



# Home Energy Efficiency Rebates Program Impact Evaluation Report

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

**Prepared for:**

**Nicor Gas Company**

**FINAL**

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## 1. Introduction

This report presents the results of the impact evaluation of the Nicor Gas 2022 Home Energy Efficiency Rebates (HEER) program and a summary of the energy savings impacts achieved by the program. The appendices present the impact analysis methodology and Illinois total resource cost (TRC) inputs. Program year 2022 covers January 1, 2022, through December 31, 2022.

## 2. Program Description

The Nicor Gas HEER program provides Nicor Gas customers with rebate incentives for purchasing high annual fuel utilization efficiency (AFUE) furnaces and boilers, tankless water heaters, and advanced thermostats. Participants may apply for the rebates themselves, or contractors may assist them in the rebate application process. Rebates are processed and sent to residential customers after installation of qualified measures. Members of the Nicor Gas Contractor Circle may offer rebates as instant discounts.

The program had 28,157 participants in 2022 and completed 28,836 projects as shown in Table 2-1.

**Table 2-1. 2022 Volumetric Findings Detail**

Participation	Total
Participants *	28,157
Installed Projects †	28,836

\* Participants are defined as count of unique building account numbers.

† Installed Projects are defined as count of unique project IDs.

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. 2022 Installed Measure Quantities**

Measure	Quantity Unit	Installed Quantity
Advanced Thermostat - Manual Baseline	Each	7,347
Advanced Thermostat - Programmable Baseline	Each	9,907
Advanced Thermostat - Unknown Baseline	Each	629
Boilers, >95% AFUE <300 MBH	Each	107
Combination Boilers, >95% AFUE <300 MBH	Each	56
Furnace, >95% AFUE	Each	11,162
Furnace, >97% AFUE	Each	878
Tankless Water Heater	Each	249

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

### 3. Program Savings Detail

Table 3-1 summarizes the energy savings the HEER Program achieved by path in 2022.

**Table 3-1. 2022 Annual Energy Savings Summary**

Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Advanced Thermostats	1,555,454	96%	1,494,453	0.90	1,345,007
Boilers and Furnaces	2,187,245	100%	2,186,894	Furnaces >95 AFUE and Boilers = 0.84 Furnaces > 97 AFUE = 0.86	1,840,656
Water Heaters	21,714	84%	18,250	0.84	15,330
<b>Total or Weighted Average</b>	<b>3,764,414</b>	<b>98%</b>	<b>3,699,597</b>		<b>3,200,994</b>

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

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

Source: Guidehouse evaluation team analysis.

## 4. Program Savings by Measure

The program includes 8 measures as shown in Table 4-1. Furnace and advanced thermostat measures contributed the most savings.

**Table 4-1. 2022 Annual Energy Savings by Measure**

Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Advanced Thermostat - Manual Baseline	745,112	100%	742,703	0.90	668,433
Advanced Thermostat - Programmable Baseline	754,921	93%	698,934	0.90	629,041
Advanced Thermostat - Unknown Baseline	55,422	95%	52,816	0.90	47,534
Boilers, >95% AFUE <300 MBH	25,303	100%	25,303	0.84	21,255
Combination Boilers, >95% AFUE <300 MBH	14,644	98%	14,293	0.84	12,006
Furnace, >95% AFUE	1,964,037	100%	1,964,037	0.84	1,649,791
Furnace, >97% AFUE	183,261	100%	183,261	0.86	157,604
Tankless Water Heater	21,714	84%	18,250	0.84	15,330
<b>Total or Weighted Average</b>	<b>3,764,414</b>	<b>98%</b>	<b>3,699,597</b>		<b>3,200,994</b>

\* 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 website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022/>.

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

## 5. Impact Analysis Findings and Recommendations

### 5.1 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 ex ante savings. Following the table, we provide findings and recommendations, including discussion of all measures with realization rates above or below 100%. Appendix 1 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)	Realization Rate	Data Source(s)
Advanced Thermostat - Manual Baseline	Each	Varies	Varies	100%	Illinois TRM, v10.0†, Section 5.3.16 and PTD
Advanced Thermostat - Programmable Baseline	Each	Varies	Varies	93%	Illinois TRM, v10.0†, Section 5.3.16 and PTD
Advanced Thermostat - Unknown Baseline	Each	Varies	Varies	95%	Illinois TRM, v10.0†, Section 5.3.16 and PTD
Boilers, >95% AFUE <300 MBH	Each	Varies	Varies	100%	Illinois TRM, v10.0†, Section 5.3.6 and PTD
Combination Boilers, >95% AFUE <300 MBH	Each	Varies	Varies	98%	Illinois TRM, v10.0†, Section 5.3.17 and PTD
Furnace, >95% AFUE	Each	Varies	Varies	100%	Illinois TRM, v10.0†, Section 5.3.7 and PTD
Furnace, >97% AFUE	Each	Varies	Varies	100%	Illinois TRM, v10.0†, Section 5.3.7 and PTD
Tankless Water Heater	Each	Varies	Varies	84%	Illinois TRM, v10.0†, Section 5.4.2 and PTD

\* Program Tracking Data (PTD) provided by Nicor Gas, extract dated January 31, 2023.

† State of Illinois Technical Reference Manual version 10.0 from <http://www.ilsag.info/technical-reference-manual.html>.

### 5.2 Findings and Recommendations

#### 5.2.1 Advanced Thermostats Household Factor

**Finding 1.** The tracking data field “Residential Building Type” was blank. To verify the ex ante savings, the evaluation team relied on the tracking data savings inputs to determine housing type. We found 151 measure instances where the tracking data lists the household factor (HF) as 65% (multi-family value) but the ex-ante values reflected single family inputs (HF = 100%). Evaluation used single family inputs to estimate verified savings for these 151 measures.

**Recommendation 1.** Populate the “Residential Building Type” field in the tracking data and use it to determine household factor for advanced thermostats. Ensure SF thermostats use a household factor of 100%, and MF thermostats use a household factor of 65%.

### 5.2.2 Advanced Thermostats Heating Reduction

**Finding 2.** The evaluation team found 1,734 advanced thermostats data entries labeled as programmable baseline but the ex ante savings calculation used manual baseline heating reduction values. The evaluation found 133 advanced thermostats labeled as “unknown baseline”, but the ex-ante savings calculation used manual baseline heating reduction values. The verified savings used the appropriate TRM inputs based on the measure descriptions.

**Recommendation 2.** Ensure all advanced thermostat with programmable baseline use a heating reduction value of 7.1% and advanced thermostat with unknown baseline with heating reduction value of 8.5%.

### 5.2.3 Combination Boilers

**Finding 3.** The combination boilers had a 100% gross savings realization rate except four projects (PRJ-3230506, PRJ-3232562, PRJ-3233038, and PRJ-3233699) which had a lower verified gross savings realization rate. Verified savings relied on TRM v10 inputs and other custom inputs provided in the tracking data.

**Recommendation 3a.** Ensure custom values from tracking data (e.g. heating input capacity, existing and efficient annual fuel utilization efficiency ratings (AFUE)) are used in the ex-ante savings calculation.

**Recommendation 3b.** Ensure values deemed by the TRM are accurately used in ex-ante savings calculations (e.g. AFUE\_base, UEF\_base, EUF\_eff, GPD, and household factors defined for single family and multifamily spaces).

### 5.2.4 Tankless Water Heater

**Finding 4.** The tankless water heaters were verified with a gross savings realization rate of 84%. The final tracking data ex-ante savings differed from the reported mid-year ex-ante savings, with a realization rate of 100%. Verified savings used deemed values in TRM v10.0 and other custom inputs provided in the tracking data. Guidehouse could not isolate a cause for the discrepancy between the ex-ante and verified savings.

**Recommendation 4a.** Review the tracking system inputs and ensure actual values and deemed TRM inputs listed in the tracking data are used in the ex-ante savings calculation.

**Recommendation 4b.** Ensure values deemed by TRM are accurately used in ex-ante savings calculations (UEF\_base = 0.536, GPD = 17.6, Household = 2.56 for SF).



## Appendix A. Impact Analysis Methodology

Guidehouse determined verified gross savings for each program measure by conducting a tracking system review. Guidehouse used the Illinois TRM v10.0<sup>1</sup> methodology to calculate verified gross savings. Guidehouse calculated verified net energy savings by multiplying the verified gross savings estimates by a deemed net-to-gross ratio (NTG). The 2022 NTG were based on past evaluation research and defined by a consensus process through SAG.<sup>2</sup>

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<sup>1</sup> Available on the SAG web site: <http://www.ilsag.info/technical-reference-manual.html>

<sup>2</sup> A deemed value. Available on the SAG website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2022/>

## 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. Currently, 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**

Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Advanced Thermostat - Manual Baseline	Each	7,347	11	745,112	742,703	668,433
Advanced Thermostat - Programmable Baseline	Each	9,907	11	754,921	698,934	629,041
Advanced Thermostat - Unknown Baseline	Each	629	11	55,422	52,816	47,534
Boilers, >95% AFUE <300 MBH	Each	107	25	25,303	25,303	21,255
Combination Boilers, >95% AFUE <300 MBH	Each	56	21.5	14,644	14,293	12,006
Furnace, >95% AFUE	Each	11,162	20	1,964,037	1,964,037	1,649,791
Furnace, >97% AFUE	Each	878	20	183,261	183,261	157,604
Tankless Water Heater	Each	249	13	21,714	18,250	15,330
<b>Total or Weighted Average</b>		<b>30,335</b>	<b>14.7</b>	<b>3,764,414</b>	<b>3,699,597</b>	<b>3,200,994</b>

Source: Nicor Gas tracking data and evaluation team analysis.