



Business Energy Efficiency Rebates Program Impact Evaluation Report

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

Prepared for:

Nicor Gas Company

FINAL

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1. Introduction

This report presents the results of the Nicor Gas 2023 Business Energy Efficiency Rebates (BEER) program impact evaluation and a summary of the total program's energy impacts, broken out by program path and relevant measures. 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 BEER program provides incentives to business (private) and public sector customers that install new, high efficiency space heating, water heating, pipe insulation, commercial kitchen, and weatherstripping equipment covered by the program. The program consists of four delivery paths:

- Rebates for prescriptive cost-effective equipment as well as services (such as boiler tune-ups) to improve the energy efficiency of existing equipment.
- Free assessments and direct install measures, such as efficient faucet aerators, low-flow showerheads, and pre-rinse sprayers.
- Business optimization measures including steam traps and tune-ups.
- Midstream commercial food service (CFS) equipment incentives offering using midstream delivery channels. This path's goals are to reduce barriers for food service operators to purchasing energy efficient equipment, and to reduce energy usage in the commercial food service sector.

The program had 453 participants in 2023 and completed 491 projects as shown in Table 2-1. The program served customers in both the private and public sectors.

Table 2-1. 2023 Volumetric Findings Detail

Participation	Assessment Direct Install	Business Optimization Program	Midstream CFS	Prescriptive	Total
Private Sector					
Participants *	111	88	77	102	377
Installed Projects †	111	92	86	118	407
Measure Types Installed ‡	5	12	8	22	40
Public Sector					
Participants *	9	5	5	58	77
Installed Projects †	9	5	5	65	84
Measure Types Installed ‡	4	3	2	12	18
Program 2023 Total					
Participants *	120	93	82	159	453
Installed Projects †	120	97	91	183	491
Measure Types Installed ‡	5	14	8	24	41

Note: Values in this table represent distinct counts, so totals may not represent a sum of the respective column or row.

* Participants are defined as the distinct count of project site addresses

† Installed Projects are defined as the distinct count of project IDs

‡ Measure Types Installed are defined as the distinct count of tracking data measure name

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 Category	Program Path	Measure	Quantity Unit	Installed Quantity
Private	Assessment Direct Install	Faucet Aerator - Bath	Each	475
		Faucet Aerator - Kitchen	Each	7
		Pre-Rinse Spray Valves	Each	29
		Showerheads	Each	89
	Business Optimization Program	Boiler Tune Up, Process	Each	28
		Pipe Insulation	Ln Ft	1,926
		Steam Trap, Dry Cleaner	Each	524
		Steam Trap, Industrial High Pressure	Each	175
		Steam Trap, Industrial Medium Pressure	Each	217
		Automatic Conveyor Broiler	Each	21
	Midstream CFS	Combination Oven	Each	1
		Convection Oven	Each	16
		Dishwasher	Each	2
		Fryer	Each	56
		Griddle	Each	7
		Infrared Salamander Broiler	Each	1
	Prescriptive	Kitchen Demand Ventilation Controls	Each	3
		Boiler Chemical Descaling	Each	3
		Boiler Tune Up, Process	Each	5
		Boiler Tune Up, Space Heating	Each	25
		Combination Oven	Each	3
		Compressed Air Heat Recovery	Each	1
		Fryer	Each	24
		High Efficiency Boiler	Each	15
		High Efficiency Furnace	Each	67
		Infrared Charbroiler	Each	3
		Infrared Heaters	Each	3
		Pasta Cooker	Each	1
Pipe Insulation		Ln Ft	1,307	
Small Commercial Thermostat		Each	6	
Steam Trap, Commercial		Each	115	
Steam Trap, Dry Cleaner		Each	98	

Program Category	Program Path	Measure	Quantity Unit	Installed Quantity
Public		Steam Trap, Industrial High Pressure	Each	14
		Steam Trap, Industrial Medium Pressure	Each	83
		Water Heater	Each	3
	Assessment Direct Install	Faucet Aerator - Bath	Each	40
		Faucet Aerator - Kitchen	Each	1
		Pre-Rinse Spray Valves	Each	1
		Showerheads	Each	2
		Boiler Tune Up, Process	Each	1
	Business Optimization Program	Boiler Tune Up, Space Heating	Each	5
		Steam Trap, Commercial	Each	12
	Midstream CFS	Convection Oven	Each	3
		Fryer	Each	3
	Prescriptive	Boiler Tune Up, Process	Each	1
		Boiler Tune Up, Space Heating	Each	87
		High Efficiency Boiler	Each	21
		High Efficiency Furnace	Each	7
		Small Commercial Thermostat	Each	1
		Steam Trap, Commercial	Each	130
		Steam Trap, Industrial High Pressure	Each	8
		Steam Trap, Industrial Medium Pressure	Each	10
Water Heater		Each	1	

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

3. Program Savings Detail

Table 3-1 summarizes the energy savings the BEER 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+	Verified Net Savings (Therms)
Private, Non-Disadvantaged Communities	Assessment Direct Install	13,196	100%	13,199	0.86	11,351
	Business Optimization Program	1,287,471	101%	1,298,035	0.92	1,194,192
	Midstream CFS	110,909	88%	98,000	0.80	78,400
	Prescriptive	592,695	100%	590,461	Thermostat = 0.92 All Other = 0.86	507,835
Private, Non-DAC Subtotal		2,004,271	100%	1,999,695		1,791,779

Program Category	Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Private, Disadvantaged Communities	Assessment Direct Install	1,628	100%	1,628	1.00	1,628
	Business Optimization Program	576,815	101%	583,311	1.00	583,311
	Midstream CFS	14,043	88%	12,393	1.00	12,393
	Prescriptive	25,767	102%	26,172	1.00	26,172
Private, DAC Subtotal		618,253	101%	623,504		623,504
Public, Non-Disadvantaged Communities	Assessment Direct Install	626	100%	626	0.86	538
	Business Optimization Program	2,407	106%	2,548	0.92	2,344
	Midstream CFS	3,607	66%	2,377	0.80	1,902
	Prescriptive	298,566	101%	301,661	Thermostat = 0.92 All Other = 0.86	12,419
Public, Non-DAC Subtotal		305,206	101%	307,212		264,226
Public, Disadvantaged Communities	Assessment Direct Install	20	100%	20	1.00	20
	Business Optimization Program	2,781	100%	2,781	1.00	2,781
	Prescriptive	67,202	103%	68,968	1.00	68,968
Public, DAC Subtotal		70,003	103%	71,769		71,769
Total		2,997,733	100%	3,002,180		2,751,278

Note Totals may not sum due to rounding.

* 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/>. Projects in disadvantaged communities designated sites (DAC) have a NTG of 1.0.

Source: Guidehouse evaluation team analysis.

4. Program Savings by Measure

The BEER program includes 28 reporting measures as shown in Table 4-1; Table 4-2 and Table 4-3 present the results by program sector type. The Steam Trap – Industrial High Pressure, Steam Trap – Dry Cleaner, and Boiler Tune Up – Space Heating measures contributed the most savings.

Table 4-1. 2023 Annual Energy Savings by Measure – Program Total

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Program Total, Non-Disadvantaged Communities	Assessment Direct Install	Faucet Aerator - Bath	5,809	100%	5,809	0.86	4,996
		Faucet Aerator - Kitchen	112	100%	112	0.86	96
		Pre-Rinse Spray Valves	5,935	100%	5,935	0.86	5,104
		Showerheads	1,966	100%	1,969	0.86	1,693
	Business Optimization Program	Boiler Tune Up, Process	52,557	100%	52,557	0.92	48,353
		Pipe Insulation	4,101	12%	499	0.92	459
		Steam Trap, Commercial	2,407	106%	2,548	0.92	2,344
		Steam Trap, Dry Cleaner	294,376	101%	297,518	0.92	273,717
		Steam Trap, Industrial High Pressure	686,063	101%	691,805	0.92	636,460
	Midstream CFS	Steam Trap, Industrial Medium Pressure	250,374	102%	255,655	0.92	235,203
		Automatic Conveyor Broiler	61,526	100%	61,526	0.80	49,221
		Convection Oven	4,374	80%	3,517	0.80	2,813
		Dishwasher	88	82%	73	0.80	58
		Fryer	38,563	75%	29,015	0.80	23,212
		Griddle	4,112	100%	4,119	0.80	3,295
	Prescriptive	Kitchen Demand Ventilation Controls	5,853	36%	2,129	0.80	1,703
		Boiler Chemical Descaling	18,910	100%	18,910	0.86	16,263
		Boiler Tune Up, Process	23,151	100%	23,151	0.86	19,910
		Boiler Tune Up, Space Heating	284,016	100%	284,108	0.86	244,333
		Combination Oven	1,514	114%	1,733	0.86	1,490
		Compressed Air Heat Recovery	1,571	100%	1,571	0.86	1,351
		Fryer	13,226	108%	14,300	0.86	12,298
		High Efficiency Boiler	172,254	97%	167,668	0.86	144,195
		High Efficiency Furnace	16,152	104%	16,746	0.86	14,402
		High Efficiency Furnace	2,124	105%	2,223	0.86	1,912
		Infrared Charbroiler	2,120	100%	2,120	0.86	1,823
		Infrared Heaters	597	100%	597	0.86	513
		Pasta Cooker	1,380	100%	1,380	0.86	1,187

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG+	Verified Net Savings (Therms)
		Pipe Insulation	4,290	19%	799	0.86	687
		Small Commercial Thermostat	1,069	82%	880	0.92	810
		Steam Trap, Commercial	22,649	106%	23,974	0.86	20,618
		Steam Trap, Dry Cleaner	47,557	101%	48,065	0.86	41,336
		Steam Trap, Industrial High Pressure	78,759	101%	79,436	0.86	68,315
		Steam Trap, Industrial Medium Pressure	199,298	102%	202,720	0.86	174,340
		Water Heater	624	279%	1,740	0.86	1,496
	Assessment Direct Install	Faucet Aerator - Bath	461	100%	461	1.00	461
		Pre-Rinse Spray Valves	1,187	100%	1,187	1.00	1,187
	Business Optimization Program	Boiler Tune Up, Process	25,134	100%	25,134	1.00	25,134
		Boiler Tune Up, Space Heating	1,352	100%	1,352	1.00	1,352
		Steam Trap, Dry Cleaner	62,835	101%	63,505	1.00	63,505
		Steam Trap, Industrial High Pressure	318,812	101%	321,471	1.00	321,471
		Steam Trap, Industrial Medium Pressure	171,464	102%	174,630	1.00	174,630
	Program Total, Disadvantaged Communities	Combination Oven	566	100%	566	1.00	566
		Convection Oven	837	81%	676	1.00	676
		Dishwasher	455	100%	455	1.00	455
	Midstream CFS	Fryer	7,301	101%	7,361	1.00	7,361
		Infrared Salamander Broiler	240	100%	240	1.00	240
		Kitchen Demand Ventilation Controls	4,644	67%	3,096	1.00	3,096
	Prescriptive	Boiler Tune Up, Process	889	100%	889	1.00	889
		Boiler Tune Up, Space Heating	8,898	100%	8,898	1.00	8,898
		High Efficiency Furnace	2,638	105%	2,758	1.00	2,758
		Steam Trap, Commercial	23,985	106%	25,389	1.00	25,389
		Steam Trap, Dry Cleaner	11,211	101%	11,330	1.00	11,330
		Steam Trap, Industrial High Pressure	30,831	101%	31,032	1.00	31,032
		Steam Trap, Industrial Medium Pressure	14,518	102%	14,844	1.00	14,844

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG+	Verified Net Savings (Therms)
Total			2,997,733	100%	3,002,180		2,751,278

* 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/>. Projects in disadvantaged communities designated sites (DAC) have a NTG of 1.0.

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

Table 4-2. 2023 Annual Energy Savings by Measure – Private Sector

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG+	Verified Net Savings (Therms)
Private, Non-Disadvantaged Communities	Assessment Direct Install	Faucet Aerator - Bath	5,468	100%	5,468	0.86	4,703
		Faucet Aerator - Kitchen	107	100%	107	0.86	92
		Pre-Rinse Spray Valves	5,698	100%	5,698	0.86	4,900
		Showerheads	1,922	100%	1,926	0.86	1,656
	Business Optimization Program	Boiler Tune Up, Process	52,557	100%	52,557	0.92	48,353
		Pipe Insulation	4,101	12%	499	0.92	459
		Steam Trap, Dry Cleaner	294,376	101%	297,518	0.92	273,717
		Steam Trap, Industrial High Pressure	686,063	101%	691,805	0.92	636,460
	Midstream CFS	Steam Trap, Industrial Medium Pressure	250,374	102%	255,655	0.92	235,203
		Automatic Conveyor Broiler	61,526	100%	61,526	0.80	49,221
		Convection Oven	3,742	78%	2,922	0.80	2,338
		Dishwasher	88	82%	73	0.80	58
		Fryer	35,587	77%	27,233	0.80	21,786
		Griddle	4,112	100%	4,119	0.80	3,295
	Prescriptive	Kitchen Demand Ventilation Controls	5,853	36%	2,129	0.80	1,703
		Boiler Chemical Descaling	18,910	100%	18,910	0.86	16,263
		Boiler Tune Up, Process	23,151	100%	23,151	0.86	19,910
		Boiler Tune Up, Space Heating	107,894	100%	107,754	0.86	92,668
		Combination Oven	1,514	114%	1,733	0.86	1,490
		Compressed Air Heat Recovery	1,571	100%	1,571	0.86	1,351
Fryer		13,226	108%	14,300	0.86	12,298	
High Efficiency Boiler		56,449	87%	49,308	0.86	42,405	

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Private, Disadvantaged Communities		High Efficiency Furnace	16,152	104%	16,746	0.86	14,402
		Infrared Charbroiler	2,120	100%	2,120	0.86	1,823
		Infrared Heaters	597	100%	597	0.86	513
		Pasta Cooker	1,380	100%	1,380	0.86	1,187
		Pipe Insulation	4,290	19%	799	0.86	687
		Small Commercial Thermostat	808	80%	646	0.92	594
		Steam Trap, Commercial	18,637	106%	19,728	0.86	16,966
		Steam Trap, Dry Cleaner	47,557	101%	48,065	0.86	41,336
		Steam Trap, Industrial High Pressure	78,759	101%	79,436	0.86	68,315
		Steam Trap, Industrial Medium Pressure	199,298	102%	202,720	0.86	174,340
		Water Heater	381	393%	1,497	0.86	1,287
		Assessment Direct Install	Faucet Aerator - Bath	441	100%	441	1.00
		Pre-Rinse Spray Valves	1,187	100%	1,187	1.00	1,187
	Business Optimization Program	Boiler Tune Up, Process	23,705	100%	23,705	1.00	23,705
		Steam Trap, Dry Cleaner	62,835	101%	63,505	1.00	63,505
		Steam Trap, Industrial High Pressure	318,812	101%	321,471	1.00	321,471
		Steam Trap, Industrial Medium Pressure	171,464	102%	174,630	1.00	174,630
	Midstream CFS	Combination Oven	566	100%	566	1.00	566
		Convection Oven	837	81%	676	1.00	676
		Dishwasher	455	100%	455	1.00	455
		Fryer	7,301	101%	7,361	1.00	7,361
		Infrared Salamander Broiler	240	100%	240	1.00	240
		Kitchen Demand Ventilation Controls	4,644	67%	3,096	1.00	3,096
	Prescriptive	Boiler Tune Up, Space Heating	2,317	100%	2,317	1.00	2,317
		High Efficiency Furnace	2,638	105%	2,758	1.00	2,758
		Steam Trap, Dry Cleaner	11,211	101%	11,330	1.00	11,330
		Steam Trap, Industrial Medium Pressure	9,602	102%	9,766	1.00	9,766
Total			2,622,524	100%	2,623,199		2,415,283

* 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/>. Projects in disadvantaged communities designated sites (DAC) have a NTG of 1.0.

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

Table 4-3. 2023 Annual Energy Savings by Measure – Public Sector

Savings Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Public, Non-Disadvantaged Communities	Assessment Direct Install	Faucet Aerator - Bath	341	100%	341	0.86	293
		Faucet Aerator - Kitchen	4	100%	4	0.86	4
		Pre-Rinse Spray Valves	237	100%	237	0.86	204
		Showerheads	43	100%	43	0.86	37
	Business Optimization Program	Steam Trap, Commercial	2,407	106%	2,548	0.92	2,344
	Midstream CFS	Convection Oven	631	94%	595	0.80	476
		Fryer	2,976	60%	1,783	0.80	1,426
	Prescriptive	Boiler Tune Up, Space Heating	176,121	100%	176,355	0.86	151,665
		High Efficiency Boiler	115,805	102%	118,360	0.86	101,790
		High Efficiency Furnace	2,124	105%	2,223	0.86	1,912
Small Commercial Thermostat		262	89%	234	0.92	215	
Steam Trap, Commercial		4,012	106%	4,246	0.86	3,652	
	Water Heater	243	100%	243	0.86	209	
Public, Disadvantaged Communities	Assessment Direct Install	Faucet Aerator - Bath	20	100%	20	1.00	20
	Business Optimization Program	Boiler Tune Up, Process	1,429	100%	1,429	1.00	1,429
		Boiler Tune Up, Space Heating	1,352	100%	1,352	1.00	1,352
	Prescriptive	Boiler Tune Up, Process	889	100%	889	1.00	889
		Boiler Tune Up, Space Heating	6,581	100%	6,581	1.00	6,581
		Steam Trap, Commercial	23,985	106%	25,389	1.00	25,389
		Steam Trap, Industrial High Pressure	30,831	101%	31,032	1.00	31,032
	Steam Trap, Industrial Medium Pressure	4,917	103%	5,078	1.00	5,078	
Total			375,210	101%	378,981		335,996

* 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/>. Projects in disadvantaged communities designated sites (DAC) have a NTG of 1.0.

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 the evaluation team’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 more or less than 100%. The findings and recommendations presented are specific to individual measures, the program realization rate is 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)
Automatic Conveyor Broiler	Each	Varies	Varies	100%	Program Tracking Data (PTD)* IL TRM†, 4.2.22,
Boiler Chemical Descaling	Each	Varies	Varies	100%	IL TRM, 4.4.49, PTD
Boiler Tune Up, Process	Each	Varies	Varies	100%	IL TRM, 4.4.3, PTD
Boiler Tune Up, Space Heating	Each	Varies	Varies	100%	IL TRM, 4.4.2, PTD
Combination Oven	Each	Varies	Varies	111%	IL TRM, 4.2.1, PTD
Compressed Air Heat Recovery	Each	Varies	Varies	100%	IL TRM, 4.7.9, PTD
Convection Oven	Each	Varies	Varies	80%	IL TRM, 4.2.5, IL TRM v11.0 Errata Memo, PTD
Dishwasher	Each	Varies	Varies	97%	IL TRM, 4.2.6, PTD
Faucet Aerator - Bath	Each	Varies	Varies	100%	IL TRM, 4.3.2, PTD
Faucet Aerator - Kitchen	Each	Varies	Varies	100%	IL TRM, 4.3.2, PTD
Fryer	Each	Varies	Varies	86%	IL TRM, 4.2.7, PTD
Griddle	Each	Varies	Varies	100%	IL TRM, 4.2.8, PTD
High Efficiency Boiler	Each	Varies	Varies	97%	IL TRM, 4.4.10, PTD
High Efficiency Furnace	Each	Varies	Varies	104%	IL TRM, 4.4.11, PTD
Infrared Charbroiler	Each	Varies	Varies	100%	IL TRM, 4.2.12, PTD
Infrared Heaters	Each	Varies	Varies	100%	IL TRM, 4.4.12, PTD
Infrared Salamander Broiler	Each	Varies	Varies	100%	IL TRM, 4.2.14, PTD
Kitchen Demand Ventilation Controls	Each	Varies	Varies	50%	IL TRM, 4.2.16, PTD
Pasta Cooker	Each	1,380	1,380	100%	IL TRM, 4.2.17, PTD
Pipe Insulation	Ln Ft	Varies	Varies	15%	IL TRM, 4.4.14, PTD
Pre-Rinse Spray Valves	Each	Varies	Varies	100%	IL TRM, 4.2.11, PTD
Showerheads	Each	Varies	Varies	100%	IL TRM, 4.3.3, PTD
Small Commercial Thermostat	Each	Varies	Varies	82%	IL TRM, 4.4.48, PTD
Steam Trap, Commercial	Each	Varies	Varies	106%	IL TRM, 4.4.16, PTD
Steam Trap, Dry Cleaner	Each	Varies	Varies	101%	IL TRM, 4.4.16, PTD

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
Steam Trap, Industrial High Pressure	Each	Varies	Varies	101%	IL TRM, 4.4.16, PTD
Steam Trap, Industrial Medium Pressure	Each	Varies	Varies	102%	IL TRM, 4.4.16, PTD
Water Heater	Each	Varies	Varies	279%	IL TRM, 4.3.1, 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

Finding 1. The evaluation team compared inputs in the tracking data to the Qualified Products List (QPL) according to manufacturer and model number. The Fryer, Convection Oven, Griddle, Dishwasher, Automatic Conveyor Broiler, and Combination Oven measures had certain efficient measure inputs that did not match between the tracking data and QPL. Verified savings values utilize the QPL values in those cases. More details can be seen in Appendix B for the Fryer, Convection Oven, Griddle, and Combination Oven details as these had savings inputs provided in the tracking data.

It should be noted the evaluation team did not utilize the QPL for every measure of the Food Service Equipment end use:

- The Infrared Salamander Broiler because the QPL efficient input rate was larger than the tracking data’s provided base input rate.
- The Infrared Charbroiler because the Vulcan VCCB25 specifics could not be found.
- The Fryer measure of the model Henny Penny EEG-16# because it could not be found in the QPL.
- Kitchen Demand Ventilation Controls because the QPL only provided incentive values.
- Pre-Rinse Spray Valves because the evaluation team understood ex ante savings to follow the Illinois Technical Reference Manual version 11.0 (IL TRM v11.0).

Recommendation 1. Review the QPL and tracking data, and ensure reported measure input values and ex ante savings reflect the correct efficient values.

Finding 2. We found a few cases where the tracking database was missing important inputs. In such cases the evaluation team made some assumptions to calculate savings for a few of the program measures:

- The tracking data did not have details for Dishwasher and Automatic Conveyor Broilers. The IL TRM v11.0 deemed inputs and the QPL values for efficient input cases were used for verified savings calculations. These measures had a realization rate of 100%, except for the Dishwasher in VendorProjectID 1284350.
- The evaluation team assumed the Griddle width value provided in the tracking data was in inches for all instances of the measure and divided it by 12 before including it in the savings calculation.

- In the tracking data, Pre-Rinse Spray Values have a base case flow (FLO_base) value of 1.9 and an efficient case flow (FLO_eff) value of 1.06 for Measure IDs MC-9365289 MC-9395754 MC-9396077 MC-9537424 MC-9466652 MC-9474601 MC-9492688 MC-9395408 MC-9412680. However, the evaluation team found these measures' ex ante savings use a FLO_base value of 2.14 and a FLOW_eff value of 0.98, which align with the IL TRM v11.0. For verified savings, the evaluation team also used the TRM values.
- Convection Ovens with the tracking data Manufacturer Nieco were Vulcan (Measure ID 1208832) and Southbend (Measure ID 1294946) according to the QPL.

Recommendation 2. Review the manufacturer information. Ensure the tracking data reflects all necessary input values and conclusions used in ex ante savings values.

Finding 3. The evaluation team was unable to replicate ex ante savings for some Fryer measures (Measure IDs 1338244 1178352 1284375 1301116 1395844 1395850 1160269 1239078) and all Convection Oven measures before applying the QPL changes as noted in Finding 1. The evaluation team was also unable to replicate ex ante savings for two of the Kitchen Demand Controlled Ventilation measures (Measure IDs 1290233 and 1338278), as well as the Boiler Tune Up – Space Heating measure with Measure ID MLI – 11637952.

Recommendation 3. Ensure the tracking data reflect the savings assumptions and inputs reflect the ex ante savings values reported for their respective measures.

Finding 4. During the midyear interim impact analysis¹, the evaluation team was unable to recreate ex ante savings for a number of the High Efficiency Boiler, High Efficiency Furnace, Pipe Insulation, and Water Heater measures. These issues were not addressed in the final tracking data used for this report.

Recommendation 4. Provide more information behind the ex ante calculations for these measures. Ensure all inputs align with IL TRM or values provided in the tracking data could be used to reproduce the ex ante savings.

Finding 5. The steam trap ex ante savings appear to use deemed TRM inputs, steam loss per leaking trap (Sa) and temperature of saturated steam (T1) for the Industrial Steam Trap measures. This approach is consistent with the verified savings approach. However, the ex ante appear to use values from the tracking data field Utilization Factor for T1. The evaluation team is unsure of the source of these values, so verified savings use the deemed T1 values in IL TRM v11.0.

Recommendation 5. The program should utilize the “Measure Notes” field in the tracking data to document outliers in savings inputs or changes in savings calculation methodologies.

Finding 6a. The evaluation team calculated a realization rate of negative 99% for the Boiler Tune Up – Space Heating measure with Measure ID MLI – 13372384. Verified savings utilize the values provided in the tracking data, specifically Post Installation Efficiency and Pre Installation Efficiency values as they are documented in the data columns.

¹ Nicor Gas 2023 Interim Impact Review Summary Findings (email on 11/17/2024).

Finding 6b. The Boiler Tune Up – Space Heating measures with Measure IDs MLI - 14053045 and MLI – 14053062 are in climate zone 3 and verified savings utilize the associated Equivalent Full Load Hours (EFLH) values. The evaluation team observed ex ante savings for these measures use the EFLH value associated with Climate Zone 2.

Recommendation 6. Review ex ante savings calculations for all Boiler Tune Up – Space Heating measures. Ensure the information provided in the tracking data aligns with the calculated ex ante savings and the project's climate zone information.

Finding 7. The ex ante savings use a baseline adjustment factor (BAF) value of 1.0 for the Small Commercial Thermostat measure. The tracking data does not provide information about a baseline measure, so verified savings use a BAF of 0.8 for unknown. Additionally, the evaluation team was unable to recreate ex ante savings for Measure ID MLI – 10318635.

Recommendation 7. Provide a field in the tracking data that contains information about the baseline thermostat. Ensure the ex ante savings reflect TRM values provided in the tracking data.

Appendix A. Impact Analysis Methodology

Guidehouse calculated the verified gross savings for each measure type by conducting a review of the tracking data and applying the algorithms of IL TRM v11.0² and IL TRM v11.0 Errata Memo³. The evaluation team checked that provided savings inputs from the tracking data matched IL TRM v11.0 and that custom inputs were properly used. Then the tracking data and custom values used for the verified savings were adjusted from the tracking data, as necessary. The savings algorithms were applied to determine the verified savings of each measure. Verified gross realization rates are calculated by dividing the verified savings by the ex ante gross savings.

For most Food Service Equipment end use measures (applicable measures can be found in the Assessment Direct Install, Midstream CFS, and Prescriptive program paths), Guidehouse conducted an additional tracking data verification step. The evaluation team compared the tracking data values for these ENERGY STAR measures to the ENERGY STAR QPLs⁴ by manufacturer and model number. Where the team found tracking data values and QPLs values disagreed, the evaluation team updated the tracking data using the QPL values. This approach aligns with Guidehouse's process for the ComEd and Peoples Gas and North Shore Gas evaluations.

The evaluation team calculated verified net savings by multiplying the verified gross savings estimates by a NTGR deemed by a consensus process through the IL SAG.⁵ Measures installed in a disadvantaged community designated site, identified using the provided tracking data column DAC - ILSFA IE tract, used a NTG ratio of 1.00.

² Available on the Illinois Stakeholder Advisory Group website: <https://www.ilsag.info/technical-reference-manual/il-statewide-technical-reference-manual-version-11-0/>

³ Ibid

⁴ Obtained from the Implementation Contractor for the 2023 calendar year: <https://www.il-foodservicerebates.com/qualifying-equipment>

⁵ Available on the Illinois Stakeholder Advisory Group website: <https://www.ilsag.info/evaluator-ntg-recommendations-for-2023/>

Appendix B. Impact Analysis Supplemental Information

Table B-1. Combination Oven Energy Star QPL Values Used for Verified Savings

Program Path	Measure ID	Convection Cooking Energy Efficiency	Steam Cooking Energy Efficiency	Convection Production Capacity	Steam Production Capacity	Number of Pans	Realization Rate
Midstream CFS	1269849	0.62	0.58	414	688	40	100%
Prescriptive	MLI - 13005301	0.6	0.48	117	181	12	114%
Prescriptive	MLI - 13005575	0.6	0.48	117	181	12	114%
Prescriptive	MLI - 13005661	0.6	0.48	117	181	12	114%

Source: Nicor Gas tracking data, Energy Star QPL, and evaluation team analysis.

Table B-2. Convection Oven Energy Star QPL Values Used for Verified Savings

Program Path	Measure ID	Cooking Efficiency	Production Capacity	Preheat Energy Rate	Idle Energy Rate	Realization Rate
Midstream CFS	1165910	0.51*	78*	40,000	6,798*	109%
Midstream CFS	1199171	0.51*	78*	40,000	6,798*	109%
Midstream CFS	1200480	0.51*	78*	40,000	6,798*	109%
Midstream CFS	1208832	0.5*	79*	50,000	9,473*	46%
Midstream CFS	1221146	0.51*	78*	40,000	6,798*	109%
Midstream CFS	1221148	0.51*	78*	40,000	6,798*	109%
Midstream CFS	1221709	0.53*	90*	45,000	7,179*	108%
Midstream CFS	1245032	0.51	96*	50,000	8,651	87%
Midstream CFS	1275735	0.51	96*	50,000	8,651	47%
Midstream CFS	1294946	0.51*	78*	40,000	6,798*	49%
Midstream CFS	1303294	0.55*	95*	70,000	8,866*	45%

* Tracking data and Energy Star QPL match

Source: Nicor Gas tracking data, Energy Star QPL, and evaluation team analysis.

Table B-3. Fryer Energy Star QPL Values Used for Verified Savings

Program Path	Measure ID	Cooking Efficiency	Production Capacity	Preheat Energy Rate	Idle Energy Rate	Realization Rate
Midstream CFS	1156120	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1160269	0.54*	60*	10,592	8,764*	100%
Midstream CFS	1166708	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1174229	0.54*	60*	10,592	8,764*	103%
Midstream CFS	1176760	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1176768	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1178352	0.6*	66*	9,265*	3,832*	25%
Midstream CFS	1180898	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1182693	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1186656	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1191569	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1192596	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1205208	0.5	57	9,785	7,296	104%
Midstream CFS	1206261	0.5	57	9,785	7,296	104%
Midstream CFS	1210529	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1210911	0.5*	58*	11,903	7,966*	103%
Midstream CFS	1222361	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1225500	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1225504	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1225516	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1225577	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1226813	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1232426	0.54*	60*	10,592*	8,764*	100%
Midstream CFS	1239078	0.5	49	10,470*	7,317*	100%

Program Path	Measure ID	Cooking Efficiency	Production Capacity	Preheat Energy Rate	Idle Energy Rate	Realization Rate
Midstream CFS	1241183	0.5*	57*	9,785*	7,296*	100%
Midstream CFS	1275163	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1276384	0.5*	57*	9,785*	7,296*	100%
Midstream CFS	1279015	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1284375	0.5*	72*	13,755*	7,040*	33%
Midstream CFS	1286944	0.54*	60*	10,592*	8,764*	100%
Midstream CFS	1288772	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1292474	0.54*	60*	10,592*	8,764*	100%
Midstream CFS	1296990	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1297003	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1301116	0.53*	66*	8,141*	7,409*	33%
Midstream CFS	1302728	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1302746	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1306414	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1306418	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1308297	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1310780	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1336157	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1338244	0.56*	107*	16,935*	11,819*	20%
Midstream CFS	1388642	0.5*	49*	10,470*	7,317*	100%
Midstream CFS	1392916	0.5*	58*	11,903*	7,966*	100%
Midstream CFS	1395844	0.54*	64*	8,935*	5,790*	33%
Midstream CFS	1395850	0.54*	64*	8,935*	5,790*	33%
Prescriptive	MLI - 13372073	0.61	99	14,884	11,226	111%
Prescriptive	MLI - 13372257	0.61	99	14,884	11,226	111%

Program Path	Measure ID	Cooking Efficiency	Production Capacity	Preheat Energy Rate	Idle Energy Rate	Realization Rate
Prescriptive	MLI - 13372375	0.61	99	14,884	11,226	111%
Prescriptive	MC-9422003	0.54*	67	10,275	8,510	108%

* Tracking data and Energy Star QPL match

Source: Nicor Gas tracking data, Energy Star QPL, and evaluation team analysis.

Table B-4. Griddle Energy Star QPL Values Used for Verified Savings

Program Path	Measure ID	Cooking Efficiency	Production Capacity	Griddle Surface Area	Preheat Energy Rate	Idle Energy Rate	Realization Rate
Midstream CFS	1395834	0.51*	11.9*	6.00*	2,817	1,418*	112%
Midstream CFS	1395841	0.48*	12.5*	5.57	1,886	906*	99%
Midstream CFS	1395843	0.48*	12.5*	5.57	1,886	906*	99%
Midstream CFS	1395848	0.48*	12.5*	5.57	1,886	906*	99%
Midstream CFS	1395858	0.48*	12.5*	5.57	1,886	906*	99%

* Tracking data and Energy Star QPL match

Source: Nicor Gas tracking data, Energy Star QPL, and evaluation team analysis.

Appendix C. Program Specific Inputs for the Illinois TRC

Table C-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 Table C-1 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 C-1. 2023 Cost Effectiveness Inputs

Program Category	Program Path	Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Private, Non-Disadvantaged Communities	Assessment Direct Install	Faucet Aerator - Bath	Each	437	10.0	5,468	5,468	4,703
		Faucet Aerator - Kitchen	Each	7	10.0	107	107	4,900
		Pre-Rinse Spray Valves	Each	24	5.0	5,698	5,698	1,656
		Showerheads	Each	89	10.0	1,922	1,926	459
	Business Optimization Program	Boiler Tune Up, Process	Each	24	2.0	52,557	52,557	273,717
		Pipe Insulation	Ln Ft	1,926	15.0	4,101	499	235,203
		Steam Trap, Dry Cleaner	Each	426	6.0	294,376	297,518	49,221
		Steam Trap, Industrial High Pressure*	Each	121	6.2	686,063	691,805	58
		Steam Trap, Industrial Medium Pressure*	Each	140	8.6	250,374	255,655	3,295
	Midstream CFS	Automatic Conveyor Broiler	Each	21	12.0	61,526	61,526	16,263
		Convection Oven	Each	13	12.0	3,742	2,922	92,668
		Dishwasher*	Each	1	14.3	88	73	1,351
		Fryer	Each	44	12.0	35,587	27,233	42,405
		Griddle	Each	7	12.0	4,112	4,119	1,823
	Prescriptive	Kitchen Demand Ventilation Controls	Each	1	20.0	5,853	2,129	1,187
		Boiler Chemical Descaling	Each	3	6.0	18,910	18,910	594
		Boiler Tune Up, Process	Each	5	2.0	23,151	23,151	16,966

Program Category	Program Path	Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
		Boiler Tune Up, Space Heating	Each	22	3.0	107,894	107,754	41,336
		Combination Oven	Each	3	12.0	1,514	1,733	174,340
		Compressed Air Heat Recovery	Each	1	15.0	1,571	1,571	1,287
		Fryer	Each	24	12.0	13,226	14,300	441
		High Efficiency Boiler	Each	15	25.0	56,449	49,308	1,187
		High Efficiency Furnace	Each	57	16.5	16,152	16,746	23,705
		Infrared Charbroiler	Each	3	12.0	2,120	2,120	321,471
		Infrared Heaters	Each	3	15.0	597	597	174,630
		Pasta Cooker	Each	1	12.0	1,380	1,380	566
		Pipe Insulation	Ln Ft	1,307	15.0	4,290	799	676
		Small Commercial Thermostat	Each	6	11.0	808	646	455
		Steam Trap, Commercial	Each	115	6.0	18,637	19,728	7,361
		Steam Trap, Dry Cleaner	Each	80	6.0	47,557	48,065	240
		Steam Trap, Industrial High Pressure	Each	14	6.0	78,759	79,436	2,317
		Steam Trap, Industrial Medium Pressure	Each	69	6.0	199,298	202,720	2,758
		Water Heater	Each	3	15.0	381	1,497	9,766
Private, Disadvantaged Communities	Assessment Direct Install	Faucet Aerator - Bath	Each	38	10.0	441	441	92
		Pre-Rinse Spray Valves	Each	5	5.0	1,187	1,187	48,353
	Business Optimization Program	Boiler Tune Up, Process	Each	4	2.0	23,705	23,705	636,460
		Steam Trap, Dry Cleaner	Each	98	6.0	62,835	63,505	2,338
		Steam Trap, Industrial High Pressure*	Each	54	6.5	318,812	321,471	21,786
	Steam Trap, Industrial	Each	77	6.0	171,464	174,630	1,703	

Program Category	Program Path	Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Public, Non-Disadvantaged Communities	Midstream CFS	Medium Pressure Combination Oven	Each	1	12.0	566	566	19,910
		Convection Oven	Each	3	12.0	837	676	1,490
		Dishwasher*	Each	1	14.3	455	455	12,298
		Fryer	Each	12	12.0	7,301	7,361	14,402
		Infrared Salamander Broiler	Each	1	12.0	240	240	513
		Kitchen Demand Ventilation Controls	Each	2	20.0	4,644	3,096	687
		Boiler Tune Up, Space Heating	Each	3	3.0	2,317	2,317	68,315
	Prescriptive	High Efficiency Furnace	Each	10	16.5	2,638	2,758	63,505
		Steam Trap, Dry Cleaner	Each	18	6.0	11,211	11,330	3,096
		Steam Trap, Industrial Medium Pressure	Each	14	6.0	9,602	9,766	11,330
	Assessment Direct Install	Faucet Aerator - Bath	Each	34	10.0	341	341	293
		Faucet Aerator - Kitchen	Each	1	10.0	4	4	204
		Pre-Rinse Spray Valves	Each	1	5.0	237	237	37
		Showerheads	Each	2	10.0	43	43	2,344
Business Optimization Program		Steam Trap, Commercial	Each	12	6.0	2,407	2,548	151,665
Midstream CFS		Convection Oven	Each	3	12.0	631	595	101,790
		Fryer	Each	3	12.0	2,976	1,783	1,912
Prescriptive	Boiler Tune Up, Space Heating	Each	85	3.0	176,121	176,355	3,652	
	High Efficiency Boiler	Each	21	25.0	115,805	118,360	20	
	High Efficiency Furnace	Each	7	16.5	2,124	2,223	1,429	

Program Category	Program Path	Savings Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Public, Disadvantaged Communities		Small Commercial Thermostat	Each	1	11.0	262	234	1,352
		Steam Trap, Commercial	Each	20	6.0	4,012	4,246	889
		Water Heater	Each	1	15.0	243	243	5,078
	Assessment Direct Install	Faucet Aerator - Bath	Each	6	10.0	20	20	4
	Business Optimization Program	Boiler Tune Up, Process	Each	1	2.0	1,429	1,429	476
		Boiler Tune Up, Space Heating	Each	5	3.0	1,352	1,352	1,426
		Boiler Tune Up, Process	Each	1	2.0	889	889	215
		Boiler Tune Up, Space Heating	Each	2	3.0	6,581	6,581	209
		Prescriptive	Steam Trap, Commercial	Each	110	6.0	23,985	25,389
	Steam Trap, Industrial High Pressure		Each	8	6.0	30,831	31,032	25,389
	Steam Trap, Industrial Medium Pressure		Each	10	6.0	4,917	5,078	31,032
	Total					7.3	2,997,733	3,002,180

Note: DAC Project is a project done in a disadvantaged community designated site. This information was sourced from the tracking data.
 *Weighted EUL based on measure details. Steam Trap EUL values vary between Venturi steam traps (20 years EUL) and regular steam traps (6 years). Dishwasher EUL values vary based on dishwasher type.
 Source: Nicor Gas tracking data and Guidehouse evaluation team analysis.