High Efficiency Furnace >95% AFUE*	Unit	2,067
	On Demand Water Heater	Unit	900
	Storage Water Heater	Unit	711
Total			8,675

Source: Nicor Gas tracking data and evaluation team analysis.

Program Savings Detail

Table 3 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	731,759	100%	731,425	0.80/0.90‡	1.048	629,135
Total		731,759	100%	731,425			629,135

* 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	151,796	100%	151,796	0.90	1.048	143,174
Shell	Air Sealing	104,650	100%	104,651	0.80	1.048	87,740
HVAC	Duct Insulation and Sealing	79,821	100%	79,821	0.80	1.048	66,922
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	295,928	100%	295,801	0.80	1.048	248,000
Hot Water	On Demand Water Heater	67,194	100%	67,194	0.80	1.048	56,335
Hot Water	Storage Water Heater	21,623	99%	21,415	0.80	1.048	17,954
Total		731,759	100%	731,425			629,135

* 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	76.00	76.00	100%	TRM v12.0 – Section 5.6.1; Illinois Energy Conservation Code‡
Duct Insulation and Sealing	Project	57.97	57.97	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	143.17	143.11	100%	TRM v12.0 – Section 5.3.7
On Demand Water Heater	Unit	74.66	74.66	100%	TRM v12.0 – Sections 5.4.2 and 4.3.1
Storage Water Heater	Unit	30.41	30.12	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 1. 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.

Recommendation 1. Review measures with zero ex ante savings and confirm if savings should be claimed in the final participation data. Nicor Acknowledges this error and is planning to exclude such cases from future tracking data.

Finding 2. The Capacity New Equipment and Thermal Regain Factor values for two projects IDs 235920 and 271179 were reported as zero in the participation report. Given that the projects have a reported UEF baseline efficiency of 0.5922 in the participant report, these values shouldn't be zero. Using the available data evaluation calculated negative verified savings and evaluation set the verified savings to zero with no savings realization rates.

Recommendation 2. Review the Capacity New Equipment and Thermal Regain Factors values and align them with reported UEF baseline efficiency for all measures, and ensure that savings reported are consistent with measure savings inputs.

Finding 3. Five projects with 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.

Recommendation 3. Review the tracking measure quantity or capacity values for all measures and ensure they are applied consistently to get the total savings reported.

Finding 4. 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.

Recommendation 4. 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.

Appendix A. 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 Code¹ 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.

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>

Appendix B. 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	2,126	11	151,796	151,796	143,174
Shell	Air Sealing	Project	1,377	20	104,650	104,651	87,740
HVAC	Duct Insulation and Sealing	Project	1,377	20	79,821	79,821	66,922
HVAC	Gas High Efficiency Furnace >92% AFUE	Unit	117	20	10,747	10,747	9,010
HVAC	Gas High Efficiency Furnace >95% AFUE	Unit	2,067	20	295,928	295,801	248,000
Hot Water	On Demand Water Heater	Unit	900	13	67,194	67,194	56,335
Hot Water	Storage Water Heater	Unit	711	13	21,623	21,415	17,954
Total			8,675	17.28	731,759	731,425	629,135

Note: The total for the Effective Useful Life is the weighted average.
 Source: Evaluation team analysis.