Guidehouse
Outwit Complexity

Home Energy Savings Program Impact Evaluation Report

Energy Efficiency Plan: Program Year 2023 (1/1/2023-12/31/2023)

Prepared for:

Nicor Gas Company

FINAL

May 15, 2024

Prepared by:

Marisa Rudolph
Guidehouse

Robert Hodge
Guidehouse

Submitted to:

Nicor Gas Company
1844 Ferry Road
Naperville, IL 60563

Submitted by:

Guidehouse
150 N. Riverside Plaza, Suite 2100
Chicago, IL 60606

Contact:

Ted Walker
Partner
404.602.3463
ted.walker@guidehouse.com

Stu Slote
Director
802.526.5113
stu.slote@guidehouse.com

Laura Agapay-Read
Associate Director
312.583.4178
laura.agapay.read@guidehouse.com

Charles Ampong
Associate Director
608.446.3172
charles.ampong@guidehouse.com

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1. 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.

2. 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 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 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

Program Path	Measure	Quantity Unit	Installed Quantity
	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.

3. Program Savings Detail

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

Table 3-1. 2023 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.

4. 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 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

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	NPSO	Verified Net Savings (Therms)
		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

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	NPSO	Verified Net Savings (Therms)
		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%	1,163	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

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	NPSO	Verified Net Savings (Therms)
		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.

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 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 A provides a description of the impact analysis methodology.

Table 5-1. 2023 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 5.3.16 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 7.30	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 4.24	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*

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
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**.

5.2 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) had conflicting climate zones in the “Project” and “Contacts” tab of the tracking data. Guidehouse confirmed that the “Customer” and “Site” zips did not match the location listed in the “Project” tab. Resource Innovations confirmed this Door Sweep was installed in climate zone 1.

Recommendation 7. Update zip codes and counties in the "Project" tab to reflect the actual Customer or Site location rather than the IC, Trade Ally, etc. in in the Contact tab if possible.

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.

Appendix A. 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]. 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.

[1] Illinois Statewide Technical Reference Manual version 11.0 from **http://www.ilsag.info/technical-reference-manual.html**

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. 2023 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

Program Path	Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
	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

Program Path	Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
	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.