



# **Income Qualified Single-Family Retrofits IHWAP Impact Evaluation Report**

**Energy Efficiency Plan Year 2021  
(1/1/2021-12/31/2021)**

**Prepared for:**

**Nicor Gas**

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## 1. Introduction

This report presents the results of the impact evaluation of the Nicor Gas 2021 Income Qualified (IQ) Single-Family Retrofits (SFR) – Illinois Home Weatherization Assistance Program (IHWAP). It presents a summary of the energy impacts for the total program and broken out by relevant measure and program structure details. Program year 2021 covers January 1, 2021 through December 31, 2021.

## 2. Program Description

The SFR-IHWAP Program provides retrofits to single family households in Nicor Gas service areas with incomes at or below 80% of the area median income. The program offers assessments, direct installation of energy efficiency measures, replacement of inefficient equipment, technical assistance, and educational information for customers to further save money on energy bills through two program components: Resource Innovations implements the components of the program, leveraging Illinois' Home Weatherization Assistance Program (IHWAP). This program component is offered jointly by ComEd, Peoples Gas, North Shore Gas, and Nicor Gas and is delivered through community action agencies.

The program had 403 participants in 2021 and completed 407 projects as shown in Table 2-1.

**Table 2-1. 2021 Volumetric Findings Detail**

<b>Participation</b>	<b>Total</b>
Participants *	403
Installed Projects †	407
Measure Types	20

\* Participants are defined as the count of unique addresses

† Installed Projects are defined as the unique project ids

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

Table 2-2 summarizes the Nicor Gas installed measure quantities that are the basis for verified energy savings.

**Table 2-2. 2021 Installed Measure Quantities**

<b>Measure</b>	<b>Installed Quantity Total</b>
Advanced Thermostat	205
Air Sealing	394
Attic Insulation	357
Basement Sidewall Insulation	114
Duct Insulation and Sealing	43
Floor Insulation	24
Furnace Tune-Up	45
Gas High Efficiency Boiler – Early Replacement (ER)	10
Gas High Efficiency Boiler – Time-of-Sale (TOS)	5
Gas High Efficiency Furnace - ER	175
Gas High Efficiency Furnace - TOS	87
Gas Water Heater - ER	155
Gas Water Heater - TOS	14
Hot Water (HW) Pipe Insulation	254
Low Flow Faucet Aerator - Bathroom	164
Low Flow Faucet Aerator - Kitchen	57
Low Flow Showerhead	144
Programmable Thermostat	75
Rim Insulation	174
Wall Insulation	86

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

### 3. Program Savings Detail

Table 3-1 summarizes the energy savings the Nicor Gas SFR-IHWAP portion of the IQ-SFR Program in 2021. The evaluation team found that Nicor Gas claimed 100% of the gas savings from the joint program with ComEd in 2021.

**Table 3-1. 2021 Annual Energy Savings Summary**

Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
SFR-IHWAP	188,018	100%	188,015	1.00	188,015
<b>Total or Weighted Average</b>	<b>188,018</b>	<b>100%</b>	<b>188,015</b>	<b>1.00</b>	<b>188,015</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 web site: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021>.

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

## 4. Program Savings by Measure

The Nicor Gas program includes 20 measures as shown in Table 4-1. The attic insulation and air sealing measures contributed the most savings.

**Table 4-1. 2021 Annual Energy Savings by Measure**

End Use Type	Research Category	Ex Ante Gross Savings (Therms)	Verified Gross RR	Verified Gross Savings (Therms)	NTG	Verified Net Savings (Therms)
HVAC	Duct Insulation and Sealing	17,189	100%	17,189	1.00	17,189
HVAC	Gas High Efficiency Boiler - ER	1,922	100%	1,922	1.00	1,922
HVAC	Gas High Efficiency Boiler - TOS	715	100%	715	1.00	715
HVAC	Gas High Efficiency Furnace - ER	22,980	100%	22,980	1.00	22,980
HVAC	Gas High Efficiency Furnace - TOS	11,956	100%	11,956	1.00	11,956
HVAC	Programmable Thermostat	4,688	100%	4,688	1.00	4,688
HVAC	Furnace Tune-Up	3,003	100%	3,003	1.00	3,003
HVAC	Advanced Thermostat	19,512	100%	19,513	1.00	19,513
Hot Water	HW Pipe Insulation	2,455	100%	2,455	1.00	2,455
Hot Water	Gas Water Heater - ER	6,420	100%	6,420	1.00	6,420
Hot Water	Gas Water Heater - TOS	185	100%	185	1.00	185
Hot Water	Low Flow Faucet Aerator - Bathroom	265	100%	265	1.00	265
Hot Water	Low Flow Faucet Aerator - Kitchen	501	100%	501	1.00	501
Hot Water	Low Flow Showerhead	465	100%	465	1.00	465
Shell	Air Sealing	36,925	100%	36,923	1.00	36,923
Shell	Basement Sidewall Insulation	11,188	100%	11,188	1.00	11,188
Shell	Floor Insulation	1,116	100%	1,116	1.00	1,116
Shell	Wall Insulation	5,543	100%	5,543	1.00	5,543
Shell	Attic Insulation	39,177	100%	39,175	1.00	39,175
Shell	Rim Insulation	1,814	100%	1,814	1.00	1,814
<b>Total or Weighted Average</b>		<b>188,018</b>	<b>100%</b>	<b>188,015</b>	<b>1.00</b>	<b>188,015</b>

Source: Nicor Gas tracking data and Guidehouse 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. Following the table, we provide findings and recommendations, including discussion of measures with realization rates above or below 100 percent. Appendix A 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	Each	91.61	91.61	100%	TRM, v9.0†, Section 5.3.16, PTD*
Air Sealing	Projects	93.72	93.71	100%	TRM, v9.0, Section 5.6.1 PTD
Attic Insulation	Sq. Ft.	0.12	0.12	100%	TRM, v9.0, Section 5.6.5 PTD
Basement Sidewall Insulation	Sq. Ft.	0.38	0.38	100%	TRM, v9.0, Section 5.6.2 PTD
Duct Insulation and Sealing	Each	399.74	399.74	100%	TRM, v9.0, Section 5.3.4 PTD
Floor Insulation	Sq. Ft.	0.12	0.12	100%	TRM, v9.0, Section 5.6.3 PTD
Furnace Tune-Up	Each	66.73	66.73	100%	TRM, v9.0, Section 5.3.13 PTD
Gas High Efficiency Boiler - ER	Each	192.21	192.21	100%	TRM, v9.0, Section 5.3.6 PTD
Gas High Efficiency Boiler - TOS	Each	142.95	142.95	100%	TRM, v9.0, Section 5.3.6 PTD
Gas High Efficiency Furnace - ER	Each	131.31	131.31	100%	TRM, v9.0, Section 5.3.7 PTD
Gas High Efficiency Furnace - TOS	Each	137.42	137.42	100%	TRM, v9.0, Section 5.3.7 PTD
Gas Water Heater - ER	Each	41.42	41.42	100%	TRM, v9.0, Section 5.4.2 PTD
Gas Water Heater - TOS	Each	13.19	13.19	100%	TRM, v9.0, Section 5.4.2 PTD
HW Pipe Insulation	Lin. Ft.	0.88	0.88	100%	TRM, v9.0, Section 5.4.1 PTD
Low Flow Faucet Aerator – Bathroom	Each	0.91	0.91	100%	TRM, v9.0, Section 5.4.4 PTD
Low Flow Faucet Aerator – Kitchen	Each	7.96	7.96	100%	TRM, v9.0, Section 5.4.4 PTD
Low Flow Showerhead	Each	2.61	2.61	100%	TRM, v9.0, Section 5.4.5 PTD
Programmable Thermostat	Each	60.89	60.89	100%	TRM, v9.0, Section 5.3.11 PTD
Rim Insulation	Sq. Ft.	0.1	0.1	100%	TRM, v9.0, Section 5.6.6 PTD
Wall Insulation	Sq. Ft.	0.1	0.1	100%	TRM, v9.0, Section 5.6.4 PTD

\* Tracking data from Nicor Gas, extract dated February 2, 2022.

† State of Illinois Technical Reference Manual version 9.0 from <http://www.ilsag.info/technical-reference-manual.html>.

## 5.2 Findings and Recommendations

### 5.2.1 Duct Insulation and Sealing

The tracking data is missing a UEF\_efficient value for MEA-2021.07.19-243931. Guidehouse calculated the value to be 0.65.

**Recommendation 1.** Ensure the UEF\_efficient value for the duct insulation and sealing projects is provided in the tracking data.

## Appendix A. Impact Methodology

Guidehouse determined verified gross savings for each program measure by conducting a tracking system review. Guidehouse checked that measure inputs matched deemed TRM (v9.0) inputs and validated custom inputs or adjusted as necessary. To be eligible, a TRM measure must meet the physical, operational, and baseline characteristics as defined in the applicable version of the TRM.<sup>1</sup> Verified gross realization rates are calculated by dividing the verified gross savings by the ex ante gross savings. In 2021, the NTG estimates used to calculate the net verified savings were defined by a consensus process through the SAG.<sup>2</sup>

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<sup>1</sup> Illinois Statewide Technical Reference Manual for Energy Efficiency Version 9.0 from <http://www.ilsag.info/technical-reference-manual.html>

<sup>2</sup> Available on the SAG web site: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2021/>

## 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	Research Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
HVAC	Advanced Thermostat	Each	213	11.0	19,512	19,513	19,513
Shell	Air Sealing	Projects	394	20.0	36,925	36,923	36,923
Shell	Attic Insulation	Sq. Ft.	320,135	20.0	39,177	39,175	39,175
Shell	Basement Sidewall Insulation	Sq. Ft.	29,737	20.0	11,188	11,188	11,188
HVAC	Duct Insulation and Sealing	Each	43	20.0	17,189	17,189	17,189
Shell	Floor Insulation	Sq. Ft.	9,682	20.0	1,116	1,116	1,116
HVAC	Furnace Tune-Up	Each	45	3.0	3,003	3,003	3,003
HVAC	Gas High Efficiency Boiler - ER	Each	10	25.0	1,922	1,922	1,922
HVAC	Gas High Efficiency Boiler - TOS	Each	5	25.0	715	715	715
HVAC	Gas High Efficiency Furnace - ER	Each	175	20.0	22,980	22,980	22,980
HVAC	Gas High Efficiency Furnace - TOS	Each	87	20.0	11,956	11,956	11,956
Hot Water	Gas Water Heater - ER	Each	155	13.0	6,420	6,420	6,420
Hot Water	Gas Water Heater - TOS	Each	14	13.0	185	185	185
Hot Water	HW Pipe Insulation	Lin. Ft.	2,790	15.0	2,455	2,455	2,455
Hot Water	Low Flow Faucet Aerator - Bathroom	Each	290	10.0	265	265	265
Hot Water	Low Flow Faucet Aerator - Kitchen	Each	63	10.0	501	501	501
Hot Water	Low Flow Showerhead	Each	178	10.0	465	465	465
HVAC	Programmable Thermostat	Each	77	16.0	4,688	4,688	4,688
Shell	Rim Insulation	Sq. Ft.	17,363	20.0	1,814	1,814	1,814
Shell	Wall Insulation	Sq. Ft.	55,939	20.0	5,543	5,543	5,543
<b>Total or Weighted Average</b>				<b>18.4</b>	<b>188,018</b>	<b>188,015</b>	<b>188,015</b>

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