Guidehouse

Income Eligible Multi Family and Public Housing 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 Multi-Family Income Eligible Program (MFIE) and Public Housing Program (PHA). The report is separated into two sections, the MFIE section includes the Retrofits program, Healthy Homes program, Ameren – Nicor program, Illinois Home Weatherization Assistance Program (IHWAP), and Assessment program. The second section presents results for the PHA program. This report presents a summary of the energy impacts for the total program and is broken out by relevant measure and program structure details. The appendix presents the impact analysis methodology. Program year 2024 covers January 1, 2024 through December 31, 2024.

Multi-Family Income Eligible Program

Program Description

The Nicor Gas MFIE Program offers products and energy saving measures for income-qualified customers in multi-family dwellings within the Nicor Gas service territory. The 2024 Retrofits, Healthy Homes, Ameren – Nicor, IHWAP and Assessments included direct installation of water heating efficiency measures (faucet aerators, showerheads, shower timer), high efficiency boilers, advanced thermostats, programmable and reprogrammable thermostats, attic insulation, basement insulation, pipe insulation, air sealing, floor insulation, furnace, boiler controls, steam traps, furnace tune-ups, and boiler tune-ups.

The program had 418 participants in 2024 and completed 3,804 projects as shown in Table 1.

Table 1. 2024 Volumetric Findings Detail

Participation	Retrofits	Assessment	Healthy Homes	IHWAP	Ameren – Nicor	Total
Participants *	337	43	10	5	23	418
Installed Projects †	3,717	38	7	1	41	3,804
Measure Types Installed ‡	48	15	16	8	17	104

* Participants are defined as distinct count of addresses.
† Installed Projects are defined as distinct count of project IDs.
‡ Measure Types Installed are the distinct count of Nicor measure names.
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	Program Path	Measure	Quantity Unit	Installed Quantity
Multi Family Income Eligible	Retrofits	Attic Insulation	SQ FT	700,525
		Assessment/No Savings	Unit	699,186
		Air Sealing	LN FT	448,838
		Wall Insulation	Unit	33,356

Program Category	Program Path	Measure	Quantity Unit	Installed Quantity
		Pipe Insulation	LN FT	13,705
		Linkageless Boiler Controls for Space Heating	Unit	3,400
		Shower Timer	Unit	2,299
		Low Flow Showerheads (IU)	Unit	1,697
		Low Flow Aerator - Kitchen (IU)	Unit	1,644
		Basement/Sidewall Insulation	Unit	1,625
		Floor Insulation Above Crawlspace	Unit	1,556
		Controls for Domestic Hot Water	Unit	1,509
		Low Flow Aerator - Bathroom (IU)	Unit	1,146
		Programmable Thermostats	Unit	663
		Steam Boiler Averaging Controls	Unit	431
		DHW Pipe Insulation	LN FT	408
		Steam Trap	Unit	280
		Advanced Thermostat	Unit	246
		Boiler Tune Up	Unit	186
		Cover and Gap Sealers for AC	Unit	117
		DHW Boiler Tune Up	Unit	83
		Boiler Reset Controls	Unit	41
		Air Filter Replacement	Unit	15
		Furnace Tune Up	Unit	7
		Reprogrammable Thermostats	Unit	7
		Low Flow Aerator - Bathroom (CA)	Unit	5
		High Efficiency Boiler	Unit	1
	Assessment	Assessment/No Savings	Unit	38
		Air Sealing	Unit	21
		Air Filter Replacement	Unit	19
		Low Flow Showerheads (IU)	Unit	17
		Low Flow Aerator - Bathroom (IU)	Unit	16
		Advanced Thermostat	Unit	10
		Boiler Pipe Insulation	LN FT	9
		DHW Pipe Insulation	LN FT	9
		Low Flow Aerator - Kitchen (IU)	Unit	6
		Programmable Thermostats	Unit	6
	Healthy Homes	Assessment/No Savings	Unit	26
		DHW Pipe Insulation	LN FT	22
		Advanced Thermostat	Unit	4
		Air Sealing	Unit	3
		Air Filter Replacement	Unit	2

Program Category	Program Path	Measure	Quantity Unit	Installed Quantity
		Duct Sealing	Unit	2
		Furnace Tune Up	Unit	2
		Low Flow Aerator - Bathroom (IU)	Unit	1
		Low Flow Aerator - Kitchen (IU)	Unit	1
		Low Flow Showerheads (IU)	Unit	1
	IHWAP	Air Sealing	Unit	4,439
		Assessment/No Savings	Unit	112
		Low Flow Aerator - Bathroom (IU)	Unit	19
		Low Flow Aerator - Kitchen (IU)	Unit	14
		Low Flow Showerheads (IU)	Unit	4
		IE Custom	Unit	1
	Ameren - Nicor	Floor Insulation Above Crawlspace	SQ FT	5,600
		Attic Insulation	SQ FT	1,600
		DHW Pipe Insulation	LN FT	176
		Assessment/No Savings	Unit	158
		Air Sealing	Unit	86
		Duct Sealing	Unit	37
		Low Flow Aerator - Kitchen (IU)	Unit	33
		Furnace Tune Up	Unit	32
		Advanced Thermostat	Unit	31
		Low Flow Aerator - Bathroom (IU)	Unit	29
		Air Filter Replacement	Unit	27
		Low Flow Showerheads (IU)	Unit	27
		Boiler Pipe Insulation	LN FT	1

Source: Nicor Gas tracking data and evaluation team analysis.

Program Savings Detail

Table 3 summarizes the energy savings the MFIE 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†	NPSO‡	Verified Net Savings (Therms)
Multi-Family Income Eligible	Retrofits	682,595	100%	683,484	1.00	N/A	683,484
	Ameren – Nicor	20,325	100%	20,359	1.00	N/A	20,359
	IHWAP	3,769	100%	3,769	1.00	N/A	3,769

Program Category	Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	NPSO‡	Verified Net Savings (Therms)
	Assessment	1,591	100%	1,590	1.00	N/A	1,590
	Healthy Homes	1,330	102%	1,355	1.00	N/A	1,355
Total		**709,610**	**100%**	**710,531**	**1.00**		**710,531**

* 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-2024/ .
Source: Evaluation team analysis.
† NTG, Net to Gross is the deemed value available on the SAG website: https://www.ilsag.info/evaluator-ntg-recommendations-for-2024/.
‡ Market rate net savings are multiplied by a deemed non-participant spillover (NPSO) factor of 1.048. Do not apply to this program.
Source: Evaluation team analysis.

Program Savings by Measure

The program includes 30 measures as shown in Table 4. The Air Sealing and Controls for Domestic Hot Water measures contributed the most savings.

Table 4. 2024 Annual Energy Savings by Measure

Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	NSPO‡	Verified Net Savings (Therms)
Retrofit	Air Sealing	189,082	100%	189,082	1.00	N/A	189,082
	Controls for Domestic Hot Water	94,614	100%	94,614	1.00	N/A	94,614
	Pipe Insulation	91,749	96%	87,870	1.00	N/A	87,870
	Attic Insulation	71,105	98%	70,002	1.00	N/A	70,002
	Boiler Tune Up	54,997	100%	54,997	1.00	N/A	54,997
	Steam Trap	40,319	100%	40,319	1.00	N/A	40,319
	Programmable Thermostats	26,833	100%	26,863	1.00	N/A	26,863
	Steam Boiler Averaging Controls	26,329	100%	26,329	1.00	N/A	26,329
	Boiler Reset Controls	21,481	100%	21,481	1.00	N/A	21,481

Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	NSPO‡	Verified Net Savings (Therms)
	Low Flow Showerheads (IU)	20,984	100%	20,984	1.00	N/A	20,980
	DHW Boiler Tune Up	6,810	202%	13,748	1.00	N/A	13,748
	Advanced Thermostat	11,551	100%	11,551	1.00	N/A	11,551
	Shower Timer	8,722	100%	8,722	1.00	N/A	8,722
	Low Flow Aerator - Kitchen (IU)	4,637	100%	4,637	1.00	N/A	4,637
	Linkageless Boiler Controls for Space Heating	2,302	100%	2,302	1.00	N/A	2,302
	DHW Pipe Insulation	1,945	100%	1,954	1.00	N/A	1,954
	Low Flow Aerator - Bathroom (IU)	1,957	99%	1,937	1.00	N/A	1,937
	Wall Insulation	1,869	103%	1,930	1.00	N/A	1,930
	Basement/Sidewall Insulation	1,140	100%	1,140	1.00	N/A	1,140
	High Efficiency Boiler	2,133	48%	1,016	1.00	N/A	1,016
	Cover and Gap Sealers for AC	838	100%	838	1.00	N/A	838
	Furnace Tune Up	500	100%	500	1.00	N/A	500
	Reprogrammable Thermostats	330	100%	330	1.00	N/A	330
	Floor Insulation Above Crawlspace	182	100%	182	1.00	N/A	182
	Air Filter Replacement	151	100%	151	1.00	N/A	151
	Low Flow Aerator - Bathroom (CA)	34	100%	34	1.00	N/A	34
	Retrofits Subtotal	***682,595***	***100%***	***683,484***	***1.00***		***683,484***
Ameren – Nicor	Duct Sealing	10,893	100%	10,893	1.00	N/A	10,893

Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	NSPO‡	Verified Net Savings (Therms)
	Air Sealing	3,903	101%	3,937	1.00	N/A	3,937
	Furnace Tune Up	1,827	100%	1,827	1.00	N/A	1,827
	Advanced Thermostat	1,665	100%	1,665	1.00	N/A	1,665
	Floor Insulation Above Crawlspace	795	100%	795	1.00	N/A	795
	DHW Pipe Insulation	366	100%	366	1.00	N/A	366
	Low Flow Aerator - Kitchen (IU)	243	100%	243	1.00	N/A	243
	Attic Insulation	298	100%	298	1.00	N/A	298
	Air Filter Replacement	181	100%	181	1.00	N/A	181
	Low Flow Showerheads (IU)	109	100%	109	1.00	N/A	109
	Low Flow Aerator - Bathroom (IU)	43	100%	43	1.00	N/A	43
	Boiler Pipe Insulation	3	100%	3	1.00	N/A	3
	Ameren – Nicor Subtotal	***20,325***	***100%***	***20,359***	***1.00***		***20,359***
IHWAP	Air Sealing	2,403	100%	2,403	1.00	N/A	2,403
	IE Custom	1,178	100%	1,178	1.00	N/A	1,178
	Low Flow Aerator - Kitchen (IU)	123	100%	123	1.00	N/A	123
	Low Flow Aerator - Bathroom (IU)	34	100%	34	1.00	N/A	34
	Low Flow Showerheads (IU)	31	100%	31	1.00	N/A	31
	IHWAP Subtotal	***3,769***	***100%***	***3,769***	***1.00***		***3,769***
Assessment	Advanced Thermostat	731	100%	731	1.00	1.000	731

Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	NSPO‡	Verified Net Savings (Therms)
	Programmable Thermostats	332	100%	332	1.00	1.000	332
	Low Flow Showerheads (IU)	161	100%	161	1.00	1.000	161
	Air Sealing	154	100%	154	1.00	1.000	154
	Air Filter Replacement	150	100%	149	1.00	1.000	149
	Low Flow Aerator - Kitchen (IU)	25	100%	25	1.00	1.000	25
	DHW Pipe Insulation	17	100%	17	1.00	1.000	17
	Low Flow Aerator - Bathroom (IU)	17	100%	17	1.00	1.000	17
	Boiler Pipe Insulation	4	100%	4	1.00	1.000	4
	Assessment Subtotal	***1,591***	***100%***	***1,590***	***1.00***	N/A	***1,590***
Healthy Homes	Air Sealing	496	100%	496	1.00	N/A	496
	Duct Sealing	369	100%	369	1.00	N/A	369
	Advanced Thermostat	267	100%	267	1.00	N/A	267
	Furnace Tune Up	119	100%	119	1.00	N/A	119
	DHW Pipe Insulation	46	100%	46	1.00	N/A	46
	Air Filter Replacement	16	100%	16	1.00	N/A	16
	Low Flow Aerator - Kitchen (IU)	9	100%	9	1.00	N/A	9
	Low Flow Showerheads (IU)	6	100%	6	1.00	N/A	6
	Low Flow Aerator - Bathroom (IU)	3	100%	3	1.00	N/A	3
	Healthy Homes Subtotal	***1,330***	***100%***	***1,330***	***1.00***		***1,330***
Total		**709,610**	**100%**	**710,531**	**1.00**		**710,531**

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 a discussion of all measures with realization rates above or below 100%. Appendix A provides a description of the impact analysis methodology.

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	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.3.16 and PTD*
Air Filter Replacement	Unit	Varies	Varies	101%	Illinois TRM, v12.0†, Section 5.3.21 and PTD*
Air Sealing	LN FT	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.6.1 and PTD*
Attic Insulation	SQ FT	Varies	Varies	98%	Illinois TRM, v12.0†, Section 5.6.5 and PTD*
Basement/Sidewall Insulation	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.6.2 and PTD*
Boiler Pipe Insulation	LN FT	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.3.2 and PTD*
Boiler Reset Controls	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 4.4.4 and PTD*
Boiler Tune Up	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 4.4.2 and PTD*
Controls for Domestic Hot Water	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 4.3.8 and PTD*
Cover and Gap Sealers for AC	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 4.4.38 and PTD*
DHW Boiler Tune Up	Unit	Varies	Varies	202%	Illinois TRM, v12.0†, Section 4.3.10 and PTD*

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
DHW Pipe Insulation	LN FT	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.4.1 and PTD*
Duct Sealing	Unit	Varies	Varies	96%	Illinois TRM, v12.0†, Section 5.3.4 and PTD*
Floor Insulation Above Crawlspace	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.6.3 and PTD*
Furnace Tune Up	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.3.13 and PTD*
High Efficiency Boiler	Unit	2,133	1,015	48%	Illinois TRM, v12.0†, Section 4.4.10 and PTD*
Linkageless Boiler Controls for Space Heating	Unit	0.68	0.68	100%	Illinois TRM, v12.0†, Section 4.4.21 and PTD*
Low Flow Aerator - Bathroom (CA)	Unit	6.77	6.77	100%	Illinois TRM, v12.0†, Section 4.3.2 and PTD*
Low Flow Aerator - Bathroom (IU)	Unit	Varies	Varies	99%	Illinois TRM, v12.0†, Section 5.4.4 and PTD*
Low Flow Aerator - Kitchen (IU)	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.4.4 and PTD*
Low Flow Showerheads (IU)	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.4.5 and PTD*
Pipe Insulation	LN FT	Varies	Varies	96%	Illinois TRM, v12.0†, Section 4.4.14 and PTD*
Programmable Thermostats	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.3.11 and PTD*
Reprogrammable Thermostats	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.3.11 and PTD*
Shower Timer	Unit	3.79	3.79	100%	Illinois TRM, v12.0†, Section 5.4.9 and PTD*
Steam Boiler Averaging Controls	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 4.4.36 and PTD*

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
Steam Trap	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 4.4.16 and PTD*
Wall Insulation	Unit	Varies	Varies	103%	Illinois TRM, v12.0†, Section 5.6.4 and PTD*

* 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.

Findings and Recommendations

The evaluation team developed findings and recommendations based on the 2024 evaluation. The findings and recommendations are organized by path type in the following sections.

Retrofits

Finding 1. For five out of 186 instances for *Boiler Tune Up – MF IE* measure, tracking data reported zero Therms savings. The evaluation team assigned zero savings to these measures. The measure IDs associated with this finding are:

Recommendation 1. Include additional notes in the tracking data to describe the circumstance that led to reporting zero savings for any measures.

Finding 2. For two (MEA-2024.08.06-746304, MEA-2024.09.13-772316) out of 1,068 instances of the *Low Flow Aerator – Bath (DI) MF-IU* measure, the ex-ante calculations referenced section 4.3.2, Low Flow Faucet Aerators of the Volume 2 of IL TRM, to calculate savings. This section is applicable when the aerator is installed in the common areas of a multifamily building. However, the measure name indicates that the aerator is located inside a unit (IU). Accordingly, the evaluation team used section 5.4.4, Low Flow Faucet Aerators of the Volume 3 of IL TRM, to calculate verified savings, consistent with the "Inside-Unit" location specified in the measure name. This measure accounts for 0.28% of Retrofit component's verified gross Therms savings and the impact of this adjustment resulted in a RR of 99% for this measure.

Recommendation 2. Use appropriate section of the IL TRM to calculate savings, consistent with the measure name.

Finding 3. Ex ante calculations for various instances of *Pipe Insulation* measures used Length of Pipe inputs which were inconsistent to the reported values in the tracking data. The evaluation team calculated verified savings using the reported Length of Pipe. The overall Pipe Insulation measure accounts for 12.58% of Retrofit component's verified gross Therms savings and the impact of this adjustment resulted in a RR of 96% for this measure. The details of the reported Length of Pipe and Length of Pipe used by ex-ante calculations along with number of impacted instances are provided in the table below.

Table 6. Measure Instances of Pipe Insulation with Inconsistent Length of Pipe

Measure Name	Ex Ante Length of Pipe	Reported Length of Pipe	Impacted Instances	Measure IDs of Impacted Instances	Total Number of Instances	Percentage of Impacted Instances
Pipe Insulation, DHW Large >2"	1	1.26	2	MEA-2024.04.11-682800 MEA-2024.07.31-743437	2	100%
Pipe Insulation, DHW Medium 1.26-2"	1	1.26	5	MEA-2024.04.11-682801 MEA-2024.06.04-717393 MEA-2024.07.31-743438 MEA-2024.07.31-743439 MEA-2024.08.06-745775	9	55%
Pipe Insulation, DHW Small <=1.25"	1	1.26	1	MEA-2024.11.06-801345	37	3%
Pipe Insulation, HW Medium 2.1" to 4"	1	1.26	1	MEA-2024.11.06-801366	19	5%
Pipe Insulation, Steam Large 5.1" to 8"	2.05	1	3	MEA-2024.08.12-757537 MEA-2024.10.08-784078 MEA-2024.10.08-784082	13	23%
Pipe Insulation, Steam Med 2.1" to 5"	1 1.26	1.26 1	1 3	MEA-2024.08.19-761037 MEA-2024.08.12-757538 MEA-2024.10.08-784080 MEA-2024.10.08-784084	15 15	7% 20%
Pipe Insulation, Steam Med Fitting	2.05	1	3	MEA-2024.07.31-743451	11	27%
Pipe Insulation, Steam Small 1" to 2"	2.78 1	1 1.26	1 1	MEA-2024.07.02-731771 MEA-2024.08.19-761038	14 14	7% 7%
Pipe Insulation, X-Large >8"	2.44	1	1	MEA-2024.10.08-784081	2	50%

Source: Evaluation team analysis.

Finding 4. For one (MEA-2024.09.13-772357) out of 19 instances for the measure *Pipe Insulation, HW Medium 2.1" to 4"*, ex ante calculations were based on a Heat Loss from Bare Pipe of 175.6 Btu/hr-ft, Heat Loss from Insulated Pipe of 29.75 Btu/hr-ft, and Equivalent Full Load Hours of 4,963 hours. However, tracking data reported Heat Loss from Bare Pipe as 35.888 Btu/hr-ft, Heat Loss from Insulated Pipe as 8.778 Btu/hr-ft and Equivalent Full Load Hours as 8,766 hours. For calculating verified savings, the evaluation team used the inputs reported in the program data. *Pipe Insulation, HW Medium 2.1" to 4"* accounts for 0.85% of Retrofit component's verified gross Therms savings and the impact of this adjustment resulted in a RR of 99% for this measure.

Finding 5. For one (MEA-2024.11.06-803776) out of 36 instances for the measure *Pipe Insulation, HW Small*, the evaluation team was unable to replicate the ex ante savings. The tracking data reported 55.1987 Therms but the supplemental MMDB[1] file shows 77.611 Therms. Furthermore, the supplemental MMDB file shows this measure instance as "Xsmall < 1" size category, however, program data showed the project as HW Small. The evaluation team used the reported values in the program data to calculate verified savings. This measure accounts for 1.15% of Retrofit component's verified gross Therms savings and the impact of this adjustment resulted in a RR of 99% for this measure.

Finding 6. For all the five instances for the measure *Wall Insulation*, ex ante calculations used Efficiency of Heating System as 72% consistent with IL TRM v12.0. However, tracking data reported Efficiency of Heating System as 69.7%. The evaluation team used algorithm inputs reported in the program data to calculate verified savings. This measure accounts for 0.28% of Retrofit component's verified gross Therms savings and the impact of this adjustment resulted in a RR of 103% for this measure.

Finding 7. For one (MEA-2024.09.23-776011) out of 105 instances for the *Attic Insulation* measure, ex ante calculations used pre-R-value of 0. However, tracking data reported pre-R-value of 14. The evaluation team used algorithm inputs reported in the program data to calculate verified savings. This measure accounts for 9.96% of the Retrofit component's verified gross Therms savings and the combined impact of the adjustments in findings 8 and 9 resulted in a RR of 98% for this measure.

Finding 8. For the only instance for the measure *Non-Condensing Boilers, >85%*, ex ante calculations used baseline Boiler efficiency as 80%. However, tracking data reported baseline Boiler efficiency as 84%. The evaluation team used algorithm inputs reported in the program data to calculate verified savings. This measure accounts for 0.15% of Retrofit component's verified gross Therms savings and the impact of this resulted in a RR of 48% for this measure.

Recommendation 3. For each measure for findings 3-8, ensure that savings are calculated based on the inputs recorded in the program tracking data.

Finding 9. For two (MEA-2024.06.24-727737 and MEA-2024.06.24-727736) out of 11 measure instances for Steam Trap - MF, IE measure, ex ante calculations capped the savings to 20% of the building annual gas consumption. However, the program data does not include annual gas

[1] MF IE + PHA Feedback 04.07.25.xlsx

consumption for the building. The evaluation team applied the 20% cap to the building annual gas consumption provided in the supplemental MMDB file to calculate verified savings.

Recommendation 4. Ensure that the annual gas consumption of the building is included in the tracking data.

Finding 10. For one (MEA-2024.02.08-648022) out of 36 instances for the measure *Pipe Insulation, HW Small*, ex ante calculations used Heat Loss from Bare Pipe as 90.662 Btu/hr-ft and Heat Loss from Insulated Pipe as 18.849 Btu/hr-ft. However, tracking data reported Heat Loss from Bare Pipe as 35.888 Btu/hr-ft and Heat Loss from Insulated Pipe as 8.778 Btu/hr-ft. The evaluation team used inputs from the supplemental MMDB file provided by Nicor to calculate verified savings.

Finding 11. For two (MEA-2024.05.23-711697 and MEA-2024.05.23-711698) out of six measure instances for *Furnace Tune Up* measure, ex ante calculations used Boiler Input Capacity as 60 MBH. However, the tracking data reported Boiler Input Capacity as 50 MBH. The evaluation team used a Boiler Input Capacity of 60 MBH, consistent with the supplemental MMDB file provided by Nicor, to calculate verified savings.

Recommendation 5. Ensure that inputs used to calculate savings are recorded accurately in the tracking data. Instead of providing supplemental data after final tracking data have been submitted for evaluation, we recommend that Nicor Gas and the program implementer review the data collection and documentation process to improve the data tracking quality.

Finding 12. For one (MEA-2024.09.13-772419) out of nine instances for the measure Pipe Insulation, DHW Medium 1.26-2", the tracking data did not include all required inputs for calculating savings. Since the installation was in-unit, the ex ante savings were calculated using the methodology from Section 5.3.2 of the Residential Section in the IL-TRM v12.0. The evaluation team used the inputs provided in the supplemental MMDB file to calculate verified savings that are consistent with the savings reported in the tracking data. A summary of the inputs required to calculate savings for this measure is shown:

- Rexist – Not provided in the tracking data
- Rnew – Not provided in the tracking data
- Circumference - Tracking data reported as 1, supplemental calculations use 0.415
- Leffective - Tracking data reported as 1, supplemental calculations use 0.824
- Delta T - Tracking data reported as 90, supplemental calculations use 60

Recommendation 6. Consider enhancing program data collection to distinguish Pipe Insulation installation locations in Multifamily buildings as either in-unit or common areas and ensure that all the relevant inputs are reported correctly in the program data.

Ameren – Nicor

Finding 13. For nine out of 27 instances for the measure *Air Filter Replacement*, ex ante calculations used Furnace Heating Load as 861, corresponding to Springfield climate zone. However, for these instances, tracking data reported Furnace Heating Load as 1,005 therms, corresponding to Chicago climate zone. The evaluation team used the installation address to determine Furnace Heating Load as 861, corresponding to Springfield climate zone. This measure accounts for 0.97% of Ameren – Nicor component's verified gross Therms savings.

Recommendation 7. Ensure that algorithm inputs are reported consistent with the climate zones in the program data.

Finding 14. For two (MEA-2024.08.13-757970 and MEA-2024.08.13-757988) out of 41 instances for the *Air Sealing* measure, ex ante calculations used Adjustment for fossil heating savings and IE Net Correction as 76% and 110%, applicable for Air sealing along with attic insulation installations. The measure name states only Air Sealing and does not include Attic Insulation installations. The evaluation team used Adjustment for fossil heating savings and IE Net Correction as 100%, corresponding to only air sealing without attic insulation installations. This measure accounts for 18.5% of Ameren – Nicor component's verified gross Therms savings, and the impact of this adjustment resulted in a RR of 101% for this measure.

Recommendation 8. For Air sealing without attic insulation, do not apply adjustment for fossil heating and IE Net Correction factors.

Assessment

Finding 15. For one (MEA-2024.03.22-668167) out of five measure instances for *Programmable Thermostat* measure, ex ante calculations used a custom Gas Heating Consumption input for a Boiler heating system. However, the tracking data reported a default Gas Heating Consumption of 1,005 Therms, consistent with Chicago climate zone from IL TRM. The evaluation team used the custom Gas Heating Consumption consistent with ex ante calculations.

Recommendation 9. Ensure that custom algorithm inputs are reported correctly in the program tracking data.

Public Housing Energy Savings Program

Program Description

The Public Housing Energy Savings (PHES) Program works with public housing authorities (PHAs) in ComEd, Nicor Gas, Peoples Gas (PGL), and North Shore Gas (NSG) territories to achieve electric and gas savings. The PHAs themselves are the program participants, though the residents of the properties are directly affected by the program through in-unit and common area upgrades. Gas savings opportunities included both heating and water heating equipment upgrades and envelope measures (attic insulation, air sealing, and air filter replacement). The program also included gas saving direct install measures, such as boiler and furnace tune up, and water measure like shower timer.

The program had 24 participants in 2024 and completed 100 projects as shown in Table 7.

Table 7. 2024 Volumetric Findings Detail – Public Housing

Participation	Public Housing Energy Savings
Participants *	24
Installed Projects †	100
Measure Types Installed ‡	8
Total Number of Units in Buildings #	77

* Participants are defined as distinct count of addresses.
† Installed Projects are defined as distinct count of project IDs.
‡ Measure Types Installed are the distinct count of Nicor measure names.
# Total number of Units in Buildings are the quantity of Unit Assessment measures
Source: Nicor Gas tracking data and evaluation team analysis.

Table 8 summarizes the installed measure quantities that are the basis for verified energy savings.

Table 8. 2024 Installed Measure Quantities – Public Housing

Program Category	Program Path	Measure	Quantity Unit	Installed Quantity
Multi-Family Income Eligible	Public Housing	Health & Safety Services	Unit	239,408
		Attic Insulation	SQ FT	106,326
		Air Sealing	LN FT	63,794
		Furnace Tune Up	Unit	228
		Unit Assessment	Unit	77
		Air Filter Replacement	Unit	71
		Shower Timer	Unit	48
		Boiler Tune Up	Unit	8

Source: Nicor Gas tracking data and evaluation team analysis.

Program Savings Detail

Table 9 summarizes the energy savings achieved by Public Housing Program in 2024.

Table 9. 2024 Annual Energy Savings Summary – Public Housing

Program Category	Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms	NTG†	NSPO‡	Verified Net Savings (Therms)
Multi-Family Income Eligible	Public Housing	46,527	101%	46,849	1.00	N/A	46,849

* 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/ntg.
Source: Evaluation team analysis.
† NTG, Net to Gross is the deemed value available on the SAG website: https://www.ilsag.info/evaluator-ntg-recommendations-for-2024/.
‡ The non-IE market rate net savings are 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 10. The Air Sealing and Furnace Tune Up measures of the Public Housing path contributed the most savings.

Table 10. 2024 Annual Energy Savings by Measure – Public Housing

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

Multi-Family Income Eligible	Public Housing	Air Sealing	25,565	104%	26,538	1.00	N/A	26,538
		Furnace Tune Up	10,239	100%	10,239	1.00	N/A	10,239
		Attic Insulation	7,855	92%	7,204	1.00	N/A	7,204
		Boiler Tune Up	1,972	100%	1,972	1.00	N/A	1,972
		Air Filter Replacement	714	100%	714	1.00	N/A	714
		Shower Timer	182	100%	182	1.00	N/A	182
Total			**46,527**	**101%**	**46,849**	**1.00**		**46,849**

* 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/ntg.
Source: Evaluation team analysis.
† NTG, Net to Gross is the deemed value available on the SAG website: https://www.ilsag.info/evaluator-ntg-recommendations-for-2024/.
‡ The non-IE market rate net savings are 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 11 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.

Table 11. Verified Gross Savings Parameters – Public Housing

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
Air Filter Replacement	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.3.21 and PTD*
Air Sealing	LN FT	Varies	Varies	104%	Illinois TRM, v12.0†, Section 5.6.1 and PTD*
Assessment/No Savings	Unit	-	-	-	-
Attic Insulation	SQ FT	Varies	Varies	92%	Illinois TRM, v12.0†, Section 5.6.5 and PTD*
Boiler Tune Up	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 4.4.2 and PTD*

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
Furnace Tune Up	Unit	Varies	Varies	100%	Illinois TRM, v12.0†, Section 5.3.13 and PTD*
Shower Timer	Unit	3.79	3.79	100%	Illinois TRM, v12.0†, Section 5.4.9 and PTD*

* 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

Finding 16. For five out of six instances for the measure *Air Sealing*, ex ante calculations used Adjustment for fossil heating savings as 76%, applicable when calculating savings using Blower Door Test methodology. However, the program data reported that the methodology used for calculating savings is Prescriptive Infiltration Reduction methodology. The evaluation team used Adjustment for fossil heating savings as 80%, corresponding to Prescriptive Infiltration Reduction methodology to calculate verified savings. This measure accounts for 59.17% of Public Housing component's verified gross Therms savings and the impact of this resulted in an RR of 104% for this measure.

Recommendation 10. Use input parameter values consistent with the calculation methodology.

Finding 17. For four out of six instances for the measure Attic Insulation, ex ante calculations did not consider a Minimum R-value of 3 for uninsulated assemblies in Pre-install and post-install R-values. Tracking data reported Efficiency of Heating system as 72%. However, ex ante calculations used Efficiency of heating system as 76%. The evaluation team considered a Minimum R-value of 3 for uninsulated assemblies in Pre-install and post-install R-values, and a reported Efficiency of Heating system as 72%. This measure accounts for 16.06% of Public Housing component's verified gross Therms savings and the impact of this resulted in an RR of 92% for this measure.

Recommendation 11. Ensure that savings are calculated based on the inputs recorded in the program tracking data.

Appendix A. Impact Analysis Methodology

The evaluation team used the same impact methodology for each component. Verified gross savings were determined for each program measure by:

- Reviewing the savings algorithm inputs in the measure workbook for agreement with the IL-TRM v12.0 and IL-TRM Errata, where applicable.
- Validating the savings algorithm was applied correctly.
- Cross-checking per-unit savings values in the program tracking data with the verified values in the measure workbook or in Guidehouse's calculations if the workbook did not agree with the IL-TRM v12.0.
- 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 an NTG ratio. In Program Year 2024, 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.
- Guidehouse sourced methodologies and assumptions from the Illinois IL-TRM v12.0 and the final 2024 tracking data.

Appendix B. Program Specific Inputs for the Illinois TRC

Income Eligible Multi Family

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

Program Category	Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Verified Gross Annual Water Savings (Gallons)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Multi Family Income Eligible	Retrofits	Air Sealing	FALSE	LN FT	448,838	20.0	NO	-	189,082	189,082	189,082
		Controls for Domestic Hot Water	FALSE	Unit	1,509	15.0	NO	-	94,614	94,614	94,614
		Pipe Insulation	FALSE	LN FT	13,705	15.0	NO	-	91,749	87,870	87,870
		Attic Insulation	FALSE	SQ FT	700,525	20.0	NO	-	71,105	70,002	70,002
		Boiler Tune Up	FALSE	Unit	186	3.0	NO	-	54,997	54,997	54,997
		Steam Trap	FALSE	Unit	280	6.0	NO	284,842	40,319	40,319	40,319
		Programmable Thermostats	FALSE	Unit	663	8.0	NO	-	26,833	26,833	26,833
		Steam Boiler Averaging Controls	FALSE	Unit	431	20.0	NO	-	26,329	26,329	26,329
		Boiler Reset Controls	FALSE	Unit	41	16.0	NO	-	21,481	21,481	21,481

Program Category	Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Verified Gross Annual Water Savings (Gallons)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
		Low Flow Showerheads (IU)	FALSE	Unit	1,697	10.0	NO	3,330,169	20,984	20,984	20,984
		DHW Boiler Tune Up	FALSE	Unit	83	3.0	NO	-	6,810	13,748	13,748
		Advanced Thermostat	FALSE	Unit	246	11.0	NO	-	11,551	11,551	11,551
		Shower Timer	FALSE	Unit	2,299	2.0	NO	1,395,515	8,722	8,722	8,722
		Low Flow Aerator - Kitchen (IU)	FALSE	Unit	1,644	10.0	NO	874,927	4,637	4,637	4,637
		Linkageless Boiler Controls for Space Heating	FALSE	Unit	3,400	16.0	NO	-	2,302	2,302	2,302
		DHW Pipe Insulation	FALSE	LN FT	408	15.0	NO	-	1,945	1,954	1,954
		Low Flow Aerator - Bathroom (IU)	FALSE	Unit	1,146	10.0	NO	440,123	1,957	1,937	1,937
		Wall Insulation	FALSE	Unit	33,356	20.0	NO	-	1,869	1,930	1,930
		Basement/Sidewall Insulation	FALSE	Unit	1,625	20.0	NO	-	1,140	1,140	1,140
		High Efficiency Boiler	FALSE	Unit	1	16.5	NO	-	2,133	1,016	1,016
		Cover and Gap Sealers for AC	FALSE	Unit	117	5.0	NO	-	838	838	838

Program Category	Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Verified Gross Annual Water Savings (Gallons)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
		Furnace Tune Up	FALSE	Unit	7	3.0	NO	-	500	500	500
		Reprogrammable Thermostats	FALSE	Unit	7	8.0	NO	-	330	330	330
		Floor Insulation Above Crawlspace	FALSE	Unit	1,556	20.0	NO	-	182	182	182
		Air Filter Replacement	FALSE	Unit	15	3.0	NO	-	151	151	151
		Low Flow Aerator - Bathroom (CA)	FALSE	Unit	5	10.0	NO	7,689	34	34	34
	Ameren – Nicor	Duct Sealing	FALSE	Unit	37	20.0	NO	-	10,893	10,893	10,893
		Air Sealing	FALSE	LN FT	86	20.0	NO	-	3,903	3,937	3,937
		Furnace Tune Up	FALSE	Unit	32	3.0	NO	-	1,827	1,827	1,827
		Advanced Thermostat	FALSE	Unit	31	11.0	NO	-	1,665	1,665	1,665
		Floor Insulation Above Crawlspace	FALSE	Unit	5,600	20.0	NO	-	795	795	795
		DHW Pipe Insulation	FALSE	LN FT	176	15.0	NO	-	366	366	366
		Low Flow Aerator - Kitchen (IU)	FALSE	Unit	33	10.0	NO	45,880	243	243	243

Program Category	Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Verified Gross Annual Water Savings (Gallons)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
		Attic Insulation	FALSE	SQ FT	1,600	20.0	NO	-	298	298	298
		Air Filter Replacement	FALSE	Unit	27	3.0	NO	-	181	181	181
		Low Flow Showerheads (IU)	FALSE	Unit	27	10.0	NO	17,299	109	109	109
		Low Flow Aerator - Bathroom (IU)	FALSE	Unit	29	10.0	NO	9,812	43	43	43
		Boiler Pipe Insulation	FALSE	LN FT	1	15.0	NO	-	3	3	3
		Air Sealing	FALSE	LN FT	4,439	20.0	NO	-	2,403	2,403	2,403
		IE Custom	FALSE	Unit	1	15.0	NO	-	1,178	1,178	1,178
	IHWAP	Low Flow Aerator - Kitchen (IU)	FALSE	Unit	14	10.0	NO	23,256	123	123	123
		Low Flow Aerator - Bathroom (IU)	FALSE	Unit	19	10.0	NO	7,677	34	34	34
		Low Flow Showerheads (IU)	FALSE	Unit	4	10.0	NO	4,847	31	31	31
		Advanced Thermostat	FALSE	Unit	10	11.0	NO	-	731	731	731
	Assessment	Programmable Thermostats	FALSE	Unit	6	8.0	NO	-	332	332	332

Program Category	Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Verified Gross Annual Water Savings (Gallons)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
		Low Flow Showerheads (IU)	FALSE	Unit	17	10.0	NO	29,792	161	161	161
		Air Sealing	FALSE	LN FT	21	20.0	NO	-	154	154	154
		Air Filter Replacement	FALSE	Unit	19	3.0	NO	-	150	149	149
		Low Flow Aerator - Kitchen (IU)	FALSE	Unit	6	10.0	NO	5,537	25	25	25
		DHW Pipe Insulation	FALSE	LN FT	9	15.0	NO	-	17	17	17
		Low Flow Aerator - Bathroom (IU)	FALSE	LN FT	16	10.0	NO	4,448	17	17	17
		Boiler Pipe Insulation	FALSE	Unit	9	15.0	NO	-	4	4	4
		Air Sealing	FALSE	LN FT	3	20.0	NO	-	496	496	496
		Duct Sealing	FALSE	Unit	2	20.0	NO	-	369	369	369
	Healthy Homes	Advanced Thermostat	FALSE	Unit	4	11.0	NO	-	267	267	267
		Furnace Tune Up	FALSE	Unit	2	3.0	NO	-	119	119	119
		DHW Pipe Insulation	FALSE	LN FT	22	15.0	NO	-	46	46	46
		Air Filter Replacement	FALSE	Unit	2	3.0	NO	-	16	16	16

Program Category	Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Verified Gross Annual Water Savings (Gallons)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
		Low Flow Aerator - Kitchen (IU)	FALSE	Unit	1	10.0	NO	1,661	9	9	9
		Low Flow Showerheads (IU)	FALSE	Unit	1	10.0	NO	909	6	6	6
		Low Flow Aerator - Bathroom (IU)	FALSE	Unit	1	10.0	NO	577	3	3	3
Total or Weighted Average						**14.8**		**6,484,961**	**709,610**	**710,531**	**710,531**

Source: Evaluation team analysis.

Public Housing Energy Savings

Table B-12 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-2. Verified Cost Effectiveness Inputs – Public Housing

Program Category	Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Verified Gross Annual Water Savings (Gallons)	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Multi Family Income Eligible	**Public Housing**	Air Sealing	FALSE	LN FT	63,794	20.0	NO	-	25,565	26,538	26,538
		Furnace Tune Up	FALSE	Unit	228	3.0	NO	-	10,239	10,239	10,239
		Attic Insulation	FALSE	SQ FT	106,326	20.0	NO	-	7,855	7,204	7,204
		Boiler Tune Up	FALSE	Unit	8	3.0	NO	-	1,972	1,972	1,972
		Air Filter Replacement	FALSE	Unit	71	3.0	NO	-	714	714	714
		Shower Timer	FALSE	Unit	48	2.0	NO	29,138	182	182	182
Total or Weighted Average						**15.2**		**29,138**	**46,527**	**46,849**	**46,849**

Source: Evaluation team analysis.