



Project Name:

2024 DSM Portfolio Evaluation Report

Prepared for:

NIPSCO

Prepared by:

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an E Source Company

In Partnership with:

The Cadmus Group, LLC

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ILLUME Advising LLC, an E Source Company (ILLUME) is a forward-thinking consulting company at the rare intersection of insight and execution. Founded in 2013 by industry thought-leaders Anne Dougherty and Sara Conzemius, the company has quickly grown to include a deep bench of quantitative and qualitative research experts. ILLUME uses cutting edge research strategies to help build a resilient energy future to enrich lives, improve global health, and ensure a more secure and sustainable future.

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Table of Contents

Acknowledgments i

Executive Summary 1

Portfolio Performance and Insights 1

Savings Achievements..... 4

Summary of Recommendations 19

Program Offerings..... 29

Evaluation Objectives and Methodology..... 32

1. Home Rebates Program 41

 Program Design and Delivery 42

 Evaluation Methodology 43

 Impact Evaluation 44

 Process Evaluation..... 61

 Conclusions and Recommendations 83

2. Retail Products Program 86

 Program Design and Delivery 87

 Evaluation Methodology 89

 Impact Evaluation 89

 Process Evaluation..... 98

 Conclusions and Recommendations 99

3. Home Energy Assessment (HEA) Program..... 101

 Program Design and Delivery 102

 Evaluation Methodology 104

 Impact Evaluation 104

 Process Evaluation..... 127

 Conclusions and Recommendations 143

4. Income-Qualified Weatherization Program 145

 Program Design and Delivery 146

 Evaluation Methodology 149

 Impact Evaluation 149

 Process Evaluation..... 177

 Conclusions and Recommendations 192

5. Multi-Family Direct Install (MFDI) Program 194

 Program Design and Delivery 195

 Program Performance 196

 Evaluation Methodology 197

 Impact Evaluation 197

 Process Evaluation..... 209

 Conclusions and Recommendations 210

6. Appliance Recycling Program 211

 Program Design and Delivery 212

 Evaluation Methodology 214

 Impact Evaluation 214

Process Evaluation.....	220
Conclusions and Recommendations	224
7. Behavioral Program.....	227
Program Design and Delivery	228
Evaluation Methodology	234
Impact Evaluation	234
Process Evaluation.....	248
Conclusions and Recommendations	260
8. Residential New Construction Program	264
Program Design and Delivery	265
Evaluation Methodology	271
Impact Evaluation	271
Process Evaluation.....	285
Conclusions and Recommendations	288
9. School Education Program	292
Program Design and Delivery	293
Evaluation Methodology	290
Impact Evaluation	290
Process Evaluation.....	301
Conclusions and Recommendations	310
10. HomeLife Calculator Program	313
Program Design and Delivery	314
Evaluation Methodology	316
Impact Evaluation	316
Process Evaluation.....	328
Conclusions and Recommendations	330
11. Residential Online Marketplace.....	331
Program Design and Delivery	332
Evaluation Methodology	336
Impact Evaluation	336
Process Evaluation.....	361
Conclusions and Recommendations	371
12. Commercial and Industrial (C&I) Programs	375
Program Design and Delivery	376
Evaluation Methodology	382
Impact Evaluation	382
Process Evaluation.....	409
Conclusions and Recommendations	415
13. Commercial & Industrial (C&I) Online Marketplace (OLM) Program.....	418
Program Design and Delivery	419
Evaluation Methodology	422
Impact Evaluation	422
Conclusions and Recommendations	434
Appendix	435
Appendix 1. Home Rebates Program.....	436

Appendix 2. Retail Products Program	467
Appendix 3. Home Energy Assessment (HEA) Program	475
Appendix 4. IQW Program	507
Appendix 5. MFDI Program.....	527
Appendix 6. Appliance Recycling Program	532
Appendix 7. Behavioral Program	538
Appendix 8. Residential New Construction Program	545
Appendix 9. School Education Program	566
Appendix 10. HomeLife Calculator Program	573
Appendix 11. Residential Online Marketplace (OLM) Program	579
Appendix 12. Commercial & Industrial (C&I) Programs	595
Appendix 13. Commercial & Industrial (C&I) Online Marketplace Program.....	609

EXECUTIVE SUMMARY

NIPSCO's demand-side management (DSM) portfolio contains twelve residential programs and six commercial and industrial (C&I) programs that serve its customer base. This executive summary includes key findings from the evaluation team's¹ evaluation, measurement, and verification (EM&V) of these programs, including impact results (*ex post* gross and net savings impacts) and process findings (program operations, performance, and opportunities for improvement). Overall, the portfolio achieved 104,655,007 kWh *ex post* gross electric energy savings, 13,222 kW *ex post* gross peak demand reduction, and 5,313,894 therms *ex post* gross natural gas energy savings. Considering *ex post* gross savings, the residential portfolio exceeded its peak demand reduction and natural gas energy goals for 2024 but did not meet its electric energy goal. The C&I portfolio came close to achieving its electric energy and natural gas savings goals but fell short of its peak demand reduction goals.

Portfolio Performance and Insights

Thousands of residential and C&I customers participated in NIPSCO's DSM programs in 2024. NIPSCO's portfolio included the same programs as offered in 2023 as well as an additional income-qualified (IQ) Behavioral program. Additionally, the Residential Lighting program was renamed as the Retail Products program in 2024 to reflect changes in the measures offered.

To evaluate program impacts and performance, the evaluation team held discussions with program staff and surveyed and interviewed program participants. The evaluation team also conducted tracking data analysis, engineering analysis, desk reviews, and/or virtual on-sites for each program.

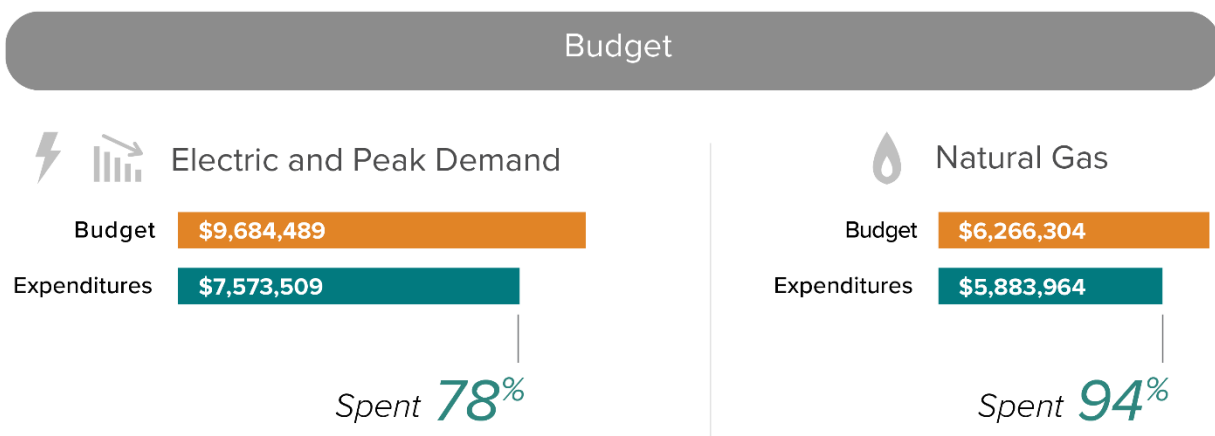
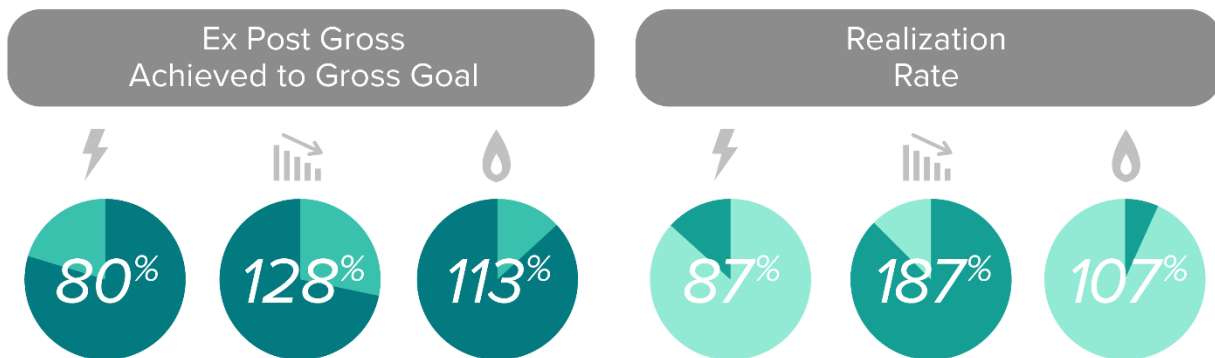
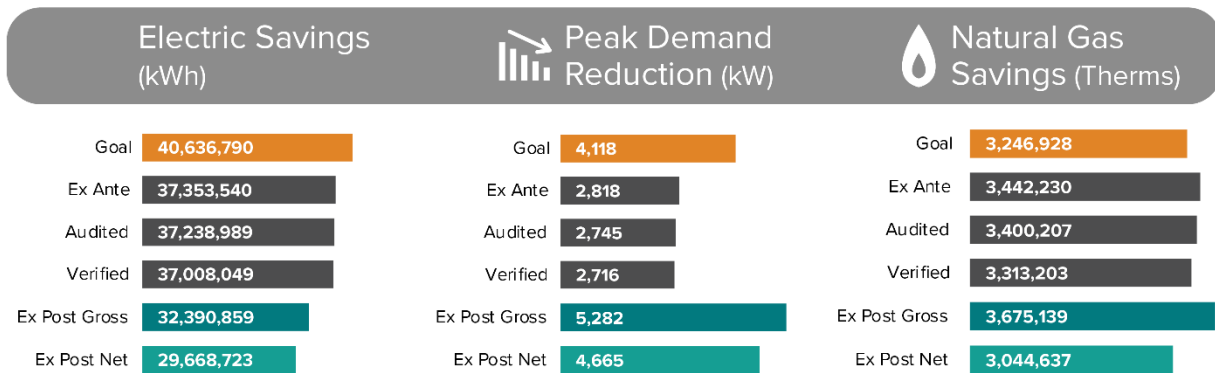
The next two pages summarize savings impacts, spending, and key accomplishments for the residential and C&I portfolios. As the summaries show, NIPSCO's residential programs performed well against its peak demand reduction and natural gas energy goals and had realization rates close to 100% for electric and natural gas savings, and close to 200% for peak demand reduction. NIPSCO's C&I programs fell short of its savings goals for all fuels, but came close to achieving its electric and natural gas savings goals; realization rates for the C&I portfolio were relatively close to 100% across all fuels.

¹ The evaluation team includes ILLUME Advising (lead firm) and Cadmus.

RESIDENTIAL SECTOR



- The residential portfolio exceeded its savings goals for demand reduction and natural gas, but fell short of its electric savings goals.
- Overall, electric program performance was driven by the Behavioral programs and the Retail Products program.
- Realization rates varied across programs and measures mainly due to differences in savings calculation assumptions used by the implementation and evaluation teams.



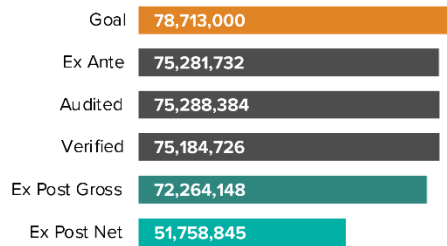
COMMERCIAL & INDUSTRIAL SECTOR



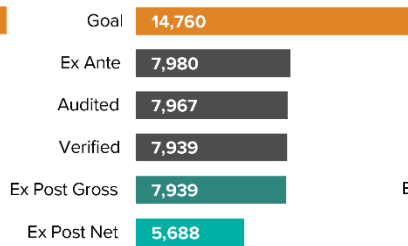
- The C&I portfolio almost achieved its electric and natural gas savings goals, but fell short of its peak demand reduction goal.
- Overall, electric performance was driven by the Custom and Prescriptive programs. Gas performance was largely driven by the Custom and New Construction programs.
- Realization rates were close to 100% at the portfolio-level, but varied by measure and program.



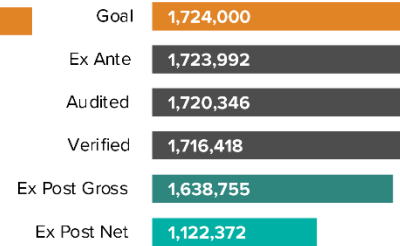
Electric Savings
(kWh)



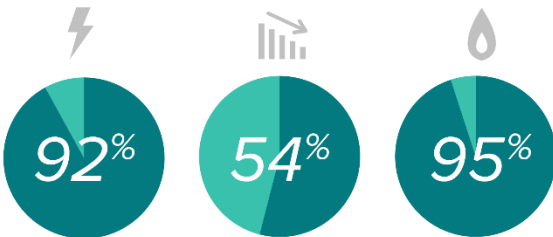
Peak Demand Reduction
(kW)



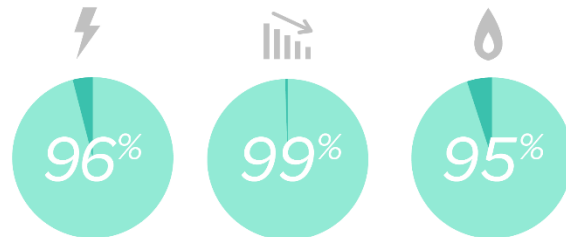
Natural Gas Savings
(Therms)



Ex Post Gross Achieved to Gross Goal



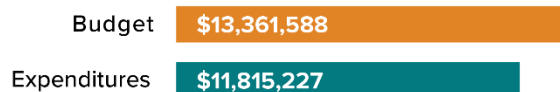
Realization Rate



Budget



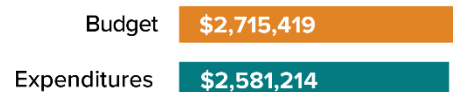
Electric and Peak Demand



Spent **88%**



Natural Gas



Spent **95%**

Savings Achievements

The following section details the program and portfolio-level savings achievements relative to planning goals, and at each step of the impact evaluation, the contribution of each program to portfolio savings, and a summary budget and spend for each program.

Portfolio Results

Table 1 and Table 2 show 2024 gross planning goals for electric and natural gas savings, and each program's performance in achieving those goals. These tables show goal achievement in terms of *ex post* gross savings.

Goal attainment varied widely across individual programs in 2024. On the residential side, the Appliance Recycling program had the lowest electric (34%) goal achievement, the New Construction program had the lowest peak demand goal achievement (26%), and the Online Marketplace had the lowest natural gas goal achievement (40%). On the C&I side, the SBDI program greatly exceeded its savings goals for all fuels. The C&I New Construction program exceeded its electric and peak demand savings goals, and the Prescriptive and Online Marketplace programs exceeded its natural gas goals, while the other C&I programs did not achieve savings goals for any fuels.

Table 1. 2024 Portfolio Electric Goal Achievement

PROGRAM	ELECTRICITY			DEMAND		
	GROSS ELECTRIC SAVINGS GOAL (kWh)	EX POST GROSS ELECTRIC SAVINGS (kWh)	SHARE OF ELECTRIC GOAL ACHIEVED (%)	GROSS PEAK DEMAND REDUCTION GOAL (kW)	EX POST GROSS PEAK DEMAND REDUCTION (kW)	SHARE OF PEAK DEMAND GOAL ACHIEVED (%)
Residential Programs						
Home Rebates	969,022	1,170,422	121%	1,499	748	50%
Retail Products	4,128,834	3,224,462	78%	493	313	63%
Home Energy Assessment	605,584	827,122	137%	196	395	201%
Appliance Recycling	1,531,674	518,656	34%	272	72	27%
School Education	3,007,890	2,600,695	86%	371	459	124%
Multi Family Direct Install	1,078,007	1,778,612	165%	260	259	100%
Behavioral	19,673,564	13,112,846	67%	0	1,506	n/a
IQ-Behavioral	6,646,436	7,395,708	111%	0	860	n/a
New Construction	919,662	371,509	40%	483	125	26%

PROGRAM	ELECTRICITY			DEMAND		
	GROSS ELECTRIC SAVINGS GOAL (kWh)	EX POST GROSS ELECTRIC SAVINGS (kWh)	SHARE OF ELECTRIC GOAL ACHIEVED (%)	GROSS PEAK DEMAND REDUCTION GOAL (kW)	EX POST GROSS PEAK DEMAND REDUCTION (kW)	SHARE OF PEAK DEMAND GOAL ACHIEVED (%)
HomeLife Calculator	451,166	511,911	113%	64	108	169%
Income-Qualified Weatherization	778,892	567,111	73%	195	270	139%
Online Marketplace	846,059	311,804	37%	286	168	59%
Total Residential	40,636,790	32,390,859	80%	4,118	5,282	128%
Commercial & Industrial Programs						
Prescriptive	25,975,290	19,449,218	75%	8,608	3,944	46%
Custom	36,123,997	32,599,259	90%	3,735	1,381	37%
New Construction	13,661,975	15,927,648	117%	1,725	1,980	115%
Small Business Direct Install	1,574,260	3,965,677	252%	367	594	162%
Online Marketplace	590,348	277,184	47%	108	37	34%
Strategic Energy Management	787,130	45,163	6%	217	5	2%
Total Commercial & Industrial	78,713,000	72,264,148	92%	14,760	7,939	54%
Total 2024 Portfolio	119,349,790	104,655,007	88%	18,878	13,222	70%

Table 2. 2024 Portfolio Natural Gas Goal Achievement

PROGRAM	GROSS NATURAL GAS SAVINGS GOAL (THERMS)	EX POST NATURAL GAS SAVINGS (THERMS)	SHARE OF NATURAL GAS GOAL ACHIEVED (%)
Residential Programs			
Home Rebates	805,193	1,076,137	134%
Retail Products	n/a	n/a	n/a
Home Energy Assessment	126,417	154,890	123%
Appliance Recycling	n/a	n/a	n/a
School Education	135,920	152,117	112%
Multi Family Direct Install	89,423	51,042	57%

PROGRAM	GROSS NATURAL GAS SAVINGS GOAL (THERMS)	EX POST NATURAL GAS SAVINGS (THERMS)	SHARE OF NATURAL GAS GOAL ACHIEVED (%)
Behavioral	1,119,038	1,196,549	107%
IQ-Behavioral	451,762	585,805	130%
New Construction	231,057	221,530	96%
HomeLife Calculator	18,254	47,213	259%
Income-Qualified Weatherization	93,889	118,826	127%
Online Marketplace	175,975	71,030	40%
Total Residential	3,246,928	3,675,139	113%
Commercial & Industrial Programs			
Prescriptive	73,270	148,290	202%
Custom	887,669	766,150	86%
New Construction	732,891	542,684	74%
Small Business Direct Install	17,240	173,651	1,007%
Online Marketplace	4,310	7,979	185%
Strategic Energy Management	8,620	0	0%
Total Commercial & Industrial	1,724,000	1,638,755	95%
Total 2024 Portfolio	4,970,928	5,313,894	107%

Table 3 through Table 5 show the electric energy, peak demand reduction, and natural gas energy savings achieved by each program in the 2024 NIPSCO portfolio. The tables include realization rates, which are the percentage of savings claimed by NIPSCO (*ex ante*) that the evaluation team verified. Ideally, realization rates are as close to 100% as possible, indicating that the planned savings closely align with evaluated savings. At the portfolio level, this was generally the case; the team verified 93% of electric energy, 122% of demand, and 103% of therms savings. Program-level realization rates varied for reasons described in the individual chapters.

Table 3. 2024 Portfolio Electric Energy Savings

PROGRAM	REPORTED ELECTRIC SAVINGS (KWH)			EVALUATED ELECTRIC SAVINGS (KWH)			
	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	REALIZATION RATE (%)	NTG RATIO (%)	EX POST NET
Residential Programs							
Home Rebates	653,068	652,955	652,955	1,170,422	179%	59%	686,236
Retail Products	3,928,606	3,928,606	3,720,823	3,224,462	82%	57%	1,836,333
Home Energy Assessment	717,846	652,588	648,518	827,122	115%	78%	646,044
Appliance Recycling	586,870	581,725	581,725	518,656	88%	61%	317,715
School Education	3,019,288	3,019,355	3,073,046	2,600,695	86%	96%	2,485,893
Multi Family Direct Install	1,831,703	1,831,703	1,761,343	1,778,612	97%	97%	1,724,790
Behavioral	16,629,663	16,629,663	16,629,663	13,112,846	79%	100%	13,112,846
IQ-Behavioral	8,319,895	8,319,895	8,319,895	7,395,708	89%	100%	7,395,708
New Construction	246,627	246,627	246,627	371,509	151%	30%	111,360
HomeLife Calculator	591,103	591,108	696,152	511,911	87%	96%	490,212
Income-Qualified Weatherization	462,870	438,799	430,366	567,111	123%	100%	567,111
Online Marketplace	366,001	345,965	246,935	311,804	85%	94%	294,476
Total Residential	37,353,540	37,238,989	37,008,049	32,390,859	87%	n/a	29,668,723
Commercial & Industrial Programs							
Prescriptive	19,679,614	19,679,614	19,679,614	19,449,218	99%	79%	15,364,882
Custom	34,785,345	34,785,345	34,681,344	32,599,259	94%	76%	24,775,437
New Construction	16,534,477	16,534,477	16,534,477	15,927,648	96%	52%	8,282,377
Small Business Direct Install	3,965,677	3,965,677	3,965,677	3,965,677	100%	77%	3,053,571
Online Marketplace	271,456	278,109	278,451	277,184	102%	86%	237,416
Strategic Energy Management	45,163	45,163	45,163	45,163	100%	100%	45,163
Total Commercial & Industrial	75,281,732	75,288,384	75,184,726	72,264,148	96%	n/a	51,758,845
Total 2024 Portfolio	112,635,271	112,527,373	112,192,774	104,655,007	93%	n/a	81,427,568

Table 4. 2024 Portfolio Peak Demand Reduction

PROGRAM	REPORTED PEAK DEMAND REDUCTION (KW)			EVALUATED PEAK DEMAND REDUCTION (KW)			
	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	REALIZATION RATE (%)	NTG RATIO (%)	EX POST NET
Residential Programs							
Home Rebates	858	858	858	748	87%	64%	479
Retail Products	448	448	426	313	70%	60%	188
Home Energy Assessment	314	253	251	395	126%	84%	332
Appliance Recycling	80	79	79	72	91%	61%	44
School Education	372	375	428	459	123%	95%	438
Multi Family Direct Install	209	209	202	259	124%	98%	253
Behavioral	-	-	-	1506	n/a	100%	1,506
IQ-Behavioral	-	-	-	860	n/a	100%	860
New Construction	97	97	97	125	129%	27%	33
HomeLife Calculator	78	78	93	108	139%	95%	103
Income-Qualified Weatherization	172	150	146	270	157%	100%	270
Online Marketplace	190	198	137	168	88%	95%	160
Total Residential	2,818	2,745	2,716	5,282	187%	n/a	4,665
Commercial & Industrial Programs							
Prescriptive	3,904	3,904	3,904	3,944	101%	79%	3,116
Custom	1,467	1,467	1,440	1,381	94%	76%	1,049
New Construction	1,968	1,968	1,968	1,980	101%	52%	1,029
Small Business Direct Install	585	585	585	594	101%	77%	457
Online Marketplace	50	37	37	37	73%	88%	32
Strategic Energy Management	5	5	5	5	99%	100%	5
Total Commercial & Industrial	7,980	7,967	7,939	7,939	99%	n/a	5,688
Total 2024 Portfolio	10,798	10,712	10,655	13,222	122%	n/a	10,354

Table 5. 2024 Portfolio Natural Gas Savings

PROGRAM	REPORTED NATURAL GAS SAVINGS (THERMS)			EVALUATED NATURAL GAS SAVINGS (THERMS)			
	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	REALIZATION RATE (%)	NTG RATIO (%)	EX POST NET
Residential Programs							
Home Rebates	830,117	830,117	830,117	1,076,137	130%	60%	641,947
Retail Products	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Home Energy Assessment	167,722	137,475	134,803	154,890	92%	88%	135,960
Appliance Recycling	n/a	n/a	n/a	n/a	n/a	n/a	n/a
School Education	138,327	138,355	96,150	152,117	110%	102%	154,777
Multi Family Direct Install	49,762	49,762	44,017	51,042	103%	98%	49,904
Behavioral	1,122,151	1,122,151	1,122,151	1,196,549	107%	100%	1,196,549
IQ-Behavioral	606,045	606,045	606,045	585,805	97%	100%	585,805
New Construction	270,108	270,108	270,108	221,530	82%	21%	46,521
HomeLife Calculator	39,145	39,151	37,168	47,213	121%	99%	46,521
Income-Qualified Weatherization	118,407	106,593	104,544	118,826	100%	100%	118,826
Online Marketplace	100,448	100,449	68,101	71,030	71%	95%	67,826
Total Residential	3,442,230	3,400,207	3,313,203	3,675,139	107%	n/a	3,044,637
Commercial & Industrial Programs							
Prescriptive	212,141	212,141	212,141	148,290	70%	79%	117,149
Custom	720,446	716,801	712,899	766,150	106%	76%	582,274
New Construction	608,473	608,472	608,478	542,684	89%	52%	282,196
Small Business Direct Install	174,863	174,863	174,863	173,651	99%	n/a	133,711

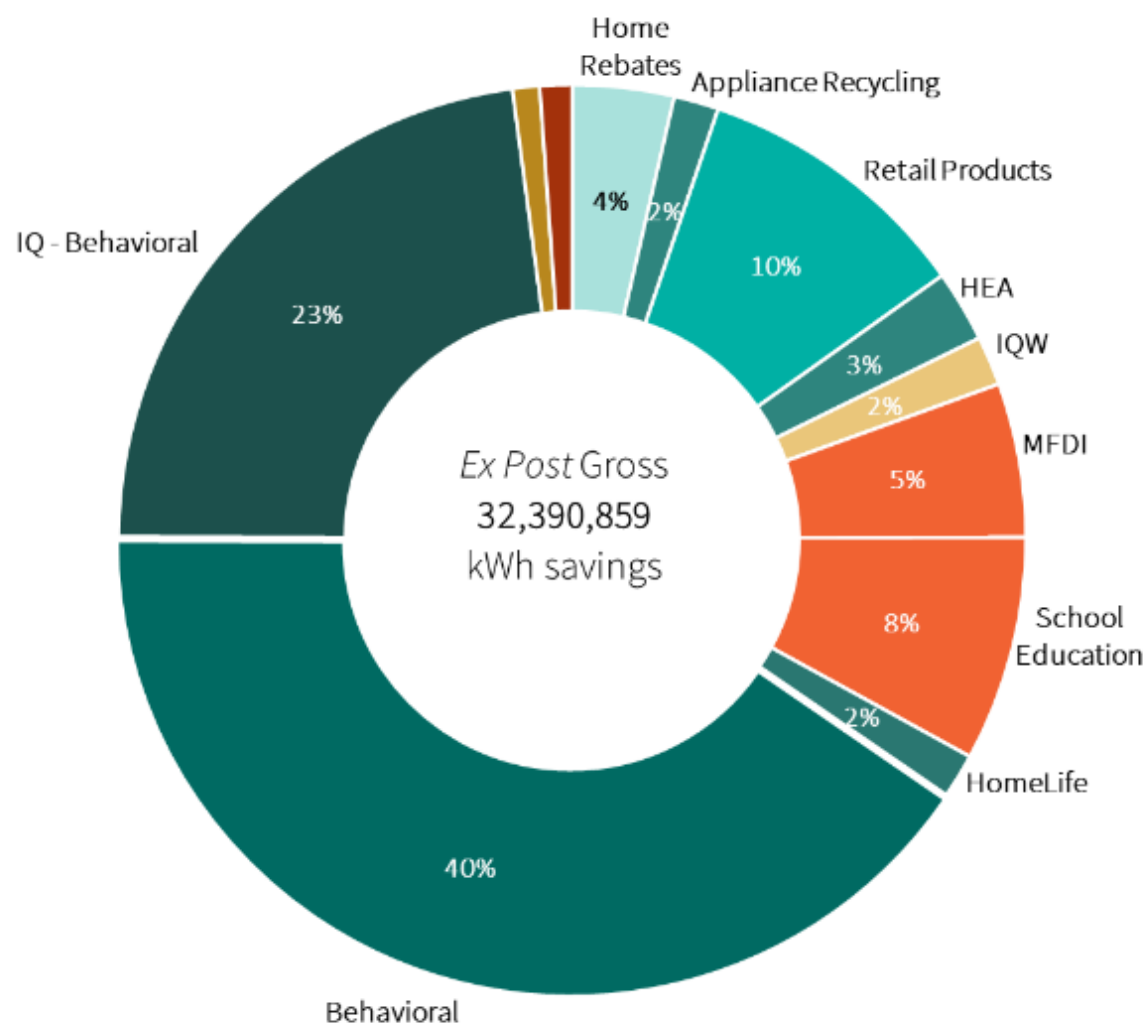
PROGRAM	REPORTED NATURAL GAS SAVINGS (THERMS)			EVALUATED NATURAL GAS SAVINGS (THERMS)			
	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	REALIZATION RATE (%)	NTG RATIO (%)	EX POST NET
Online Marketplace	8,069	8,069	8,036	7,979	99%	88%	7,042
Strategic Energy Management	-	-	-	-	n/a	n/a	-
Total Commercial & Industrial	1,723,992	1,720,346	1,716,418	1,638,755	95%	n/a	1,122,372
Total 2024 Portfolio	5,166,221	5,120,553	5,029,622	5,313,894	103%	n/a	4,167,009

Program Contribution to Portfolio Savings

Figure 1 through Figure 4 illustrate each program's contribution to total *ex post* gross portfolio energy and demand savings. The Behavioral and IQ-Behavioral programs contributed the largest share of electric energy savings to the Residential portfolio, with 40% and 23% of total electric energy (kilowatt-hour) savings, respectively. The Retail Products program accounted for the next largest share (10%). The Behavioral programs also accounted for the largest share of peak demand reduction (kilowatts) for the Residential portfolio, with Behavioral contributing 29% of total peak demand reduction, and IQ-Behavior contributing 16%, followed by the Home Rebates programs at 14%.

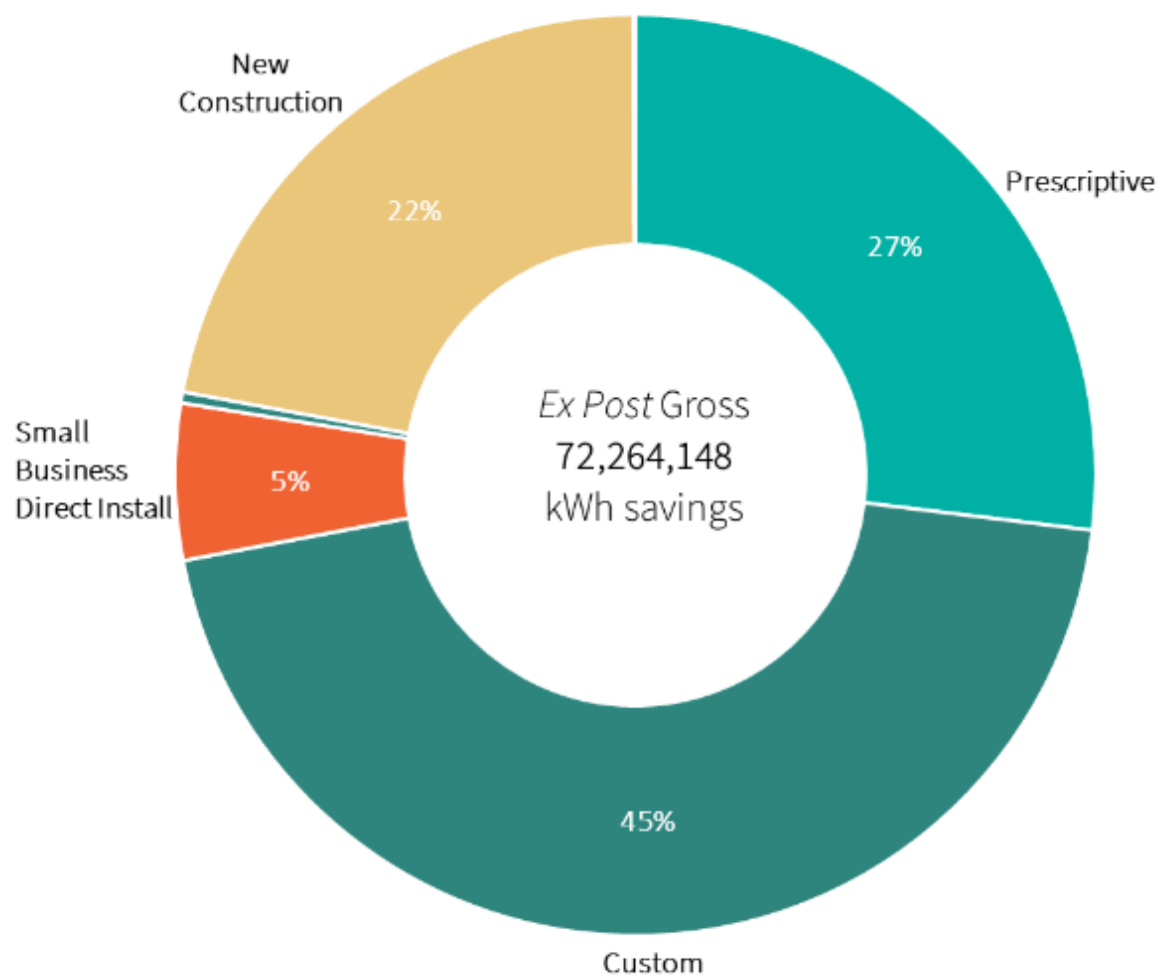
In the C&I sector, the Custom program contributed the largest share of electric energy savings, with 45% of the total C&I portfolio electric energy (kilowatt-hour) savings, with the Prescriptive program contributing 27% and the New Construction program contributing 22%. The Prescriptive and New Construction programs contributed the largest share of peak demand reduction (kilowatts) to the C&I portfolio, accounting for 50% and 25% of peak demand reduction, respectively.

Figure 1. Residential Program Contributions to Portfolio Electric Savings (kWh) by *Ex Post* Gross ^a



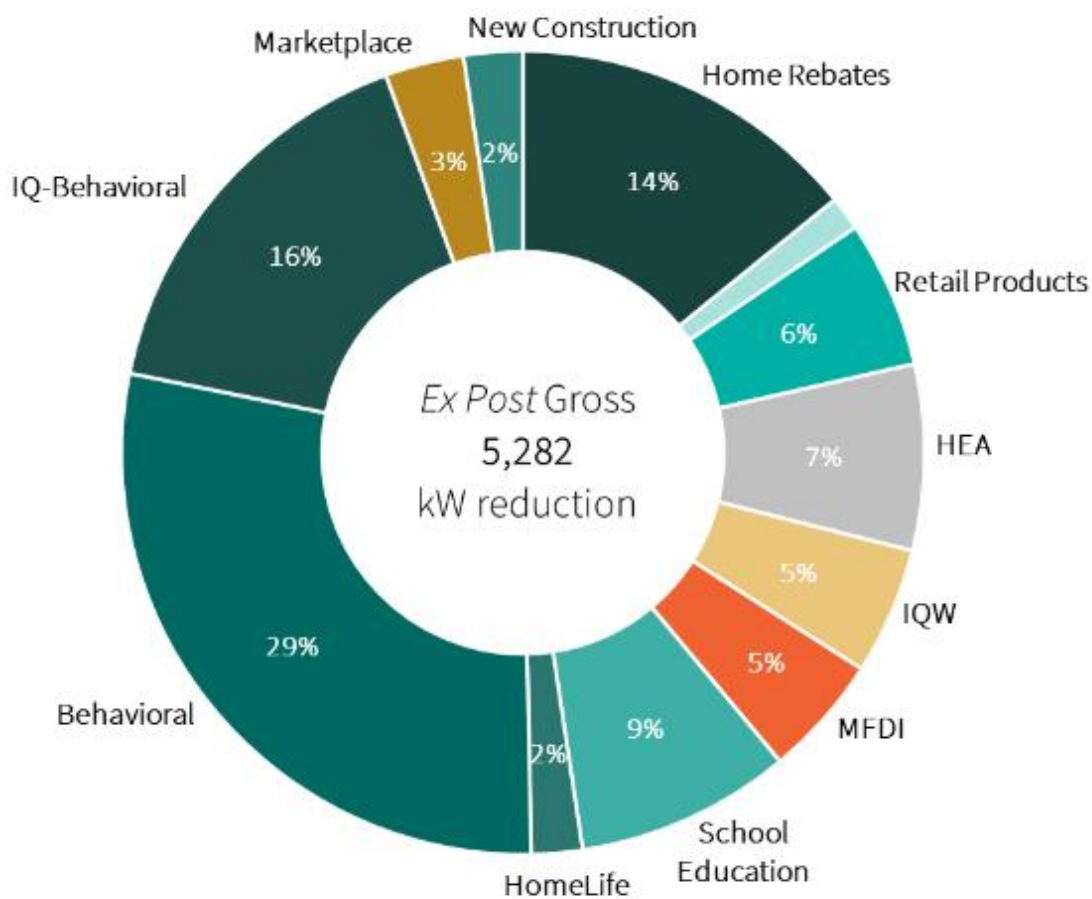
^aTwo residential programs, New Construction and Online Marketplace, are not labeled due to savings of 1% or less of the total portfolio in 2024.

Figure 2. C&I Program Contributions to Portfolio Electric Savings (kWh) by *Ex Post* Gross ^a



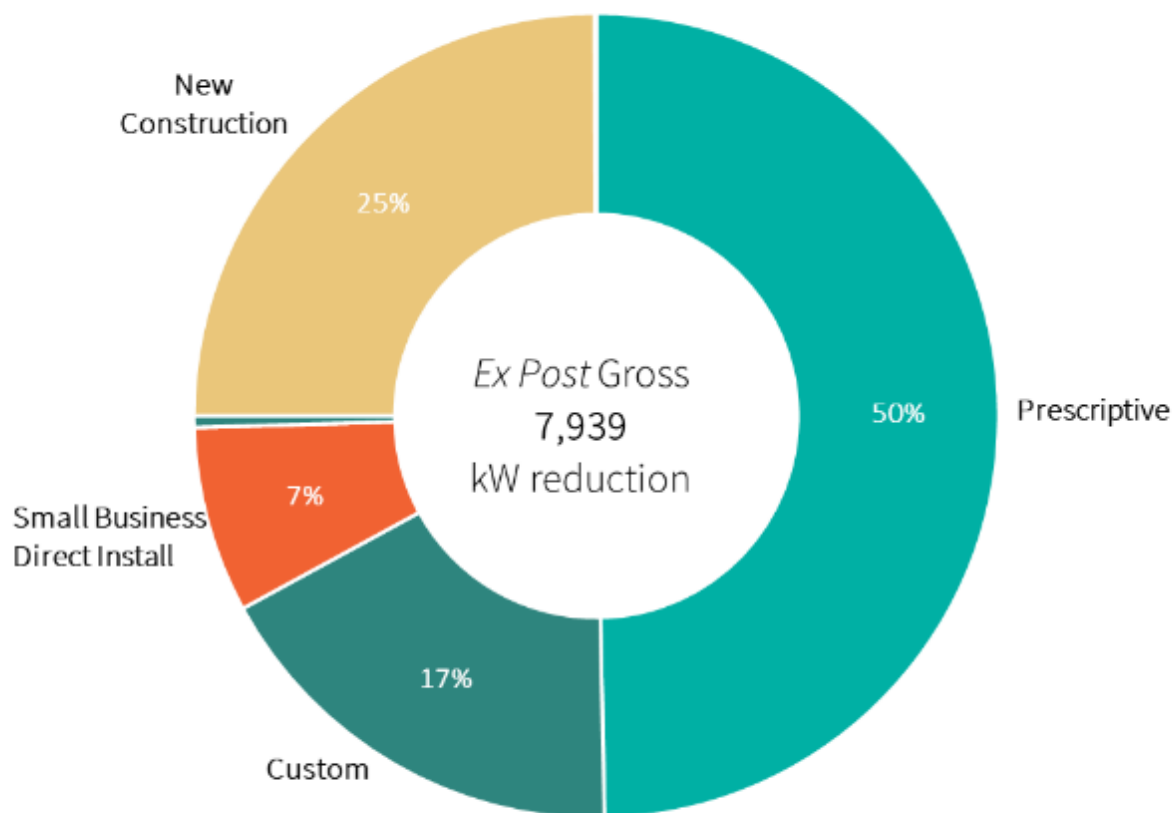
¹ Two C&I programs, Online Marketplace and SEM, are not labeled due to savings of less than 1% of the total portfolio in 2024.

Figure 3. Residential Program Contribution to Portfolio Peak Demand Reduction (kW) by *Ex Post* Gross ^a



^a One residential program, Appliance Recycling, is not labeled due to savings of 1% or less of the total portfolio in 2024.

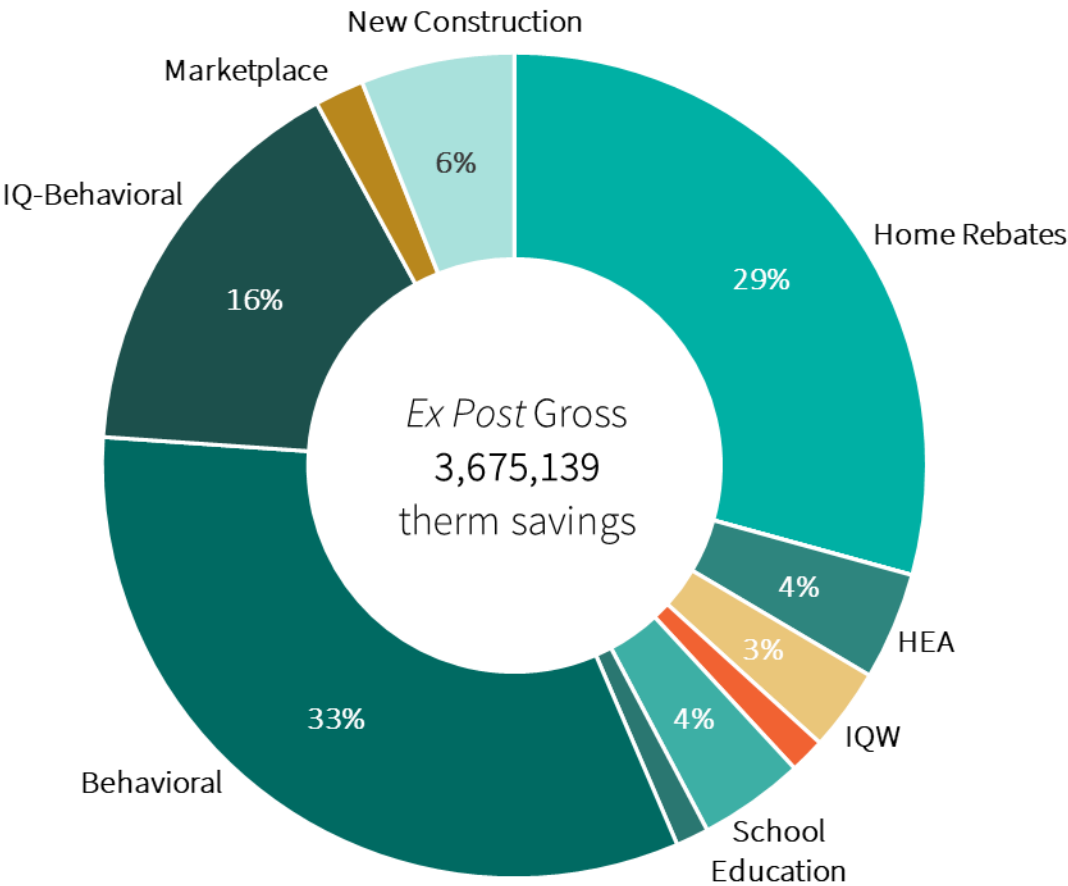
Figure 4. C&I Program Contribution to Portfolio Peak Demand Reduction (KW) by *Ex Post* Gross ^a



^a Two C&I programs, Online Marketplace and SEM, are not labeled due to savings of less than 1% of the total portfolio in 2024.

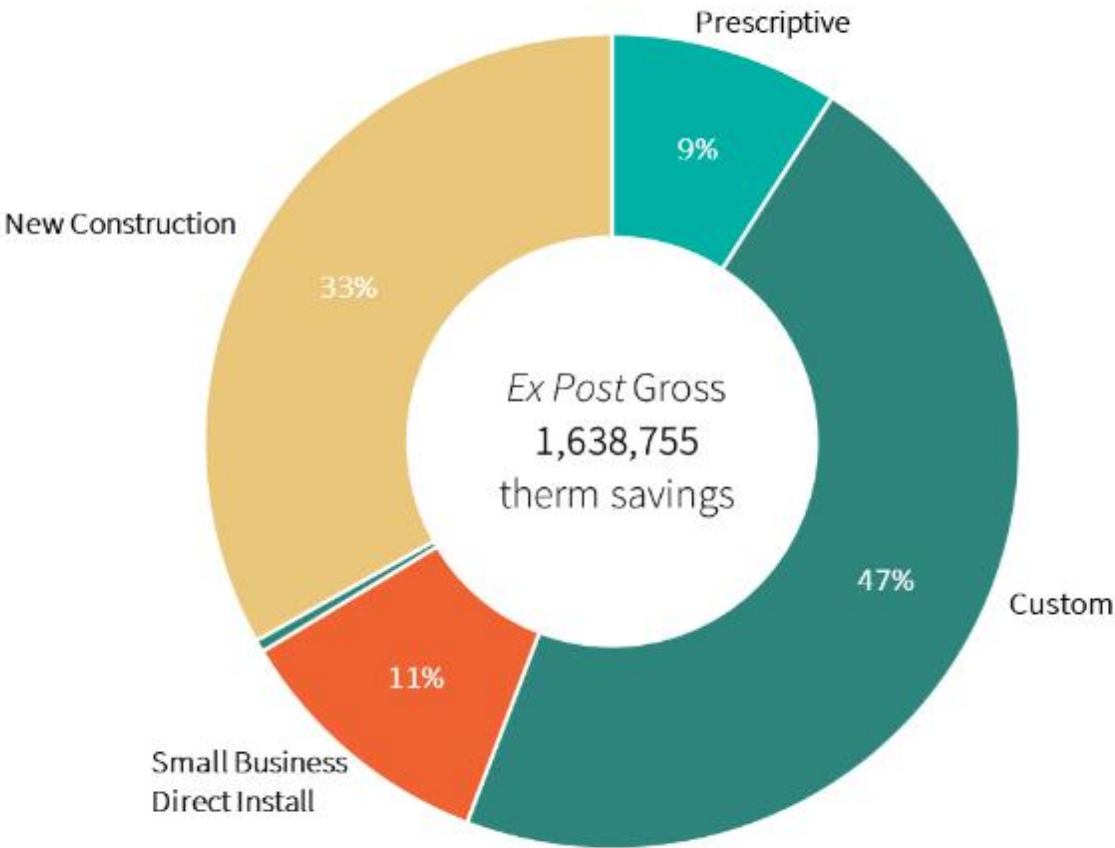
Figure 5 illustrates each program’s contribution to total *ex post* gross natural gas portfolio energy savings. The Behavioral and IQ-Behavioral programs accounted for the largest share of Residential natural gas energy (therm) savings, with 33% and 16% of the Residential portfolio savings, respectively. The Home Rebates program was the second largest contributor to the Residential program’s natural gas savings total (29%). The Custom program contributed 47% of the natural gas energy savings for the C&I sector, the most of any of the C&I programs, followed by New Construction at 33%.

Figure 5. Residential Program Contribution to Portfolio Natural Gas Savings (Therms) by *Ex Post* Gross ^a



^a Two residential programs, MFDI and HomeLife, are not labeled due to savings of 1% or less of the total portfolio in 2024.

Figure 6. Residential Program Contribution to Portfolio Natural Gas Savings (Therms) by *Ex Post* Gross ^a



¹ Two C&I programs, Online Marketplace and SEM, are not labeled due to savings of less than 1% of the total portfolio in 2024.

Budget

As shown in Table 6 and Table 7, NIPSCO spent 84% of its electric budget and 94% of its natural gas budget for the 2024 portfolio which appears in line with the percentage of goal achieved at the portfolio level.

Table 6. 2024 Electric Portfolio Budget and Spending

PROGRAM	BUDGET (\$)	ACTUAL SPEND (\$)	BUDGET SPENT (%)	SHARE OF ELECTRIC GOAL ACHIEVED (%)	SHARE OF PEAK DEMAND GOAL ACHIEVED (%)
Residential Programs					
Home Rebates	797,654.59	460,524.80	58%	121%	50%
Retail Products	1,363,476.26	1,210,056.42	89%	78%	63%
Home Energy Assessment	406,376.03	492,641.82	121%	137%	201%
Appliance Recycling	768,660.47	297,875.78	39%	34%	27%
School Education	1,643,190.90	1,588,823.11	97%	86%	124%

PROGRAM	BUDGET (\$)	ACTUAL SPEND (\$)	BUDGET SPENT (%)	SHARE OF ELECTRIC GOAL ACHIEVED (%)	SHARE OF PEAK DEMAND GOAL ACHIEVED (%)
Multi Family Direct Install	560,885.89	913,355.84	163%	165%	100%
Behavioral	1,006,632.83	852,953.11	85%	67%	n/a
IQ-Behavioral	498,483.30	480,210.69	96%	111%	n/a
New Construction	876,315.27	219,240.70	25%	40%	26%
Home Life Calculator	275,108.66	359,159.89	131%	113%	169%
Income-Qualified Weatherization	969,624.00	512,299.18	53%	73%	139%
Online Marketplace	518,080.92	186,367.18	36%	37%	59%
Total Residential	9,684,489.11	7,573,508.52	78%	80%	128%
Commercial & Industrial Programs					
Prescriptive	4,336,709.50	2,731,180.48	63%	75%	46%
Custom	6,195,452.50	5,867,538.37	95%	90%	37%
New Construction	2,243,019.11	2,405,796.11	107%	117%	115%
Small Business Direct Install	330,076.45	723,977.32	219%	252%	162%
Online Marketplace	118,420.01	74,183.19	63%	47%	34%
Strategic Energy Management	137,909.99	12,551.09	9%	6%	2%
Total Commercial & Industrial	13,361,587.57	11,815,226.56	88%	92%	54%
Total 2024 Portfolio	23,046,076.68	19,388,735.08	84%	88%	70%

Table 7. 2024 Natural Gas Portfolio Budget and Spending

PROGRAM	BUDGET (\$)	ACTUAL SPEND (\$)	BUDGET SPENT (%)	SHARE OF NATURAL GAS GOAL ACHIEVED (%)
Residential Programs				
Home Rebates	1,672,831.99	1,689,453.40	101%	134%
Retail Products	-	-	n/a	n/a
Home Energy Assessment	820,294.78	717,375.94	87%	123%
Appliance Recycling	-	-	n/a	n/a
School Education	456,177.83	448,467.30	98%	112%
Multi Family Direct Install	303,702.62	201,457.34	66%	57%
Behavioral	565,148.75	561,650.85	99%	107%
IQ-Behavioral	279,860.94	269,441.99	96%	130%
New Construction	884,513.59	890,052.07	101%	96%

PROGRAM	BUDGET (\$)	ACTUAL SPEND (\$)	BUDGET SPENT (%)	SHARE OF NATURAL GAS GOAL ACHIEVED (%)
HomeLife Calculator	23,667.23	75,698.07	320%	259%
Income-Qualified Weatherization	987,918.14	829,151.54	84%	127%
Online Marketplace	272,187.74	201,215.99	74%	40%
Total Residential	6,266,303.60	5,883,964.49	94%	113%
Commercial & Industrial Programs				
Prescriptive	147,001.49	294,455.54	200%	202%
Custom	1,375,853.22	1,034,912.53	75%	86%
New Construction	1,135,954.47	828,072.92	73%	74%
Small Business Direct Install	37,776.27	381,046.64	1009%	1007%
Online Marketplace	5,472.94	42,179.14	771%	185%
Strategic Energy Management	13,360.69	547.29	4%	0%
Total Commercial & Industrial	2,715,419.07	2,581,214.05	95%	95%
Total 2024 Portfolio	8,981,722.67	8,465,178.53	94%	107%

Summary of Recommendations

The evaluation team proposes several recommendations based on the 2024 evaluation intended to improve program uptake, processes, and performance within NIPSCO's DSM portfolio. This section includes a summary of these recommendations. Please refer to the individual program chapters for more details on recommendations and detailed findings that support these recommendations.

Home Rebates Program

- Increase marketing efforts for smaller measures by targeting residential customers directly through channels like emails, social media ads, and bill inserts, bypassing contractor interactions.
- Cross-promote the program through current participants of other NIPSCO programs, particularly the Home Energy Assessment (HEA) program.
- Encourage program-affiliated contractors to cross-promote other NIPSCO offerings with customers, including the smaller measures offered through the Home Rebates program.
- Ensure customers receive the rebate in the required eight weeks or fewer, as outlined in the program abstract. If there is an issue with the participant's application, communicate to the customer that this may delay their rebate.
- Encourage contractors to fill out applications for their customers and provide the rebate as an up-front discount.

- Consider offering bonus incentives to contractors who provide the most up-front discounts to customers.
- Make the online application easier to find on the NIPSCO website, like how the PDF application is currently linked toward the top of the program's website.
- Advertise the online application directly to contractors as they are leading customer interactions and education.
- Provide an explanation in the rebate application as to why the program requires the level of detail it does to help ease customer frustration.
- Conduct User Experience (UX) testing on the application to determine pain points and areas for improvement, as well as ways to maximize application completion.
- Consider prioritizing program delivery strategies (i.e., targeted outreach) for measures that will bring more peak demand reduction through the Home Rebates program, such as air conditioners and smart thermostats.
- Update the *ex ante* savings calculations to reference the Illinois TRM v13.0 as instructed by the new Indiana TRM Workbook v1.0. Where applicable, use Indiana location-specific input assumptions from the Indiana TRM v1.0, which maps to climate-comparable Illinois TRM cities.

Retail Products Program

- Calculate savings using actual unit characteristics for each model number from the ENERGY STAR® Qualified Products List rather than relying on category averages.
- Update the baseline wattage assumptions used in *ex ante* savings to account for brightness and represent what the bulbs were designed to replace, e.g., LED under cabinet fixtures replace fixtures using T5 fluorescent tubes.
- Promote the benefits of using air purifiers and bathroom exhaust fans, particularly those with high CFM per watt or CADR per watt, and the incentives NIPSCO provides.
- Provide incentives for a variety of air purifiers and bathroom exhaust fan sizes and models. The current ENERGY STAR qualified products list is long, but there is an opportunity to further expand the list of program eligible models to include those that maximize savings potential, like those with high CFM per watt or CADR per watt.
- Determine the calculated savings of various air purifier and bathroom exhaust fan models using the ENERGY STAR qualified products list to determine which additional models will bring the most savings to the program.
- Implement quality-control measures to ensure that all incentivized lighting is EISA exempt.

Home Energy Assessment (HEA) Program

- Ensure that technicians have proper training in how to install all measures. Consider developing an installation quality assurance checklist for technicians to help deliver consistent service.
- Remind technicians to leave behind any relevant documentation, such as operation manuals, for all equipment they install. If physical operation manuals are not available, consider developing leave-behind materials with QR codes and/or URLs to help participants access online versions.
- Consider developing a referral program as several respondents suggested expanding marketing efforts and word of mouth was the second most likely way respondents learned about the HEA program.
- Cross-promote the Home Online Marketplace in the digital reports participants receive for the HEA program to encourage participants to purchase and install additional energy efficient equipment. Educate technicians on this program and its discounts, especially if a participant's recommendations include a product available on the marketplace.
- Update *ex ante* savings to use 100% HVAC saturation values when the technician determines the HVAC type on site.
- To ensure the most up-to-date savings values, update *ex ante* savings to use deemed values from the current Illinois TRM when available instead of using older values from previous EM&V reports. Continue to use values from EM&V reports for metrics collected via primary data collection, such as ISRs.

Appliance Recycling Program

- Provide CLEAResult advance notice of NIPSCO marketing efforts for the Appliance Recycling program so it can prepare for an increased call volume.
- Update the program *ex ante* estimates to use the most recent 2024 *ex post* evaluation results, making sure to apply the recommended part-use factor for refrigerator and freezer recycling measures.
- Develop program processes to improve consistent collection of information about the unit age and size of the recycled refrigerators and freezers. These processes could include:
 - Use data validation in the tracking database to ensure that staff are entering each appliance's age and size into the tracking database in a consistently formatted manner. In addition to requiring a four-digit year and appropriate size value, this validation could require entering a value of "missing," for unavailable data, which program staff could monitor over time and take action if the percentage of "missing" values surpasses an acceptable threshold.
 - Direct field staff to attempt to clean an appliance label before making an estimate as to whether the information cannot be read. Ensure that field staff have the proper supplies that enable them to clean appliance labels.
 - Consider adding a field to document the source of the size and age entered into the database, so program staff can know which entries came directly from an appliance sticker and which were field staff's estimates.
- Work with CLEAResult to further improve the scheduling process, including:
 - Recommending that CLEAResult gives field staff permission to update the schedule directly in cases where they are in direct contact with the customer.

- o Ensuring that the call center staff are offering all available days and times (not just Saturdays) and are looking for availability as soon as possible for customer rescheduling.
- Ensure that CLEAResult staff are providing participants with the already-developed leave-behind materials that share information about NIPSCO's other energy efficiency programs and the impact of the Appliance Recycling program.
- Consider enhancing leave-behind materials to include a QR code for customers to access a survey to share their experiences with the program and a receipt that documents the appliance pick-up.
- Ensure that field staff have business cards and identification badges and that trucks are marked with the NIPSCO or CLEAResult logo to provide customers with assurance of the field staff's legitimacy.

School Education Program

- Consider providing additional curriculum and resources to teachers such as (a) a summary video providing an overview of each item in the kit is and its purpose, which teachers could use in class to show how items work; (b) videos in Spanish and along with a vocabulary sheet to help students with language barriers better engage with materials; (c) more interactive, digital activities or simulations; and (d) suggestions for activities or assignments teachers could use with students to confirm that they took their kit home and installed items. For example, some teachers had students take photos or videos that were then shared in class.
- Provide different versions of the curriculum for the high school program. Teachers recommended varying levels of difficulty to accommodate different grade and ability levels, as well as including curriculum that is not science focused and could be incorporated into other subjects. Possible topics could include the history of lighting and career opportunities in energy efficiency.
- Consider ways to further differentiate between the fifth-grade and high school programs through the curriculum and the items provided in the kits.
- Consider offering the in-person presentation option for the NEF programs in NIPSCO's service area as some teachers suggested that having a guest speaker talk to students about the program could be beneficial.
- Provide additional information in the parent/guardian letter and the kit insert clearly explaining the intention of the program to reassure families who have concerns about the kit and how the program will use information supplied in the Home Energy Worksheet (HEW).
- Update program materials to clearly indicate that students will need assistance from their parents to complete the HEWs. Having assistance from parents/guardians will provide more accurate home characteristic information.
- Consider including a teacher survey as part of the evaluation for both the fifth-grade and high school programs in the future to solicit feedback from a larger number of teachers. Additional feedback will allow NIPSCO to better understand teacher perceptions of and satisfaction with the program and to better identify any additional pain points. The survey could gather awareness of, use of, and satisfaction with the curriculum, program materials, supplemental materials, and resources the program provides. It could also identify areas of improvement.
- Send follow-up fliers or emails to parents and teachers of School Education program participants reminding them of NIPSCO's other programs. Explore opportunities and channels to educate

participants about other NIPSCO programs through the School Education program, such as the program website and other program materials including the kit insert.

- Consider educating high school students participating in the program about NIPSCO's other energy efficiency programs and encourage them to share this information with their parents.
- Continue to monitor awareness and participation in other NIPSCO programs and energy efficiency practices at home via the parent survey.
- Improve the visibility of NIPSCO's programs on the kit insert and identify ways to highlight savings opportunities by participating in other NIPSCO programs.
- Implement the following updates to *ex ante* savings to improve the accuracy of *ex ante* savings estimates:
 - Update all inputs with deemed values in the Illinois TRM to use the Illinois TRM instead of using older values from previous evaluations.
 - Use the as-used value provided in the TRM as the Illinois TRM algorithm is not set up to use the actual, rated flow rate for faucet aerators.
 - Include an incandescent replacement factor for nightlights to account for units that do not replace an existing nightlight.
 - Update the power outlet gasket savings calculation to include heating season savings.
 - Update the switch gaskets savings calculation to use the Illinois TRM.
 - Update ISRs to the values found in the most recent participant survey.
 - Update household characteristics to the values found in the most recent HEWs.

Multi-Family Direct Install Program

- To improve the accuracy of *ex ante* savings estimates,
 - Update all *ex ante* savings inputs for parameters not derived from program data to use the deemed values in the Illinois TRM when available instead of using older values from previous evaluations.
 - Use the "as-used" value provided in the TRM for the flow rate for faucet aerators, as the Illinois TRM is also not set up to use the actual, rated flow rate.
 - Remove the portion of thermostat electric savings calculated from therms for all-electric households to improve the accuracy of savings for all-electric households.
 - Use the "Cooling_DemandReduction" factor instead of the "Cooling_Reduction" factor to calculate demand savings for thermostats.

Behavioral and IQ-Behavioral Programs

- Continue to monitor the new 2024 waves as more data is available that spans the cooling season. Consider adjusting goals while the program establishes its separate IQ and non-IQ cohorts. Monitor all waves as savings can take a few years to build up for new waves, but savings can also decrease in household and overall savings for older waves. If savings for older waves present a steady decline (starting with using 2024 as a comparison), consider retiring the waves or moving those control customers into other waves as treatment customers.

- Consider a customer behavior study to understand why behavioral savings increase or decrease over time. The study can examine savings data from the lifespan of the program, as well as demographic and educational messaging data to find drivers of long-term savings. The study can attempt to understand how much customer knowledge about energy savings comes from this program, while helping understand the persistence of savings for the program going forward.
- Monitor statistical significance as well as savings, particularly when the program makes changes that could increase savings, such as instituting AMI high bill alerts.
- Consider conducting a study to determine how the NIPSCO team can maximize savings while maintaining the ability to calculate statistical significance for savings differences with smaller wave sizes. This could help inform the strategy for adding participants to the program to drive savings in future years.
- Using move-out, zip code, and/or renter data at the customer level from NIPSCO, Oracle, or from the census for the whole NIPSCO service territory, investigate any fundamental differences between the waves and the service territory to take into consideration when rebalancing customers in future waves.
- Conduct research to better understand the underlying reasons for variable savings to inform decisions about whether to reassign wave participants. The aim of this research would be to better understand who is in each wave and the savings potential of IQ homes. It could include investigating baseline usage for IQ and non-IQ waves and attempting to collect different home data from Oracle or NIPSCO, such as square footage, home vintage, equipment in homes, or cooling system types, to understand the differences between waves with positive and negative savings and the differences in seasonal savings.
- Develop new strategies, such as targeting messaging to new waves to update their home profile information, to increase engagement with the online portal. With increased portal engagement, NIPSCO can better market other program offerings to program participants.
- Conduct a customer survey to better understand customer interest in portal usage. A brief survey could gather 1) participant preferences for mail, email, or both types of communication and 2) relative interest in energy savings tips, the customer portal, or information in other NIPSCO programs. Alternatively, consider conducting an in-depth customer survey, which the evaluation team conducted last in 2018. A more extensive survey could also ask customers about their preferences for email frequency, messaging, and other resources needed to inform Oracle's tip library and potentially drive program cross-participation.
 - When considering these options, it will be especially important to understand the differences between the non-IQ and IQ programs regarding program satisfaction and opportunities for engagement. Additional research questions could include how to use key words and language for the IQ program that aligns with its participants' current saving habits and motivations.
- Conduct research on different consumption and usage patterns in IQ homes to provide useful recommendations to customers shown to have lower baseline usage—and possibly lower opportunities for savings—than their non-IQ cohorts. The program can use this information to enhance messaging to these customers, specifically messaging for programs targeting IQ offerings

that align with the findings on customer usage. Use 2025 as a comparison year to 2024, which can serve as a control year for messaging to IQ and non-IQ customers.

- Consider different targeted messages to older waves and newer waves. Customers who have remained in the program for more than five years may be homeowners or long-term renters who could make capital improvements to their homes and might have bigger opportunities for new heating systems, for example. Newer waves may be more interested in a wide range of NIPSCO's offerings, targeted messaging about low-capital investment energy efficiency improvements, or using the online portal, as mentioned above.
- Conduct a message testing study with a sample of customers from waves that demonstrate high savings to evaluate the effectiveness of using targeted channeling efforts that highlight other NIPSCO programs. For example, the team could test using more targeted channeling messaging with participants who are in the oldest waves and have the highest behavioral savings. If the test results demonstrate that targeted channeling leads to higher cross participation and additional energy savings, this could be a new model to drive more savings from the highest-savings participants in the largest program in NIPSCO's residential portfolio.
- Conduct brief pre- and post-high bill alert surveys to understand if the attention from high bill alerts is leading to higher customer engagement or possibly higher customer satisfaction. High bill alert emails may have led to increased awareness of and attention to the program communications.
- Consider conducting an experiment creating cohorts of waves that 1) receive the same messaging or timed messages as 2024 or 2) receive messages during different months of the year. NIPSCO can conduct better research to look at savings by month and strategize when to send reports that may attract customer attention.

Residential New Construction Program

- Conduct ENERGY STAR manufactured new homes manufacturer interviews as part of the 2025 evaluation to better understand energy efficiency decision-making.
- Conduct manufactured home community owner interviews as part of the 2025 evaluation to better understand the relationship and decision-making responsibility between community owners and homeowners as it relates to program participation.
- Conduct benchmarking research on other utility programs that incentivize ENERGY STAR-manufactured new homes to inform program design and NTG analysis.
- Update manufactured home baseline and design energy models with information from new homes manufacturer interviews to increase estimated savings accuracy.

- Consider marketing the manufactured home rebates through additional channels, such as social media and radio, as well as through direct engagement with manufactured home community owners, to increase program awareness and participation.
- Shift the 90-day application window to start at the time of sale or when the utility account is in the name of the new owner so that new homeowners have adequate time to apply.
- Consider increasing the electric rebate amount for HERS Base and HERS Plus incentives to offset the incremental equipment cost and to increase electric participation.
- Consider lowering the cooling efficiency requirements for participating in electric rebates to lower the equipment cost and to increase participation.
- Consider using more conservative numbers for planned participants in future program designs for new home and manufactured home electric measures to lower the risk of overestimating the program's planned savings.
- Consider conducting a multivariant regression analysis to better understand which home characteristics correlate well to savings. Consider including the following:
 - Ventilation system type (ERV, air cyclers, exhaust-only) to determine how it correlates to savings compared to other home characteristics.
 - Normalizing the savings in the analysis to home area to identify which other characteristics (if any) correlate highly to savings.
- Consider normalizing the deemed *ex ante* savings for all measures on a per-area basis and track home area for all new home and manufactured home measures in the program database to improve *ex ante* savings estimates and reduce the impact of home size variability.
- Consider comparing future *ex ante* savings estimates to the following evaluated value ranges to ensure values align with previous evaluations:
 - kWh: 0.250/sf to 0.329/sf
 - kW: 0.000100/sf to 0.000114/sf
 - Therms: 0.081/sf to 0.109/sf
- Consider updating the Natural Gas Furnace – 95% AFUE prescriptive savings calculation for new homes by revising parameters to reflect the average participating home values for HERS Base participants instead of TRM defaults in baseline parameters (e.g., 80% AFUE TRM default vs. 92.1% AFUE average of HERS Base participants, and 13.4 SEER2 (14.0 SEER) TRM default vs. 13.7 SEER2 (14.4 SEER) average of HERS Base participants) to reduce overestimation of the incremental savings in planned savings.
- Work with the evaluation team to develop new manufactured home models (and review existing models) to revise future planned savings estimates for all variations of manufactured home measures to improve planned savings estimates.

HomeLife Calculator Program

- Update all inputs that have deemed values in the Illinois TRM to use those values instead of using older values from previous evaluations.
- Use the “as-used” flow rate value for faucet aerators provided in the Illinois TRM as the TRM is not set up to use the rated flow rate for faucet aerators.

- Include an incandescent replacement factor for nightlights to account for units that do not replace an existing nightlight.
- Update the power outlet gasket *ex ante* savings calculation to include heating season savings.
- Update the switch gaskets *ex ante* savings calculation to use the Illinois TRM.
- Update ISRs to the values found in the most recent participant survey.

Income-Qualified Weatherization Program

- Ensure that technicians are properly trained in how to install all measures. Consider developing an installation quality assurance checklist for technicians to help deliver consistent service.
- Update *ex ante* savings to use 100% HVAC saturation values when the technician determines the HVAC type on site.
- To ensure the most up-to-date savings values, update *ex ante* savings use deemed values from the current Illinois TRM when available instead of using older values from previous EM&V reports. Continue to use values from EM&V reports for metrics collected via primary data collection, such as ISRs.

Residential Online Marketplace

- Ensure the program design file and associated tracking data use savings values that account for the correct quantity of nightlight(s) within each energy saver kit.
- Ensure the program design file and associated tracking data use savings values calculated with the correct and most up to date variables, such as Full Load Hours and Cooling Demand Reduction.
- Distribute messaging to free thermostat recipients encouraging them to install the equipment and providing installation resources to those who need assistance.
- Conduct follow-up surveys with free thermostat recipients to confirm whether they ultimately installed the free thermostat. These follow-up surveys can be used to inform a “partial ISR” that NIPSCO can apply to these measures in the future, to account for the fact that even if a customer does not immediately install a measure, it can still produce meaningful energy savings in the future.
- Oversample recipients of free thermostats in future evaluations to ensure that a sufficient population of participants who have not yet installed their thermostat are available for future research. Include links to additional program offerings in the customer check out process.
- Include literature and information on other program offerings with the thermostats that are sent to customers.
- Send follow-up marketing emails to OLM participants to directly inform them of additional program and energy saving opportunities.
- Use the most recent and relevant TRM with the correct effective date to determine savings for the current program year.
- Refrain from using more than one version of the same TRM for *ex ante* measure calculations.

Commercial and Industrial Programs

- Establish a consistent, documented method for measure documentation and tracking database entry. The evaluation team would recommend making one measure entry per single piece of equipment to reduce the potential for duplication risks as the measure rolls up to the project and the customer levels.
- Update any savings calculations or assumptions from the Indiana 2015 TRM with those available in the Indiana TRM Workbook v1.0 and the Illinois TRM (the most current version at start of program year).
- Revise all Indiana 2015 TRM EFLH references to EFLH values in the Illinois TRM mapped to Indiana cities as specified in the Indiana Workbook TRM v1.0.
- Examine the circumstances of the SBDI bonus incentive promotion and concurrent program activity, as well as budget spent, to evaluate whether and how it can be duplicated in future years.
- Increase SEM program incentive levels (as well as those for the Custom and Prescriptive programs) for refrigeration measures to match those offered in Illinois. This will help attract a larger number of qualified refrigeration efficiency contractors to work in Indiana.
- Add staff to work with and learn from the current field engineer. The new staff could help expand the reach of the program and could be trained to take over for the current field engineer when they retire.
- Consider options, such as an uplift or spillover analysis, to better understand the impact of the SEM program and actions by the field engineer. Especially if program expansion is a goal, NIPSCO may want to complete additional studies on the effects of field engineer referrals to other programs and identification of low- and no-cost energy saving suggestions that customers act on (which might be counted as savings under a more standard model SEM program).
- Ensure the SBDI program delivery matches the program abstract process narrative, which states that the trade ally will identify potential measures that could benefit the customer and then install those measures.
- Conduct targeted outreach for the SBDI program to those who have not yet participated in the program.

Commercial and Industrial Online Marketplace

- Consider expanding program offerings and kit components to meet the needs of new and returning customers with products viable for an online marketplace distribution platform.
- Consider offering industry-specific kits again or developing industry-specific messaging for existing kits, especially if there is a target industry for future iterations of the C&I OLM and monitor the effects on uptake with targeted customer segments. Industry-specific kits could aid in expanding to a new customer base.
- Revisit the accuracy of savings calculations specifically for LED lamps, LED exit signs, bath aerators, and showerheads, if these products will be part of the 2025 kits.

Program Offerings

NIPSCO's DSM portfolio consists of 18 programs distributed across the Residential and C&I sectors. NIPSCO administers these programs with the support of third-party implementers, TRC Company and Oracle (Behavioral and IQ-Behavioral programs). The 2024 program year marked the first year of a three-year program cycle. A brief description of each program's offering follows:

- The **Home Rebates program** provides incentives to natural gas and electric residential customers to purchase energy-efficient heating and cooling products. The program includes energy-efficient measures such as smart thermostats, furnaces, air conditioners, boilers, heat pumps, dehumidifiers, electric clothes dryers, and air purifiers.
- The **Retail products program** provides upstream discounts on energy-efficient products such as advanced power strips, air purifiers, clothes dryers, televisions, and EISA exempt LED lighting. NIPSCO works with retailers and manufacturers to offer reduced prices at the point of sale.
- The **Home Energy Assessment (HEA) program** provides no-cost, in-home energy assessments to residential customers. During an assessment, an energy advisor analyzes the efficiency of the heating and cooling systems and insulation levels in the home. They then install energy-saving lighting and water conservation measures, as well as duct sealing to qualifying homes during the assessment. The program also provides outlet gaskets as a leave-behind measure and provides air sealing and attic as a follow-up measure. The assessment concludes with the advisor providing a report of findings and energy-saving recommendations. The primary focus of the program is to educate customers about energy efficiency in their homes.
- The **Appliance Recycling program** provides removal and recycling services to electric customers who reduce energy consumption through recycling unneeded refrigerators, freezers, room air conditioners, and dehumidifiers. There is a limit of two large appliances (refrigerators and freezers) and two small appliances (room air conditioner or dehumidifier) per household, per year.
- The **School Education program** works with teachers to educate students about energy efficiency and how they can make an impact at school and home. Participating teachers receive classroom curriculum and take-home efficiency kits to distribute to their students. In 2024, the program continued to work with fifth-grade teachers and added high school teachers.
- The **Multi-Family Direct Install (MFDI) program** provides property owners and managers of Multi-Family housing a no-cost property walk-through for residential units and common spaces and energy efficiency measures in-unit at no-cost as well. The walk-through results in a report with recommendations for energy-efficient upgrades. During a follow up visit, a program approved contractor will install some or all the suggested energy-efficient measures in the residential units.
- The **Behavioral program** sends paper and/or electronic home energy reports to selected customers that educates them on their energy consumption patterns. Participants receive a targeted, individualized report that is intended to motivate them to engage in energy-saving behaviors. The report shows the participants' monthly energy use and compares this use to similarly sized homes nearby, and it also provides semi-customized energy-saving tips. Participants may opt-out through an online portal.

- The **Income-Qualified Behavioral program** operates in the same way as the Behavioral program but only includes income-qualified (IQ) customers. The program also provides resources for IQ customers for assistance.
- The **Residential New Construction program** provides incentives to residential home builders to build higher efficiency homes. The program offers several tiers of incentives utilizing HERS ratings, to encourage energy efficiency in residential home construction. The program also incentivizes qualified manufactured new homes.
- The **HomeLife Calculator program** offers residential customers a free online ‘do-it-yourself’ audit to help customers learn about their home’s energy use and provide recommendations on how to save energy. Eligible participants also receive a free energy savings kit with various measures including connected LEDs, LED nightlights, water saving devices, advanced power strips, as well as light switch and power outlet gaskets.
- The **Income-Qualified Weatherization (IQW) program** provides no-cost, in-home energy assessments to income-qualified residential customers. Program participants receive a home assessment, where an energy advisor first analyzes the efficiency of heating and cooling systems and insulation levels in the home. Depending on opportunities in the home, the advisor installs energy-saving lighting and water-conservation measures, as well as duct sealing and air sealing to qualifying homes during the assessment.

Electric customers with qualifying non-ENERGY STAR® refrigerators ten years old or older are also eligible to receive a new, ENERGY STAR®-rated refrigerator, and those with attic insulation levels below R-11 may qualify for attic insulation. Both items are installed after the initial assessment. The advisor also provides a report on findings and energy-saving recommendations.

- The **Residential Online Marketplace** provides an online retail platform for customers to buy energy-saving equipment, such as thermostats, clothes washers and dryers, refrigerators and freezers, and air purifiers. Through the Online Marketplace, NIPSCO also offered limited time offer energy-saving kits marketed as Energy Savers Starter Packs, each containing a customized mix of measures including a thermostat, lighting, and water saving devices.
- The **C&I Prescriptive program** provides rebates for the installation of energy efficiency equipment and system improvements. The program offers rebates for lighting, pumps and drives, heating, cooling, and refrigeration equipment.
- The **C&I Custom program** provides incentives for measures not included in the Prescriptive program that are unique to the commercial participant’s application or process. The program requires individual engineering analyses to determine savings. This program offers customers incentives based on the calculated savings for energy savings opportunities outside the traditional rebate program.
- The **C&I New Construction program** offers incentives to encourage building owners, designers, and architects to exceed standard building practices. Projects may also qualify for either prescriptive or custom incentives.

- The **Small Business Direct Install (SBDI) program** provides small business participants incentives for refrigeration, lighting, HVAC, and other natural gas-saving measures typically used in small business operations. These incentives are higher than offered through the C&I Prescriptive program to overcome first-cost barriers traditionally experienced by small business customers.
- The **Strategic Energy Management (SEM) program** aims to integrate energy management into everyday business and operations practices. This results in persistent energy savings and long-term cost reduction for participants. Staff at all levels participate in daily operational habits to ensure the buildings and equipment are operating as efficiently and cost-effectively as possible. The program also encourages participants to use a performance tracking tool, such as ENERGY STAR® Portfolio Manager®, to benchmark and track their progress toward their energy conservation goals.
- The **C&I Online Marketplace** provides free energy-saving kits to businesses, with measures included in the kits customized to meet different needs (such as office, water saving and conservation). These kits contain lighting and water saving measures as well as other measures, such as advanced power strips, exit signs, smart plugs, outlet and switch gaskets. In 2024, the program removed their a la carte options and only offered kits.

Evaluation Objectives and Methodology

The evaluation team employs consistent methods across programs and prior evaluation years whenever possible. The evaluation process can be broken into three key areas of research, which are summarized below:

Impact Evaluation. The evaluation team verifies measure installation, calculates evaluated (or gross) savings, and measures freeridership and spillover to produce net savings impacts. This research includes conducting engineering desk reviews of project savings calculations, completing site visits to observe project conditions and measure savings performance, and surveying participants to understand program influence.

Process Evaluation. The evaluation team investigates program processes, participation barriers, and the program experiences of customers and trade allies. This research uses telephone and online surveys with program actors (trade allies, participants, and other supporting actors), and interviews with implementation staff to better understand program performance. This research gives stakeholders insight into the aspects of success or potential improvement for each program and provides context for impact findings.

Cost-Effectiveness. The evaluation team conducts a cost-effectiveness analysis (a form of economic analysis) to compare the relative costs and benefits from NIPSCO's investment in each program. In the energy efficiency industry, cost-effectiveness metrics serve as an indicator of the economic attractiveness of any energy efficiency investment or practice, as compared to the costs of energy produced and delivered in the absence of such investments.

Research Questions

The evaluation team developed key research questions for each program, designed to address program-specific evaluation needs. Impact activities for most programs included an assessment of these research areas:

- Data quality review
- In-service rates or ISRs
- Measure verification (including evaluating savings and calculating realization rates)
- Freeridership
- Spillover
- Program cost-effectiveness

Process activities for most programs included an assessment of these research areas:

- Program design, delivery, and administration
- Communication and coordination between NIPSCO and its implementers
- Marketing strategies
- Program processes (including application processes)
- Drivers of participation and barriers to participation
- Quality control processes
- Future program plans

Impact Evaluation Approach

To determine portfolio impacts, the evaluation team completed the following activities for all programs:

- Compared tracking data, program documents, and scorecard data for alignment and accuracy
- Reviewed savings values, calculations, assumptions, and sources
- Collected ISR data for program measures, where applicable
- Calculated *ex post* gross savings values for programs and the portfolio
- Estimated freeridership and spillover behavior from participant surveys, site visits, and secondary sources
- Calculated *ex post* net savings values for programs and the portfolio

The team employed statistical and engineering-based analysis techniques to achieve these results, adjusting program-reported gross savings (*ex ante*) using the information gathered through database and document reviews, engineering reviews of tracking data and project work papers, Illinois TRM v12.0, Indiana TRM Workbook (v1.0) deemed savings calculation reviews, and on-site verification and metering.

The evaluation team's presentation of analysis results follows a progression, with each savings type corresponding to a specific step in the evaluation process.

The evaluation team defined these key savings terms as follows for the impact evaluation:

- **Reported *ex ante* savings:** Annual gross savings for the evaluation period, as reported by NIPSCO in the 2024 DSM Scorecard.
- **Audited savings:** Annual gross savings after alignment or reconciliation with the program tracking data.
- **Verified savings:** Annual gross savings after alignment with the program tracking data (i.e., Audited savings), and adjustments related to ISRs.
- **Evaluated *ex post* savings:** Annual gross savings with all previous adjustments (i.e., Verified savings), and adjusted to include the best available inputs and methodology available at the time of the evaluation.
- **Realization rate (percentage):** the percentage of savings the program realized, calculated using the following equation:

$$\text{Realization Rate} = \frac{\text{Ex Post Gross Savings}}{\text{Ex Ante Gross Savings}}$$

- **Evaluated net savings:** Evaluated *ex post* savings, adjusted for attribution (i.e., freeridership and spillover).

Process Evaluation Approach

For the process evaluation, the evaluation team held discussions with program and implementation staff to document how each program worked, identify, and understand the important influences on the program's operations, and gain insight into factors influencing the program's performance. For some programs, the evaluation team also conducted surveys and interviews with program participants to understand their perspectives and experiences with a given program.

Research Activities

The evaluation team conducted the following research activities by program. Table 8 details the activities that informed the impact evaluations, and Table 9 details the activities that informed the process evaluations.

Table 8. 2024 Impact Evaluation Activities

PROGRAM	DATABASE REVIEW	ENGINEERING ANALYSIS	VERIFICATION/ SITE VISITS	NTG ESTIMATION/ UPDATES	GATHER IMPACT INPUTS VIA PARTICIPANT SURVEYS
RESIDENTIAL					
Home Rebates	✓	✓		✓	✓
Retail Products	✓	✓			
Home Energy Assessment	✓	✓		✓	✓
Appliance Recycling	✓	✓			
School Education	✓	✓			
Multi Family Direct Install	✓	✓			
Behavioral	✓	✓		N/A	
IQ-Behavioral	✓	✓		N/A	
New Construction	✓	✓			
HomeLife Calculator	✓	✓			
Income-Qualified Weatherization	✓	✓		N/A	✓
Residential Online Marketplace	✓	✓		✓	✓
C&I					
Prescriptive	✓	✓	✓		
Custom	✓	✓	✓		
C&I New Construction	✓	✓	✓		
Small Business Direct Install	✓	✓	✓	✓	✓
C&I Online Marketplace	✓	✓	✓		
Strategic Energy Management	✓	✓	✓		

Table 9. 2024 Process Evaluation Activities

PROGRAM	PROGRAM STAFF INTERVIEWS/DISCUSSIONS	MATERIALS REVIEW	PARTICIPANT SURVEYS/INTERVIEWS
RESIDENTIAL			
Home Rebates	✓	✓	✓
Retail Products	✓	✓	
Home Energy Assessment	✓	✓	✓
Appliance Recycling	✓	✓	
School Education	✓	✓	✓
Multi Family Direct Install	✓	✓	
Behavioral	✓	✓	
IQ Behavioral	✓	✓	
New Construction	✓	✓	✓
HomeLife Calculator	✓	✓	
Income-Qualified Weatherization	✓	✓	✓
Residential Online Marketplace	✓	✓	✓
C&I			
Prescriptive	✓	✓	
Custom	✓	✓	
New Construction	✓	✓	
Small Business Direct Install	✓	✓	✓
C&I Online Marketplace	✓	✓	
Strategic Energy Management	✓	✓	✓

Database and Document Review

The evaluation team reviewed NIPSCO's program tracking databases, scorecards, and other documentation to assess the quality of information and to identify potential anomalous entries, outliers, duplicates, and missing values. This included reviewing all data fields recommended in the Illinois TRM v12.0, along with those necessary to calculate deemed savings. The evaluation team conducted a database and document review for all programs, including these specific activities:

- Verified that all customer and vendor information needed to conduct primary research was available and complete
- Confirmed that all measure-specific data included the necessary details in the proper formats to enable impact evaluation
- Confirmed that all program costs and other tracking information required to calculate impacts and assess resource allocation were available and complete
- Assessed new marketing, outreach materials, and other related activities

The evaluation team closely reviewed the calculation procedures and savings estimate documentation. The evaluation team also verified the appropriateness of NIPSCO's analyses for calculating savings as well as the assumptions used for participating facilities' structural attributes and operational characteristics.

Verification and Virtual Site Visits

For the C&I programs, the evaluation team verified measure installation via virtual site visits with select customers. Virtual site visit activities focused on verifying and measuring program measures installed in C&I buildings. The evaluation team did not perform any onsite activities, including metering, as part of the 2024 evaluation.

The total number of measures reviewed via virtual site visits is outlined in Table 10 below. The team reviewed program tracking data in Spring 2024, a second time in Fall 2024, and a third time in early 2025, to identify high-saving projects and draw these projects into a sample for recruitment. The evaluation team completed virtual verifications between Spring 2024 and February 2025.

Table 10. 2024 Virtual Verification Impact Evaluation Samples

PROGRAM	TOTAL NUMBER OF SAMPLED MEASURES	NUMBER OF VIRTUAL SITE VISIT MEASURES	PERCENT <i>EX ANTE</i> ELECTRIC SAVINGS SAMPLED	PERCENT <i>EX ANTE</i> GAS SAVINGS SAMPLED
C&I Prescriptive	33	2	13%	15%
C&I Custom	34	7	15%	36%
C&I New Construction	31	6	24%	33%
C&I SBDI	21	-	16%	6%
C&I Schools SEM	10	-	62%	n/a
C&I Total Programs	129	15	16%	29%

NIPSCO provided contact information for project decision-makers and implementation contractors, and the evaluation team contacted customers at selected sites to schedule interviews and virtual visits in advance. The evaluation team conducted these primary tasks during the M&V virtual visits:

- Verified that all measures were installed correctly and functioning properly and confirmed the operational characteristics of the installed equipment such as temperature, setpoints, and annual operating hours.

- Collected physical data such as cooling capacity or horsepower and analyzed the energy savings realized from the installed improvements and measures.

Program Staff Interviews and Discussions

The evaluation team attended meetings with NIPSCO implementation staff to understand how the programs were designed and delivered. The meetings covered wide-ranging topics such as program design and administration, communication and data tracking processes, marketing strategies, trade ally and participant interactions, and challenges and successes.

Participant Surveys

The team conducted quantitative research to address the program’s impact and process needs, depending on the status and design of the program. To support the impact and process evaluations, the evaluation team conducted surveys for select programs. The evaluation team designed these surveys to collect data about market awareness of NIPSCO’s energy-saving programs, product installation rates, customer behavior and equipment use, participant satisfaction with program components, and barriers to participation. Where applicable, the surveys informed process and impact research questions, such as freeridership and spillover.

Sampling

The evaluation team used a sampling approach to develop sample frames for participant surveys. Table 11 shows the population and sample sizes, as well as the number of completes for surveys.

Table 11. Survey Population and Sample Sizes

PROGRAM	RESPONDENT GROUP	SURVEYS OR INTERVIEWS	POPULATION (COUNT OF UNIQUE ELIGIBLE CUSTOMERS)	TARGET COMPLETES	ACHIEVED COMPLETES
RESIDENTIAL					
Home Rebates	Participants	Surveys	3,465	280	280
Home Energy Assessment	Participants	Surveys	1,199	115	61
Income-Qualified Weatherization	Participants	Surveys	557		54
Residential Online Marketplace	Participants	Surveys	708	70	70
Appliance Recycling	Contractors	Interviews	NA	3	3
School Education	Teachers	Interviews	fifth-grade: 289	6	2
			high school: 28	6	6
Residential New Construction	Participants	Interviews	6 (as of Jan 2025 at time of interviews)	6	1

PROGRAM	RESPONDENT GROUP	SURVEYS OR INTERVIEWS	POPULATION (COUNT OF UNIQUE ELIGIBLE CUSTOMERS)	TARGET COMPLETES	ACHIEVED COMPLETES
C&I					
Small Business Direct Install	Participants	Surveys	246	70	29
SEM	Participant	Interviews	6	3	0
SEM	Field Engineer	Interviews	NA	1	1

NTG Methods

An NTG ratio is made of two components: freeridership and spillover. Freeridership is the percentage of savings that would have occurred in the absence of the program because participants would have behaved the same (purchasing the same measures) without the influence of the program. Spillover occurs when customers purchase energy-efficient measures or adopt energy-efficient building practices without participating in a utility-sponsored program. The evaluation team used the following equation to calculate NTG for each program:

$$\text{Program NTG Ratio} = 100\% - \text{Freeridership} + \text{Spillover}$$

In 2024, programs that included NTG analysis primarily used the self-report approach. The approach accounted for customers' intention absent the program and influence of program offerings on customers' decisions. Programs that did not include customer surveys in 2024 relied on prior years' NTG results.

Self-Report Method

To determine a freeridership score, the evaluation team relied on self-report participant surveys, in which the evaluation team asked participants a series of questions about what their actions would have been in the absence of the program. The specific net-to-gross batteries were tailored to each individual program design. The evaluation team used each unique set of responses to calculate a freeridership score for that individual. The evaluation team then aggregated the scores and determined a total freeridership score by fuel type. To facilitate comparisons over program years, the evaluation team used NTG question batteries consistent with those used in prior evaluations.

Spillover is measured by asking participants who purchased a particular measure if, because of the program, they decided to install another energy-efficient measure or undertake some other activity to improve energy efficiency. The evaluation team assessed spillover through self-report surveys, in which interviewers read a list of energy-efficient products to respondents and asked if they had installed any of the products in their home or business since participating in the program. If respondents said they had made energy-efficient improvements or purchased products, interviewers asked how influential the program was on their purchasing decisions.

The evaluation team estimated spillover savings for measures where participants said the program was very influential in their decision. The team used specific information about participants, determined through the evaluation, and used the Illinois TRM v12.0 and EM&V *ex post* savings analyses as a baseline reference. The sum of the estimated spillover savings, divided by savings achieved through the program for each relevant

measure, yielded spillover savings as a percentage of total savings, which the evaluation team then extrapolated to the population of program participants.

Intention/Influence Method for Self-Reports

For the *intention/influence* method, the evaluation team assessed freeridership in two steps. Although the questions were like those used in the self-report method, the *intention/influence* questions explored the participant's intention and the program's *influence* in more detail.

The evaluation team first scored these two parts of the survey separately, then combined them with equal weight to determine one freeridership score for each survey respondent. A similar but slightly modified version of this approach was used for kit programs, which have a somewhat different program design compared to other programs such as the Appliance Recycling or C&I programs. Spillover under this method focused on the program's *influence* on a participant's decision to invest in additional energy-efficient measures.

The evaluation team derived the participants' *intention* freeridership score by translating their responses into a matrix value and applying a consistent, rules-based calculation to obtain the final freeridership score.

The evaluation team used the following process for determining the intention freeridership score:

- Customers were categorized as 0% freeriders if they were not aware of a program (i.e., efficient) measure and had no plans to install that measure prior to hearing about the program. Customers also were categorized as 0% freeriders if they knew about the program but had no plans to install an efficient, program-promoted measure.
- Customers were categorized as 100% freeriders if they would have installed the measure in the program's absence or if they had already installed the measure before learning about the program.
- Customers received a partial freeridership score if they planned to install the measure and the program altered their decision. This effect may have included the installation's timing, the number of measures installed, or the efficiency levels of measures installed. For customers who were highly likely to install a measure, and for whom the program had less effect on their decisions, the evaluation team assigned a higher intention freeridership score.

The evaluation team assessed the influence of freeridership by asking participants how important various program elements were in their purchase decision-making process. The maximum rating of any program factor determined a participant's influence freeridership score (0% to 100% score range using a 1 to 4 scale).

The evaluation team calculated the arithmetic mean of the intention and influence freeridership components to estimate total freeridership for programs.

$$\text{Total Freeridership} = \frac{\text{Intention FR Score} + \text{Influence FR Score}}{2}$$

The influence and intention scores contribute equally to the total freeridership score. The higher the total freeridership score, the greater the deduction of savings from the gross savings estimates.

Using the calculated freeridership and spillover values, the evaluation team applied the overall NTG ratio to the *ex post* gross savings to identify the *ex post* net savings.

Deemed Savings Method

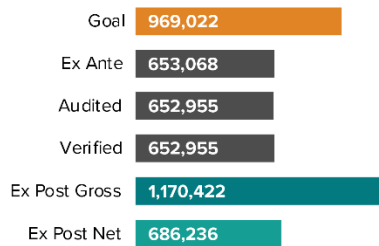
For several programs, where the evaluation team did not do primary research or there was not enough participation or robust enough data to calculate new NTG values from primary research, the evaluation relied on either 1) past evaluation estimates for that same program or 2) NTG values from other NIPSCO programs with similar program designs to estimate NTG for the 2024 evaluation year.

HOME REBATES

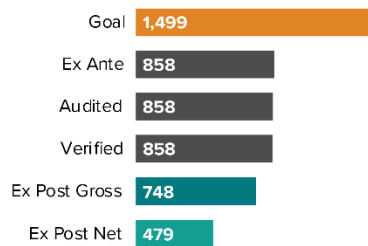


- The Home Rebates Program met its 2024 savings goals for electric energy savings and natural gas savings but fell short of the peak demand savings goal.
- Overall, customers are very satisfied with the Home Rebates program and NIPSCO but less satisfied with the rebate amount and the rebate wait time.
- While contractors drove program awareness for furnaces, air conditioner units, and tune-ups, participants most commonly learned about rebates for other measures through the NIPSCO website.

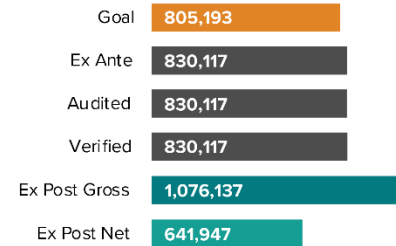
⚡ Electric Savings (kWh)



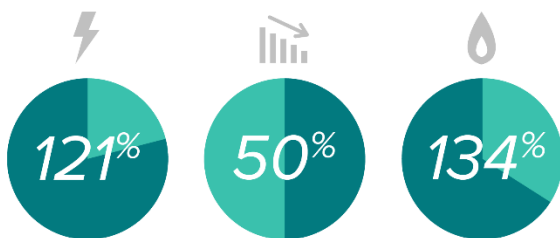
📊 Peak Demand Reduction (kW)



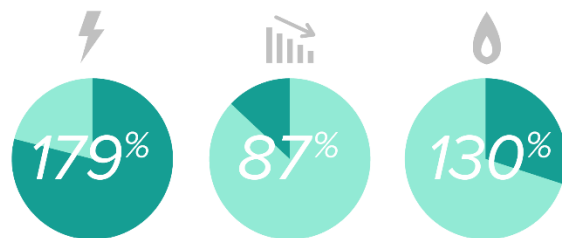
💧 Natural Gas Savings (Therms)



Ex Post Gross Achieved to Gross Goal



Realization Rate



Budget



Electric and Peak Demand



Spent **58%**



Natural Gas



Spent **101%**

Program Design and Delivery

NIPSCO offers the Home Rebates (formally known as Energy Efficiency Rebates) program to encourage customers to install energy efficient equipment that reduces energy consumption. The program is available to all residential gas and electric customers with an active NIPSCO account. The 2024 program includes the following measure categories:

- Air conditioners
- Air conditioner tune-ups
- Air purifiers
- Air-source heat pumps
- Air-source heat pump tune-ups
- Boilers
- Ceiling fans
- Clothes washers and dryers
- Dehumidifiers
- Dishwashers
- Ductless mini-split heat pumps
- Furnaces
- Heat pump water heaters
- Low-E Storm Windows
- Pool pumps
- Refrigerators and freezers
- Smart Vents
- Wi-Fi thermostats

The program's rebates range from \$3 for certain freezers to \$750 for a heat pump water heater. Rebate levels vary by the equipment's efficiency level and measure type.

As was the case in previous years, customers can install the measures through a contractor of their choice or install the measures themselves. A licensed HVAC contractor must complete air conditioner and air-source heat pump tune-ups. Customers or contractors can complete the application—either through an online portal or through a form that they email, mail, or fax to NIPSCO.

In 2023, NIPSCO added a Midstream program component to the program, which was continued in 2024.² Distributors offer these measures with an instant discount at the time of purchase. Distributors confirm that purchasers are NIPSCO customers via a Midstream portal and then submit a project for the customer through the portal. Four measures are eligible through the midstream program:

- Air conditioners
- Air-source heat pumps
- Furnaces
- Heat pump water heaters.

For customers who are looking for a contractor, NIPSCO provides a link on its website to program-participating contractors, also known as trade allies. Customers can navigate to the "Trade Ally Search" page on the NIPSCO website to find contact information for contractors that are part of the TRC Trade Ally Network in their area. Contractors have the option to provide an instant discount on equipment or services to their customers and can submit the rebate application on their behalf. If contractors do not pursue the instant discount option, participants must fill out and submit the rebate forms themselves. Customers or contractors must submit rebate applications within 60 days of the measure installation. TRC, the implementation contractor, randomly inspects 10% of all installations each year as a means of quality control. Based on the program's documentation, NIPSCO advertised the program through direct contractor outreach, email, direct mail, community outreach events, public relations, social media, cross-selling, and its website.

² In 2024, there were 11 furnaces and 1 air conditioner that were incentivized through the midstream program.

Changes from the 2023 Design

The program increased the incentives for five measures in 2024 compared to 2023 and decreased them for one measure. Prior to the implementation of the 2024 program design in April of that year, the program incentivized ductless mini-split heat pumps with a rating of 17+Seasonal Energy Efficiency Ratio (SEER) and 9.5 Heating Seasonal Performance Factor (HSPF), offering a rebate of \$250 per unit. However, starting in April, only ductless mini-split heat pumps with ratings of 17.1+ SEER2 and 8.6 HSPF2 qualified for incentives, resulting in a significantly reduced rebate of \$60 per unit. Tracking data indicates that the ductless mini-split models incentivized before April 2024 generated higher kWh savings compared to those eligible after the change.

Table 12. Incentive Changes from 2023

2023 MEASURE	2023 REBATE	2024 REBATE
Ductless Mini-Split Heat Pump	\$250	\$60
Natural Gas Boiler - ≥ 92% AFUE	\$200	\$250
Natural Gas Furnace - ≥ 95% AFUE	\$200	\$250
Air Source Heat Pump 16 SEER	\$200	\$400
Air Source Heat Pump 17+ SEER	\$300	\$500
Air Conditioner 15 SEER (ECM savings)	\$105	\$220
Air Source Heat Pumo 15.2 SEER2 - MS	\$150	\$135
ENERGY STAR Heat Pump Water Heater - ≥ 2.0 UEF	\$750	\$350

Program Performance

The Home Rebates program exceeded its electric and natural gas energy savings goals, but it fell short of its peak demand reduction goal. Legacy air conditioners played a significant role in causing the Home Rebates program to fall short of its peak demand reduction goal. This was mainly due to the evaluation team applying lower deemed savings from the 2023 evaluation to these measures, compared to *ex ante* savings. Table 13 summarizes the savings for the full year of program performance, including the program’s savings goals.

Table 13. 2024 Home Rebates Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	969,022.49	653,068.16	652,955.25	652,955.25	1,170,421.96	686,235.83	121%
Peak Demand Reduction (kW)	1,498.868	857.693	857.667	857.667	747.812	478.754	50%
Natural Gas Energy Savings (therms/yr.)	805,192.65	830,116.56	830,116.56	830,116.56	1,076,137.37	641,946.77	134%

As in past evaluations, the evaluation team found that using actual installed measure characteristics changed the savings substantially. Also, differences between the approaches outlined in the Illinois TRM v12.0, which the evaluation team used to calculate *ex post* savings, and the Indiana TRM (v2.2), which the implementation team used to calculate *ex ante* savings—especially the inclusion of early replacement savings in the Illinois TRM v 12.0 and the use of 2023 billing analysis results—contributed to the differences observed between *ex ante* and *ex post* gross savings. Table 14 outlines the *ex post* savings and net-to-gross (NTG) adjustment factors.

Table 14. 2024 Home Rebates Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	179%	42%	0%	59%
Peak Demand Reduction (kW)	87%	36%	0%	64%
Natural Gas Energy Savings (therms/yr.)	130%	41%	0%	60%

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

The program spent 58% of the electric budget and 101% of the natural gas budget, which aligns with the planned goal achievement. Table 15 lists the 2024 Home Rebates program budget and expenditures by fuel type.

Table 15. 2024 Home Rebates Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$797,654.59	\$460,524.80	58%
Natural Gas	\$1,672,831.99	\$1,689,453.40	101%

Evaluation Methodology

To inform the 2024 Home Rebates NIPSCO impact and process evaluation, the evaluation team completed the following research activities:

- **Program staff interviews and discussions** to understand the program’s process, delivery, and design.
- **Documentation and materials review** to provide context on the program’s implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program’s participation data.
- **Engineering analysis** to review the program’s savings assumptions and algorithms for reasonableness and accuracy.
- **Participant surveys (n=280)** to understand the participant experience in the program and to gather information to calculate freeridership and spillover rates.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop savings estimates? Are there any updates that the program should make?
- What are the *ex post* program savings? Do these suggest any needed updates to the program's design, delivery, or savings assumptions?
- How effective was the program in influencing participant decision making? What are the program's freeridership estimates (net savings)?

For all measure types, the evaluation team compared its engineering calculations to NIPSCO's *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: standard engineering practices and relevant building codes, the Indiana TRM Workbook v1.0, the Illinois TRM v12.0, and NIPSCO's program tracking database.

Per the Indiana TRM Workbook v1.0, the Indiana TRM "is intended to be used as an accompaniment to [the Illinois TRM], automatically incorporating the most recent and effective version of the [Illinois] TRM, including measures newly added to the [Illinois] TRM." For each measure, the evaluation team first prioritized the Indiana TRM, which directly references the Illinois TRM for most measures. The team prioritized the VEIC Proposed Indiana Assumptions on the "Code Baseline Measures" tab of the Indiana TRM as a source for baseline assumptions, which provided for specific measures. Additionally, the evaluation team used the "Weather Zone Mapping" tab to map cities in NIPSCO's territory to the appropriate Illinois city to estimate weather impacts. Where provided, we utilized coincidence factors from the "Loadshapes" tab of the Indiana TRM.

Audited and Verified Savings

The Home Rebates program rebated 8,775 measures in 2024. The evaluation team audited the measure quantities by looking for duplicate records, ensuring measures followed program guidelines, and had the proper deemed savings values. The evaluation team removed one dehumidifier from the audited data after we found that the same account and address had previously participated in the Residential New Construction program before applying for the dehumidifier rebate. This violated the program rule that homes participating in and receiving an incentive in the Residential New Construction Program are not eligible to participate in the Home Rebates program for three years. All other measures in the tracking data followed the program's guidelines and represented proper deemed savings amounts.

The evaluation team found that some measures used *ex ante* savings values from 2023, which are located in the NIPSCO Residential 22-23 Program Design workbook. In the program tracking data, measures with per-unit savings that matched the 2023 design are considered 2023 Legacy measures, most of which received incentives prior to the 2024 program design that went into effect in April 2024. We include these measures as separate line items with "Legacy 2023 Measure" added to the end of the measure name in the tables throughout this report. We considered measures that customers installed after April 2024 to be non-Legacy measures and evaluated them on a per-measure basis using the Illinois TRM v12.0. Table 16 summarizes the audited quantity, applied in-service rates (ISRs), and resulting verified quantity per measure.

We used deemed IRSs of 100% for all measures, which is typical for larger HVAC measures that participants do not typically uninstall. The evaluation team conducted a survey in 2024 to assess IRSs for these smaller measures; however, none of the survey participants removed any measures after installation.

Table 16. 2024 Home Rebates Program Audited & Verified Quantities

MEASURE	UNIT OF MEASURE	AUDITED QUANTITY	ISR	VERIFIED QUANTITY
Air conditioners	Air Conditioner	538	100%	538
Air conditioners - Legacy 2023 Measure	Air Conditioner	261	100%	261
Air conditioner tune-ups	Tune-up	378	100%	378
Air conditioner tune-ups – Legacy 2023 Measure	Tune-up	98	100%	98
Air purifiers	Air Purifier	54	100%	54
Air-source heat pumps	Heat Pump	24	100%	24
Air-source heat pumps - Legacy 2023 Measure	Heat Pump	38	100%	38
Air-source heat pump tune-ups	Tune-up	3	100%	3
Air-source heat pump tune-ups – Legacy 2023 Measure	Tune-up	1	100%	1
Boilers	Boiler	24	100%	24
Boilers - Legacy 2023 Measure	Boiler	34	100%	34
Dehumidifiers	Dehumidifier	56	100%	56
Dehumidifiers – Legacy 2023 Measure	Dehumidifier	6	100%	6
Electric clothes dryers	Dryer	49	100%	49
Electric clothes washers	Washer	124	100%	124
Furnaces	Furnace	2,728	100%	2,728
Furnaces - Legacy 2023 Measure	Furnace	1,821	100%	1,821
Heat pump water heaters	Water Heater	13	100%	13
Heat pump water heaters - Legacy 2023 Measure	Water Heater	10	100%	10
Pool pumps	Pump	4	100%	4
Pool pumps – Legacy 2023 Measure	Pump	1	100%	1
Wi-Fi thermostats	Thermostat	1,479	100%	1,479
Wi-Fi thermostats - Legacy 2023 Measure	Thermostat	802	100%	802
Room Air Conditioners	Room AC	28	100%	28
Refrigerators with Freezers	Refrigerator	98	100%	98
Upright Freezers	Freezer	6	100%	6
Dishwashers	Dishwasher	92	100%	92
Ceiling Fans	Ceiling Fan	2	100%	2
Smart Vents	Smart Vent	2	100%	2
Total		8,774		8,774

Ex Post Gross Savings

The evaluation team referred to the Illinois TRM v12.0 to calculate *ex post* electric and natural gas energy savings and demand reduction for all 2024 measures. The evaluation team verified the measure characteristics provided in the tracking data using the Air Conditioning, Heating, and Refrigeration Institute (AHRI) and ENERGY STAR Qualified Product List (QPL) model number lookups and applied them to variables such as capacities, efficiencies, HVAC equipment type and model, and project location.

To reflect the rate of early replacement measures versus time-of-sale and replace-on-burnout measures, the evaluation team used responses from the 2024 participant survey to calculate early replacement rates and blended savings according to the Illinois TRM v12.0. The evaluation team calculated measure-specific early replacement rates for furnaces and air conditioners and calculated a blended early replacement rate for other measures with lower participation counts. The measures included in the blended early replacement rate counts are heat pumps, boilers, electric clothes dryers, electric clothes washers, dishwashers, refrigerators, pool pumps, air purifiers, and heat pump water heaters. Table 17 summarizes early replacement rates calculated and applied during the 2024 evaluation.

Table 17. 2024 Home Rebates Program Early Replacement Rates by Measure

MEASURE CATEGORY	% EARLY REPLACEMENT
Natural Gas Furnace (n=47)	21%
Air Conditioner (n=58)	14%
Blended ^a (n=25)	16%
^a The evaluation team calculated a blended early replacement rate for heat pumps, boilers, electric clothes dryers, electric clothes washers, dishwashers, refrigerators, pool pumps, air purifiers, and heat pump water heaters.	

The evaluation team used various sources including the results of the 2023 billing analysis, the Indiana TRM Workbook v1.0, and deemed savings values from the 2023 evaluation for other inputs. These cases and the approach used are listed below:

- For furnaces, heat pumps, heat pump tune-ups, and boilers, the evaluation team used the results of the 2023 billing analysis, which updated Equivalent Full Load Hours (EFLH) by nearest city.
- For the Legacy 2023 measures, which include some air conditioners, air conditioner tune-ups, air source heat pumps, air source heat pump tune-ups, ductless mini-split heat pumps, heat pump water heaters, boilers, furnaces, dehumidifiers, pool pumps, and Wi-Fi thermostats, the evaluation team used deemed savings values specific to each measure equal to the *ex post* gross savings per measure from the 2023 evaluation.
- For measures that reduce demand, the evaluation team opted for Illinois-specific coincidence factors provided in the Illinois TRM v12.0, depending on which values made the most sense for that specific measure.
- For air conditioners, room air conditioners, heat pumps, water heaters, thermostats, and tune-ups, the evaluation team assigned cooling hours and ground water temperatures by matching each installation’s city to the closest city in the Indiana TRM Workbook v1.0.

Engineering Reviews

The evaluation team reviewed each of the measures, updated the assumptions if the Illinois TRM v12.0 had made changes, and recalculated savings based on the specific measure characteristics of installed measures.

The evaluation team sourced coincidence factors for peak demand savings calculations from the Indiana TRM v1.0 workbook and the Illinois TRM v12.0 depending on which measure we were evaluating. We chose different sources due to some coincidence factors in the Indiana v1.0 workbook seeming unreasonable to the evaluation team. Measures with applied coincidence factors from the Indiana TRM v1.0 workbook include central air conditioners, AC tune-ups, air-source heat pump tune-ups, ceiling fans, heat pump water heaters, refrigerators, and freezers. Measures with applied coincidence factors from the Illinois TRM v12.0 include pool pumps, air purifiers, clothes dryers, clothes washers, dehumidifiers, dishwashers, room ACs, smart thermostats, and indoor lighting.

As in past evaluations, the evaluation team found that using actual measure characteristics could change the savings substantially. The implementer uses a deemed savings value for each measure, whereas the evaluation team uses measure characteristics, like unit size or location, to create custom calculations for each installed measure. Also, due to differences between the approaches outlined in the Illinois TRM v12.0 and the 2022 EM&V report, the latter of which includes now-outdated inputs and assumptions taken from the Indiana TRM v2.2, differences between *ex post* and *ex ante* savings for the 2024 evaluation are greater than evaluations prior to 2022. Detailed calculations by measure type are in *Appendix 1. Home Rebates Program Algorithms and Assumptions*.

For all Legacy 2023 measures, the evaluation team used a deemed savings value from the 2023 program evaluation results. The Legacy 2023 measures’ sources, assumptions, and notable differences are the same as the previous evaluation and are in the *Home Rebates* chapter of the 2023 DSM Portfolio Evaluation Report. For more information on what is considered a Legacy measure, please refer to the *Audited and Verified Savings* section of this report.

Ex Post Gross Savings Summary

Table 18 shows the *ex ante* deemed savings and *ex post* gross per-measure savings for 2024 Home Rebates program measures. We explain these differences in greater detail in Table 98, below.

Table 18. 2024 Home Rebates Program *Ex Ante* & *Ex Post* Gross Per-Measure Savings Values

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Air conditioners	Air Conditioner	223.38	0.731	0.00	394.46	0.600	0.00
Air conditioners - Legacy 2023 Measure	Air Conditioner	673.27	0.748	0.00	289.18	0.218	0.00
Air conditioner tune-ups	Tune-up	47.17	0.043	0.00	125.57	0.062	0.00
Air conditioner tune-ups – Legacy 2023 Measure	Tune-up	44.34	0.101	0.00	126.51	0.062	0.00
Air purifiers	Air Purifier	433.70	0.050	0.00	405.53	0.046	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Air-source heat pumps	Heat Pump	887.97	0.602	0.00	1,095.98	0.589	0.00
Air-source heat pumps - Legacy 2023 Measure	Heat Pump	654.44	0.423	0.00	946.37	0.444	0.00
Air-source heat pump tune-ups	Tune-up	225.15	0.113	0.00	429.26	0.070	0.00
Air-source heat pump tune-ups – Legacy 2023 Measure	Tune-up	199.57	0.063	0.00	346.73	0.055	0.00
Boilers	Boiler	0.00	0.000	256.60	0.00	0.000	230.74
Boilers - Legacy 2023 Measure	Boiler	0.00	0.000	207.24	0.00	0.000	281.28
Dehumidifiers	Dehumidifier	115.59	0.027	0.00	169.10	0.038	0.00
Dehumidifiers – Legacy 2023 Measure	Dehumidifier	113.33	0.026	0.00	166.35	0.038	0.00
Electric clothes dryers	Dryer	200.15	0.027	0.00	228.18	0.031	0.00
Electric clothes washers	Washer	112.98	0.015	0.00	275.20	0.035	0.00
Furnaces	Furnace	0.00	0.000	171.81	102.50	0.000	208.44
Furnaces - Legacy 2023 Measure	Furnace	0.00	0.000	130.42	67.60	0.000	189.40
Heat pump water heaters	Water Heater	2,040.22	0.097	0.00	2,295.04	0.426	0.00
Heat pump water heaters - Legacy 2023 Measure	Water Heater	2,150.81	0.102	0.00	2,393.97	0.418	0.00
Pool pumps	Pump	248.70	0.464	0.00	248.70	0.349	0.00
Pool pumps – Legacy 2023 Measure	Pump	316.24	0.215	0.00	316.24	0.214	0.00
Wi-Fi thermostats	Thermostat	78.67	0.095	66.67	109.59	0.124	72.03
Wi-Fi thermostats - Legacy 2022 Measure	Thermostat	66.24	0.070	15.10	52.57	0.120	51.09
Room Air Conditioners	Room AC	62.64	0.071	0.00	83.08	0.098	0.00
Refrigerators with Freezers	Refrigerator	53.05	0.008	0.00	101.15	0.015	0.00
Upright Freezers	Freezer	27.80	0.004	0.00	49.48	0.007	0.00
Dishwashers	Dishwasher	68.17	0.005	0.00	68.17	0.005	0.00
Ceiling Fans	Ceiling Fan	20.82	0.011	0.00	21.70	0.009	0.00
Smart Vents	Smart Vent	593.00	0.253	0.00	198.00	0.320	0.00

Table 19 highlights notable differences between *ex ante* and *ex post* gross estimates. New federal standards that require any residential HVAC equipment manufactured in, or imported into, the United States to meet new minimum efficiency ratings, became effective January 1, 2023. In alignment with the Illinois TRM v12.0, *ex post* savings assumed a sell-through period for 2023, and adopted the new federal standards which determine assumed baselines in 2024. In addition, an updated metric depicted as SEER2, EER2, and HSPF2, reflecting a more stringent updated test method to determine equipment efficiencies, is often being used in HVAC equipment documentation and efficiency standards.

For this evaluation, all efficiency values were either converted to SEER2, EER2, or HSPF2, or these specifications were pulled directly from the AHRI database during verification.

Table 19. 2024 Home Rebates Program Notable Differences Between *Ex Ante* & *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Air Conditioner	<i>Ex ante</i> savings were calculated using the IL TRM v12.0 and EE Rebates 2022 EM&V results for assumed capacity, EFLHc values, peak coincidence factor, and early replacement rates.	IL TRM v12.0 and program tracking data. CF are assumed from the Indiana TRM (v2.2). Assumed an average EER2 conversion factor for each SEER2 measure group tier based on AHRI data. Early replacement rate from the 2024 Home Rebates participant survey.	Small differences due to using actual instead of assumed SEER2, EER2 and capacity; Additional early replacement savings all contributed to <i>ex post</i> deviating from <i>ex ante</i> . However, the largest driver is due to differences in approach between the 2022 EM&V report and Illinois TRM v12.0/Indiana TRM (v2.2) for determining EFLHc values. Specifically, the Illinois TRM was used in accompaniment with the IN TRM for <i>ex post</i> savings to map cities in NIPSCO's territory to the appropriate Illinois city to estimate weather impacts to determine appropriate EFLHc values for the analysis while <i>ex ante</i> used an average EFLHc value taken from the 2022 EM&V report. This resulted in <i>ex post</i> gross savings significantly larger than <i>ex ante</i> .
Air Conditioner Tune Up	<i>Ex ante</i> savings were calculated according to the IL TRM v12.0 and EE Rebates 2022 EM&V results for assumed average capacity, EFLHc, SEER2, and EER2 values.	Illinois TRM v12.0, Indiana TRM (v2.2) and program tracking data. Assumed CF from the IL TRM v.12. Used assumed SEER and cooling capacity when available, otherwise used average AC tracking data values for AC capacity and the Illinois TRM v12.0 assumed existing air conditioner SEER2 of 9.5. Varied Indiana TRM (v2.2) EFLH by closest city. Assumed Illinois TRM v12.0 maintenance energy savings (MFe) and demand reduction (MFd) factors.	Higher average cooling capacity resulted in slightly higher energy savings in 2024. However, the largest driver for significantly higher savings was the assumption of an existing air conditioner SEER2 of 9.5 and EER2 of 8.8 from the Illinois TRM v12.0, as well as the larger EFLHc value used in the <i>ex post</i> analysis.
Air Purifier	<i>Ex ante</i> savings were calculated using the Illinois TRM v12.0. Specifically, applied deemed savings using parameter assumptions by CADR range from the Illinois TRM v12.0 .	Illinois TRM v12.0 and program tracking data. Used actual ENERGY STAR QPL reported CADR.	Differences due to the use of actual CADR and calculated savings cause <i>ex post</i> gross to be slightly lower than <i>ex ante</i> .

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Air Source Heat Pump	<i>Ex ante</i> savings were calculated using the Indiana TRM (v2.2), IL TRM v12.0 and used some inputs from the 2022 EM&V report to determine assumed capacity, EFLHc values, peak coincidence factor, and early replacement rates.	Illinois TRM v12.0 and program tracking data. Assumed CF and cooling EFLH inputs from the IL TRM v12.0, and heating EFLH inputs from the 2023 billing analysis. Used actual capacities and efficiencies confirmed during AHRI look ups. Early replacement rate from the 2024 EE Rebates participant survey. Included derating factors and SEER2 and HSPF2 adjustment factors.	The evaluation team's use of actual capacities, SEER2, and HSPF2 efficiencies is the largest driver for greater than <i>ex ante</i> savings. Also, small differences due to <i>ex post</i> using the closest city instead of broadly applying EFLH from 2022 EM&V report.
Air Source Heat Pump Tune-up	<i>Ex ante</i> savings were calculated according to the IL TRM v12.0 and used EE Rebates 2022 EM&V results for assumed average capacity, EFLHc, SEER2, and EER2 values.	Illinois TRM v12.0, Indiana TRM (v2.2) and program tracking data. Assumed CF from the IL TRM v.12 and EFLH values from 2023 billing analysis. Used assumed SEER and cooling capacity when available, average AC tracking data values for AC capacity and the Illinois TRM v12.0 assumed existing air conditioner SEER2 of 9.5, when not. Varied Indiana TRM (v2.2) EFLH by closest city. Assumed Illinois TRM v12.0 maintenance energy savings (MFe) and demand reduction (MFd) factors.	Higher average cooling capacity resulted in slightly higher energy savings in 2024. However, the largest driver for significantly higher savings was using the actual average EER2 of 8.8 from the Air Source Heat Pump measures in the tracking data as well as the larger EFLHc value used in the <i>ex post</i> analysis taken from the Illinois TRM v12.0.
Boiler	<i>Ex ante</i> savings were calculated using the IL TRM v12.0 and the 2022 EM&V report. Assumed average capacity from 2022 EM&V boiler data, TRM assumed base AFUE, 2022 EM&V billing analysis EFLH, and a 2022 EM&V average AFUE of 95%.	Illinois TRM v12.0 and program tracking data. Used actual capacity and AFUE. Used closest city EFLH from 2023 billing analysis. Early replacement rate from the 2024 EE Rebates participant survey.	Small differences due to using actual instead of assumed AFUE and capacity. Smaller early replacement savings, lower average capacity, and using the closest city instead of broadly applying an average for EFLH drove slightly lower therm savings than <i>ex ante</i> .
Dehumidifier	<i>Ex ante</i> savings were calculated using the Illinois TRM v12.0. Specifically, ENERGY STAR deemed savings based on measure capacity.	Illinois TRM v12.0 and program tracking data. Used actual ENERGY STAR QPL reported average capacities and L/kWh.	Differences due to the use of actual capacities and L/kWh values cause <i>ex post</i> gross to deviate from <i>ex ante</i> .
Clothes Dryer	<i>Ex ante</i> savings were calculated using the Illinois TRM v12.0.	Illinois TRM v12.0 and program tracking data. Used	Small differences due to the use of actual efficient CEF.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
		actual ENERGY STAR QPL reported CEF efficient.	
Clothes Washer	<i>Ex ante</i> savings were calculated using the Illinois TRM v12.0.	Illinois TRM v12.0 and program tracking data. Used actual ENERGY STAR QPL reported IMEF efficient and capacity.	Differences due to the use of actual capacities and IMEF values cause ex post gross to have significantly larger savings than ex ante.
Furnace	<i>Ex ante</i> savings were calculated using Illinois TRM v.12.0 and EE Rebates 2022 EM&V results for assumed AFUE and EFLHH. Assumed furnace capacity of 74,098.41 Btuh, which was sourced from the 2022 EM&V report.	IL TRM v12.0 2023 billing analysis results for EFLHH, and information in program tracking data. Actual AFUE and capacity values were used to calculate ex post savings. Early replacement rate was taken from the 2024 participant survey.	The Illinois TRM assigns kWh cooling savings, associated with the Engine Control Module (ECM) installed alongside existing AC's, to furnaces, while in past evaluations and for ex ante, these savings were applied to AC's. Additional early replacement savings, plus small differences due to using actual instead of assumed AFUE (96% average) and capacity (74,069 Btuh average) drove slightly higher Therm savings than ex ante
Heat Pump Water Heater	<i>Ex ante</i> savings were calculated using the Illinois TRM v12.0 with incoming water temperature (Tin) assumed from the 2022 EM&V report. Pulled UEF efficient from lowest available UEF for 50-78 gallon heat pump water heaters on the ENERGY STAR website.	Illinois TRM v12.0 and program tracking data. Used actual UEF efficient and calculated baseline UEF values. Assumed coincidence factor and natural gas heating saturations from the Indiana TRM (v2.2). Assumed closest city Tin based on tracking data.	Differences due to <i>ex post</i> using actual UEF efficient and calculated baseline UEF values and using the closest city instead of broadly applying an average EFLH from the 2022 EM&V report. There were also therm penalties associated with the heating cost from conversion of heat in home to water heat for homes with natural gas space heating.
Pool Pump	<i>Ex ante</i> savings were calculated using the Illinois TRM v12.0.	Illinois TRM v12.0 and the program tracking data were used to determine inputs based on if the pump was an in-ground or above ground configuration and whether the pool pump was classified as an ENERGY STAR or CEE Tier 1 certified pump through ENERGY STAR QPL model number look ups.	There were no discrepancies between <i>ex ante</i> and <i>ex post</i> annual electric energy savings. However, there is a slight discrepancy in electric demand savings due to difference in coincidence factors because <i>ex post</i> was sourced from IN TRMv2.2 and <i>ex ante</i> was sourced from IL TRM v12.0.
Smart Wi-Fi Thermostat	<i>Ex ante</i> savings were calculated using IL TRM v12.0 and 2022 EM&V values for capacities and efficiencies. Cooling and heating EFLH were assumed to be averages from the 2022 EM&V report.	Illinois TRM v12.0 algorithm, 2024 program average heating and cooling capacities, and a CF of 0.34. Cooling EFLH was assumed from the Indiana TRM (v2.2) in accompaniment with IL TRM by closest city. Electric heating consumption was	Largest drivers in differences due to differences in average capacities and using the closest city instead of broadly applying average EFLH from 2022 EM&V report. Ultimately this resulted in greater ex post savings than <i>ex ante</i> .

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
		assumed from the Illinois TRM v12.0 based on matching HDD similar Indiana cities like Illinois cities. Assumed closest city EFLH and electric heating consumption based on tracking data.	
Room Air Conditioner	Ex ante savings were calculated using the Illinois TRM v12.0. Determined capacity according to btu/hr. tracked in the measure name. CEER efficient inputs sourced from ENERGY STAR program requirements.	Illinois TRM v12.0 and program tracking data. Used actual ENERGY STAR QPL CEER efficient and capacities. Cooling EFLH was assumed from the Indiana TRM (v2.2) in accompaniment with IL TRM by closest city. Early replacement rate determined from 2024 participant survey.	Largest drivers for differences due to difference in actual capacities, CEER efficient values, and using closest city instead of broadly applying Chicago EFLH from IL TRM v12.0. <i>Ex Post</i> savings also included early replacement savings to Room ACs that <i>ex ante</i> did not. These resulted in greater <i>ex post</i> savings than <i>ex ante</i> .
Refrigerators with Freezers	Ex ante savings were calculated using the Illinois TRM v12.0.	Illinois TRM v12.0 and program tracking data. Used actual ENERGY STAR QPL look up for volume, UEC baseline, UEC efficient and existing UEC. Early replacement rate determined from 2024 participant survey	Largest drivers for differences are due to difference in actual volume, UEC baseline, UEC efficient and existing UEC inputs instead of default values from IL TRM that were used for <i>ex ante</i> savings. <i>Ex Post</i> savings also included early replacement savings that <i>ex ante</i> did not. These resulted in greater <i>ex post</i> savings than <i>ex ante</i> .
Freezers	Ex ante savings were calculated using the Illinois TRM v12.0.	Illinois TRM v12.0 and program tracking data. Used actual ENERGY STAR QPL look up for volume, kWh baseline, and kWh ESTAR. Coincidence Factor for <i>ex post</i> savings sourced from IN TRM v1.0 workbook.	Largest drivers for differences are due to difference in actual volume, kWh baseline, and kWh ESTAR inputs instead of default values from IL TRM that were used for <i>ex ante</i> savings. <i>Ex Post</i> savings also included CF inputs from IN TRM rather than IL TRM like <i>ex ante</i> . These resulted in greater <i>ex post</i> savings than <i>ex ante</i> .
Dishwasher	<i>Ex ante</i> savings were calculated using the Illinois TRM v12.0.	<i>Ex post</i> savings were calculated using the Illinois TRM v12.0.	No difference between <i>ex post</i> and <i>ex ante</i> savings.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Ceiling Fans	<i>Ex ante</i> savings were calculated using the Illinois TRM v12.0.	<i>Ex post</i> savings were calculated using the Illinois TRM v12.0 and look ups in ENERGY STAR QPL for low and high watts ES.	Slight differences due to <i>ex ante</i> assuming low and high watts ES from IL TRM v12.0 and <i>ex post</i> using ENEEGY STAR QPL look ups for these inputs.
Smart Vent	<i>Ex ante</i> used deemed savings from NIPSCO RES 2021 IRP Potential Study.	<i>Ex post</i> used deemed savings from NIPSCO 2021 Demand Side Management Market Potential Study. ³	<i>Ex post</i> could not find exact source used for <i>ex ante</i> calculation nor a TRM that had an algorithm or deemed savings for smart vents. The NIPSCO 2021 market potential study was only source available with deemed savings for smart vents, which resulted in lower savings than <i>ex ante</i> .

Realization Rates

The next three tables (Table 20 through Table 22) show the program’s *ex ante* savings, verified savings, and *ex post* gross savings, as well as the total program realization rates for kWh, kW, and therms. The largest drivers for electric energy savings realization rates were air conditioner tune-ups, which had a 270% realization rate and made up roughly 5% of the *ex post* gross savings. The largest driver for peak coincident demand savings realization rates were air conditioners and legacy air conditioners, which had a 65% realization rate and made up roughly 51% of *ex post* gross savings. The largest driver for natural gas energy savings realization rates were furnaces and legacy furnaces, which had a 129% realization rate and made up roughly 85% of *ex post* gross savings.

Table 20. 2024 Home Rebates Program *Ex Ante* & *Ex Post* Gross Electric Energy Savings

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Air conditioners	120,177.02	120,177.02	120,177.02	212,218.52
Air conditioners - Legacy 2023 Measure	175,723.05	175,723.05	175,723.05	75,477.02
Air conditioner tune-ups	17,830.26	17,830.26	17,830.26	47,465.61
Air conditioner tune-ups – Legacy 2023 Measure	4,345.32	4,345.32	4,345.32	12,397.51
Air purifiers	23,420.00	23,420.00	23,420.00	21,898.65
Air-source heat pumps	21,311.28	21,311.28	21,311.28	26,303.47

³ <https://www.nipsco.com/docs/librariesprovider11/rates-and-tariffs/irp/2021-nipsco-irp-appendix-b.pdf?sfvrsn=6>

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Air-source heat pumps - Legacy 2023 Measure	24,868.64	24,868.64	24,868.64	35,962.06
Air-source heat pump tune-ups	675.45	675.45	675.45	1,287.78
Air-source heat pump tune-ups – Legacy 2023 Measure	199.57	199.57	199.57	346.73
Boilers	0.00	0.00	0.00	0.00
Boilers - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Dehumidifiers	6,585.97	6,473.06	6,473.06	9,469.32
Dehumidifiers – Legacy 2023 Measure	680.00	680.00	680.00	998.09
Electric clothes dryers	9,807.37	9,807.37	9,807.37	11,180.91
Electric clothes washers	14,009.22	14,009.22	14,009.22	34,124.83
Furnaces	0.00	0.00	0.00	279,609.30
Furnaces - Legacy 2023 Measure	0.00	0.00	0.00	123,099.60
Heat pump water heaters	26,522.86	26,522.86	26,522.86	29,835.53
Heat pump water heaters - Legacy 2023 Measure	21,508.10	21,508.10	21,508.10	23,939.71
Pool pumps	994.78	994.78	994.78	994.78
Pool pumps – Legacy 2023 Measure	316.24	316.24	316.24	316.24
Wi-Fi thermostats	116,350.78	116,350.78	116,350.78	162,087.26
Wi-Fi thermostats - Legacy 2022 Measure	53,123.04	53,123.04	53,123.04	42,162.35
Room Air Conditioners	1,753.87	1,753.87	1,753.87	2,326.37
Refrigerators with Freezers	5,199.30	5,199.30	5,199.30	9,912.45
Upright Freezers	166.80	166.80	166.80	296.89
Dishwashers	6,271.60	6,271.60	6,271.60	6,271.60
Ceiling Fans	41.64	41.64	41.64	43.39
Smart Vents	1,186.00	1,186.00	1,186.00	396.00
Total Savings	653,068.16	652,955.25	652,955.25	1,170,421.96
Total Program Realization Rate				179%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 21. 2024 Home Rebates Program *Ex Ante* & *Ex Post* Gross Peak Demand Reduction

MEASURE	<i>EX ANTE</i> ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	<i>EX POST</i> GROSS PEAK DEMAND REDUCTION (KW/YR.)
Air conditioners	393.278	393.278	393.278	322.981
Air conditioners - Legacy 2023 Measure	195.120	195.120	195.120	56.829
Air conditioner tune-ups	16.254	16.254	16.254	23.339
Air conditioner tune-ups – Legacy 2023 Measure	9.898	9.898	9.898	6.092
Air purifiers	2.674	2.674	2.674	2.501
Air-source heat pumps	14.448	14.448	14.448	14.138
Air-source heat pumps - Legacy 2023 Measure	16.092	16.092	16.092	16.877
Air-source heat pump tune-ups	0.339	0.339	0.339	0.209
Air-source heat pump tune-ups – Legacy 2023 Measure	0.063	0.063	0.063	0.055
Boilers	0.000	0.000	0.000	0.000
Boilers - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Dehumidifiers	1.512	1.486	1.486	2.152
Dehumidifiers – Legacy 2023 Measure	0.156	0.156	0.156	0.226
Electric clothes dryers	1.337	1.337	1.337	1.501
Electric clothes washers	1.802	1.802	1.802	4.396
Furnaces	0.000	0.000	0.000	0.000
Furnaces - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Heat pump water heaters	1.261	1.261	1.261	5.536
Heat pump water heaters - Legacy 2023 Measure	1.020	1.020	1.020	4.176
Pool pumps	1.856	1.856	1.856	1.396
Pool pumps – Legacy 2023 Measure	0.215	0.215	0.215	0.214
Wi-Fi thermostats	140.786	140.786	140.786	183.695
Wi-Fi thermostats - Legacy 2022 Measure	55.830	55.830	55.830	96.105
Room Air Conditioners	1.994	1.994	1.994	2.738
Refrigerators with Freezers	0.747	0.747	0.747	1.495
Upright Freezers	0.024	0.024	0.024	0.042
Dishwashers	0.459	0.459	0.459	0.462

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Ceiling Fans	0.022	0.022	0.022	0.017
Smart Vents	0.506	0.506	0.506	0.640
Total Savings	857.693	857.667	857.667	747.812
Total Program Realization Rate				87%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 22. 2024 Home Rebates Program *Ex Ante* & *Ex Post* Gross Natural Gas Savings

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Air conditioners	0.00	0.00	0.00	0.00
Air conditioners - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Air conditioner tune-ups	0.00	0.00	0.00	0.00
Air conditioner tune-ups – Legacy 2023 Measure	0.00	0.00	0.00	0.00
Air purifiers	0.00	0.00	0.00	0.00
Air-source heat pumps	0.00	0.00	0.00	0.00
Air-source heat pumps - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Air-source heat pump tune-ups	0.00	0.00	0.00	0.00
Air-source heat pump tune-ups – Legacy 2023 Measure	0.00	0.00	0.00	0.00
Boilers	6,158.40	6,158.40	6,158.40	5,537.65
Boilers - Legacy 2023 Measure	7,046.16	7,046.16	7,046.16	9,563.55
Dehumidifiers	0.00	0.00	0.00	0.00
Dehumidifiers – Legacy 2023 Measure	0.00	0.00	0.00	0.00
Electric clothes dryers	0.00	0.00	0.00	0.00
Electric clothes washers	0.00	0.00	0.00	0.00
Furnaces	468,697.68	468,697.68	468,697.68	568,633.08
Furnaces - Legacy 2023 Measure	237,494.82	237,494.82	237,494.82	344,897.40
Heat pump water heaters	0.00	0.00	0.00	0.00
Heat pump water heaters - Legacy 2023 Measure	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Pool pumps	0.00	0.00	0.00	0.00
Pool pumps – Legacy 2023 Measure	0.00	0.00	0.00	0.00
Wi-Fi thermostats	98,607.52	98,607.52	98,607.52	106,534.75
Wi-Fi thermostats - Legacy 2022 Measure	12,111.98	12,111.98	12,111.98	40,970.93
Room Air Conditioners	0.00	0.00	0.00	0.00
Refrigerators with Freezers	0.00	0.00	0.00	0.00
Upright Freezers	0.00	0.00	0.00	0.00
Dishwashers	0.00	0.00	0.00	0.00
Ceiling Fans	0.00	0.00	0.00	0.00
Smart Vents	0.00	0.00	0.00	0.00
Total Savings	830,116.56	830,116.56	830,116.56	1,076,137.37
Total Program Realization Rate				130%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Ex Post Net Savings

The team estimated freeridership and spillover for 2024 measures using survey data collected from 2024 participants. For the Legacy measures, the evaluation team applied the same freeridership and spillover values used in the 2023 evaluation, which we based on primary NTG research conducted as part of the 2022 evaluation. Table 23 shows the NTG ratios by 2024 surveyed measures only.

Table 23. 2024 Home Rebates Program NTG Ratios by Measure Category

MEASURE CATEGORY	RESPONSES (N)	FREERIDERSHIP ^a	PARTICIPANT SPILLOVER	NTG
Air Conditioner	66	40%	0%	60%
Furnace	69	43%	0%	57%
HVAC Tune-Ups	30	46%	0%	54%
Other Equipment ^b	39	57%	0%	43%
Wi-Fi Thermostats	76	28%	0%	72%

^a This score is an average weighted by survey sample ex post gross program MMBtu savings.

^b Includes clothes washer (7), dishwasher (6), heat pump (6), room air purifier (5), boiler (4), electric clothes dryer (4), dehumidifier (2), refrigerator (2), freezer (1), pool pump (1) and electric heat pump water heater (1).

Intention Freeridership

The evaluation team estimated *intention* freeridership scores for all participants based on their responses to the *intention*-focused freeridership questions. Table 24 shows the 2024 Home Rebates program’s *intention* freeridership scores by measure category.

Table 24. 2024 Home Rebates Program *Intention* Freeridership Results by Measure Category

MEASURE CATEGORY	INTENTION FREERIDERSHIP SCORE (%) ^a
Air Conditioner	68%
Furnace	67%
HVAC Tune-Ups	82%
Other Equipment	80%
Wi-Fi Thermostats	46%

^a The intention freeridership score was weighted by survey sample *ex post* gross program MMBtu savings

To determine equipment *intention* freeridership, the evaluation team asked participants questions about whether they would have installed equipment at the same efficiency level, at the same time, and in the same amount if not for the Home Rebates program. To determine HVAC equipment tune-up *intention* freeridership, the evaluation team asked participants if, prior to participating in the NIPSCO program, they had a maintenance contract with a HVAC contractor that provided tune-ups and whether the contract covered the work necessary to receive the tune-up rebate from NIPSCO. The team also asked participants when they would have had a tune-up service completed if the NIPSCO program had not provided the tune-up rebate.

Influence Freeridership

The evaluation team assessed *influence* freeridership by asking participants how important the following program elements were in their purchasing decision-making process:

- Information about the program from a contractor.
- Receiving a rebate for the measure.
- Information about energy efficiency that NIPSCO provided.
- Previous participation in a NIPSCO energy efficiency program.

The evaluation team determined each respondent’s *influence* freeridership score for a measure using the maximum rating provided for any program element, as shown in Table 25.

Table 25. 2024 Home Rebates Program Influence Freeridership Scoring

MAXIMUM RATING	INFLUENCE FREERIDERSHIP SCORE (%)
1 - Not at all important	100%
2 - Not too important	75%
3 - Somewhat important	25%

MAXIMUM RATING	INFLUENCE FREERIDERSHIP SCORE (%)
4 - Very important	0%
Don't know	50%
Not applicable	50%

Table 26 shows *influence* freeridership score for each surveyed measure.

Table 26. 2024 Home Rebates Program Influence Freeridership Scores by Measure Category

MEASURE CATEGORY	INFLUENCE FREERIDERSHIP SCORE (%) ^a
Air Conditioner	12%
Furnace	18%
HVAC Tune-Ups	9%
Other Equipment	34%
Wi-Fi Thermostats	10%

^a The intention freeridership score was weighted by survey sample *ex post* gross program MMBtu savings

Final Freeridership

The evaluation team calculated the mean of the *intention* and the *influence* of freeridership components to estimate final freeridership for each surveyed measure. A higher freeridership score translates to more savings that are deducted from the gross savings estimates. Table 27 lists the *intention*, *influence*, and final freeridership scores for the 2024 Home Rebates program.

Table 27. 2024 Home Rebates Program Freeridership Score

MEASURE	INTENTION SCORE	INFLUENCE SCORE	FREERIDERSHIP SCORE
Air Conditioner	68%	12%	40%
Furnace	67%	18%	43%
HVAC Tune-Ups	82%	9%	46%
Other Equipment	80%	34%	57%
Wi-Fi Thermostats	46%	10%	28%

Participant Spillover

The evaluation team estimated participant spillover measure savings using specific information about participants determined through the evaluation using 2024 NIPSCO evaluation results and the Illinois TRM v.12 as a baseline reference.⁴

⁴ Nonparticipant spillover evaluation activities were not conducted for the 2024 program year.

The evaluation team estimated the percentage of program participant spillover by dividing the sum of additional spillover savings (as reported by survey respondents) by the total gross savings achieved by all survey respondents. The participant spillover estimate for the 2024 Home Rebates program, rounded to the nearest whole percent, is listed in Table 28.

Table 28. 2022 Home Rebates Program Participant Spillover Results

MEASURE CATEGORY	SPILOVER SAVINGS (MMBTU)	PARTICIPANT PROGRAM SAVINGS (MMBTU)	PARTICIPANT SPILOVER
Total Program	8.0	2,385.5	0%

Table 29 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 29. 2024 Home Rebates Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION				NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS			KWH	KW	THERMS
Air conditioner	212,218.52	322.981	0.00	60%		127,331.11	193.789	0.00
Air Conditioner - Legacy 2023 Measure	75,477.02	56.829	0.00	64%		48,305.29	36.371	0.00
Air conditioner tune-ups	47,465.61	23.339	0.00	54%		25,631.43	12.603	0.00
Air Conditioner tune-ups - Legacy 2023	12,397.51	6.092	0.00	47%		5,826.83	2.863	0.00
Air purifiers	21,898.65	2.501	0.00	43%		9,416.42	1.075	0.00
Air-source heat pumps	26,303.47	14.138	0.00	43%		11,310.49	6.079	0.00
Air-source heat pumps - Legacy 2022 Measure	35,962.06	16.877	0.00	58%		20,857.99	9.789	0.00
Air-source heat pump tune-ups	1,287.78	0.209	0.00	54%		695.40	0.113	0.00
Air-source heat pump tune-ups - Legacy 2023	346.73	0.055	0.00	47%		162.96	0.026	0.00
Boilers	0.00	0.000	5,537.65	43%		0.00	0.000	2,381.19
Boilers - Legacy 2022 Measure	0.00	0.000	9,563.55	43%		0.00	0.000	4,112.33
Dehumidifiers	9,469.32	2.152	0.00	43%		4,071.81	0.925	0.00
Dehumidifiers-Legacy 2023	998.09	0.226	0.00	43%		429.18	0.097	0.00
Electric clothes dryers	11,180.91	1.501	0.00	43%		4,807.79	0.645	0.00
Electric Clothes washer	34,124.83	4.396	0.00	43%		14,673.68	1.890	0.00
Furnaces	279,609.30	0.000	568,633.08	57%		159,377.30	0.000	324,120.86
Furnaces - Legacy 2023 Measure	123,099.60	0.000	344,897.40	59%		72,628.76	0.000	203,489.47
Heat pump water heaters	29,835.53	5.536	0.00	43%		12,829.28	2.380	0.00

MEASURE	EX POST GROSS SAVINGS/REDUCTION				NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS			KWH	KW	THERMS
Heat pump water heaters - Legacy 2023 Measure	23,939.71	4.176	0.00	43%		10,294.07	1.796	0.00
Pool pumps	994.78	1.396	0.00	43%		427.76	0.600	0.00
Pool pumps - Legacy 2023 Measure	316.24	0.214	0.00	43%		135.98	0.092	0.00
Wi-Fi thermostats	162,087.26	183.695	106,534.75	72%		116,702.82	132.260	76,705.02
Wi-Fi thermostats - Legacy 2022 Measure	42,162.35	96.105	40,970.93	76%		32,043.39	73.040	31,137.91
Room Air Conditioners	2,326.37	2.738	0.00	43%		1,000.34	1.177	0.00
Refrigerators with Freezers	9,912.45	1.495	0.00	43%		4,262.35	0.643	0.00
Upright Freezers	296.89	0.042	0.00	43%		127.66	0.018	0.00
Dishwashers	6,271.60	0.462	0.00	43%		2,696.79	0.199	0.00
Ceiling Fans	43.39	0.017	0.00	43%		18.66	0.007	0.00
Smart Vents	396.00	0.640	0.00	43%		170.28	0.275	0.00
Total Savings	1,170,421.96	747.812	1,076,137.37			686,235.83	478.754	641,946.77

Table 30 shows the NTG results for each fuel.

Table 30. 2024 Home Rebates Program NTG results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	653,068.16	1,170,421.96	59%	686,235.83
Peak Demand Reduction (kW)	857.693	747.812	64%	478.754
Natural Gas Energy Savings (therms/yr.)	830,116.56	1,076,137.37	60%	641,946.77

Process Evaluation

The evaluation team conducted a participant survey for the Home Rebates program to answer the following questions:

- How do participants become aware of the Home Rebates program? Is program marketing reaching participants effectively?
- What drives participation in the program?
- How familiar were participants with other NIPSCO energy efficiency programs?
- What is the customer experience like for those who install different measure types (i.e., furnaces vs. dryers, etc.)?
- What was the customer's experience with the rebate application like?
- What were the customer's interactions with installers/retailers like?

- How satisfied were participants with the program—including the participation process and the equipment they received?
- How satisfied are customers with NIPSCO?
- Do participants have any recommendations for program improvement?

Participant Feedback

The evaluation team surveyed 280 customers who participated in the Home Rebates program. To understand how participants might experience the program differently based on the type of measures they install, the evaluation team surveyed program participants who received rebates for purchasing a furnace, smart thermostat, air conditioner, HVAC tune-up, and other program measures. Many participants installed multiple measure types. Because of this, to achieve enough responses in each measure type and a variety of measures in the “Other Measures” category, we asked participants about their rarest measure type. The number of responses by measure is summarized in Table 31.

Table 31. 2024 Home Rebates Participant Survey Disposition

INSTALLED MEASURE	RESPONSES
Smart Thermostat	76
Furnace	69
Air Conditioner	66
HVAC Tune-up	30
Other Measures ^a	39
Total	280

^a Includes clothes washer (7), dishwasher (6), heat pump (6), room air purifier (5), boiler (4), electric clothes dryer (4), dehumidifier (2), refrigerator (2), freezer (1), pool pump (1) and electric heat pump water heater (1).

Energy Efficiency Awareness and Marketing

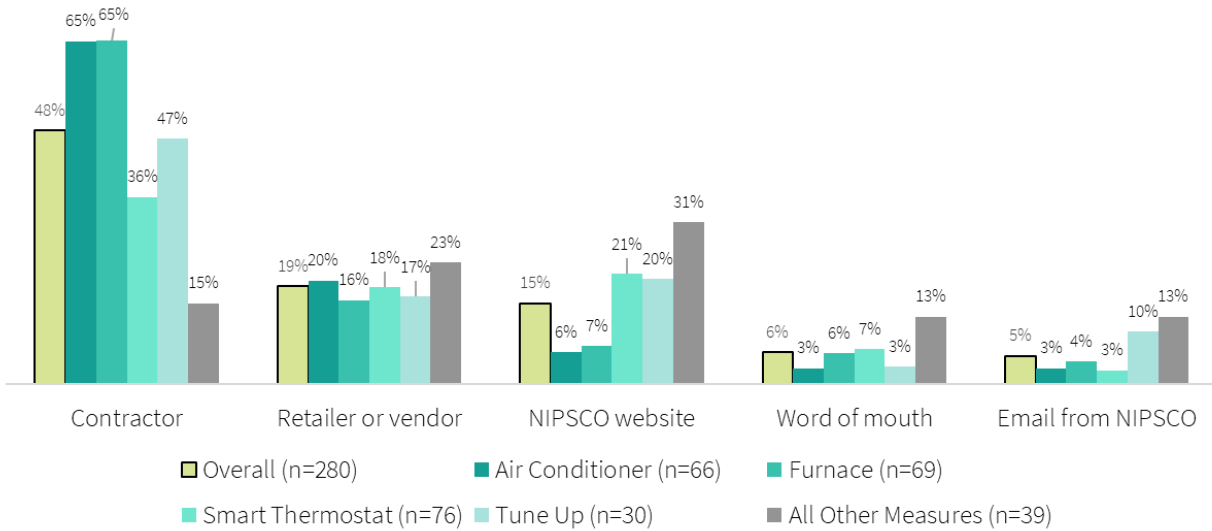
This section examines the main factors that motivate customers to engage with the NIPSCO Home Rebates program, including how customers initially discovered the program and the main factors driving their participation. The evaluation team also assessed customers’ involvement with other NIPSCO offerings by asking them which programs they are aware of and whether they have participated in them. For those who replaced existing equipment, the evaluation team inquired about their previous equipment’s condition to understand if it was still functional during the replacement. Asking these questions provides insights into the best ways to improve customer outreach and engagement with NIPSCO’s energy efficiency programs as well as the key motivational factors that might encourage customers to participate in future programs.

Program Awareness

Nearly half of all survey participants (48%) learned about the Home Rebates program through their contractor. Contractors were the primary source of awareness for customers that installed air conditioners (65%), furnaces (65%), and HVAC tune-ups (47%). Not surprisingly, 93% of customers who heard about the program through contractors used a contractor to install their new equipment.

The "Other Measures" category includes appliances such as clothes washers and dishwashers, as well as equipment like pool pumps and water heaters (see details in Table 31). Those participants were more likely to find out about the program through the NIPSCO website (31%) or their retailer or vendor (23%). While only 15% of participants who purchased these other measures learned about the program through a contractor, as seen in Figure 7, about 61% of participants who installed these measures used a contractor. Figure 7 shows the most common sources of awareness overall and by measure type.

Figure 7. Source of Program Awareness by Measure Type

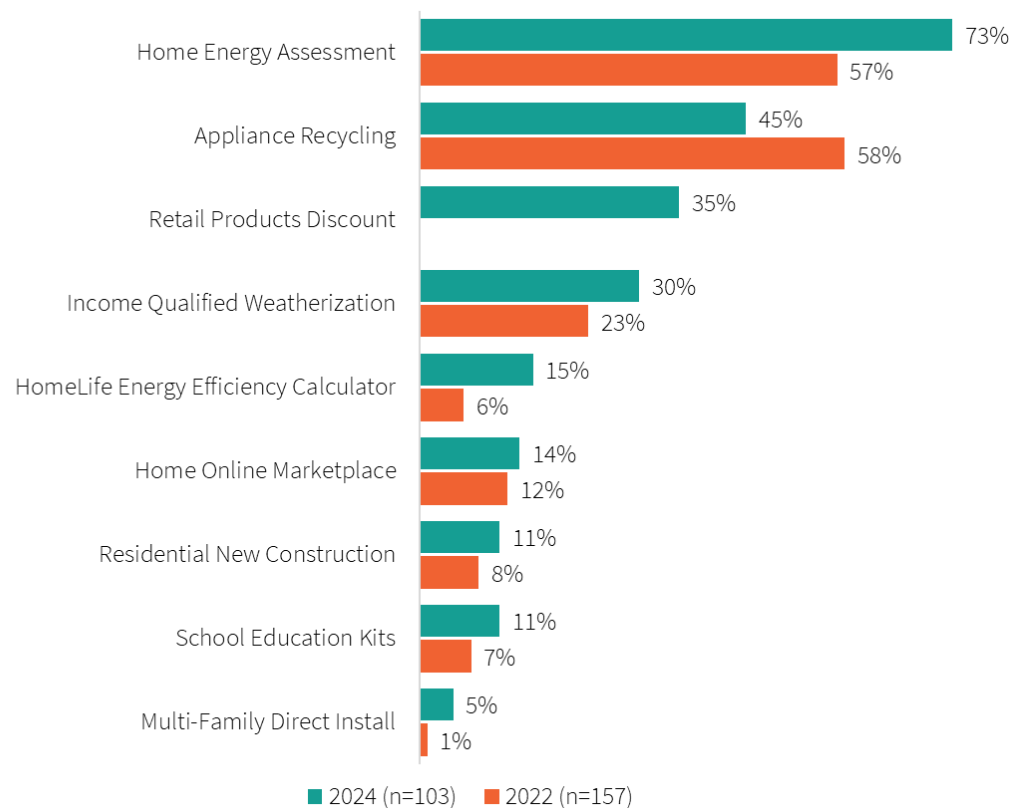


Source: Home Rebates Participant Survey Question: "How did you learn about NIPSCO's Home Rebates?" This was a multiple-response question (n=280).

Over one-third (39%) of survey respondents were familiar with or had participated in a NIPSCO energy efficiency program before their participation in the Home Rebates program in 2024. Nearly three-fourths (73%) of those aware of other programs were aware of the Home Energy Assessment (HEA) program.

Across all measures, customers were most aware of the HEA program, with those who installed air conditioners having the highest proportion of awareness compared to other programs (86%). In 2022, when we last conducted a participant survey, survey respondents who had heard about other NIPSCO programs (n=157) were also fairly aware of the HEA program (57%), while overall awareness of other NIPSCO programs was about half (47%) of all 2022 respondents.

Figure 8. Awareness of Other NIPSCO Programs



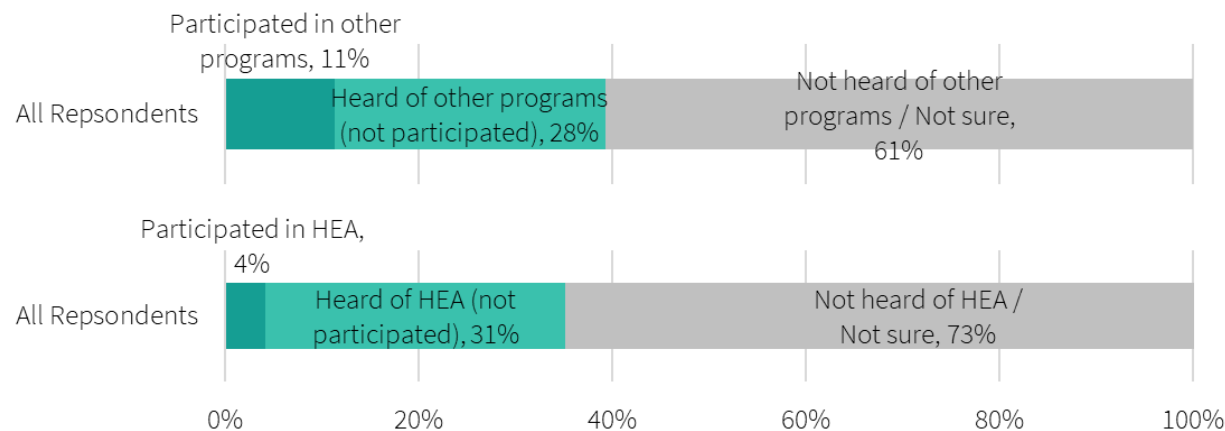
Source: Home Rebates Participant Survey Question: “What energy efficiency programs are you aware of?” This was a multiple-response question (2024 n=110, 2022 n=157).

Of the 110 respondents who reported that they were aware of other NIPSCO programs, 32 (29%) said they had participated in one or more of these programs. In other words, 11% of all 280 survey respondents had previously participated in one or more NIPSCO programs prior to their participation in the 2024 Home Rebates program.

Of those who heard about the Home Rebates program because of previous participation in another program (n=6), half of them participated in the HEA program. In the context of all survey respondents, 31% had heard of the HEA program and 4% reported that they had participated. However, only about 2% of the 2023 and 2024 Home Rebates program participants participated in the HEA program in 2022, 2023, or 2024, according to program tracking data.⁵ This indicates that the survey may have reached customers who were more engaged with NIPSCO and its programs. Other programs that 2024 Home Rebates program respondents had participated in were the Appliance Recycling (3%), and Retail Products Discount (3%) programs.

⁵ The total population of the 2023 and 2024 Home Rebates participants was about 6,200 participants, while the total population of the 2022 – 2024 HEA participants was about 2,900 participants.

Figure 9. Awareness of Other NIPSCO Programs

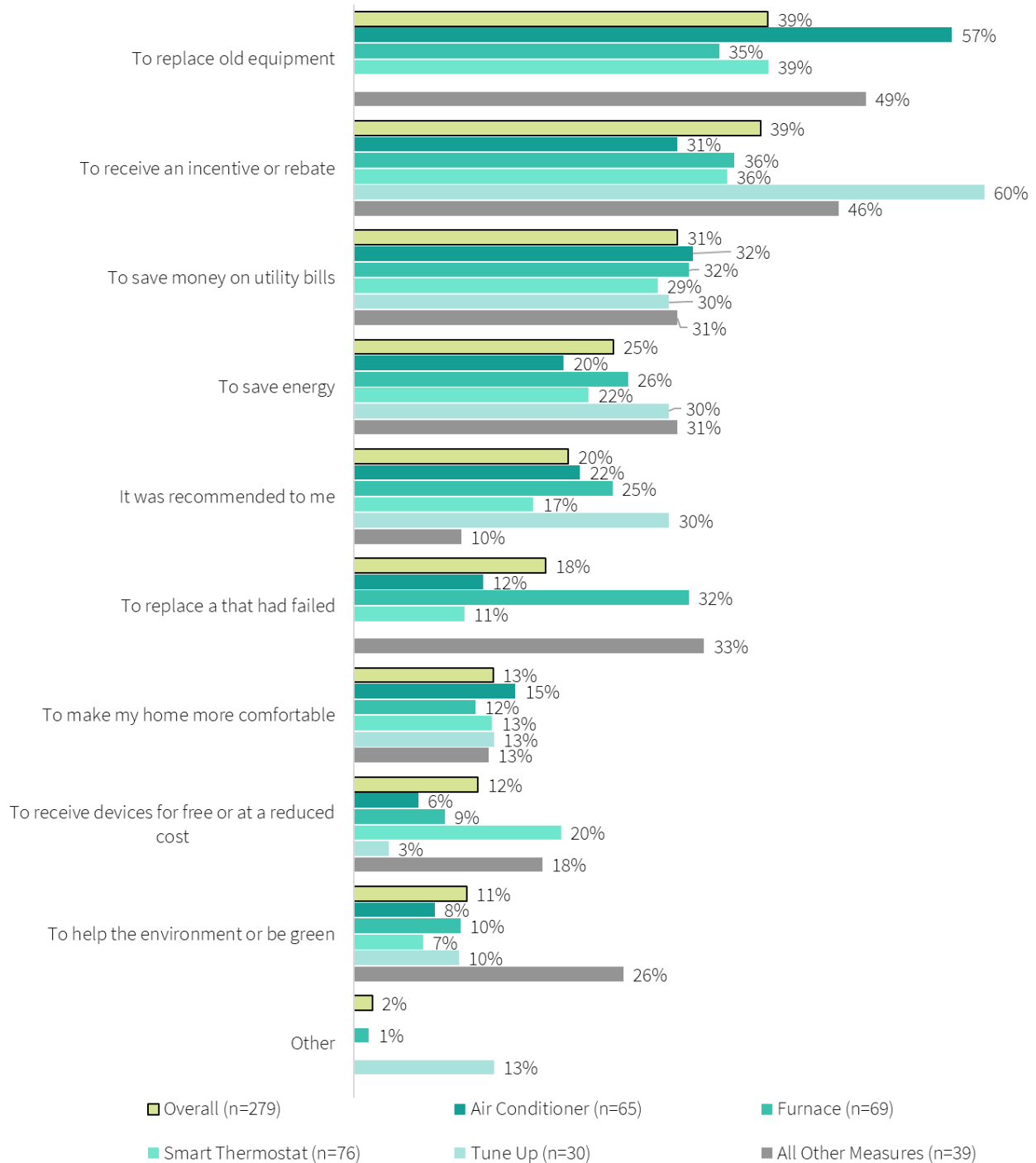


Source: Home Rebates Participant Survey Questions: “Besides the Home Rebates program, are you aware that NIPSCO offers other energy efficiency programs?” “What energy efficiency programs are you aware of?” “What energy efficiency programs have you participated in?” (n=280).

Decision-Making

The most common reasons that respondents decided to participate in the Home Rebates program were to replace old equipment (39%), to get the rebate/incentive (39%), to save money on utility bills (31%), and to save energy (25%). While most responses followed this trend, there was some variation in respondents’ motivation to participate related to the type of measure they installed. For customers who installed air conditioners, the most common reason was to replace old equipment (57%); for customers who had HVAC tune-ups, the primary reason for participation was to receive an incentive or rebate, which stood out at 60%, as shown in Figure 10.

Figure 10. Reason to Participate by Measure Type

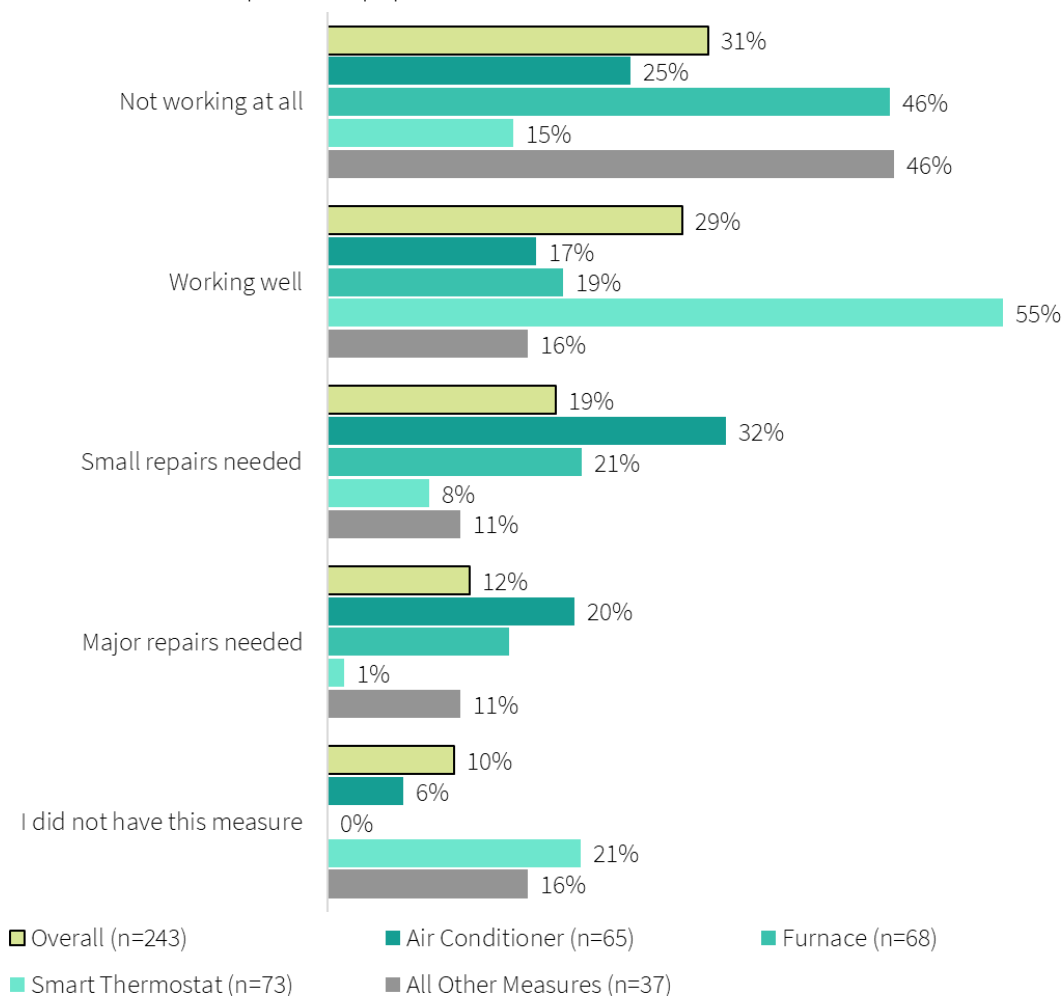


Source: Home Rebates Participant Survey Questions: “Why did you decide to participate in NIPSCO’s Home Rebates?” (n=279).

Many respondents reported that their old equipment was “not working at all” (31%) or “working well” (29%) before they replaced it through the program. Of the respondents who installed furnaces or other measures through the program, most reported that their old equipment was “not working at all” (46%). Most customers replaced their thermostat even though it was “working well” (55%). Notably, for respondents who installed air conditioners, their responses were spread between “not working at all” (25%), “working well” (17%), “small

repairs needed” (32%), and “major repairs needed” (20%). Most often, those who reported they did not have the equipment prior to participating in the program were those with Smart thermostats, as shown in Figure 11.

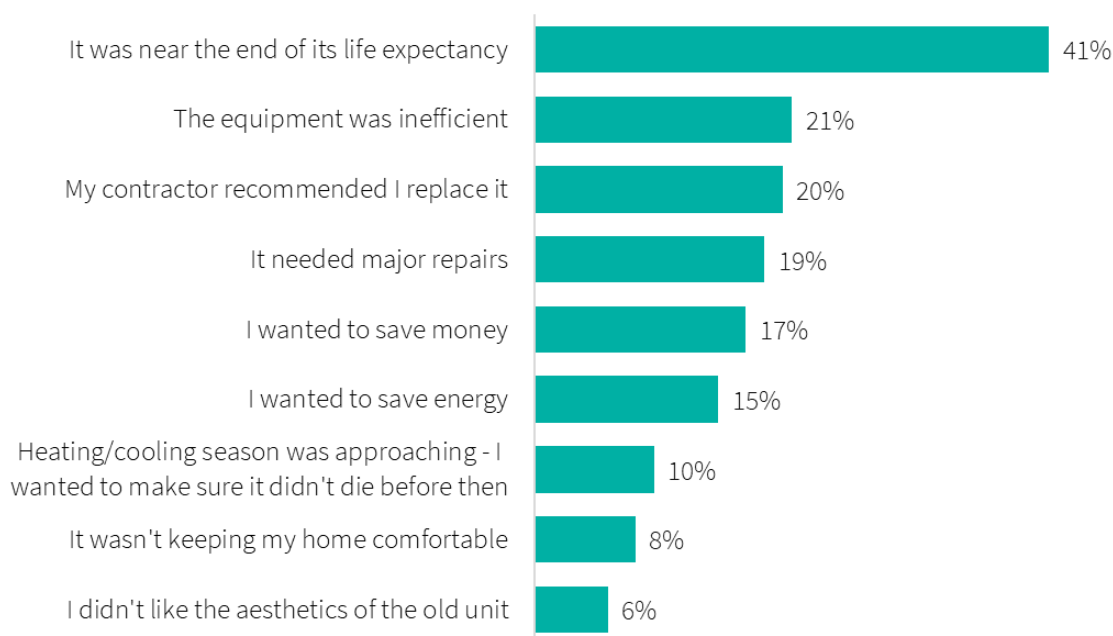
Figure 11. Condition of Replaced Equipment



Source: Home Rebates Participant Survey Question: “Now, just to confirm, how would you describe the working condition of your old equipment when you replaced it?” This was a single-response question (n=243). Only customers who did not do a tune-up were asked this question.

For respondents whose equipment was working when they replaced it through the program, the most common reasons they decided to replace the equipment were that “it was near the end of its life expectancy” (41%), “the equipment was inefficient” (21%), and “my contractor recommended I replace it,” (20%) as shown in Figure 12.

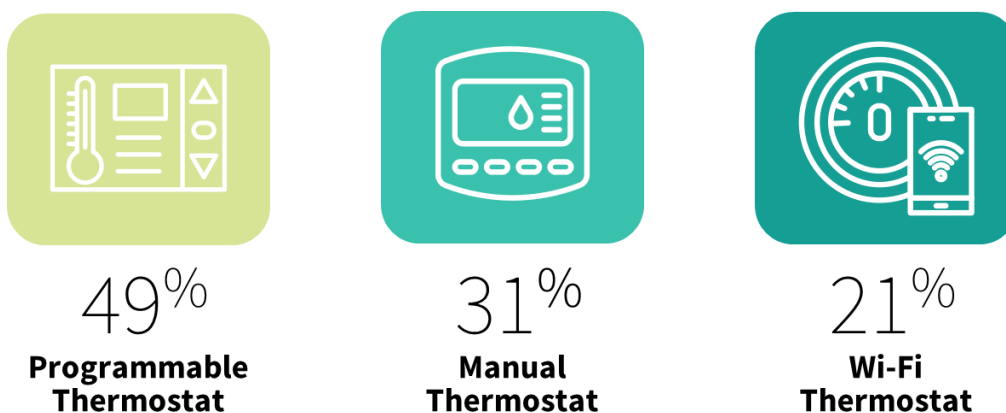
Figure 12. Reason for Replace Working Equipment



Source: Home Rebates Participant Survey Question: "You said that your old equipment was still working, why did you decide to replace it?" This was a multiple-response question (n=135). Only customers who did not do a tune-up and answered that their old equipment was still working were shown this question.

As seen in Figure 13, of the respondents who installed a Wi-Fi thermostat through the program (n=76), most reported that it replaced a programmable thermostat (49%) or a manual thermostat (31%).

Figure 13. Replaced Thermostat



Source: Home Rebates Participant Survey Question: "What kind of thermostat did the new smart Wi-Fi thermostat replace?" (n=75). Only customers who received a thermostat were shown this question.

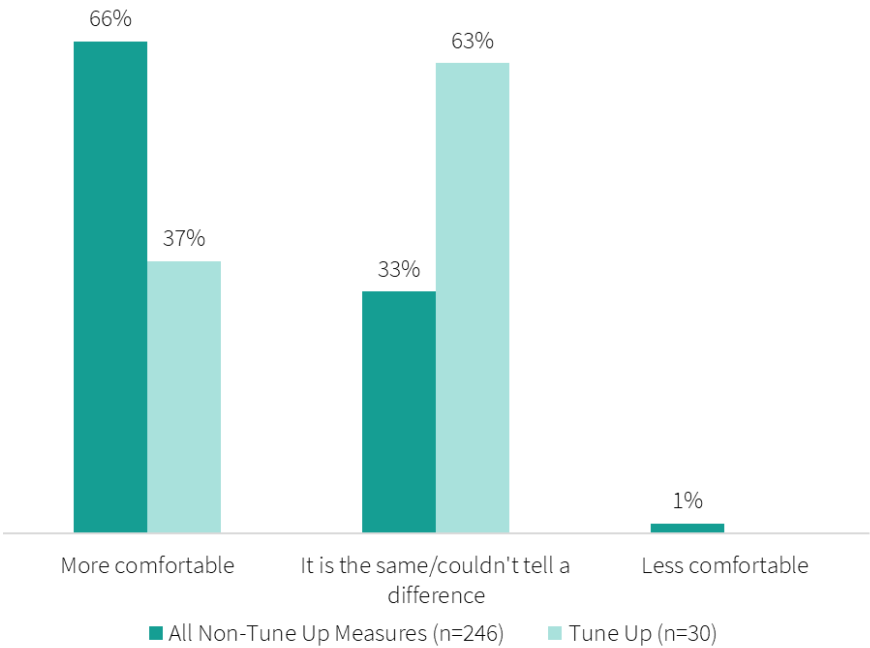
Program and Measure Experience

This section examines the installation and rebate experience of Home Rebates program participant survey respondents.

Installation Experience

Since participating in the Home Rebates program, most respondents (66%) reported that their home is more comfortable than before. This was consistent across all measures except tune-ups; tune-ups showed an inverse pattern with a majority of respondents (63%) saying that they could not tell a difference after participating in the program. This is not entirely surprising as often the maintenance is done regularly and not out of a specific need; however, 37% of respondents who received a tune-up did report that their home was more comfortable than before. Only three respondents reported that their home was less comfortable, as shown in Figure 14.

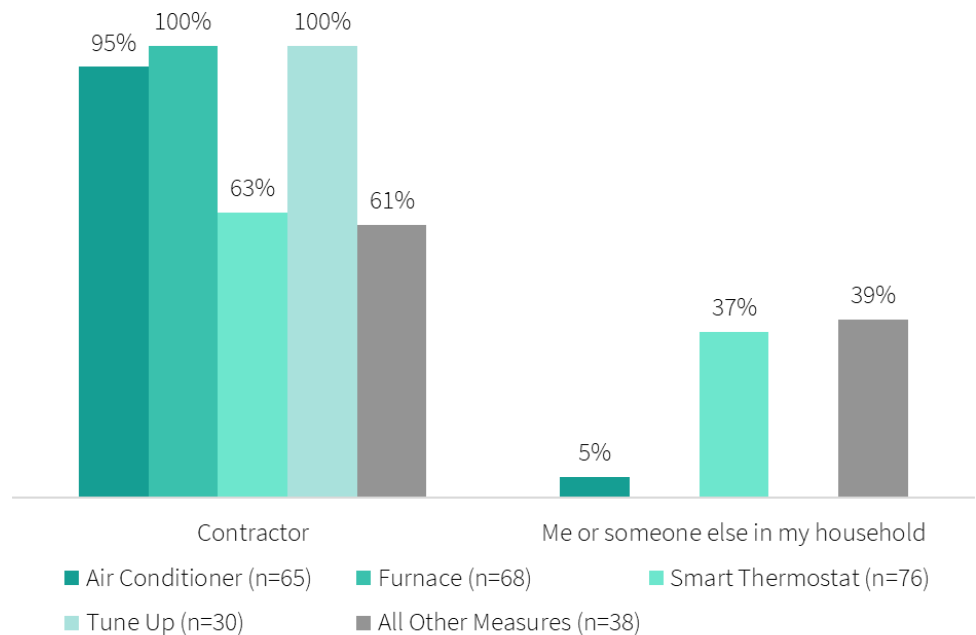
Figure 14. Home Comfort Level After Participation



Source: Home Rebates Participant Survey Question: “Since participating in the program, would you say the comfort level in your home is ...?”. (n=276)

As seen in Figure 15, most respondents relied on a contractor to install their equipment, particularly for furnaces (100%) and air conditioners (95%). Those who installed smart thermostats and other measures were more split in their responses, with a significant portion of respondents reporting that they installed the equipment themselves or had someone else in their household complete the installation. Customers who receive an HVAC tune-up are required to hire a contractor.

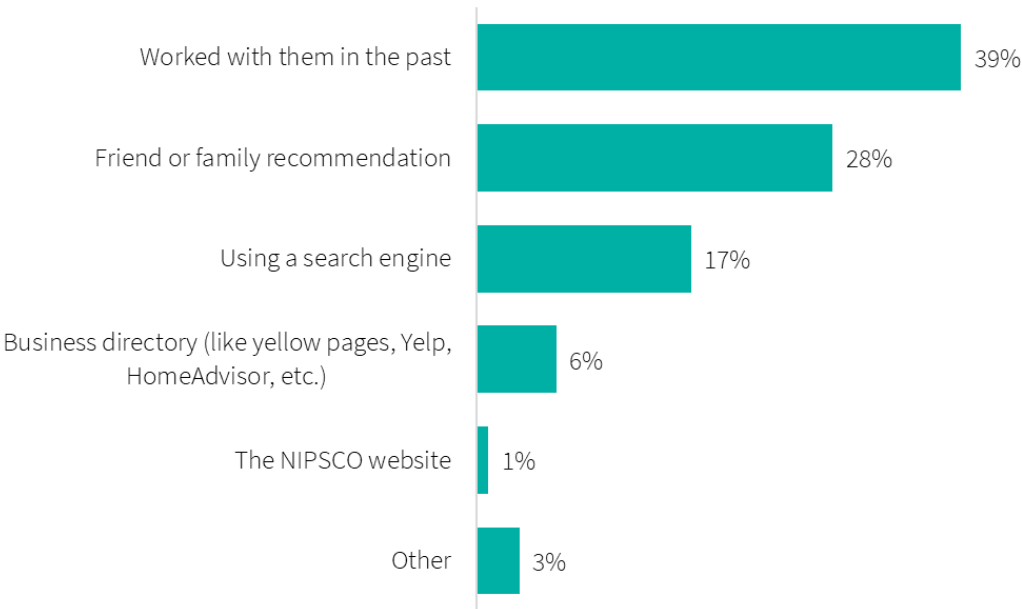
Figure 15. Who Installed Equipment



Source: Home Rebates Participant Survey Question: “Who installed your [MEASURE_TYPE]?” (n=277). HVAC tune up respondents were required to use a contractor.

Respondents who used a contractor reported that the most common way they found their contractor was from having worked with them in the past (39%). Others found a contractor through a friend or family recommendation (28%) (Figure 16). Most measures followed the same pattern with one notable deviation: Tune-up customers were more likely to use a contractor they had used in the past (58% compared to 39% overall). Tune-up customers are often working from a maintenance contract (61% of survey respondents that received tune-ups), thus using the same contractor repeatedly.

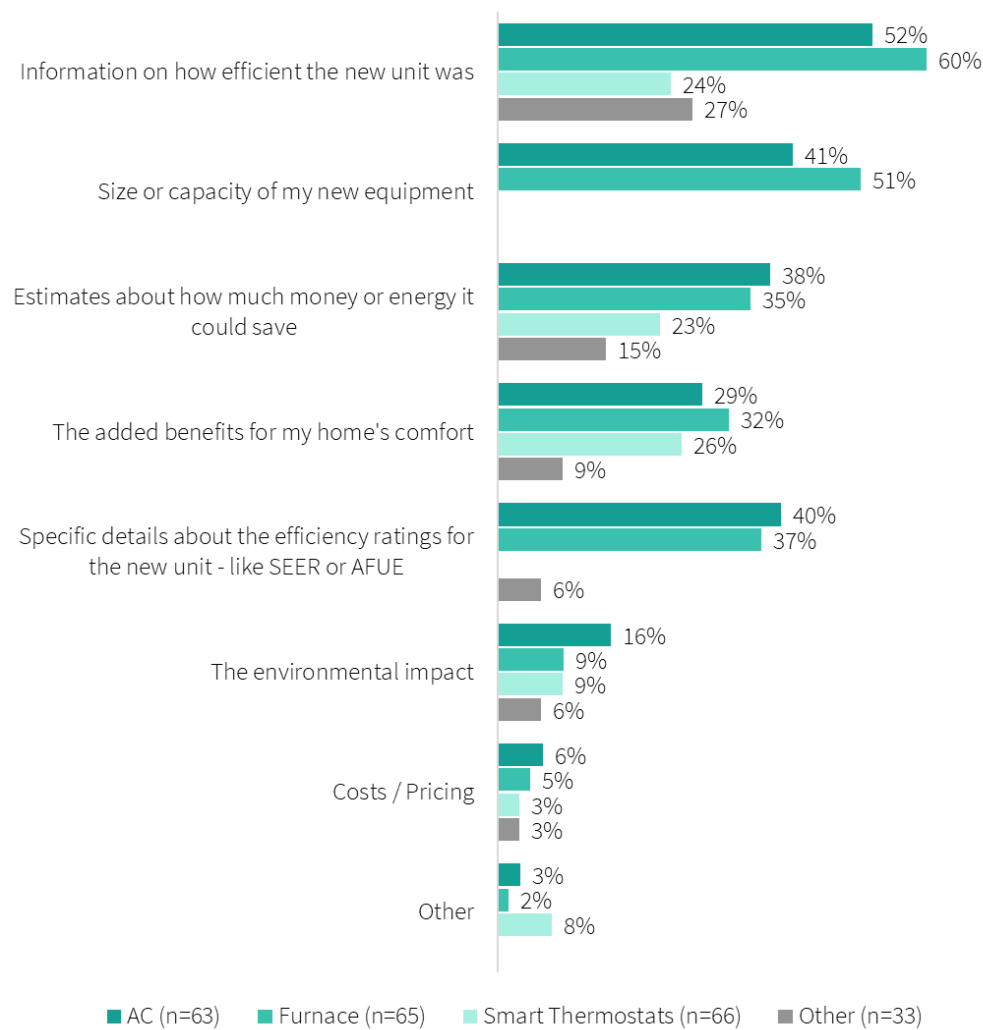
Figure 16. Method of Finding Contractor



Source: Home Rebates Participant Survey Question: “How did you find the contractor that performed the work through NIPSCO’s program”. This was a single-response question (n=204). This question was only asked to respondents who reported that they used a contractor to install their equipment or who did a tune-up in the program.

For respondents who used a contractor to install their air conditioning unit or furnace, the most common types of information that contractors provided were information on how efficient the equipment was (52% of air conditioners, 60% of furnaces) and information on the size or capacity of the new equipment (41% and 51%, respectively), as shown in Figure 17.

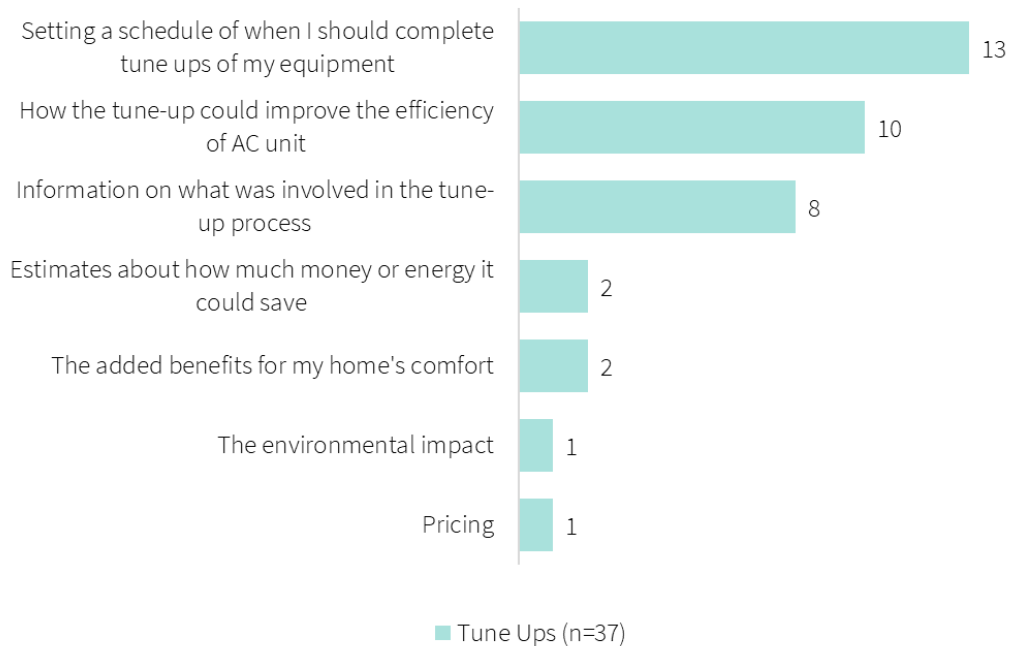
Figure 17. Information Provided by Contractor – All Measures Except Tune Ups



Source: Home Rebates Participant Survey Question: “What kind of information did your contractor provide to you before you purchased the [Measure]”. This was a Multiple-response question (n=156).

Tune-up respondents, who were offered different response options than all other respondents, most commonly reported that their contractors provided information about setting a maintenance schedule (59%, n=13) and about how the tune-up could improve the air conditioner’s function (45%, n=10, Figure 18).

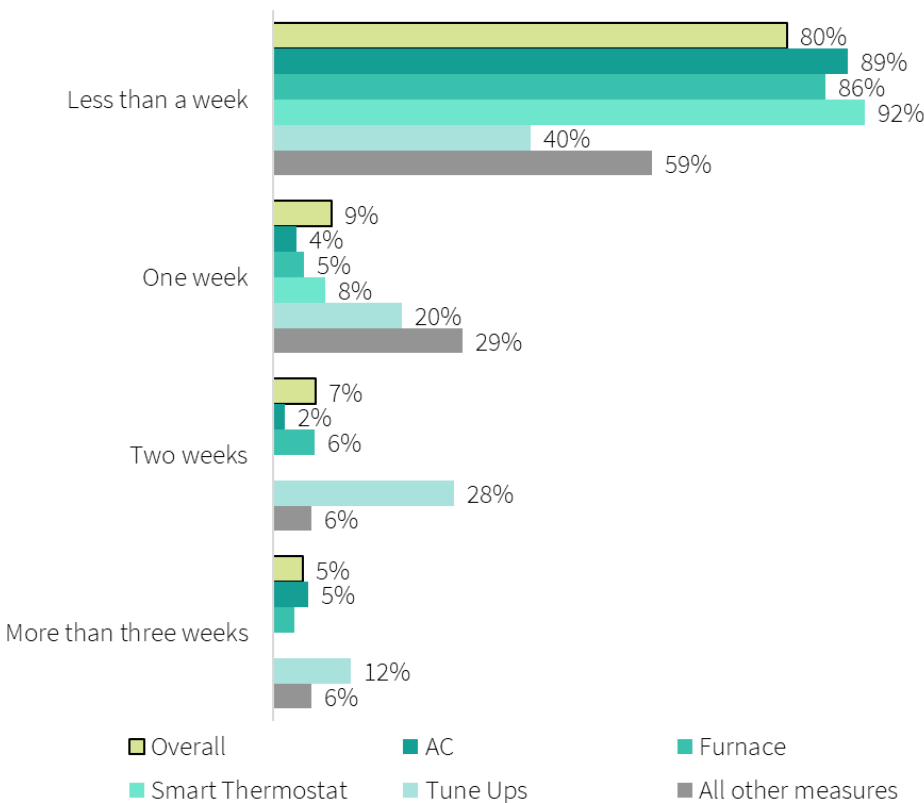
Figure 18. Information Provided by Contractor - Tune Ups Only



Source: Home Rebates Participant Survey Question: “What kind of information did your contractor provide to you before you purchased the [Measure]”. This was a Multiple-response question (n=22).

Of the respondents who used a contractor, most received their equipment/tune-up within a week of scheduling (80%) (Figure 19). This differed slightly for tune-ups compared to all other measures as tune-up respondents were slightly more likely to wait one week or more.

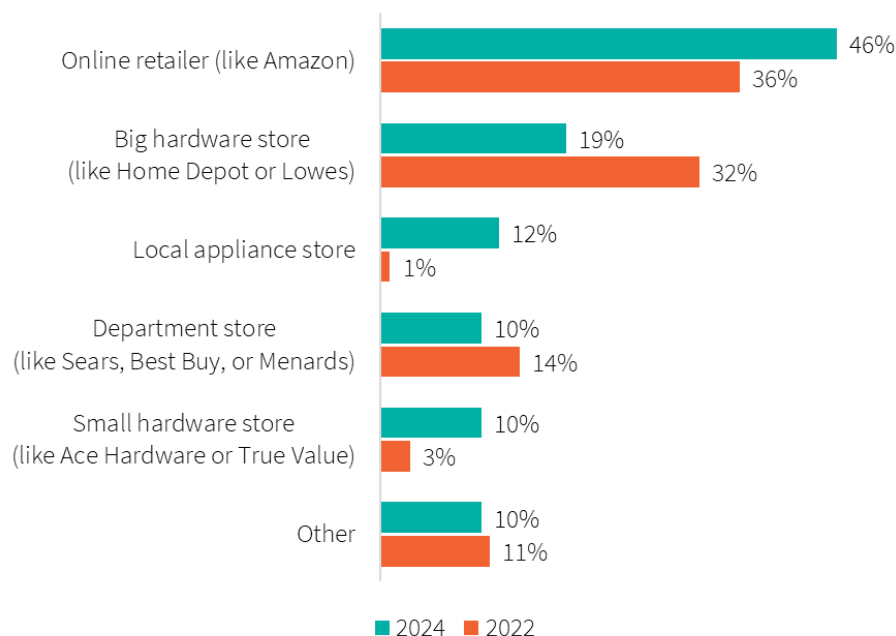
Figure 19. Wait Time After Scheduling



Source: Home Rebates Participant Survey Question: “How long did it take to install your [MEASURE_TYPE]/receive your tune-up after scheduling?” This question was only asked to respondents who reported that they used a contractor to install their equipment or who did a tune-up in the program (n=198).

Of respondents who installed their equipment themselves, the most common places that respondents reported they purchased their equipment from were online retailers (46%) and big hardware stores (19%) (Figure 20). These were notable changes from the 2022 Home Rebates program survey, which reported online retailers at 36% and big hardware stores at 32%. Small hardware stores and local appliance stores were also much more common in the 2024 survey.

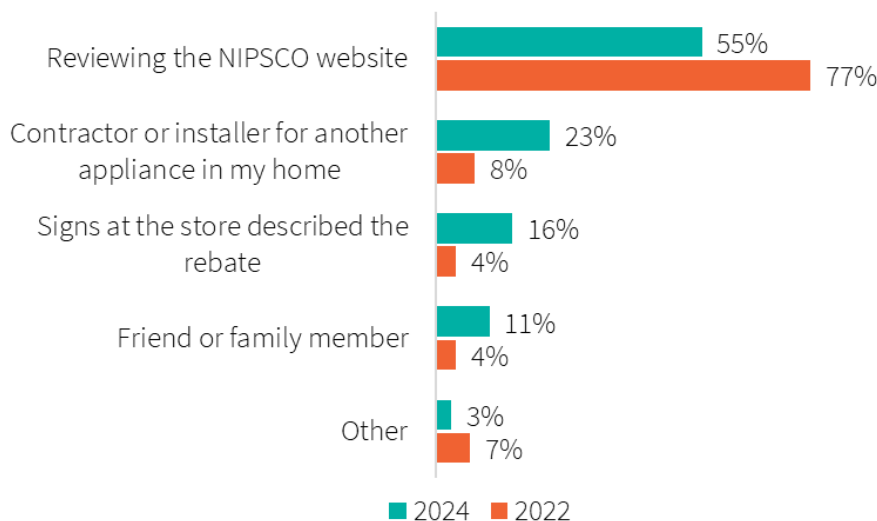
Figure 20. Where Respondent Purchased Equipment



Source: Home Rebates Participant Survey Question: “Where did you purchase your [MEASURE_TYPE]?” Only respondents who reported that they did not use a contractor or do a tune-up were shown this question (n=59).

Over half of respondents who did not use a contractor (55%) knew from looking at the NIPSCO website that the equipment was eligible for a rebate. Notably, the 2022 Home Rebates program survey respondents were mostly gaining their information from the NIPSCO website, while the 2024 survey respondents more often learned about rebate eligibility from a contractor or installer, from signage at the store, and from word of mouth (Figure 21).

Figure 21. How Respondent Found Rebate Eligibility for Equipment



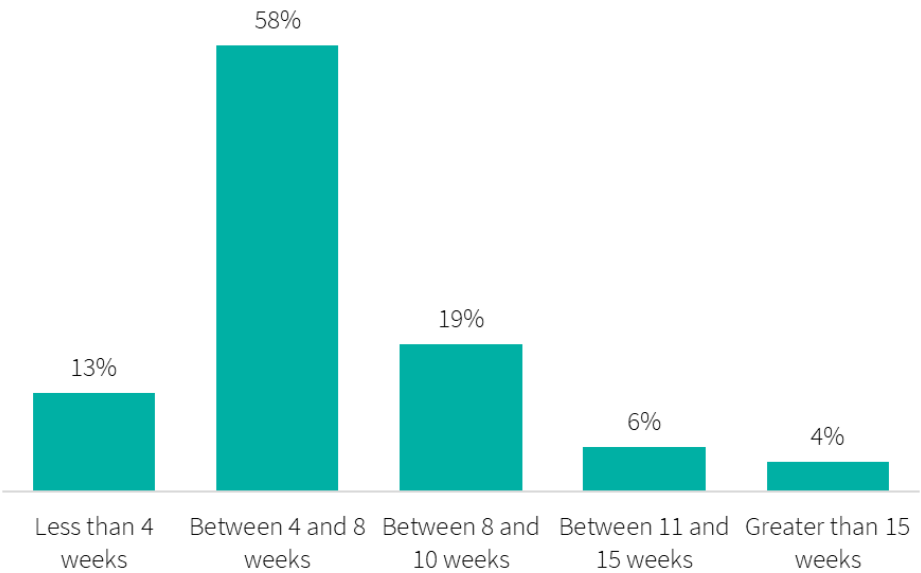
Source: Home Rebates Participant Survey Question: “How did you know the [MEASURE] was eligible for a rebate? Only respondents who reported that they did not use a contractor or do a tune-up were shown this question. (n=64).

Rebate Experience

Of the respondents who used a contractor, most (88%) received their rebate in the mail rather than receiving a discount up front from the contractor (12%) with 90% of respondents filling out the application themselves. The evaluation team asked these respondents and those who did not use a contractor about their experience with the application.

More than half of respondents (58%) who filled out the rebate application themselves reported that it took between four and eight weeks to receive their rebate, while 13% received it in less than four weeks (Figure 22). There was very little variance by equipment type. Later in the survey, all respondents discussed their level of satisfaction with the time it took to receive the rebate. Of those who filled out the rebate application themselves and received it in four weeks or fewer, 100% were “very” or “somewhat satisfied” (n = 20) with a steady decrease in satisfaction as in the wait time increased. Of those who received the rebate between four and eight weeks, 78% were “very” or “somewhat satisfied” and of those who received the rebate between eight and 15 weeks, about 42% were “very satisfied” or “somewhat satisfied.” Of the five respondents who waited more than 15 weeks to receive their rebate, only one respondent (20%) was still satisfied with this length of time.

Figure 22. Length of Time to Receive Rebate

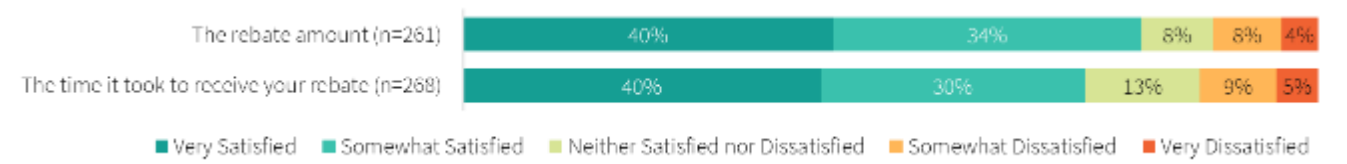


Source: Home Rebates Participant survey. Question: “About how long did it take to receive your rebate after you completed the application?” (n=156). This question was asked of respondents who installed their measure themselves or if they used a contractor but completed the rebate application themselves.

The evaluation team noted slightly lower levels of satisfaction with the time it took to receive the rebates compared to all other program aspects, with 40% indicating that they were “very satisfied” and 30% “somewhat satisfied” with the time it took, while 14% showed some dissatisfaction (Figure 23). There was a slightly greater satisfaction level with the rebate amount; 40% of respondents reported being “very satisfied” and 34% stated they were “somewhat satisfied” with it. Overall, 50 customers (19%) rated either the rebate

amount or the time it took to receive the rebate as leaving them “somewhat dissatisfied” or “very dissatisfied.” These results are consistent with the 2022 participant survey.

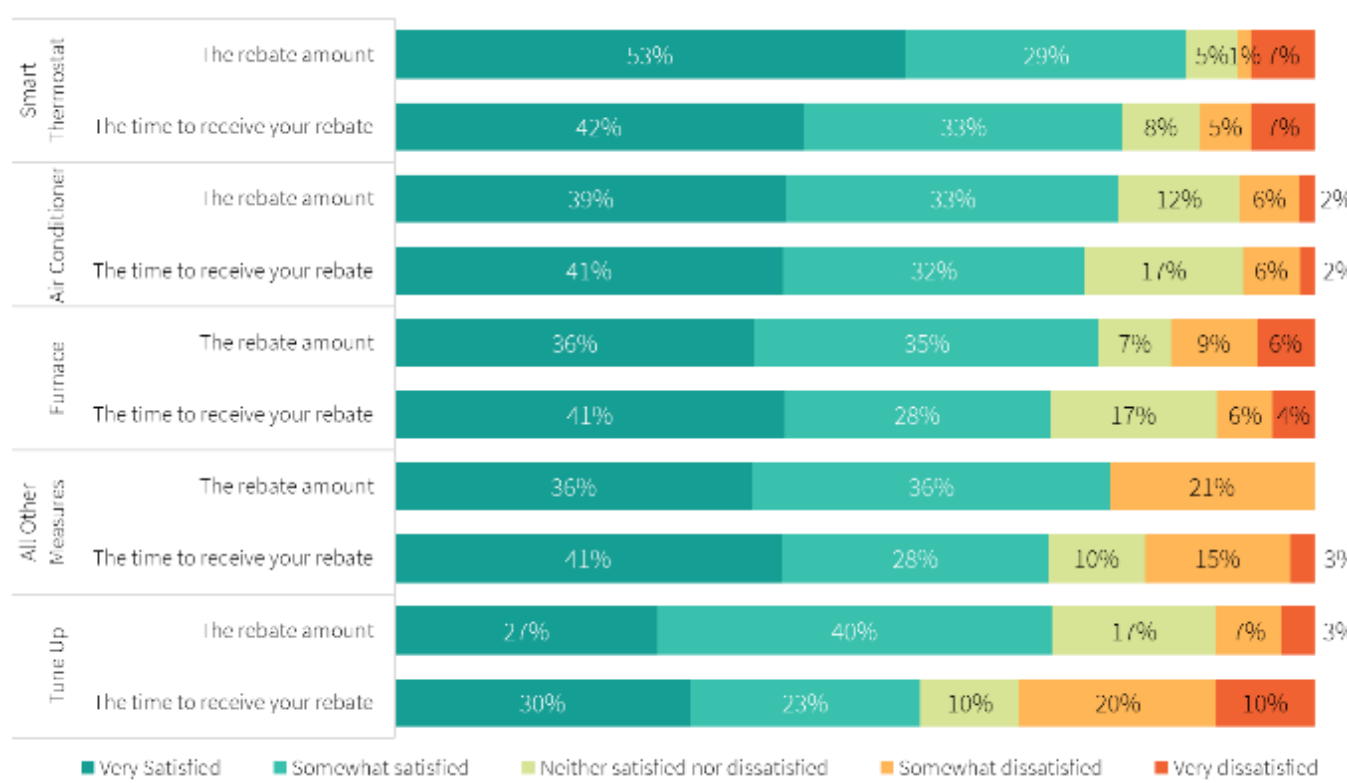
Figure 23. Satisfaction with Rebate - Overall



Source: Home Rebates Participant survey. Question: “How satisfied are you with the following aspects?”

Satisfaction with the rebate and rebate wait time was consistent across all measure types with those who received smart thermostats tending to be more satisfied for both aspects of the rebate than those who received the other measures , and those who received tune-ups reported slightly lower levels of satisfaction Figure 24).

Figure 24. Satisfaction with Rebate – By Measure Type



Source: Home Rebates Participant survey. Question: “How satisfied are you with the following aspects?”

When we asked respondents about reasons for their dissatisfaction or ways to improve the program, 28 brought up the rebate amount. Twenty respondents requested a larger rebate, with an additional four respondents saying the rebate size was not worth the program application length, and five respondents said they received a smaller rebate than they were expecting. One respondent said that they both received a rebate smaller than they were expecting and, overall, they wanted a larger rebate. In addition, 29 respondents cited the wait time for their rebate as the main reason for their dissatisfaction, and 19 specifically cited this when asked about ways to improve the program in general.

“Decrease the amount of time to receive the rebate. Make the application process less detailed. Increase the rebate amount, especially for an \$800 smart thermostat, \$60 is NOT enough of a rebate. It's pathetic. Make the process easier all around. Do not require photos of the thermostat.”

“I benefitted from it so I'm not quite complaining, but the time of the rebate, the application process was confusing, and the rebate amount were all less than satisfying.”

Satisfaction with the Program and NIPSCO

This section examines customers' satisfaction with the program, program elements, and NIPSCO overall. The section also includes details on respondents' dissatisfaction with the program and potential program improvements.

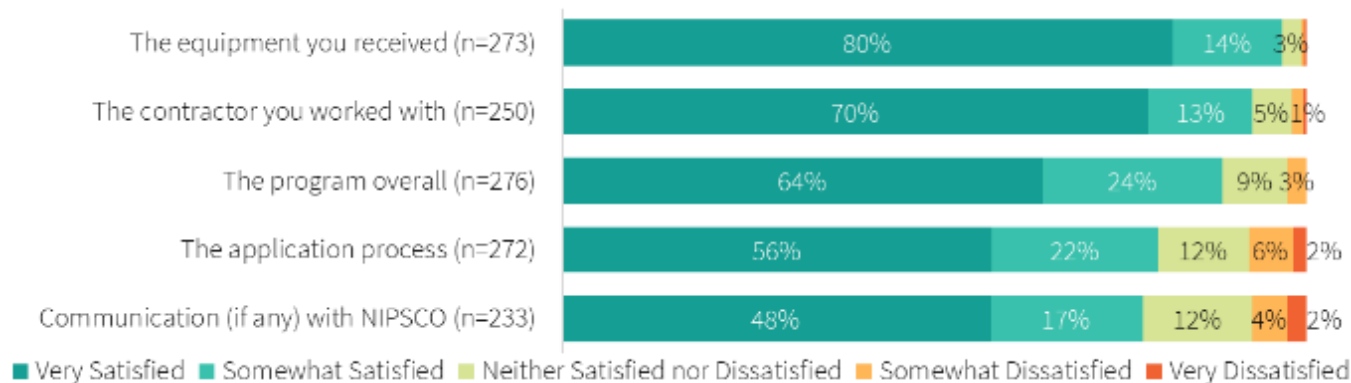
Program Satisfaction

Overall, respondents expressed high satisfaction with all aspects of the Home Rebates program. Almost two-thirds of respondents (64%) said they were “very satisfied” with the program overall and another 24% said they were “somewhat satisfied.” This is consistent with the 2022 survey, which found that most respondents were either “very satisfied” (52%) or “somewhat satisfied” (30%) with the program overall. There was, however, a slight increase in satisfaction in 2024. All other program elements received satisfaction levels that were consistent with 2022 responses.

Satisfaction was particularly high regarding the equipment customers received and the contractors they worked with; 80% and 70%, respectively, were “very satisfied,” and 14% and 13%, respectively, were “somewhat satisfied.” The application process also received positive feedback with 56% reporting they were “very satisfied” and 22% saying they were “somewhat satisfied.” Satisfaction with communication from NIPSCO was slightly lower, with 48% saying they were “very satisfied” and 17% “somewhat satisfied,” while 12% remained “neither satisfied nor dissatisfied.”

In general, respondents who received air conditioners were slightly more satisfied with the program and all program elements than other measures. With one notable exception, for the program overall, 100% of respondents who received tune-ups were satisfied, with 88% of those who received air conditioners being satisfied, slightly more than the remaining measure types.

Figure 25. Home Rebates Program Satisfaction



Source: Home Rebates Participant survey. Question: “How satisfied are you with the following aspects?”

Reasons for Dissatisfaction

Nearly a quarter of respondents (22%, n=62) reported that they were “very dissatisfied” or “somewhat dissatisfied” with at least one aspect of the program. Of those, the majority (n=50) were dissatisfied with the rebate amount or the time it took to receive the rebate, as discussed in the *Rebate Experience* section of this chapter. The evaluation team asked respondents who were anything less than “somewhat satisfied” for feedback on certain program elements.

When the evaluation team asked if there was anything the contractor could have done to improve the experience with the program, 10 of the 15 respondents who answered the question noted they were “not sure,” and five gave specific suggestions for improvement including:

- Providing more information about the program (n=2)
- Correcting installation errors (n=2)
- Behaving in a more professional manner (n=1)

As discussed above in the *Rebate Experience* section, 50 respondents were less than satisfied with their rebate experience. While the program requires specific information about products, installation, and use, this can become a burden on the respondents. For example, for the program to calculate the most accurate savings for thermostats, it is helpful to have serial numbers, but respondents feel it is “a hassle to get the precise model number.” One respondent, quoted below, made the comment that they understood the reasoning behind the amount of detail required. Fourteen respondents (38%) cited that the program application was too complicated and that that was the main reason for their dissatisfaction with it.

“[The application should] not require so much technical information and so much research to get the information.”

“I recall the application being somewhat cumbersome. However, I'm not sure if this is something that can be realistically improved while maintaining the integrity of the program.”

Notably, eight respondents said that the application would have been easier with an online option; however, there is an online application. This finding is consistent with the 2022 research, which also found that there was a lack of knowledge about the online application.

Respondents who were less than satisfied with the Home Rebates program and provided feedback on their reason (n=25) generally cited the application process and rebate amount as sources of their dissatisfaction. This is illustrated in the following customer comments:

The program application and overall process was complicated and took too long (n=19).

“It was very complicated to complete with the application and the process.”

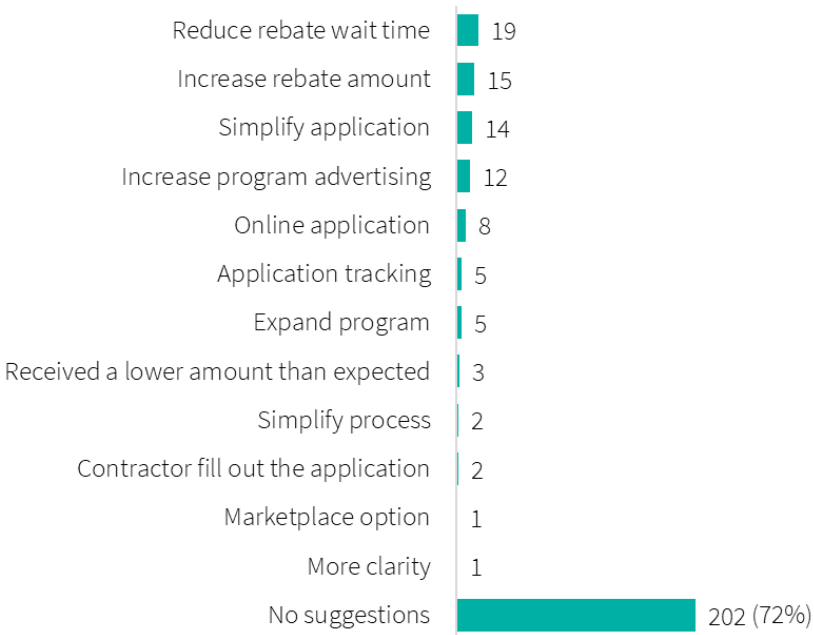
The rebate was too low (n=11).

“The amount is very small; pathetic. They make it so the person wants to give up on receiving the rebate by requiring so much detail.”

Suggestions for Improvement

Just over one-quarter (28%) of respondents provided suggestions for how NIPSCO could improve its Home Rebates program. As discussed earlier in this chapter, the most common responses involved the rebate and rebate application, with “decrease wait time to receive rebate” (n=19) and “increase the rebate” (n=16) being the most common responses. However, most respondents (72%) had no suggestions for how to improve the program (Figure 26).

Figure 26. Home Rebates Suggestions for Improvement



Source: Home Rebates Participant survey. Question: “Do you have any recommendations for how to improve NIPSCO’s Home Rebates?” (n=280)

NIPSCO Satisfaction

Over half of respondents (53%) reported they were “very satisfied and 30% said they were “somewhat satisfied” with NIPSCO as their energy provider (Figure 27). The satisfaction level with NIPSCO has generally remained unchanged from 2022, with a slight shift from “somewhat satisfied” (36% in 2022) to “very satisfied” (45% in 2022). Those who received tune-ups were slightly less satisfied with NIPSCO (69% satisfied), while those who received smart thermostats were slightly more satisfied with NIPSCO (92% satisfied).

Figure 27. Satisfaction with NIPSCO as the energy service provider



Source: Participant survey. Question: “How satisfied are you with NIPSCO overall as your energy service provider?” (n=276)

Participant Survey Demographics

Most respondents own their home (94%), live in a single-family detached home (94%), and have lived in their home for more than a year (88%). About half of the survey respondents (48%) have two occupants in their home. There is an even distribution of homes built between 1960 and the present day; details on this are presented in Table 32. These questions were optional for survey respondents.

Table 32. 2024 Home Rebates Participant Survey Demographics

DEMOGRAPHICS	PERCENTAGE
Home Ownership (n=267)	
Own	94%
Rent	1%
Other	<1%
Not Sure	<1%
Type of Residence (n=269)	
Single-family detached home	94%
Multi-Family apartment or condo building (with 4 or more units)	2%
Attached house (townhouse, row house, or twin)	4%
Mobile or manufactured home	<1%
Years Lived in Current Home (n=268)	
One year or less	7%
2-3 years	14%
4-5 years	10%
6-10 years	11%
More than 10 years	53%
Not Sure	1%
Number of People in the Home (n=259)	
One	14%
Two	48%
Three	14%

DEMOGRAPHICS	PERCENTAGE
Four	9%
Five or more	7%
Not Sure	1%
Year Home Built (n=268)	
Before 1900	1%
1900 to 1939	6%
1940 to 1959	9%
1960 to 1979	20%
1980 to 1989	7%
1990 to 1999	17%
2000 to 2004	11%
2005 or later	17%

Source: Participant survey. Questions: "What type of residence do you live in?" "Do you own or rent your residence?" "How many years have you lived in your current home?" "Including yourself, how many people live in your home?" "When was your home built?"

Conclusions and Recommendations

CONCLUSION 1: WHILE CONTRACTORS DROVE PROGRAM AWARENESS FOR FURNACES, AIR CONDITIONER UNITS, AND TUNE-UPS, PARTICIPANTS MOST COMMONLY LEARNED ABOUT REBATES FOR OTHER MEASURES THROUGH THE NIPSCO WEBSITE.

Respondents with HVAC measures most often reported that they learned about the program through their contractor, specifically when it came to air conditioners (65%), furnaces (65%), and HVAC tune-ups (47%). Participants who installed other measures were more likely to find out about the program through the NIPSCO website (31%) or their retailer or vendor (23%). Only 15% of participants who purchased other measures learned about the program through a contractor.

While larger HVAC measures are typically intentionally designed to be marketed through contractors, the Home Rebates program includes smaller measures like pool pumps and dehumidifiers, which could benefit from more direct marketing to customers. Further, some survey respondents suggested increasing program advertising to improve the program (n=13).

Recommendations:

- Increase marketing efforts for smaller measures by targeting residential customers directly through channels like emails, social media ads, and bill inserts, bypassing contractor interactions.
- Cross-promote the program through current participants of other NIPSCO programs, particularly the HEA program.
- Encourage program-affiliated contractors to cross-promote other NIPSCO offerings with customers, including the smaller measures offered through the Home Rebates program.

CONCLUSION 2: OVERALL, CUSTOMERS ARE VERY SATISFIED WITH THE HOME REBATES PROGRAM AND NIPSCO BUT LESS SATISFIED WITH THE REBATE AMOUNT AND THE REBATE WAIT TIME.

Respondents expressed high levels of satisfaction with various aspects of the Home Rebates program with 88% saying they were “very satisfied” or “somewhat satisfied.” Satisfaction was particularly high regarding the equipment customers received and the contractor they worked with; 94% and 83%, respectively, were “very satisfied” or “somewhat satisfied.” Most respondents (83%) were also “very satisfied” or “somewhat satisfied” with NIPSCO as their energy service provider.

However, the evaluation team found slightly lower satisfaction levels regarding the rebate compared to other program aspects, with 74% reporting being “very satisfied” or “somewhat satisfied” with the rebate amount and 70% reporting they were “very satisfied” or “somewhat satisfied,” with the time it took to receive the rebate. Nearly one-fifth (19%) of respondents reported dissatisfaction with either the rebate amount or the time it took to receive the rebate, or both.

Many respondents mentioned dissatisfaction with their rebate experience when providing context for their satisfaction ratings in the open-ended comments. Nearly a quarter of respondents (22%) reported they were dissatisfied with at least one aspect of the program, the majority of which (n=50) were dissatisfied with the

rebate amount or the time it took to receive the rebate. Just over 70% of respondents received their rebate in eight weeks or fewer, and those who received their rebate faster were more satisfied with the time it took.

Recommendations:

- Ensure customers receive the rebate in the required eight weeks or fewer, as outlined in the program abstract. If there is an issue with the participant's application, communicate to the customer that this may delay their rebate.

CONCLUSION 3: MOST RESPONDENTS SUBMIT THE REBATE APPLICATION THEMSELVES, AND THE APPLICATION IS A POINT OF DISSATISFACTION FOR SOME.

Given the high proportion of contractor-lead projects and application requirements, as well as the low awareness of the online application, the high rate of customers filling out the application themselves may be limiting the program and increasing customer dissatisfaction.

Most respondents relied on a contractor to install their equipment with furnaces (100%) and air conditioners (95%) having the highest proportion of contractor installation, and smart thermostats (63%) and other measures (61%) having a slightly lower rate of contractor installation. Of the respondents who used a contractor, most (88%) received their rebate in the mail rather than receiving a discount up front from the contractor (12%), and 90% of respondents filled out the application themselves. Respondents expressed moderate satisfaction with the application process, with 78% reporting being "very satisfied" or "somewhat satisfied," and 8% reporting being "very dissatisfied" or "somewhat dissatisfied."

The complicated nature of the program application led to some frustration. For instance, one respondent felt it was "a hassle to get the precise model number" for their thermostat application. The top recommendation for overall program improvement was to make the rebate application easier to complete (n=25).

Recommendations:

- Encourage contractors to fill out applications for their customers and provide the rebate as an up-front discount.
- Consider offering bonus incentives to contractors who provide the most up-front discounts to customers.
- Make the online application easier to find on the NIPSCO website, similar to how the PDF application is currently linked toward the top of the program website.
- Advertise the online application directly to contractors as they are leading customer interactions and education.
- Provide an explanation in the rebate application as to why the program requires the level of detail it does to help ease customer frustration.
- Conduct User Experience (UX) testing on the application to determine pain points and areas for improvement, as well as ways to maximize application completion.

CONCLUSION 4: THE HOME REBATES PROGRAM MET ITS 2024 SAVINGS GOALS FOR ELECTRIC ENERGY SAVINGS AND NATURAL GAS SAVINGS BUT FELL SHORT OF THE PEAK DEMAND SAVINGS GOAL.

NIPSCO did not meet its savings goals for peak demand but exceeded its electric energy and natural gas savings goals. Air conditioners achieved an overall realization rate of 65% for peak demand savings, which significantly affected the overall peak demand realization rate since air conditioners made up a large majority of demand savings (69% of total demand savings). The evaluation team found that *ex post*'s use of actual measure characteristics and differences between the approaches outlined in the Illinois TRM v12.0 and 2022 EM&V report—the latter of which includes higher early replacement rates as well as higher coincidence factors—drove realization rates to deviate from 100%. The program had a 179% realization rate for kWh savings, an 87% realization rate for demand savings, and a 130% realization rate for therm savings.

Recommendations:

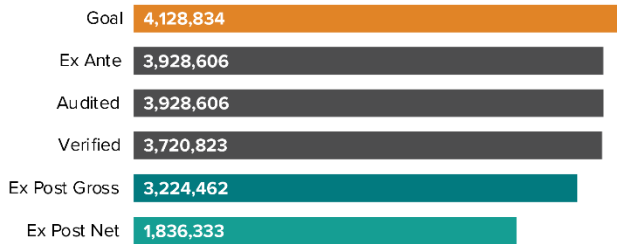
- Consider prioritizing program delivery strategies (i.e., targeted outreach) for measures that will bring more peak demand reduction through the Home Rebates program, such as air conditioners and smart thermostats.
- Update the *ex ante* savings calculations to reference the Illinois TRM v13.0 as instructed by the new Indiana TRM Workbook v1.0. Where applicable, use Indiana location-specific input assumptions from the Indiana TRM v1.0, which map to climate-comparable Illinois TRM cities.

RETAIL PRODUCTS

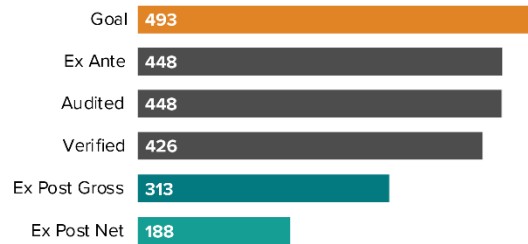


- Despite reducing 2024 residential lighting offerings in response to the expanded definition of general service lamps in the EISA backstop legislation, the program achieved 78% of its electric energy savings goal and 63% of its peak demand reduction goal.
- The use of deemed savings assumptions in ex ante savings led to large discrepancies between Ex Ante and Ex Post Savings.
- As NIPSCO looks to replace lighting savings, air purifiers and bathroom exhaust fans may provide a stable source of energy savings.

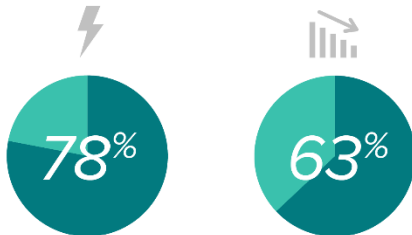
⚡ Electric Savings (kWh)



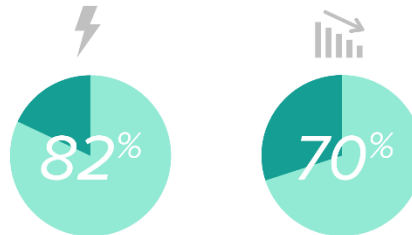
📊 Peak Demand Reduction (kW)



Ex Post Gross Achieved to Gross Goal

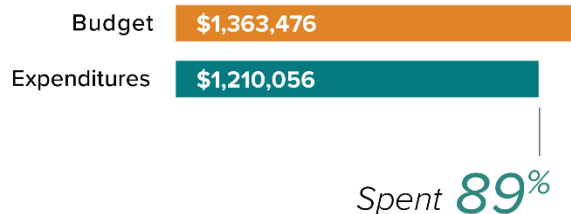


Realization Rate



Budget

⚡ 📊 Electric and Peak Demand



Program Design and Delivery

The Residential Retail Products program supports the stocking, sale, and promotion of efficient residential products at retail locations. The program uses financial incentives to increase the market saturation of energy efficient products. These incentives typically come in the form of upstream incentives paid directly to manufacturers or retailers. TRC administers the Retail Products program on behalf of NIPSCO. The program provides instant discounts or coupon vouchers on energy efficient products that meet the energy efficiency standards set forth by the Department of Energy's (DOE's) ENERGY STAR® program.

TRC establishes Memoranda of Understanding (MOUs) with retailers and manufacturers that specify product types and models, sales quotas, markdown amounts, promotional pricing levels, and specifications on product sales data for monthly reports. Retailers provide sales data monthly, and the program processes incentives for markdowns/coupons based on point-of-sale data.

Table 33 shows the measures and incentives included in the Residential Retail Products program.

Table 33. Residential Retail Products Incentives

MEASURE	INCENTIVE
LED Nightlights	\$1.50-\$10
EISA Exempt LED Lighting	Mini Decorative - \$0.75 - \$2.25
	Mini Directional - \$2
	Mini Omnidirectional - \$8
	Outdoor Floodlights - \$1.50
	Task / Under Cabinets Fixtures - \$2.19 - \$8
	Tube LED - \$0.75 - \$3
Advanced Power Strips	Tier 1 (7 plug) - \$10
	Tier 1 (5 plug) - \$10
	Tier 2 (APS) - \$15
ENERGY STAR Air Purifier/Cleaner	Smoke CADR 100 - 149 - \$22
	Smoke CADR 150 - 199 - \$50
	Smoke CADR >=200 - \$44
ENERGY STAR High Efficiency Bathroom Exhaust Fan	\$45
ENERGY STAR Clothes Dryer	Electric Dryer - \$50
	Electric Heat Pump - \$150
ENERGY STAR Television (all sizes)	\$50
Connected LED Lamps	Indoor - \$0.50 - \$1
	Outdoor - \$4
ENERGY STAR Refrigerator-Freezer	\$15
	Tier 2 - \$100
	Tier 3 - \$120
ENERGY STAR Room Air Conditioner	\$75

Changes from the 2023 Design

This program was known as the Residential Lighting program through 2023. In 2024, the program expanded beyond lighting to offer incentives for other home appliances/products such as advanced power strips (APSS), air purifiers, bathroom exhaust fans, electric dryers, TVs, refrigerator-freezers, and air conditioners. The program also provides coupons for customers to access discounts in addition to point-of-purchase discounts.

Program Performance

The 2024 Retail Products program fell short of its electric energy savings and peak demand reduction goals due to a late program launch and lower-than-expected participation. The program achieved 78% of its kWh savings goals and 63% of its kW reduction goals. In 2023, the Residential Lighting program also fell short of its electric energy savings and demand reduction goals (78% and 72%, respectively), though the program offered fewer measure types in 2023.

Table 34 summarizes savings for the full year of program performance, including program savings goals.

Table 34. 2024 Retail Products Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	4,128,833.53	3,928,606.45	3,928,606.45	3,720,823.37	3,224,462.47	1,836,332.71	78%
Peak Demand Reduction (kW)	493.185	448.321	448.321	426.203	312.911	187.742	63%
Natural Gas Energy Savings (therms/yr.)	0.00	0.00	0.00	0.00	0.00	0.00	n/a

Table 35 outlines the *ex post* and net-to-gross (NTG) adjustment factors. The EISA-exempt LED lighting measures, which make up 45% of total program electric energy savings, drove most of the realization rates. Differences in baseline wattage between *ex ante* and *ex post* savings calculations led to a collective realization rate of 60% for these measures. The evaluation team used secondary benchmarking research to determine 2024 NTG values for most measures, excluding LED fixtures where we used the NTG value from the 2023 evaluation and APSS where we used the NTG value from the 2023 Residential Online Marketplace (OLM) program evaluation.⁶

Table 35. 2024 Retail Products Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	82%	43%	0%	57%

⁶ This review covered documents published in the last two years consisting of OLM NTG studies, TRMs, and Cadmus evaluation plans. We calculated NTG values based on an average of the following sources: ComEd (2023), Ameren (2024), PPL (2024), PSE&G (2025), CA e-TRM (2024), and NJ TRM (2023).

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILOVER	NTG (%) ^b
Peak Demand Reduction (kW)	70%	40%	0%	60%
Natural Gas Energy Savings (therms/yr.)	n/a	n/a	n/a	n/a

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

Table 36 lists the 2024 program budget and expenditures by fuel type. In 2024, the program spent 89% of its electric budget.

Table 36. 2024 Retail Products Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$1,363,476.26	\$1,210,056.42	89%

Evaluation Methodology

To inform the 2024 NIPSCO Retail Products program, the evaluation team completed the following research activities:

- **Program staff interviews and discussions** to understand the program process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program participation data.
- **Engineering analysis** to review the program’s savings assumptions and algorithms for reasonableness and accuracy.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop savings estimates? Are there any updates that should be made?
- What are the *ex post* program savings? Do these suggest any needed updates to the program’s design, delivery, or savings assumptions?
- Did the program meet its participation and savings goals?
- What do other utility programs estimate for in-service rates (ISRs) and NTG ratios?

For all measure types, the evaluation team compared its engineering calculations to NIPSCO’s *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: standard engineering practices and relevant building codes, the Indiana TRM Workbook v1.0, the Illinois TRM v12.0, and NIPSCO’s program tracking database.

Per the Indiana TRM Workbook v1.0, the Indiana TRM “is intended to be used as an accompaniment to [the Illinois TRM], automatically incorporating the most recent and effective version of the [Illinois] TRM, including

measures newly added to the [Illinois] TRM.” For each measure, the evaluation team first referenced the Indiana TRM, which directly references the Illinois TRM for most measures.

The team used the VEIC Proposed Indiana Assumptions on the “Code Baseline Measures” worksheet of the Indiana TRM as a source for baseline assumptions, where provided for specific measures. Additionally, the evaluation team used the “Weather Zone Mapping” worksheet of the Indiana TRM Workbook v1.0 to map cities in NIPSCO’s territory to their appropriate Illinois city to estimate weather impacts.

Audited and Verified Savings

To audit energy savings and demand reduction, the evaluation team reviewed the program tracking database and checked savings estimates and calculations against the Indiana TRM Workbook v1.0 and the Illinois TRM v12.0 to confirm accurate application of the assumptions. Following the review, the evaluation team recalculated the program’s energy savings and demand reduction to account for errors, omissions, and inconsistencies identified in the program tracking data.

To confirm consistency in the tracking data, the evaluation team audited product quantities by comparing product descriptions, numbers of packs, and numbers of units provided in the tracking database. The evaluation team also validated product quantities through an analysis of rebate and buy-down dollar amounts and found that the data was accurate, complete, and comprehensive and did not require any modifications.

The evaluation team thoroughly investigated the energy savings and demand reduction assumptions. Through this investigation, the evaluation team identified seven LED lighting model numbers in the tracking database that the database categorized as EISA-exempt tube LEDs but were simply tube-shaped screw-in bulbs that are not EISA exempt. The evaluation team attributed zero *ex post* savings to these bulbs. This did not have a large effect on realization rates as these seven models account for just 756 individual bulbs, or about 1% of the program’s LEDs.

Table 37 lists the ISRs for all program-installed measures. For most measures the evaluation team assumed a 100% ISR, which is common practice for upstream programs; however, the Illinois TRM v12.0 specifies a 98% ISR for retail lighting, and we applied a 78% ISR to tier 1 and an 83% ISR for tier 2 APSs based on data collected from NIPSCO’s 2023 OLM program participants.

Table 37. 2024 Retail Products Program ISRs by Measure

MEASURE	ISR	SOURCE
LED Bulb	98%	IL TRM v12.0
LED Fixture	100%	Deemed
LED Nightlight	98%	IL TRM v12.0
Air Purifier	100%	Deemed
Refrigerator	100%	Deemed
Bathroom Exhaust Fan	100%	Deemed
Clothes Dryer	100%	Deemed
Advanced Power Strip – Tier 1	78%	2023 Res OLM Participant Survey

MEASURE	ISR	SOURCE
Advanced Power Strip – Tier 2	83%	2023 Res OLM Participant Survey

Table 38 summarizes the audited quantity, applied ISRs, and resulting verified quantity per measure. To calculate the verified measure quantity, the evaluation team multiplied the audited measure quantity by the ISR.

Table 38. 2024 Retail Products Program Audited and Verified Quantities

MEASURE	UNIT OF MEASURE	AUDITED QUANTITY	ISR	VERIFIED QUANTITY
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-199)	Air Purifier	1,289	100%	1,289
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	Air Purifier	100	100%	100
ENERGY STAR Clothes Dryer - Electric Dryer - Electric only savings	Dryer	5	100%	5
High Efficiency Bathroom Exhaust Fan (Continuous usage)	Fan	1	100%	1
High Efficiency Bathroom Exhaust Fan (Standard usage)	Fan	29	100%	29
Connected LED Lamps - Indoor	Lamp	558	98%	547
EISA Exempt LED Lighting - Mini Decorative	Lamp	17,848	98%	17,491
EISA Exempt LED Lighting - Mini Directional	Lamp	38	98%	37
EISA Exempt LED Lighting - Mini Omnidirectional	Lamp	7,905	98%	7,747
EISA Exempt LED Lighting - Task / Under Cabinets Fixtures	Lamp	40,537	100%	40,537
EISA Exempt LED Lighting - Tube LED	Lamp	5,143	100%	5,143
LED Nightlights	Lamp	31,015	98%	30,395
Advanced Power Strips - Tier 1 (5-plug)	Power Strip	8,207	78%	6,401
Advanced Power Strips - Tier 1 (7-plug)	Power Strip	5,329	78%	4,157
Advanced Power Strips - Tier 2 (APS)	Power Strip	130	83%	108
ENERGY STAR Refrigerator-Freezer	Refrigerator-Freezer	3	100%	3
		118,137	N/A	113,990

Ex Post Gross Savings

Engineering Reviews

The evaluation team determined the program's *ex post* gross energy savings and demand reduction through an engineering analysis. For all program measures, the evaluation team used a range of data sources to ensure it used the most recent and accurate savings assumptions. Like the *ex ante* calculations, *ex post* calculations used algorithms and assumptions from the Illinois TRM v12.0.

Whenever possible, the evaluation team verified model specifications against the ENERGY STAR qualified products list. For lighting measures, the evaluation team used the recommended baseline watts approach

prescribed in the most recent version of the UMP Residential Lighting Evaluation Protocol with the replaced bulb type determined by the type of bulb that would be used in the replaced fixture. Evaluated savings were zero for EISA-impacted lighting measures sold in 2024.

Appendix 2. Retail Products Program

Algorithms and Assumptions contains the detailed equations the evaluation team used to calculate 2024 electric savings and demand reduction for the program, and it provides a summary table of savings assumptions, and their sources, as well as how they compare to the *ex ante* assumptions.

Ex Post Gross Savings Summary

Table 39 shows the *ex ante* deemed savings and *ex post* gross per-measure savings for 2024 Retail Products program measures. The overall realization rate for the program was 82% for energy savings and 70% for demand reduction. The variance in realization rates is largely a product of methodological differences between the evaluation team's calculation of *ex post* savings and the calculation of *ex ante* savings, with the largest influence being the determination of baseline wattage for lighting measures. Table 39, below, explains these differences in greater detail.

Table 39. 2024 Retail Products Program *Ex Ante* and *Ex Post* Gross Per-Measure Savings Values

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-199)	Air Purifier	303.00	0.035	0.00	302.82	0.035	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	Air Purifier	229.00	0.026	0.00	258.32	0.030	0.00
ENERGY STAR Clothes Dryer - Electric Dryer - Electric only savings	Dryer	160.44	0.022	0.00	161.98	0.022	0.00
High Efficiency Bathroom Exhaust Fan (Continuous usage)	Fan	170.16	0.019	0.00	158.21	0.002	0.00
High Efficiency Bathroom Exhaust Fan (Standard usage)	Fan	26.51	0.003	0.00	26.79	0.003	0.00
Connected LED Lamps - Indoor	Lamp	3.48	0.000	0.00	3.78	0.001	0.00
EISA Exempt LED Lighting - Mini Decorative	Lamp	26.71	0.005	0.00	16.20	0.002	0.00
EISA Exempt LED Lighting - Mini Directional	Lamp	24.34	0.004	0.00	12.50	0.002	0.00
EISA Exempt LED Lighting - Mini Omnidirectional	Lamp	23.52	0.003	0.00	15.66	0.003	0.00
EISA Exempt LED Lighting - Task / Under Cabinets Fixtures	Lamp	26.25	0.005	0.00	14.57	0.002	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
EISA Exempt LED Lighting - Tube LED	Lamp	9.13	0.002	0.00	12.17	0.002	0.00
LED Nightlights	Lamp	30.15	0.000	0.00	30.16	0.000	0.00
Advanced Power Strips - Tier 1 (5-plug)	Power Strip	44.07	0.005	0.00	44.07	0.005	0.00
Advanced Power Strips - Tier 1 (7-plug)	Power Strip	80.34	0.009	0.00	80.34	0.009	0.00
Advanced Power Strips - Tier 2 (APS)	Power Strip	90.87	0.017	0.00	96.70	0.018	0.00
ENERGY STAR Refrigerator-Freezer	Refrigerator-Freezer	51.18	0.008	0.00	56.33	0.008	0.00

Table 40 highlights notable differences between *ex ante* and *ex post* gross estimates.

Table 40. 2024 Retail Products Program Notable Differences Between *Ex Ante* and *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
LED	<i>Ex ante</i> savings use IL TRM v12.0 assumptions with deemed baseline wattage assumption for each category of LEDs.	<i>Ex post</i> savings use IL TRM v12.0 assumptions with UMP-recommended ENERGY STAR lumens binning approach to determine baseline wattages for each model number of bulb.	Deemed baseline wattages for a broad category of LEDs led to significant overestimation of total savings
Air Purifier	<i>Ex ante</i> savings use IL TRM v12.0 deemed savings based on the CADR rating of each air purifier.	<i>Ex post</i> savings use IL TRM v12.0 assumptions along with actual unit characteristics looked up in the ENERGY STAR database to calculate savings.	Deemed savings for a broad category of units led to significant overestimation of total savings
Refrigerator	<i>Ex ante</i> savings use IL TRM v12.0 with deemed savings calculated as the simple average across all refrigerators with automatic defrost capability.	<i>Ex post</i> savings use IL TRM v12.0 assumptions along with actual unit characteristics looked up in the ENERGY STAR database to calculate savings.	Deemed savings for a broad category of units led to significant over-estimation of total savings
Bathroom Exhaust Fan	<i>Ex ante</i> savings use IL TRM v12.0 deemed savings based on an unknown CFM rating.	<i>Ex post</i> savings use IL TRM v12.0 assumptions along with actual unit characteristics looked up in the ENERGY STAR database to calculate savings.	Deemed savings for a broad category of units led to significant overestimation of total savings
Clothes Dryer	<i>Ex ante</i> savings use IL TRM v12.0 deemed savings based on product class.	<i>Ex post</i> savings use IL TRM v12.0 assumptions along with actual unit characteristics looked up in the	Deemed savings for a broad category of units led to minor differences in savings.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
		ENERGY STAR database to calculate savings.	

Waste Heat Factor – Therm Penalties

The evaluation team excluded therm penalties from the evaluated savings, consistent with previous evaluations. However, it is important to note that results in cost-effectiveness will still incorporate these penalties. The evaluation team believes this approach is appropriate as it accounts for the penalty on the electric side (where it is generated) and allows the evaluation team to show the gas program performance and measure performance more clearly. Table 41, below, shows the therm penalties calculated for the Residential Retail Products program. There were no therm penalties in the *ex ante* savings.

Table 41. 2024 Retail Products Program Waste Heat Factor Therm Penalty

MEASURE	EVALUATED <i>EX POST</i> SAVINGS (THERMS)
LED	(24,326.86)
LED Nightlight	(21,193.76)
Total Therm Penalty	(45,520.62)

Realization Rates

The next two tables (Table 42 and Table 43) show the program's *ex ante* reported savings, verified savings, *ex post* gross savings, and the total program realization rates for kWh and kW. As noted above, the variance in realization rates is largely a product of methodological differences between the evaluation team's calculation of *ex post* savings and the implementation team's calculation of *ex ante* savings, particularly for LED lighting measures. While *ex ante* and *ex post* savings are well aligned for other measures, the higher proportion of lighting savings contributed to lower overall program-level realization rates.

Table 42. 2024 Retail Products Program *Ex Ante* and *Ex Post* Gross Electric Energy Savings

MEASURE	<i>EX ANTE</i> ^A ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	<i>EX POST</i> GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-199)	390,567.00	390,567.00	390,567.00	390,334.80
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	22,900.00	22,900.00	22,900.00	25,831.56
ENERGY STAR Clothes Dryer - Electric Dryer - Electric only savings	802.20	802.20	802.20	809.91
High Efficiency Bathroom Exhaust Fan (Continuous usage)	170.16	170.16	170.16	158.21

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
High Efficiency Bathroom Exhaust Fan (Standard usage)	768.79	768.79	768.79	777.00
Connected LED Lamps - Indoor	1,941.72	1,941.72	1,902.89	2,107.46
EISA Exempt LED Lighting - Mini Decorative	476,763.90	476,763.90	467,228.62	289,095.82
EISA Exempt LED Lighting - Mini Directional	924.92	924.92	906.42	475.05
EISA Exempt LED Lighting - Mini Omnidirectional	185,933.07	185,933.07	182,214.41	123,819.97
EISA Exempt LED Lighting - Task / Under Cabinets Fixtures	1,063,898.99	1,063,898.99	1,063,898.99	590,619.24
EISA Exempt LED Lighting - Tube LED	46,933.42	46,933.42	46,933.42	62,599.91
LED Nightlights	935,221.29	935,221.29	916,516.86	935,279.83
Advanced Power Strips - Tier 1 (5-plug)	361,682.49	361,682.49	282,112.34	361,682.49
Advanced Power Strips - Tier 1 (7-plug)	428,131.86	428,131.86	333,942.85	428,131.86
Advanced Power Strips - Tier 2 (APS)	11,813.10	11,813.10	9,804.87	12,570.35
ENERGY STAR Refrigerator-Freezer	153.54	153.54	153.54	169.00
Total Savings	3,928,606.45	3,928,606.45	3,720,823.37	3,224,462.47
Total Program Realization Rate				82%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 43. 2024 Retail Products Program *Ex Ante* and *Ex Post* Gross Peak Demand Reduction

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-199)	45.115	45.115	45.115	44.581
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	2.600	2.600	2.600	2.950
ENERGY STAR Clothes Dryer - Electric Dryer - Electric only savings	0.110	0.110	0.110	0.109
High Efficiency Bathroom Exhaust Fan (Continuous usage)	0.019	0.019	0.019	0.002

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
High Efficiency Bathroom Exhaust Fan (Standard usage)	0.087	0.087	0.087	0.096
Connected LED Lamps - Indoor	0.126	0.126	0.123	0.279
EISA Exempt LED Lighting - Mini Decorative	84.172	84.172	82.489	42.760
EISA Exempt LED Lighting - Mini Directional	0.152	0.152	0.149	0.070
EISA Exempt LED Lighting - Mini Omnidirectional	23.715	23.715	23.241	20.738
EISA Exempt LED Lighting - Task / Under Cabinets Fixtures	192.078	192.078	192.078	99.766
EISA Exempt LED Lighting - Tube LED	8.917	8.917	8.917	10.605
LED Nightlights	0.000	0.000	0.000	0.000
Advanced Power Strips - Tier 1 (5-plug)	41.035	41.035	32.007	40.587
Advanced Power Strips - Tier 1 (7-plug)	47.961	47.961	37.410	48.044
Advanced Power Strips - Tier 2 (APS)	2.210	2.210	1.834	2.296
ENERGY STAR Refrigerator-Freezer	0.024	0.024	0.024	0.025
Total Savings	448.321	448.321	426.203	312.911
Total Program Realization Rate				70%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Ex Post Net Savings

The *ex post* net savings values reflect savings attributed to the program after adjusting for freeridership and spillover by applying a NTG ratio. Evaluators typically calculate NTG using survey participants' self-reported responses to questions related to what they would have done in the absence of the program (freeridership) and the influence the program had on their decision to implement additional energy efficiency projects after participating (spillover). Because of the Retail Products program's delivery type, performing this type of NTG analysis for this program was not possible for this evaluation. The evaluation team used NTG values from other evaluation reports for the Retail Products program measures in 2024. The team chose the NTG values

from various reports based on how closely the measures in those reports mapped to measures in the Retail Products program.⁷ Table 44 shows the NTG ratios by measure.

Table 44. 2024 Retail Products Program NTG Ratios by Measure

MEASURE	NTG	SOURCE
LED Bulb	39%	2023 Lighting evaluation
LED Fixture	39%	2023 Lighting evaluation
LED Nightlight	39%	2023 Lighting evaluation
Air Purifier	70%	2024 literature review
Refrigerator	58%	2024 literature review
Bathroom Exhaust Fan	65%	2024 literature review
Clothes Dryer	60%	2024 literature review
Advanced Power Strip	95%	2023 Residential OLM evaluation

Table 45 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 45. 2024 Retail Products Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-199)	390,334.80	44.581	0.00	70%	273,234.36	31.207	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	25,831.56	2.950	0.00	70%	18,082.09	2.065	0.00
ENERGY STAR Clothes Dryer - Electric Dryer - Electric only savings	809.91	0.109	0.00	60%	485.94	0.065	0.00
High Efficiency Bathroom Exhaust Fan (Continuous usage)	158.21	0.002	0.00	65%	102.84	0.002	0.00
High Efficiency Bathroom Exhaust Fan (Standard usage)	777.00	0.096	0.00	65%	505.05	0.063	0.00
Connected LED Lamps - Indoor	2,107.46	0.279	0.00	39%	821.91	0.109	0.00
EISA Exempt LED Lighting - Mini Decorative	289,095.82	42.760	0.00	39%	112,747.37	16.677	0.00
EISA Exempt LED Lighting - Mini Directional	475.05	0.070	0.00	39%	185.27	0.027	0.00
EISA Exempt LED Lighting - Mini Omnidirectional	123,819.97	20.738	0.00	39%	48,289.79	8.088	0.00

⁷ This review covered documents published in the last two years consisting of OLM NTG studies, TRMs, and Cadmus evaluation plans. We calculated NTG values based on an average of the following sources: ComEd (2023), Ameren (2024), PPL (2024), PSE&G (2025), CA e-TRM (2024), and NJ TRM (2023).

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
EISA Exempt LED Lighting - Task / Under Cabinets Fixtures	590,619.24	99.766	0.00	39%	230,341.50	38.909	0.00
EISA Exempt LED Lighting - Tube LED	62,599.91	10.605	0.00	39%	24,413.97	4.136	0.00
LED Nightlights	935,279.83	0.000	0.00	39%	364,759.14	0.000	0.00
Advanced Power Strips - Tier 1 (5-plug)	361,682.49	40.587	0.00	95%	343,598.37	38.558	0.00
Advanced Power Strips - Tier 1 (7-plug)	428,131.86	48.044	0.00	95%	406,725.27	45.642	0.00
Advanced Power Strips - Tier 2 (APS)	12,570.35	2.296	0.00	95%	11,941.83	2.181	0.00
ENERGY STAR Refrigerator-Freezer	169.00	0.025	0.00	58%	98.02	0.015	0.00
Total Savings	3,224,462.47	312.911	0.00		1,836,332.71	187.742	0.00

Table 46 shows the NTG results for each fuel.

Table 46. 2024 Retail Products Program NTG Results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	3,928,606.45	3,224,462.47	57%	1,836,332.71
Peak Demand Reduction (kW)	448.321	312.911	60%	187.742
Natural Gas Energy Savings (therms/yr.)	0.00	0.00	n/a	0.00

Process Evaluation

The 2024 Retail Products program evaluation did not include a process evaluation.

Conclusions and Recommendations

CONCLUSION 1: DESPITE REDUCING 2024 RESIDENTIAL LIGHTING OFFERINGS IN RESPONSE TO THE EXPANDED DEFINITION OF GENERAL SERVICE LAMPS IN THE EISA BACKSTOP LEGISLATION, THE PROGRAM ACHIEVED 78% OF ITS ELECTRIC ENERGY SAVINGS GOAL AND 63% OF ITS PEAK DEMAND REDUCTION GOAL.

In 2024, the program was only able to claim savings for EISA-exempt lighting but lighting still accounted for 62% of the total program *ex post* gross energy savings. In addition to air purifiers and APSs that the program added in 2023 to replace lighting savings, new 2024 measures included refrigerators, bathroom exhaust fans, and clothes dryers. These new measures had very little sales volume, however, and accounted for less than 1% of total *ex post* gross energy savings.

CONCLUSION 2: THE USE OF DEEMED SAVINGS ASSUMPTIONS IN *EX ANTE* SAVINGS LED TO LARGE DISCREPANCIES BETWEEN *EX ANTE* AND *EX POST* SAVINGS.

The evaluation team identified notable measure-level differences between *ex ante* and *ex post* savings across all measures through its engineering review. The driver of these measure-level differences was that the *ex ante* savings used deemed savings across broad categories of units, whereas the evaluation team used actual unit characteristics from the ENERGY STAR database or through manufacturer spec sheets to calculate *ex post* savings. The most notable differences between *ex ante* and *ex post* savings were for lighting measures, for which *ex ante* savings were estimated using a deemed average baseline wattage determined by bulb type. The evaluation team used the UMP-recommended ENERGY STAR lumens binning approach to determine baseline wattages for each model number of bulbs in *ex post* savings.

Recommendations:

- Calculate savings using actual unit characteristics for each model number from the ENERGY STAR Qualified Products List rather than relying on category averages.
- Update the baseline wattage assumptions to account for brightness and what the program designed them to replace—e.g., LED under cabinet fixtures replace fixtures using T5 fluorescent tubes.

CONCLUSION 3: AS NIPSCO LOOKS TO REPLACE LIGHTING SAVINGS, AIR PURIFIERS AND BATHROOM EXHAUST FANS MAY PROVIDE A STABLE SOURCE OF ENERGY SAVINGS.

In 2024, NIPSCO incentivized 1,389 air purifiers (up from 873 in 2023) at an average *ex post* per-unit energy savings of 299.62 kWh (down from 328.81 kWh in 2023). The evaluation team calculated *ex post* savings using actual CFM, CFM per watt, CADR, CADR per watt, and Partial On Power Mode values for each model, resulting in realization rates near 100%; however, the rated CFM per watt and smoke CADR per watt had a large impact on the calculated savings.

Recommendations:

- Promote the benefits of using air purifiers and bathroom exhaust fans, particularly those with high CFM per watt or CADR per watt, and the incentives NIPSCO provides.
- Provide incentives for a variety of air purifiers and bathroom exhaust fan sizes and models. The current ENERGY STAR qualified products list is long, but there is an opportunity to further expand the list of program-eligible models to include those that maximize savings potential, like those with high CFM per watt or CADR per watt.
- Determine the calculated savings of various air purifier and bathroom exhaust fan models using the ENERGY STAR qualified products list to determine which additional models will bring the most savings to the program.

CONCLUSION 4: THE EVALUATION TEAM IDENTIFIED LED LIGHTING IN THE TRACKING DATABASE THAT IS NOT EISA EXEMPT.

The evaluation team identified seven LED lighting model numbers, representing 756 bulbs, in the tracking database that the program had categorized as EISA-exempt tube LEDs but were simply tube-shaped screw-in bulbs that are not EISA exempt. The evaluation team attributed zero *ex post* savings for these bulbs, which did not have a substantial impact on the program-level *ex post* savings due to the relatively small number of bulbs involved, representing about 1% of the program's LEDs.

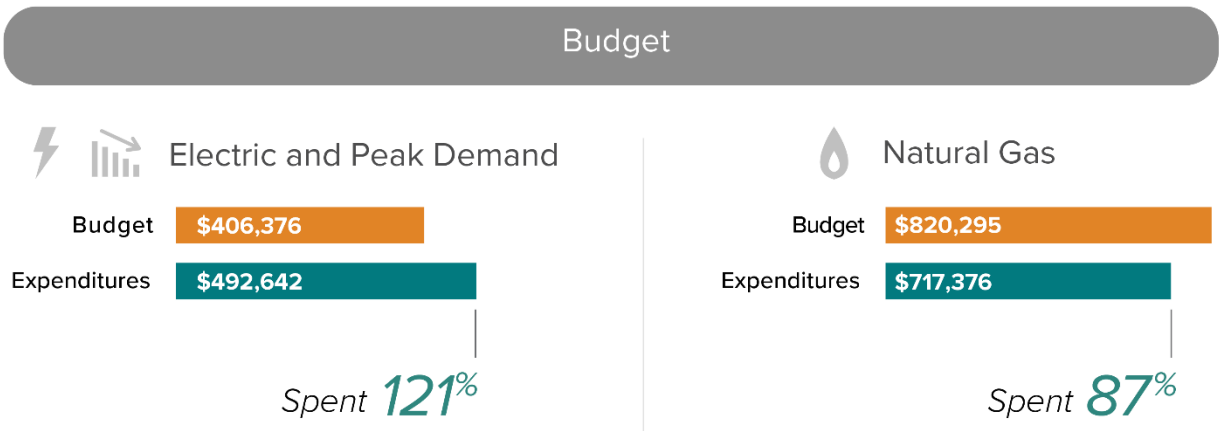
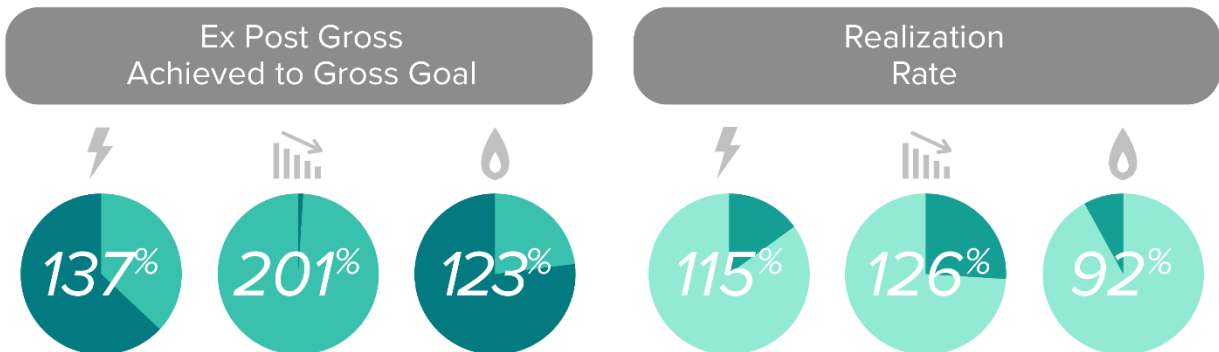
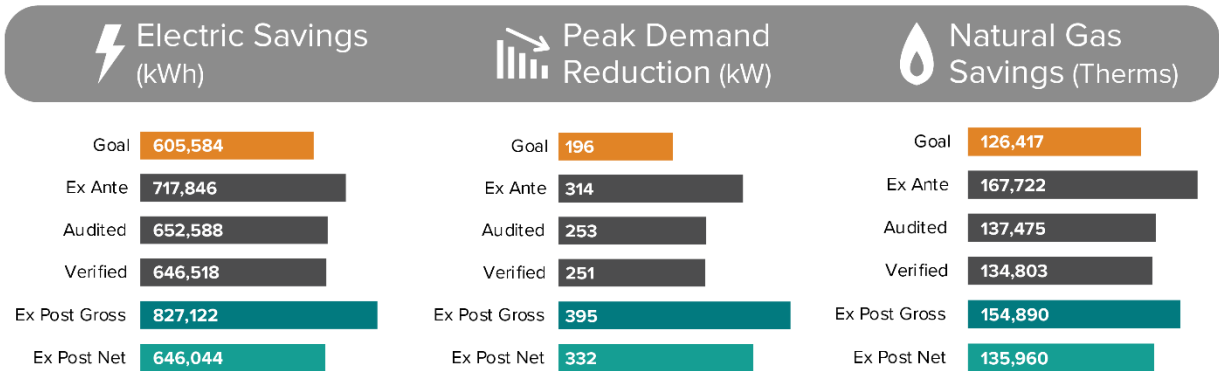
Recommendations:

- Implement quality-control measures to ensure that all incentivized lighting is EISA exempt.

HOME ENERGY ASSESSMENT (HEA)



- The HEA program exceeded all of its savings and demand reduction goals and has had consistent increases in participant satisfaction since 2021.
- The assessment report was understandable, useful, and encouraged participants to install additional recommended measures.
- Ex post gross savings were higher than ex ante savings for Attic Insulation and Air Sealing Measures because ex ante calculations used Deemed HVAC saturation Values Meant for Unknown.



Program Design and Delivery

Through the 2024 Home Energy Assessment (HEA) program, NIPSCO provided Comprehensive Home Assessments (CHA) with direct installations of energy efficiency measures. The HEA program targets single-family homeowners or renters (with landlord approval) and is designed to help participants improve the efficiency and comfort of their homes, deliver an immediate reduction in electricity and/or natural gas consumption, and promote additional efficiency work through other NIPSCO programs.

TRC administers the HEA program on behalf of NIPSCO. This includes program design and management, processing incentive payments, quality assurance and quality control (QA/QC), technical training, and providing subcontractor support to facilitate the quality installation of energy efficient measures. In addition to the energy efficient measures installed during the initial site visit, the CHA illustrates to the homeowner the value of selecting recommended follow-on work, such as additional measures designed to achieve deeper energy savings that may be eligible for a rebate.

In 2024, TRC utilized a variety of marketing strategies including but not limited to direct mail and online marketing via its website or social media channels. TRC updated existing and developed new collateral focused on increasing program awareness and educating customers on the benefits of participation. One example of collateral material usage are door hangers placed on homes adjacent to those receiving an assessment. Another example, if the customer agrees to it, are yard signs placed in the front yard of participating homes while the subcontractor performs the assessment. TRC also attended and hosted industry and public events to increase program awareness, ran advertisements via local media such as newspapers, and cross-promoted the HEA program to customers participating in other NIPSCO programs.

Interested customers could enroll in the HEA program by calling the NIPSCO Residential Energy Efficiency program hotline or by signing up through the website. TRC also encouraged subcontractors to discuss the program and schedule assessments for customers while performing other work for customers.

An energy advisor conducts the home assessment and will stop immediately if they identify any critical health and safety issues such as a gas leak or high ambient CO levels. In this case, the energy advisor provides the customer with a Notice of Health and Safety Concerns form to sign and informs the customer that they must remediate the issues before the assessment or additional work can resume. The customer is responsible for calling to reschedule once the issues are addressed.

During an assessment, an energy advisor analyzes the efficiency of the heating and cooling systems and insulation levels in the home and installs energy-saving lighting and water conservation, as well as other energy-saving measures. The assessment concludes with the energy advisor providing a report with findings and energy-saving recommendations.

Depending on the conditions, account type (i.e., combo, gas only, or electric only), and current equipment in the home, the energy advisor installs any or all the following measures during the assessment:

- ENERGY STAR certified light bulbs (9W A-Line, 4.5W Candelabra, 6W Globe, 14.5W PAR 38)—up to 22 units
- Bathroom faucet aerator (1.0 gpm)--up to two units
- Kitchen aerator (1.5 gpm)—up to one unit
- Low-flow showerhead (1.5 gpm), shower start (valve only), low-flow showerhead/shower start combo—any combination of measures but up to two units only
- Pipe wrap—up to 10 feet
- Water heater wrap (electric only)—up to one unit
- Duct sealing—\$150 value
- Smart Wi-Fi programmable thermostat—up to one unit

Outlet gaskets (leave behinds only)—up to one unit (10 gaskets) Qualifying program participants can also receive a follow-on rebate of up to \$700 on attic insulation and \$200 on air sealing. If the customer is eligible for either follow-on rebate, the subcontractor's technician will fill out key information on the HEA program's Insulation Rebate Application for the customer, such as the preexisting R-value of the attic insulation or the percentage of infiltration reduction, and advise the customer before leaving the home on how to obtain and submit for the rebate. The customer may choose to use any licensed insulation contractor to perform the additional work.

Changes from the 2023 Design

In 2024, NIPSCO added leave-behind outlet gaskets as a measure and air sealing as a follow-on measure. There were no other significant changes in the program design.

Program Performance

The HEA program exceeded all its goals in 2024, including electric energy savings, peak demand reduction, and natural gas energy savings. Table 47 summarizes savings for the full year of program performance, including program savings goals.

Table 47. 2024 HEA Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	605,584.17	717,846.15	652,588.23	648,518.45	827,121.66	646,044.28	137%
Peak Demand Reduction (kW)	196.331	314.376	253.075	250.565	394.787	332.350	201%
Natural Gas Energy Savings (therms/yr.)	126,417.37	167,721.61	137,475.42	134,802.59	154,889.66	135,960.14	123%

As documented in Table 48, below, audited savings are lower than *ex ante* savings because the evaluation team made an adjustment to the number of gaskets as they were incorrectly counted in *ex ante* data, which resulted in lower audited savings. Verified savings were lower than claimed values due to lower verified in-

service rates (ISRs) compared to those used in *ex ante* savings for select measures. The engineering analysis completed for the *ex post* gross analysis increased the savings for electric energy, peak demand savings, and natural gas savings. *Ex post* gross savings exceeded program goals for all savings types. Finally, the net-to-gross (NTG) analysis reduced *ex post* net results due to the calculated NTG values.

Table 48. 2024 HEA Program Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILLOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	115%	22%	0%	78%
Peak Demand Reduction (kW)	126%	16%	0%	84%
Natural Gas Energy Savings (therms/yr.)	92%	12%	0%	88%

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

In 2024, the HEA program exceeded program budgets for electric energy and was under the budget for natural gas. The program spent 121% of its electric budget, compared to *ex post* electric energy and peak demand goal achievement of 137% and 201%, respectively. Inversely, the program spent only 87% of its natural gas budget and achieved 123% of its *ex post* goal. Table 49 lists the 2024 program budget and expenditures by fuel type.

Table 49. 2024 HEA Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$406,376.03	\$492,641.82	121%
Natural Gas	\$820,294.78	\$717,375.94	87%

Evaluation Methodology

To inform the 2024 NIPSCO HEA program’s impact and process evaluation, the evaluation team completed the following research activities:

- **Program staff interviews and discussions** to understand the program process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program participation data.
- **Engineering analysis** to review program savings assumptions and algorithms for reasonableness and accuracy.
- **Participant surveys (n=61)** to understand the participant experience in the program and to gather information to calculate freeridership and spillover rates.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop savings estimates? Are there any updates that should be made?
- What are *ex post* program savings? Do these suggest any needed updates to program design, delivery, or savings assumptions?
- To what extent did the program influence participants' decision-making? What are the program's freeridership and spillover estimates (net savings)?
- Did the program meet its participation and savings goals?

For all measure types, the evaluation team compared its engineering calculations to NIPSCO's *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: standard engineering practices and relevant building codes, the Indiana TRM Workbook v1.0, the Illinois TRM v12.0, and NIPSCO's program tracking database.

Per the Indiana TRM Workbook v1.0, the Indiana TRM "is intended to be used as an accompaniment to [the Illinois TRM], automatically incorporating the most recent and effective version of the IL TRM, including measures newly added to the IL TRM." For each measure, the evaluation team first prioritized the Indiana TRM, which directly references the Illinois TRM for most measures. Where provided for specific measures, the team prioritized the VEIC Proposed Indiana Assumptions on the "Code Baseline Measures" tab of the Indiana TRM as a source for baseline assumptions. Additionally, the evaluation team used the "Weather Zone Mapping" tab to map cities in NIPSCO's territory to the appropriate Illinois city to estimate weather impacts. Where provided, we used coincidence factors from the "Loadshapes" tab of the Indiana TRM.

Audited and Verified Savings

Audited Savings

The evaluation team performed a tracking data audit review by looking for duplicate records and ensuring that measures followed program guidelines. The evaluation team found that no measures were duplicative and all followed program guidelines. As a result, the evaluation team did not remove any measures as part of the tracking data audit.

We did, however, identify an error in the outlet gaskets savings, which we corrected at the audited step. The program distributed gaskets as 10-packs, and the per-unit savings values for this measure took that into account, multiplying the per-gasket savings by 10. However, in the program tracking data, the savings value for the 10-pack was also multiplied by 10, resulting in *ex ante* gasket savings that were 10 times higher than they should have been. We adjusted the audited per-unit values to reflect a single gasket and applied that to the total quantity of individual gaskets from the tracking data, ultimately reducing the audited savings for all fuel types.

The evaluation team also found that some measures used savings values from 2023, which are in the NIPSCO Residential 22-23 Program Design workbook. These measures are referred to as "2023 Legacy Measures" throughout this chapter and were incentivized before the 2024 program design went into effect in April 2024.

Verified Savings

The evaluation team calculated ISRs from the 2024 participant survey. Some ISRs fell below 100% because some respondents reported removing items after the program installed them. The 98% ISR for assessment recommendations is based on the proportion of 2024 survey respondents who indicated they received an

assessment report. Outlet gaskets were a leave-behind measure and only counted when installed on an exterior wall, resulting in an ISR of 26%. Table 50 lists the ISRs for all program-installed measures. This does not include ISRs for 2023 Legacy Measures, which are in the 2023 DSM Portfolio Evaluation report.

Table 50. 2024 HEA Program In-Service Rates Ratios By Measure

MEASURE	ISR	SOURCE
Air Sealing	100%	Deemed
Assessment Recommendations	98%	2024 HEA/IQW Survey
Attic Insulation	100%	Deemed
Bathroom Aerators	91%	2024 HEA/IQW Survey
Duct Sealing	100%	Deemed
Kitchen Aerators	86%	2024 HEA/IQW Survey
LEDs	99%	2024 HEA/IQW Survey
Low-Flow Showerheads/Shower Start	100%	2024 HEA/IQW Survey
Outlet Gaskets	26%	2024 HEA/IQW Survey
Pipe Wrap	100%	Deemed
Thermostats	94%	2024 HEA/IQW Survey
Water Heater Wrap	100%	Deemed

In 2024, TRC fully switched to using the Illinois TRM for *ex ante* calculations, which includes an embedded ISR for most measures or considers it to be 100% for measures such as attic insulation and duct sealing. The evaluation team took two different approaches to calculating verified savings per measure depending on whether there was an ISR embedded in the *ex ante* savings calculation or not.

- In the cases where the savings calculation **included** an ISR embedded in the *ex ante* savings calculation, the evaluation team updated the calculation with the ISR from the 2024 participant survey to determine verified per-unit savings.⁸ Then, the evaluation team applied the verified per-unit savings to the audited unit count to determine total verified savings.
- In cases where the savings calculation **did not include** an ISR embedded in the *ex ante* savings calculation, the evaluation team applied the ISR from the 2024 participant survey to the audited unit count to determine the verified unit count.⁹ Then, the evaluation team applied the verified unit count to the audited per-unit savings to determine the total verified savings.

For Legacy 2023 Measures, the evaluation team applied 2023 per-unit verified savings to the audited unit count, except for Assessment Recommendations, where the evaluation team applied the 2023 ISR to the

⁸ Measures with embedded ISRs included: LEDs, Bathroom Aerators, Kitchen Aerators, Low-Flow Showerheads, Low-Flow Showerhead with Shower Starts, Shower Starts, and Smart Wi-Fi Programmable Thermostats.

⁹ Measures without embedded ISRs included: Air Sealing, Assessment Recommendations, Attic Insulation, Duct Sealing, Outlet Gaskets, Pipe Warp, and Water Heater Wrap.

audited unit count to determine the verified unit count. Then, the evaluation team multiplied the verified unit count by the audited per-unit savings to determine the total measure savings.

Table 51. 2024 HEA Program Audited & Verified Per-Unit Savings

MEASURE	EX ANTE ISR	EX ANTE SAVINGS			VERIFIED ISR	VERIFIED SAVINGS		
		KWH	KW	THERMS		KWH	KW	THERMS
Air Sealing - Electric Cooling and Gas Heating Savings	n/a	130.09	0.125	31.25	100%	130.09	0.125	31.25
A-Line LEDs - Electric and Gas Savings	99%	38.86	0.005	0.00	99%	38.86	0.005	0.00
A-Line LEDs - Electric Only Savings	99%	38.86	0.005	0.00	99%	38.86	0.005	0.00
Assessment Recommendations - Electric and Gas Savings	n/a	21.60	0.012	2.74	98%	21.60	0.012	2.74
Assessment Recommendations - Electric Only	n/a	21.60	0.012	0.00	98%	21.60	0.012	0.00
Assessment Recommendations - Gas Only	n/a	0.00	0.000	3.16	98%	0.00	0.000	3.16
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	n/a	208.18	0.141	59.18	100%	208.18	0.141	59.18
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	n/a	0.00	0.000	108.50	100%	0.00	0.000	108.50
Bathroom Aerator 1.0 gpm - Electric	92%	16.65	0.023	0.00	91%	16.47	0.023	0.00
Bathroom Aerator 1.0 gpm - Gas	92%	0.00	0.000	0.71	91%	0.00	0.000	0.71
Candelabra LEDs - Electric and Gas Savings	99%	28.82	0.004	0.00	99%	28.82	0.004	0.00
Candelabra LEDs - Electric Only Savings	99%	28.82	0.004	0.00	99%	28.82	0.004	0.00
Duct Sealing Package - Electric Cooling and Gas Heating Savings	n/a	99.43	0.076	56.40	100%	99.43	0.076	56.40
Duct Sealing Package - Electric Cooling and Heating Savings	n/a	1,040.60	0.076	0.00	100%	1,040.60	0.076	0.00
Duct Sealing Package - Electric Cooling Only Savings	n/a	47.54	0.076	0.00	100%	47.54	0.076	0.00
Duct Sealing Package - Gas Heating Only Savings	n/a	0.00	0.000	56.40	100%	0.00	0.000	56.40
Globe LEDs - Electric and Gas Savings	99%	27.22	0.004	0.00	99%	27.22	0.004	0.00
Globe LEDs - Electric Only Savings	99%	27.22	0.004	0.00	99%	27.22	0.004	0.00
Kitchen Aerator 1.5 gpm - Electric	93%	34.04	0.007	0.00	86%	31.47	0.006	0.00
Kitchen Aerator 1.5 gpm - Gas	93%	0.00	0.000	1.57	86%	0.00	0.000	1.57
Low-Flow Showerhead 1.5 gpm - Electric	86%	169.80	0.017	0.00	100%	197.44	0.020	0.00

MEASURE	EX ANTE ISR	EX ANTE SAVINGS			VERIFIED ISR	VERIFIED SAVINGS		
		KWH	KW	THERMS		KWH	KW	THERMS
Low-Flow Showerhead 1.5 gpm - Gas	86%	0.00	0.000	7.28	100%	0.00	0.000	8.46
Low-Flow Showerhead with Shower Start - Electric	86%	228.45	0.021	0.00	100%	265.64	0.025	0.00
Low-Flow Showerhead with Shower Start - Gas	86%	0.00	0.000	9.79	100%	0.00	0.000	11.39
Outlet Gaskets - Electric Cooling and Gas Heating Savings	100%	9.60	0.009	3.76	26%	0.96	0.001	0.38
Outlet Gaskets - Electric Cooling and Heating Savings	100%	91.20	0.087	0.00	26%	9.12	0.009	0.00
Outlet Gaskets - Electric Cooling Only Savings	100%	9.60	0.009	0.00	26%	0.96	0.001	0.00
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	100%	0.00	0.000	3.76	26%	0.00	0.000	0.38
PAR38 LEDs - Electric and Gas Savings	99%	84.47	0.013	0.00	99%	84.47	0.013	0.00
PAR38 LEDs - Electric Only Savings	99%	84.47	0.013	0.00	99%	84.47	0.013	0.00
Pipe Wrap - Electric (per foot)	n/a	54.89	0.006	0.00	100%	54.89	0.006	0.00
Pipe Wrap - Gas (per foot)	n/a	0.00	0.000	2.35	100%	0.00	0.000	2.35
Shower Start Only - Gas	98%	0.00	0.000	2.86	0%	0.00	0.000	2.86
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	90%	96.62	0.174	68.86	94%	100.92	0.182	68.86
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	90%	1,434.82	0.089	0.00	94%	1,491.76	0.093	0.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	90%	96.62	0.174	0.00	94%	100.92	0.182	0.00
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	100%	0.00	0.000	68.86	94%	0.00	0.000	64.73
Water Heater Wrap - Electric	n/a	100.46	0.011	0.00	100%	100.46	0.011	0.00

Ex Post Gross Savings

The evaluation team reviewed the program's *ex ante* assumptions, sources, and algorithms for reasonableness and updates. Below are the detailed *ex post* gross analysis results.

Engineering Reviews

The evaluation team primarily referred to the Illinois TRM v12.0 for evaluation methodology and variable assumptions to calculate *ex post* gross electric energy savings, demand reduction, and natural gas savings.

The new Indiana TRM Workbook v1.0 supports this approach, and we followed the guidelines with respect to heating and cooling hours laid out by the Indiana TRM.

Appendix A: HEA Algorithms and Assumptions contains more specific details on the algorithms, variable assumptions, and references for all program measure *ex post* gross calculations.

At the program level, realization rates were 115% for electricity, 126% for demand, and 92% for gas, though they varied at the measure level. Through the engineering review, the evaluation team identified notable differences between *ex ante* and *ex post* savings for all measures. The following overarching factors primarily drove these differences:

- The 2024 *ex ante* savings used 2022 EM&V values in savings calculations when it would have been more appropriate to use the default values in the Illinois TRM v12 because past EM&V reports may include outdated assumptions from previous Illinois TRM versions or different TRMs depending on the year. This discrepancy occurred for faucet aerators, low-flow showerheads, duct sealing, and advanced thermostats.
- For attic insulation and air sealing measures, the *ex ante* savings multiplied heating and cooling savings by a percentage value intended for when the heating and cooling equipment is unknown. However, the heating and cooling equipment was known as it was included in the program tracking data. These discrepancies resulted in >100% realization rates.
- For the outlet gasket measure, the quantity of gaskets (n=10) was multiplied by the savings twice in *ex ante* savings. Adjusting this to the actual quantity of gaskets resulted in a 10% realization rate.

As described in the *Audited Savings* section, some measures incentivized at the beginning of 2024 used 2023 *ex ante* savings assumptions. These Legacy Measures all had discrepancies between *ex ante* and *ex post* savings. For more specific details into these discrepancies, see the 2023 DSM Portfolio Evaluation Report.

Ex Post Gross Savings Summary

Table 97 shows the *ex ante* deemed savings and *ex post* gross per-measure savings for 2024 HEA program measures. A key driver in the realization rates was the use of non-100% HVAC modifiers for many measures that included cooling and heating savings *in ex ante* savings. Additionally, *ex ante* savings for many measures used the 2022 EM&V report, which references now-outdated sources, to inform some savings inputs when deemed values were listed in the Illinois TRM v12.0. Table 52 explains these differences in greater detail.

Table 52. 2024 HEA Program *Ex Ante* & *Ex Post* Gross Per-Measure Savings Values

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Air Sealing - Electric Cooling and Gas Heating Savings	Home	130.09	0.125	31.25	337.36	0.249	84.26
A-Line LEDs - Electric and Gas Savings	Lamp	38.86	0.005	0.00	39.25	0.005	0.00
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	Lamp	28.49	0.004	0.00	28.50	0.004	0.00
A-Line LEDs - Electric Only Savings	Lamp	38.86	0.005	0.00	39.25	0.005	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	Lamp	28.49	0.004	0.00	28.40	0.004	0.00
Assessment Recommendations - Electric and Gas Savings	Home	21.60	0.012	2.74	21.48	0.012	2.73
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	Home	21.24	0.012	2.70	21.24	0.012	2.70
Assessment Recommendations - Electric Only	Home	21.60	0.012	0.00	21.44	0.012	0.00
Assessment Recommendations - Electric Only - Legacy 2023 Measure	Home	21.28	0.012	0.00	21.28	0.012	0.00
Assessment Recommendations - Gas Only	Home	0.00	0.000	3.16	0.00	0.000	3.08
Assessment Recommendations - Gas Only - Legacy 2023 Measure	Home	0.00	0.000	2.70	0.00	0.000	2.70
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	Per ksf	208.18	0.141	59.18	428.83	0.252	159.93
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	Per ksf	236.00	0.102	207.00	312.40	0.377	129.78
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	Per ksf	0.00	0.000	108.50	0.00	0.000	153.92
Bathroom Aerator 1.0 gpm - Electric	Aerator	16.65	0.023	0.00	24.69	0.034	0.00
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	Aerator	34.10	0.003	0.00	20.63	0.002	0.00
Bathroom Aerator 1.0 gpm - Gas	Aerator	0.00	0.000	0.71	0.00	0.000	1.06
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	Aerator	0.00	0.000	1.50	0.00	0.000	0.89
Candelabra LEDs - Electric and Gas Savings	Lamp	28.82	0.004	0.00	29.12	0.004	0.00
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	Lamp	30.20	0.004	0.00	29.77	0.004	0.00
Candelabra LEDs - Electric Only Savings	Lamp	28.82	0.004	0.00	29.12	0.004	0.00
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	Lamp	30.20	0.004	0.00	29.71	0.004	0.00
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	Lamp	51.53	0.007	0.00	50.16	0.007	0.00
Duct Sealing Package - Electric Cooling and Gas Heating Savings	Home	99.43	0.076	56.40	219.21	0.212	65.79
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	Home	61.39	0.138	56.43	130.58	0.268	50.62
Duct Sealing Package - Electric Cooling and Heating Savings	Home	1040.60	0.076	0.00	1447.39	0.214	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	Home	1189.56	0.354	0.00	1139.29	0.269	0.00
Duct Sealing Package - Electric Cooling Only Savings	Home	47.54	0.076	0.00	209.82	0.216	0.00
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	Home	49.48	0.112	0.00	169.16	0.268	0.00
Duct Sealing Package - Gas Heating Only Savings	Home	0.00	0.000	56.40	0.00	0.000	65.79
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	Home	0.00	0.000	56.43	0.00	0.000	49.45
Globe LEDs - Electric and Gas Savings	Lamp	27.22	0.004	0.00	27.50	0.004	0.00
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	Lamp	28.52	0.004	0.00	28.50	0.004	0.00
Globe LEDs - Electric Only Savings	Lamp	27.22	0.004	0.00	27.50	0.004	0.00
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	Lamp	28.52	0.004	0.00	28.51	0.004	0.00
Kitchen Aerator 1.5 gpm - Electric	Aerator	34.04	0.007	0.00	229.46	0.045	0.00
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	Aerator	181.36	0.008	0.00	199.15	0.006	0.00
Kitchen Aerator 1.5 gpm - Gas	Aerator	0.00	0.000	1.57	0.00	0.000	9.84
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	Aerator	0.00	0.000	7.98	0.00	0.000	8.55
Low-Flow Showerhead 1.5 gpm - Electric	Showerhead	169.80	0.017	0.00	226.69	0.023	0.00
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	Showerhead	285.65	0.017	0.00	138.99	0.002	0.00
Low-Flow Showerhead 1.5 gpm - Gas	Showerhead	0.00	0.000	7.28	0.00	0.000	6.58
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	Showerhead	0.00	0.000	12.57	0.00	0.000	5.85
Low-Flow Showerhead with Shower Start - Electric	Showerhead	228.45	0.021	0.00	262.18	0.029	0.00
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	Showerhead	343.79	0.059	0.00	167.68	0.006	0.00
Low-Flow Showerhead with Shower Start - Gas	Showerhead	0.00	0.000	9.79	0.00	0.000	8.10
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	Showerhead	0.00	0.000	15.13	0.00	0.000	7.20
Outlet Gaskets - Electric Cooling and Gas Heating Savings	Gasket	9.60	0.009	3.76	0.96	0.001	0.38
Outlet Gaskets - Electric Cooling and Heating Savings	Gasket	91.20	0.087	0.00	7.49	0.001	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Outlet Gaskets - Electric Cooling Only Savings	Gasket	9.60	0.009	0.00	1.52	0.001	0.00
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	Gasket	0.00	0.000	3.76	0.00	0.000	0.37
PAR38 LEDs - Electric and Gas Savings	Lamp	84.47	0.013	0.00	85.33	0.013	0.00
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	Lamp	103.36	0.014	0.00	88.09	0.012	0.00
PAR38 LEDs - Electric Only Savings	Lamp	84.47	0.013	0.00	85.33	0.013	0.00
PAR38 LEDs - Electric Only Savings - Legacy 2023 Measure	Lamp	103.36	0.014	0.00	88.08	0.012	0.00
Pipe Wrap - Electric (per foot)	Per foot	54.89	0.006	0.00	55.76	0.006	0.00
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	Per foot	24.82	0.003	0.00	60.66	0.007	0.00
Pipe Wrap - Gas (per foot)	Per foot	0.00	0.000	2.35	0.00	0.000	2.39
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	Per foot	0.00	0.000	1.11	0.00	0.000	2.60
Shower Start Only - Gas	Showerhead	0.00	0.000	2.86	0.00	0.000	2.26
Shower Start Only - Gas - Legacy 2023 Measure	Showerhead	0.00	0.000	4.48	0.00	0.000	2.01
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	Home	96.62	0.174	68.86	254.64	0.187	85.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	Home	1434.82	0.089	0.00	1941.58	0.187	0.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	Home	96.62	0.174	0.00	175.53	0.187	0.00
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	Home	0.00	0.000	68.86	0.00	0.000	84.34
Water Heater Wrap - Electric	Home	100.46	0.011	0.00	100.46	0.011	0.00
Water Heater Wrap - Electric - Legacy 2023 Measure	Home	78.64	0.009	0.00	100.46	0.011	0.00

Table 53 highlights notable differences between ex ante and ex post gross estimates.

Table 53. 2024 HEA Program Notable Differences Between *Ex Ante* & *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Faucet Aerators	Uses Illinois TRM v12.0, 2022 EM&V values, rated flow of aerator.	Uses the Illinois TRM v12.0 for all inputs.	<i>Ex ante</i> supply temperature is informed by the 2022 EM&V Report whereas <i>ex post</i> savings use the Illinois TRM v12.0. <i>Ex ante</i> savings use the rated flow of the faucet for Low-Flow GPM, but <i>ex post</i> savings use the Illinois TRM v12.0 value.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Low-Flow Showerhead	Uses Illinois TRM v12.0, 2022 EM&V values, TRM v12.0, assumed 1.5 gpm-eff.	Illinois TRM v12.0 and participant survey; cold water inlet temperature from IL TRM; gpm-eff from IL TRM.	<i>Ex ante</i> supply temperature is informed by the 2022 EM&V Report whereas <i>ex post</i> savings use the Illinois TRM v12.0. <i>Ex ante</i> savings use the rated flow of the faucet for Low-Flow GPM, but <i>ex post</i> savings use the Illinois TRM v12.0 value. Additionally, <i>ex post</i> savings leverage the 2024 participant survey to inform the number of showers per person.
Pipe Wrap	Illinois TRM v12.0, pipe length does not use the IL TRM guidelines with alpha value to assume a vertical section of pipe.	Illinois TRM v12.0, pipe length used IL TRM guidelines with alpha value to assume a vertical section of pipe.	The Illinois TRM (v12) dictates that the first 3 inches of pipe is vertical, and vertical pipes have lower savings than horizontal. <i>Ex ante</i> assumes the whole pipe is horizontal.
Attic Insulation	Uses IL TRM v12.0 for all inputs, uses %cool and %heat when cooling and equipment types are known.	Uses IL TRM v12.0 for all inputs, uses 100% or 0% for %cool and %heat depending on project HVAC from program tracking data.	<i>Ex savings</i> incorporate %heat and %cool despite having information as to the HVAC systems of each project.
Duct Sealing	Uses IL TRM v12.0 for electric and demand savings, uses deemed gas savings. Uses 2022 EM&V report for Distribution Efficiency (DE) values and hours.	Uses IL TRM v12.0 for all inputs and savings algorithms.	<i>Ex ante</i> therm savings are deemed from a previous evaluation year, <i>ex post</i> therm savings are calculated using the IL TRM v12.0. Additionally, <i>ex ante</i> savings inform DE and hours values from the 2022 EM&V report, <i>ex post</i> uses the Illinois TRM v12.0.
Advanced Thermostats	Uses IL TRM v12.0 for most inputs. Uses 2022 EM&V report for hours	Uses IL TRM v12.0 for all inputs and savings algorithms.	<i>Ex ante</i> savings use hours from the 2022 EM&V reports, <i>ex post</i> savings use the Illinois TRM (v12).
Air Sealing	Uses IL TRM v12.0 for all inputs, uses %cool and %heat when cooling and equipment types are known.	Uses IL TRM v12.0 for all inputs, uses 100% or 0% for %cool and %heat depending on project HVAC.	<i>Ex ante</i> savings incorporate %heat and %cool despite having information as to the HVAC systems of each project.
Outlet Gaskets	Uses IL TRM v12.0 for all inputs, mistakenly accounts for 100 gaskets instead of 10.	Uses IL TRM(v12.0) for all inputs, updates quantity to 10 gaskets per project.	<i>Ex ante</i> savings mistakenly multiplies per-unit savings by the quantity of gaskets twice.

Waste Heat Factor – Therm Penalties

The evaluation team did not include therm penalties when calculating evaluated savings for the 2024 HEA program. However, cost-effectiveness testing for both the gas and electric programs will include these penalties. The evaluation team believes this approach is appropriate as it accounts for the penalty on the electric side (where generated) and allows the evaluation team to show gas program performance and measure performance more clearly.

The evaluation team does not include those values in the *ex post* analysis, but they are reported below, for use in the cost-effectiveness analysis. *Ex ante* therm penalties from lighting totaled -9,306.78 therms (from the tracking data). In total, the therm penalty for cost-effectiveness analysis is -10,335.68 therms (Table 54).

Table 54. HEA Program Waste Heat Factor Therm Penalty

MEASURE	WASTE HEAT FACTOR THERM PENALTY
A-Line LEDs - Electric and Gas Savings	(6,473.29)
Candelabra LEDs - Electric and Gas Savings	(1,447.89)
Downlight Fixture and Retrofit Kit	(261.54)
Globe LEDs - Electric and Gas Savings	(999.41)
PAR38 LEDs - Electric and Gas Savings	(1,153.55)
Total	(10,335.68)

Realization Rates

The next three tables (Table 55 through Table 57) show the program's *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms. Air sealing, attic insulation, and duct sealing had high participation and realization rates, driving the high electric and demand realization rates.

Table 55. 2024 HEA Program *Ex Ante* & *Ex Post* Gross Electric Energy Savings

MEASURE	<i>EX ANTE</i> ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	<i>EX POST</i> GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Air Sealing - Electric Cooling and Gas Heating Savings	520.36	520.36	520.36	1,349.43
A-Line LEDs - Electric and Gas Savings	177,318.18	177,318.18	177,318.18	179,086.62
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	78,546.93	78,546.93	78,546.93	78,582.45
A-Line LEDs - Electric Only Savings	5,401.54	5,401.54	5,401.54	5,455.41
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	2,678.06	2,678.06	2,678.06	2,669.95
Assessment Recommendations - Electric and Gas Savings	16,221.60	16,221.60	15,897.17	15,808.62
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	8,007.48	8,007.48	7,607.11	7,607.11
Assessment Recommendations - Electric Only	388.80	388.80	381.02	378.28
Assessment Recommendations - Electric Only - Legacy 2023 Measure	361.76	361.76	343.67	343.65
Assessment Recommendations - Gas Only	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Assessment Recommendations - Gas Only - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	6,568.90	6,568.90	6,568.90	13,531.31
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	2,012.37	2,012.37	2,012.37	2,663.86
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Electric	133.20	133.20	131.75	197.48
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	409.20	409.20	409.20	247.50
Bathroom Aerator 1.0 gpm - Gas	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric and Gas Savings	39,944.52	39,944.52	39,944.52	40,354.89
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	24,794.20	24,794.20	24,794.20	24,439.32
Candelabra LEDs - Electric Only Savings	403.48	403.48	403.48	407.63
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	1,208.00	1,208.00	1,208.00	1,188.35
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	12,367.20	12,367.20	12,367.20	12,039.32
Duct Sealing Package - Electric Cooling and Gas Heating Savings	66,021.52	66,021.52	66,021.52	145,555.77
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	19,828.97	19,828.97	19,828.97	42,176.98
Duct Sealing Package - Electric Cooling and Heating Savings	9,365.40	9,365.40	9,365.40	13,026.55
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	9,516.48	9,516.48	9,516.48	9,114.34
Duct Sealing Package - Electric Cooling Only Savings	522.94	522.94	522.94	2,308.04
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	494.80	494.80	494.80	1,691.62
Duct Sealing Package - Gas Heating Only Savings	0.00	0.00	0.00	0.00
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Globe LEDs - Electric and Gas Savings	28,172.70	28,172.70	28,172.70	28,460.97

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	16,484.56	16,484.56	16,484.56	16,471.88
Globe LEDs - Electric Only Savings	163.32	163.32	163.32	164.99
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	998.20	998.20	998.20	997.92
Kitchen Aerator 1.5 gpm - Electric	102.12	102.12	94.42	688.37
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	1,088.16	1,088.16	1,088.16	1,194.89
Kitchen Aerator 1.5 gpm - Gas	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Electric	169.80	169.80	197.44	226.69
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	571.30	571.30	571.30	277.98
Low-Flow Showerhead 1.5 gpm - Gas	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Low-Flow Showerhead with Shower Start - Electric	2,284.50	2,284.50	2,656.36	2,621.79
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	1,031.37	1,031.37	1,031.37	503.03
Low-Flow Showerhead with Shower Start - Gas	0.00	0.00	0.00	0.00
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Outlet Gaskets - Electric Cooling and Gas Heating Savings	63,340.80	6,334.08	1,646.86	1,644.28
Outlet Gaskets - Electric Cooling and Heating Savings	8,208.00	820.80	213.41	175.22
Outlet Gaskets - Electric Cooling Only Savings	960.00	96.00	24.96	39.52
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	0.00	0.00	0.00	0.00
PAR38 LEDs - Electric and Gas Savings	40,799.01	40,799.01	40,799.01	41,212.60
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	12,093.12	12,093.12	12,093.12	10,306.12
PAR38 LEDs - Electric Only Savings	1,604.93	1,604.93	1,604.93	1,621.20
PAR38 LEDs - Electric Only Savings - Legacy 2023 Measure	1,653.76	1,653.76	1,653.76	1,409.28
Pipe Wrap - Electric (per foot)	12,679.59	12,679.59	12,679.59	12,879.47
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	4,368.32	4,368.32	4,368.32	10,675.88
Pipe Wrap - Gas (per foot)	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Shower Start Only - Gas	0.00	0.00	0.00	0.00
Shower Start Only - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	34,106.86	34,106.86	35,623.39	89,886.44
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	2,869.64	2,869.64	2,983.52	3,883.16
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	579.72	579.72	605.50	1,053.20
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	0.00	0.00	0.00	0.00
Water Heater Wrap - Electric	401.84	401.84	401.84	401.84
Water Heater Wrap - Electric - Legacy 2023 Measure	78.64	78.64	78.64	100.46
Total Savings	717,846.15	652,588.23	648,518.45	827,121.66
Total Program Realization Rate				115%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 56. 2024 HEA Program *Ex Ante* & *Ex Post* Gross Peak Demand Reduction

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Air Sealing - Electric Cooling and Gas Heating Savings	0.500	0.500	0.500	0.997
A-Line LEDs - Electric and Gas Savings	22.815	22.815	22.815	22.043
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	11.028	11.028	11.028	10.704
A-Line LEDs - Electric Only Savings	0.695	0.695	0.695	0.671
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	0.376	0.376	0.376	0.365
Assessment Recommendations - Electric and Gas Savings	9.012	9.012	8.832	8.832
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	4.524	4.524	4.298	4.298
Assessment Recommendations - Electric Only	0.216	0.216	0.212	0.212

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Assessment Recommendations - Electric Only - Legacy 2023 Measure	0.204	0.204	0.194	0.194
Assessment Recommendations - Gas Only	0.000	0.000	0.000	0.000
Assessment Recommendations - Gas Only - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	4.448	4.448	4.448	7.946
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	0.870	0.870	0.870	3.215
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	0.000	0.000	0.000	0.000
Bathroom Aerator 1.0 gpm - Electric	0.184	0.184	0.183	0.275
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	0.036	0.036	0.036	0.019
Bathroom Aerator 1.0 gpm - Gas	0.000	0.000	0.000	0.000
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Candelabra LEDs - Electric and Gas Savings	5.544	5.544	5.544	6.037
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	3.284	3.284	3.284	3.328
Candelabra LEDs - Electric Only Savings	0.056	0.056	0.056	0.061
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	0.160	0.160	0.160	0.162
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	1.680	1.680	1.680	1.639
Duct Sealing Package - Electric Cooling and Gas Heating Savings	50.464	50.464	50.464	140.554
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	44.574	44.574	44.574	86.513
Duct Sealing Package - Electric Cooling and Heating Savings	0.684	0.684	0.684	1.928
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	2.832	2.832	2.832	2.152
Duct Sealing Package - Electric Cooling Only Savings	0.836	0.836	0.836	2.378
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	1.120	1.120	1.120	2.684
Duct Sealing Package - Gas Heating Only Savings	0.000	0.000	0.000	0.000

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Globe LEDs - Electric and Gas Savings	4.140	4.140	4.140	4.258
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	2.312	2.312	2.312	2.244
Globe LEDs - Electric Only Savings	0.024	0.024	0.024	0.025
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	0.140	0.140	0.140	0.136
Kitchen Aerator 1.5 gpm - Electric	0.021	0.021	0.019	0.136
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	0.048	0.048	0.048	0.035
Kitchen Aerator 1.5 gpm - Gas	0.000	0.000	0.000	0.000
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Low-Flow Showerhead 1.5 gpm - Electric	0.017	0.017	0.020	0.023
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	0.034	0.034	0.034	0.003
Low-Flow Showerhead 1.5 gpm - Gas	0.000	0.000	0.000	0.000
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Low-Flow Showerhead with Shower Start - Electric	0.210	0.210	0.250	0.286
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	0.177	0.177	0.177	0.019
Low-Flow Showerhead with Shower Start - Gas	0.000	0.000	0.000	0.000
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Outlet Gaskets - Electric Cooling and Gas Heating Savings	59.382	5.938	1.544	1.979
Outlet Gaskets - Electric Cooling and Heating Savings	7.830	0.783	0.204	0.027
Outlet Gaskets - Electric Cooling Only Savings	0.900	0.090	0.023	0.030
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	0.000	0.000	0.000	0.000
PAR38 LEDs - Electric and Gas Savings	6.279	6.279	6.279	6.165
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	1.638	1.638	1.638	1.403
PAR38 LEDs - Electric Only Savings	0.247	0.247	0.247	0.243
PAR38 LEDs - Electric Only Savings - Legacy 2023 Measure	0.224	0.224	0.224	0.192
Pipe Wrap - Electric (per foot)	1.386	1.386	1.386	1.469

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	0.528	0.528	0.528	1.218
Pipe Wrap - Gas (per foot)	0.000	0.000	0.000	0.000
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Shower Start Only - Gas	0.000	0.000	0.000	0.000
Shower Start Only - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	61.422	61.422	64.277	66.136
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	0.178	0.178	0.187	0.375
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	1.044	1.044	1.093	1.124
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	0.000	0.000	0.000	0.000
Water Heater Wrap - Electric	0.044	0.044	0.044	0.046
Water Heater Wrap - Electric - Legacy 2023 Measure	0.009	0.009	0.009	0.011
Total Savings	314.376	253.075	250.565	394.787
Total Program Realization Rate				126%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 57. 2024 HEA Program *Ex Ante* & *Ex Post* Gross Natural Gas Savings

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Air Sealing - Electric Cooling and Gas Heating Savings	125.00	125.00	125.00	337.03
A-Line LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
A-Line LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Assessment Recommendations - Electric and Gas Savings	2,057.74	2,057.74	2,016.59	2,006.75
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	1,017.90	1,017.90	967.01	967.00

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Assessment Recommendations - Electric Only	0.00	0.00	0.00	0.00
Assessment Recommendations - Electric Only - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Assessment Recommendations - Gas Only	869.00	869.00	851.62	829.72
Assessment Recommendations - Gas Only - Legacy 2023 Measure	159.30	159.30	151.34	151.34
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	1,867.36	1,867.36	1,867.36	5,046.52
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	1,765.09	1,765.09	1,765.09	1,106.61
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	752.34	752.34	752.34	1,067.30
Bathroom Aerator 1.0 gpm - Electric	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Gas	173.95	173.95	172.97	259.27
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	184.50	184.50	184.50	108.91
Candelabra LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Cooling and Gas Heating Savings	37,449.60	37,449.60	37,449.60	43,687.71
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	18,226.89	18,226.89	18,226.89	16,350.44
Duct Sealing Package - Electric Cooling and Heating Savings	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Duct Sealing Package - Gas Heating Only Savings	14,720.40	14,720.40	14,720.40	17,172.27
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	3,780.81	3,780.81	3,780.81	3,312.99
Globe LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Globe LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Electric	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Gas	227.65	227.65	227.49	1,426.30
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	534.66	534.66	534.66	572.84
Low-Flow Showerhead 1.5 gpm - Electric	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Gas	414.96	414.96	482.45	374.94
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	439.95	439.95	439.95	204.66
Low-Flow Showerhead with Shower Start - Electric	0.00	0.00	0.00	0.00
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Low-Flow Showerhead with Shower Start - Gas	1,458.71	1,458.71	1,696.73	1,206.78
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	817.02	817.02	817.02	388.64
Outlet Gaskets - Electric Cooling and Gas Heating Savings	24,808.48	2,480.85	645.02	643.82
Outlet Gaskets - Electric Cooling and Heating Savings	0.00	0.00	0.00	0.00
Outlet Gaskets - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	8,798.40	879.84	228.76	227.67
PAR38 LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
PAR38 LEDs - Electric Only Savings	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
PAR38 LEDs - Electric Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Pipe Wrap - Electric (per foot)	0.00	0.00	0.00	0.00
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Pipe Wrap - Gas (per foot)	14,297.40	14,297.40	14,297.40	14,541.72
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	2,262.18	2,262.18	2,262.18	5,299.51
Shower Start Only - Gas	2.86	2.86	2.86	2.26
Shower Start Only - Gas - Legacy 2023 Measure	4.48	4.48	4.48	2.01
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	24,307.58	24,307.58	24,306.72	30,003.82
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	0.00	0.00	0.00	0.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	6,197.40	6,197.40	5,825.35	7,590.82
Water Heater Wrap - Electric	0.00	0.00	0.00	0.00
Water Heater Wrap - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Total Savings	167,721.61	137,475.42	134,802.59	154,889.66
Total Program Realization Rate				92%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Ex Post Net Savings

The evaluation team based NTG ratios for most measures on self-reported responses to participant survey questions from the 2024 survey.

The 2024 participant survey NTG questions for direct-install measures asked what customers would have done in the absence of the program. The questions addressed the likelihood that participants would have changed to energy efficient equipment in the absence of the program and the timing associated with their change. For LEDs, the evaluation team also considered the presence of LEDs already in the home. For five measures, the evaluation team deemed the NTG ratios for the following reasons:

- Air sealing: There were no survey responses from participants that received air sealing. The team deemed the NTG ratio at 80% for air sealing.

- Assessment recommendations: As in previous evaluations (2015 – 2023), the evaluation team used a NTG ratio of 100% for the assessment recommendations measure because participants would not have received the recommendations if they had not participated in the program.
- Attic insulation: The team deemed the NTG ratio at 80% for the attic insulation, which is consistent with previous evaluation results (2018 – 2021).
- Thermostats: There was an error in the 2024 HEA program participant survey that resulted in the exclusion of thermostat freeridership questions. Since the program installed this measure at no cost, we used the results of the 2024 Residential Marketplace free thermostat survey as a proxy (93% NTG).
- Water heater wrap: There were no survey responses from participants that received water heater wraps. The team deemed the NTG ratio at 80% for air water heater wrap.

For Legacy 2023 measures, we applied the 2023 NTG ratios, calculated from the 2022 HEA program participant survey.

Participant spillover represents savings that result from purchases and actions taken outside of the program but are due to program influence. Because NIPSCO claims savings for energy-saving behavior and/or subsequent installation of energy efficient equipment associated with the energy assessment recommendations measure, calculating participant spillover would be redundant to those savings. Therefore, spillover is not included in the NTG ratio for the HEA program.

Table 58 shows the NTG ratios by measure.

Table 58. 2024 HEA Program Net-to Gross Ratios By Measure

MEASURE	NTG	SOURCE
Air Sealing	80%	Deemed
Assessment Recommendations	100%	Deemed
Attic Insulation	80%	Deemed
Bathroom Aerators	88%	2024 HEA Survey
Duct Sealing	84%	2024 HEA Survey
Kitchen Aerators	96%	2024 HEA Survey
LEDs	73%	2024 HEA Survey
Low-Flow Showerheads/Shower Start	94%	2024 HEA Survey
Outlet Gaskets	95%	2024 HEA Survey
Pipe Wrap	92%	2024 HEA Survey
Thermostats	93%	2024 Residential Online Marketplace Free Thermostat Survey
Water Heater Wrap	80%	Deemed

Table 59 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 59. 2024 HEA Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Air Sealing - Electric Cooling and Gas Heating Savings	1,349.43	0.997	337.03	80%	1,079.54	0.797	269.62
A-Line LEDs - Electric and Gas Savings	179,086.62	22.043	0.00	73%	130,249.70	16.032	0.00
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	78,582.45	10.704		64%	50,068.97	6.820	0.00
A-Line LEDs - Electric Only Savings	5,455.41	0.671	0.00	73%	3,967.72	0.488	0.00
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	2,669.95	0.365	0.00	64%	1,701.16	0.233	0.00
Assessment Recommendations - Electric and Gas Savings	15,808.62	8.832	2,006.75	100%	15,808.62	8.832	2,006.75
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	7,607.11	4.298	967.00	100%	7,607.11	4.298	967.00
Assessment Recommendations - Electric Only	378.28	0.212	0.00	100%	378.28	0.212	0.00
Assessment Recommendations - Electric Only - Legacy 2023 Measure	343.65	0.194	0.00	100%	343.65	0.194	0.00
Assessment Recommendations - Gas Only	0.00	0.000	829.72	100%	0.00	0.000	829.72
Assessment Recommendations - Gas Only - Legacy 2023 Measure	0.00	0.000	151.34	100%	0.00	0.000	151.34
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	13,531.31	7.946	5,046.52	80%	10,825.05	6.357	4,037.22
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	2,663.86	3.215	1,106.61	80%	2,131.09	2.572	885.29
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	0.00	0.000	1,067.30	80%	0.00	0.000	853.84
Bathroom Aerator 1.0 gpm - Electric	197.48	0.275	0.00	88%	172.80	0.240	0.00
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	247.50	0.019	0.00	97%	240.36	0.018	0.00
Bathroom Aerator 1.0 gpm - Gas	0.00	0.000	259.27	88%	0.00	0.000	226.86
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	0.00	0.000	108.91	97%	0.00	0.000	105.76
Candelabra LEDs - Electric and Gas Savings	40,354.89	6.037	0.00	73%	29,350.11	4.391	0.00
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	24,439.32	3.328	0.00	64%	15,571.57	2.121	0.00
Candelabra LEDs - Electric Only Savings	407.63	0.061	0.00	73%	296.47	0.044	0.00
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	1,188.35	0.162	0.00	73%	864.29	0.118	0.00
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	12,039.32	1.639	0.00	64%	7,670.88	1.044	0.00
Duct Sealing Package - Electric Cooling and Gas Heating Savings	145,555.77	140.554	43,687.71	84%	122,805.40	118.586	36,859.32
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	42,176.98	86.513	16,350.44	85%	35,668.19	73.162	13,827.22
Duct Sealing Package - Electric Cooling and Heating Savings	13,026.55	1.928	0.00	84%	10,990.50	1.627	0.00
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	9,114.34	2.152	0.00	85%	7,707.81	1.820	0.00
Duct Sealing Package - Electric Cooling Only Savings	2,308.04	2.378	0.00	84%	1,947.29	2.006	0.00

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	1,691.62	2.684	0.00	85%	1,430.57	2.269	0.00
Duct Sealing Package - Gas Heating Only Savings	0.00	0.000	17,172.27	84%	0.00	0.000	14,488.25
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	0.00	0.000	3,312.99	85%	0.00	0.000	2,801.73
Globe LEDs - Electric and Gas Savings	28,460.97	4.258	0.00	73%	20,699.66	3.097	0.00
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	16,471.88	2.244	0.00	64%	10,495.10	1.430	0.00
Globe LEDs - Electric Only Savings	164.99	0.025	0.00	73%	120.00	0.018	0.00
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	997.92	0.136	0.00	64%	635.83	0.087	0.00
Kitchen Aerator 1.5 gpm - Electric	688.37	0.136	0.00	96%	661.87	0.130	0.00
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	1,194.89	0.035	0.00	98%	1,165.02	0.034	0.00
Kitchen Aerator 1.5 gpm - Gas	0.00	0.000	1,426.30	96%	0.00	0.000	1,371.39
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	0.00	0.000	572.84	98%	0.00	0.000	558.52
Low-Flow Showerhead 1.5 gpm - Electric	226.69	0.023	0.00	94%	214.09	0.022	0.00
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	277.98	0.003	0.00	86%	237.97	0.003	0.00
Low-Flow Showerhead 1.5 gpm - Gas	0.00	0.000	374.94	94%	0.00	0.000	354.09
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	0.00	0.000	204.66	86%	0.00	0.000	175.20
Low-Flow Showerhead with Shower Start - Electric	2,621.79	0.286	0.00	94%	2,476.02	0.270	0.00
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	503.03	0.019	0.00	86%	430.62	0.017	0.00
Low-Flow Showerhead with Shower Start - Gas	0.00	0.000	1,206.78	94%	0.00	0.000	1,139.69
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	0.00	0.000	388.64	86%	0.00	0.000	332.70
Outlet Gaskets - Electric Cooling and Gas Heating Savings	1,644.28	1.979	643.82	95%	1,566.01	1.885	613.17
Outlet Gaskets - Electric Cooling and Heating Savings	175.22	0.027	0.00	95%	166.88	0.026	0.00
Outlet Gaskets - Electric Cooling Only Savings	39.52	0.030	0.00	95%	37.64	0.029	0.00
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	0.00	0.000	227.67	95%	0.00	0.000	216.83
PAR38 LEDs - Electric and Gas Savings	41,212.60	6.165	0.00	73%	29,973.92	4.484	0.00
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	10,306.12	1.403	0.00	64%	6,566.57	0.894	0.00
PAR38 LEDs - Electric Only Savings	1,621.20	0.243	0.00	73%	1,179.10	0.176	0.00
PAR38 LEDs - Electric Only Savings - Legacy 2023 Measure	1,409.28	0.192	0.00	64%	897.93	0.122	0.00
Pipe Wrap - Electric (per foot)	12,879.47	1.469	0.00	92%	11,806.61	1.347	0.00
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	10,675.88	1.218	0.00	87%	9,249.30	1.055	0.00
Pipe Wrap - Gas (per foot)	0.00	0.000	14,541.72	92%	0.00	0.000	13,330.40
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	0.00	0.000	5,299.51	87%	0.00	0.000	4,591.35

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Shower Start Only - Gas	0.00	0.000	2.26	94%	0.00	0.000	2.14
Shower Start Only - Gas - Legacy 2023 Measure	0.00	0.000	2.01	86%	0.00	0.000	1.72
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	89,886.44	66.136	30,003.82	93%	83,594.39	61.506	27,903.55
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	3,883.16	0.375	0.00	93%	3,611.34	0.348	0.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	1,053.20	1.124	0.00	93%	979.48	1.045	0.00
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	0.00	0.000	7,590.82	93%	0.00	0.000	7,059.46
Water Heater Wrap - Electric	401.84	0.046	0.00	80%	321.47	0.037	0.00
Water Heater Wrap - Electric - Legacy 2023 Measure	100.46	0.011	0.00	80%	80.37	0.009	0.00
Total Savings	827,121.66	394.787	154,889.66		646,044.28	332.350	135,960.14

Table 60 shows the net-to-gross results for each fuel.

Table 60. 2024 HEA Program Net-to-Gross results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	717,846.15	827,121.66	78%	646,044.28
Peak Demand Reduction (kW)	314.376	394.787	84%	332.350
Natural Gas Energy Savings (therms/yr.)	167,721.61	154,889.66	88%	135,960.14

Process Evaluation

The evaluation team conducted participant surveys with 2024 HEA program participants to answer the following research questions:

- How has the program changed since 2023?
- How do participants become aware of the program? Has this changed over time?
- What drives participation in the program?
- What was the customer's experience with the audit like?
- How easy was it to schedule the audit and complete the application?
- How do contractors provide findings and recommendations from the audit to the participant? How do they discuss and provide the report?
- How do customers decide to move on and install additional measures? What is their experience like?
- How useful are the information and recommendations provided through the program?
- What, if any, energy-savings actions do participants take because of the assessment? Do they participate in any other programs?

- What are customer experiences with the direct-install measures? Are customers satisfied with the quality of work provided by the contractors?
- How satisfied were participants with the program, including the participation process and audit experience? How satisfied were they with the equipment they received?
- How satisfied are customers with NIPSCO?
- Do participants have any recommendations for program improvement?
- How has the number of replaced lightbulbs per home changed over time?

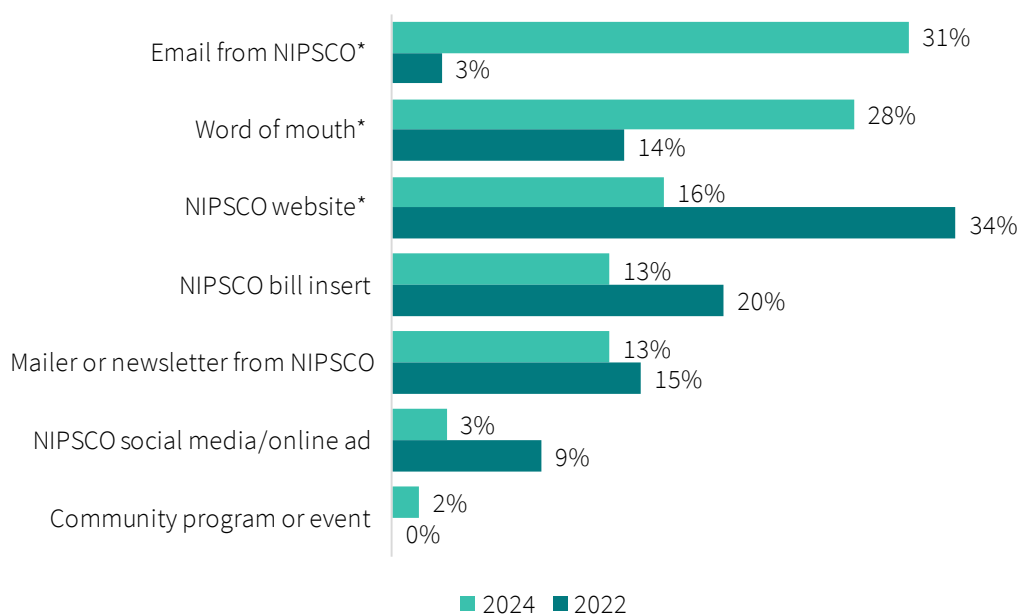
Participant Feedback

The evaluation team invited a census of 1,199 HEA program participants (from January 2024 until the end of December 2024) to complete a survey about their experience with the program and received 61 responses. The team fielded the survey via phone (44%) and web (56%) in January 2025. The following sections describe the results related to source of awareness, reasons for participation, experience with the in-home assessment, satisfaction with the program, and program impacts on customers.

Energy Efficiency Awareness and Marketing

Email (31%) and word of mouth (28%) were the most common ways in which respondents learned about the HEA program in 2024 (Figure 28. 2024 HEA Program Sources of Awareness). Both methods of awareness, especially emails, increased substantially compared to the results of the 2022 participant survey (3% and 14%, respectively). Sixteen percent of respondents said they learned about the program from the NIPSCO website, which is a notable decrease from 34% in the 2022 participant survey.

Figure 28. 2024 HEA Program Sources of Awareness



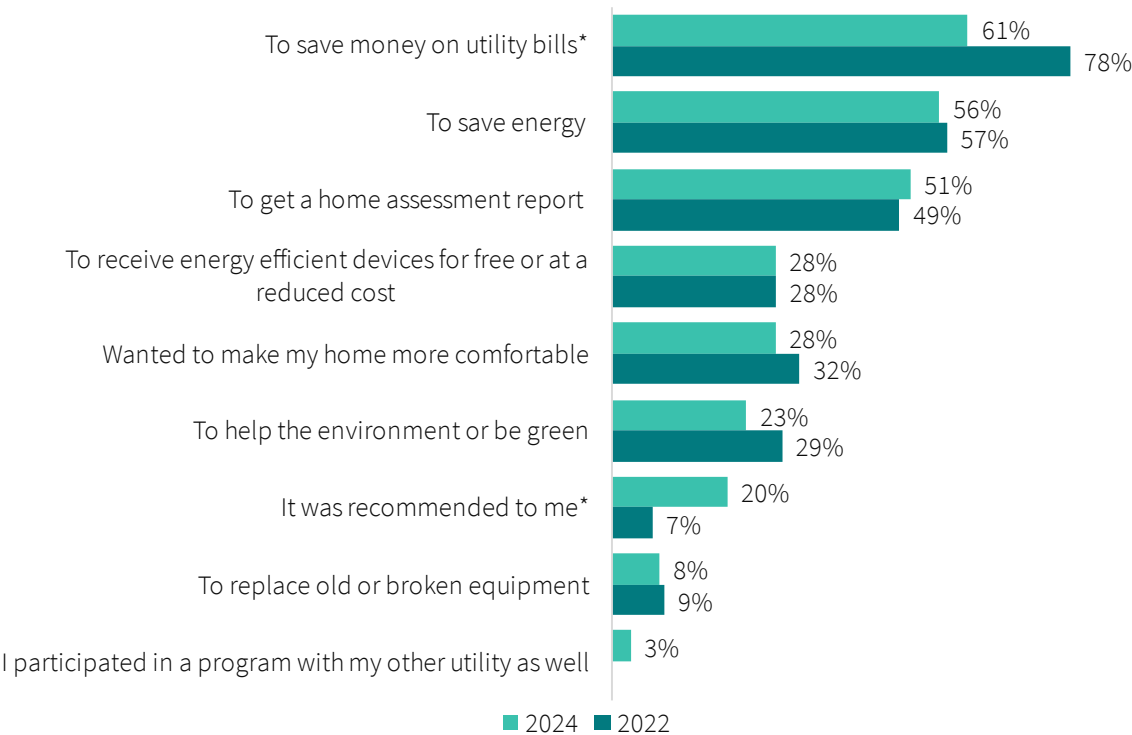
Source: HEA Participant Survey Question C.1 “How did you learn about NIPSCO’s Home Energy Assessment program?” (Multiple responses allowed) (n=61 in 2024, n=152 in 2022).

*Difference from previous year is significant at $p \leq 0.10$ (90% confidence).

Participation Drivers

Respondents indicated they most often participated in the HEA program to save money on utility bills (61%), to save energy (56%), and to get a home assessment report (51%), as shown below in Figure 29. These were the same top three participation drivers seen in 2022, 2021, and 2020.

Figure 29 Reasons for Participating in the HEA Program



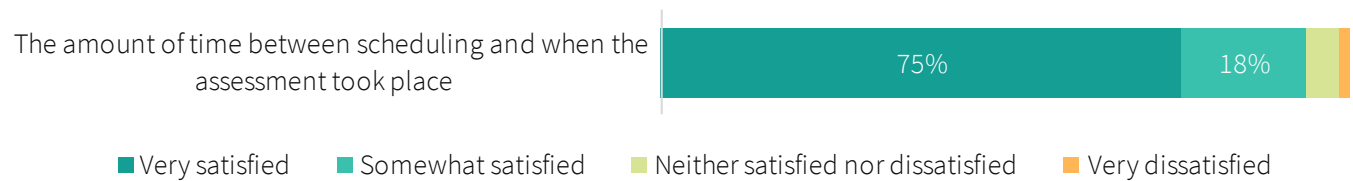
Source: HEA Participant Survey Question D.1 “Why did you decide to participate in NIPSCO’s Home Energy Assessment program?” (Multiple responses allowed) (n=61 in 2024, n=152 in 2022).

Note: * indicates difference from previous year is significant at $p \leq 0.10$ (90% confidence).

Assessment Experience

Most respondents (75%) were “very satisfied” with the time between scheduling and when the assessment took place (Figure 30). In addition, nearly all respondents (98%) found the scheduling process to be “very easy” or “somewhat easy.” Similarly, when asked about the application process itself, 92% of participants said they were *very satisfied* or *somewhat satisfied* with the process.

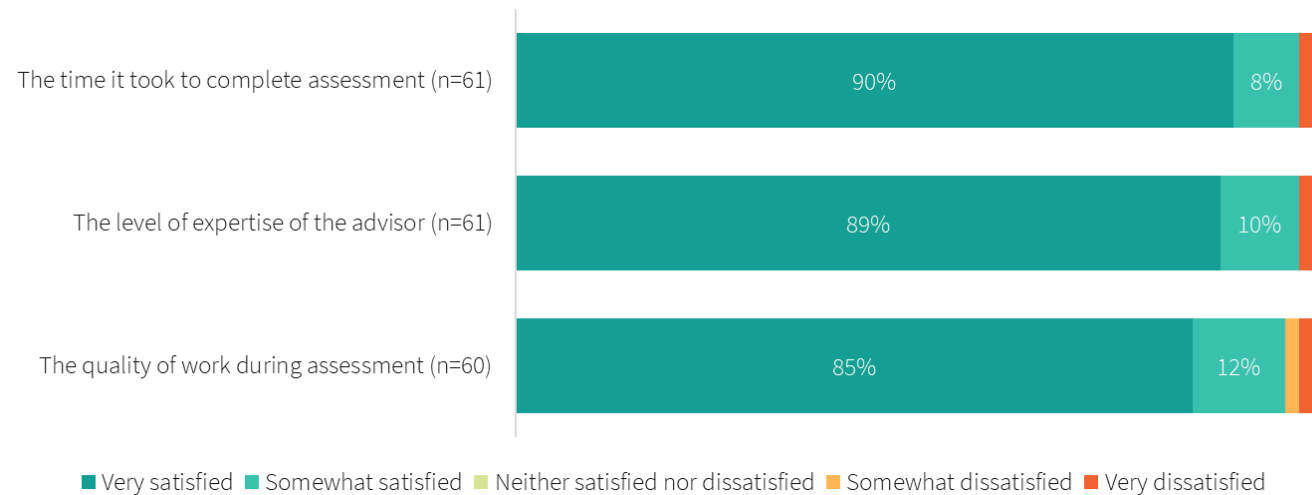
Figure 30. Scheduling experience satisfaction



Source: HEA Participant Survey Question E.12a “How satisfied were you with: The amount of time between scheduling and when the assessment took place?” (n=61).

Most respondents were “very satisfied” with the time it took to complete the assessment (90%), the level of expertise of the energy advisor (89%), and the quality of work during the assessment (85%) (Figure 31). About half of respondents (49%, n=30) had specific questions for their energy advisor during their assessment, and of those all but two were able to get those questions answered by the energy advisor. Additionally, almost all HEA program participants reported that the auditor discussed the assessment findings and recommendations with them (98%) and felt like the energy advisor provided them with helpful information about their home or equipment (97%).

Figure 31. Satisfaction with assessment length, expertise of auditor, and quality of work



Source: HEA Participant Survey. Question E.12b, E.12d, E.12f: “How satisfied were you with each of the following? The time it took to complete the assessment. The level of expertise of the energy advisor. The quality of work during the assessment.”

Per the program abstract, participants should receive a report via email during the assessment or a physical copy in the mail after the assessment is complete if they do not have an email address. Most respondents (93%) reported receiving a report. Respondents who received the report were satisfied with it overall (Figure 32).

Figure 32. Satisfaction with assessment report



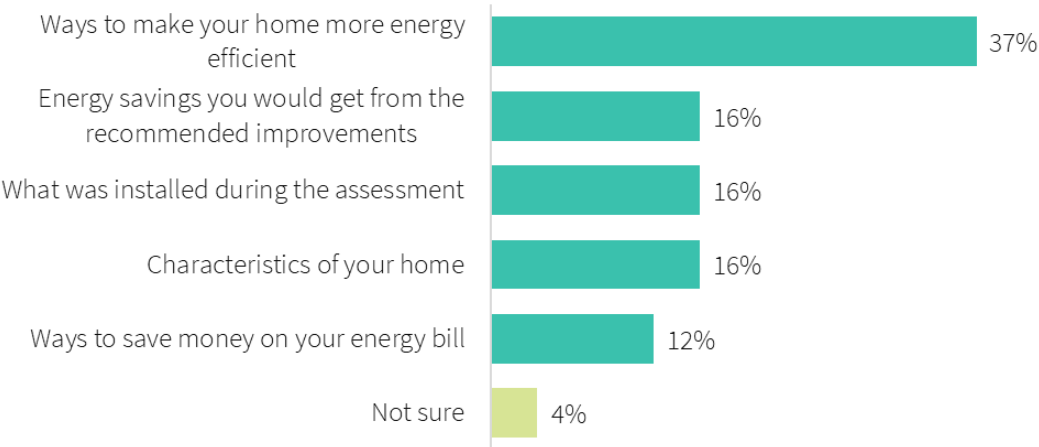
Source: HEA Participant Survey. Question E.12c: “How satisfied were you with each of the following: The assessment report overall.” (n=57)

Most HEA program respondents who received the report found it “very easy” (77%) or “somewhat easy” (21%) to understand the information provided in the report. Additionally, most respondents found the information they received from the energy advisor and the report to be “very useful” (64%) or “somewhat useful” (34%). This is an increase from 2022 when 60% of respondents found the report “very useful” and 23% found it “somewhat useful”. This may indicate that report quality or the auditor’s ability to explain the information in the report has improved. One respondent said:

“Found it very informative and enjoyed the representative [that was] sent out. He answered my questions and gave good recommendations.”

Over one-third of respondents (37%) indicated that the most useful information in the report was about ways to make their home more energy efficient (Figure 33).

Figure 33. Usefulness rating of information in the report

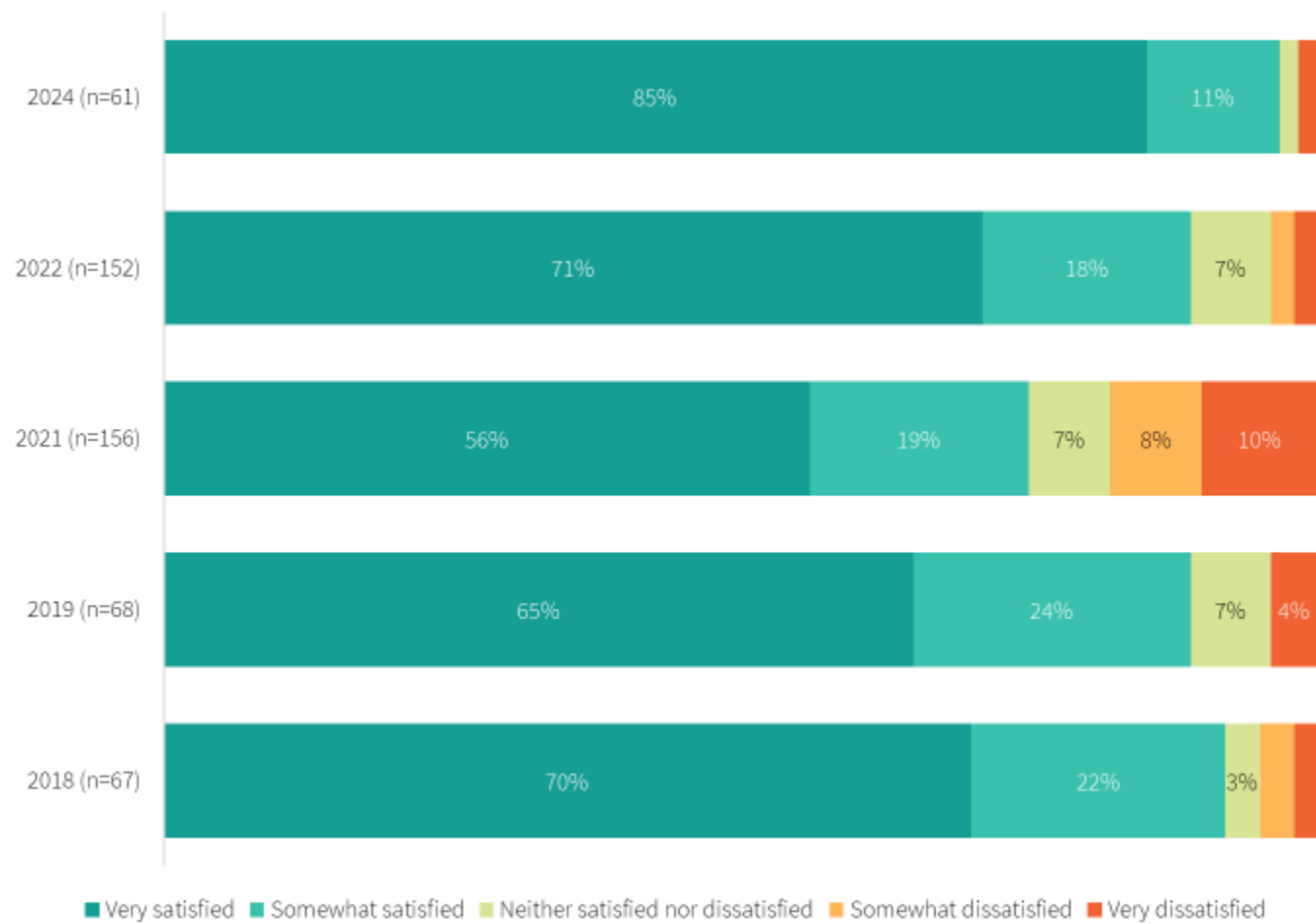


Source: HEA Participant Survey. Question E.10: “What information in the report did you find most useful?” (n=57)

Six respondents provided suggestions to improve the information provided during the assessment or in the report. Two respondents wanted air infiltration tests, one wanted the integrity of their insulation checked, and another respondent said the time allotted for the assessment was not long enough. One other respondent requested more specific recommendations on how to save on energy costs.

Overall, most respondents (96%) were “very satisfied” or “somewhat satisfied” with the energy assessment, an increase from 2022 (89%). Additionally, the percentage of respondents who were “very dissatisfied” or “somewhat dissatisfied” was lower in 2024 (2%) compared with 2022 (4%) and 2021 (18%). Figure 34, below, shows historical satisfaction ratings for the in-person energy assessment overall. Since experiencing a drop in assessment satisfaction in 2021, the HEA program has had consistently positive improvement regarding this metric.

Figure 34. Satisfaction with energy assessment¹⁰



Source: HEA Participant Survey. Question E.12i: “How satisfied were you with each of the following? The in-person assessment overall.”

Note: * indicates difference from previous year is significant at $p \leq 0.10$ (90% confidence).

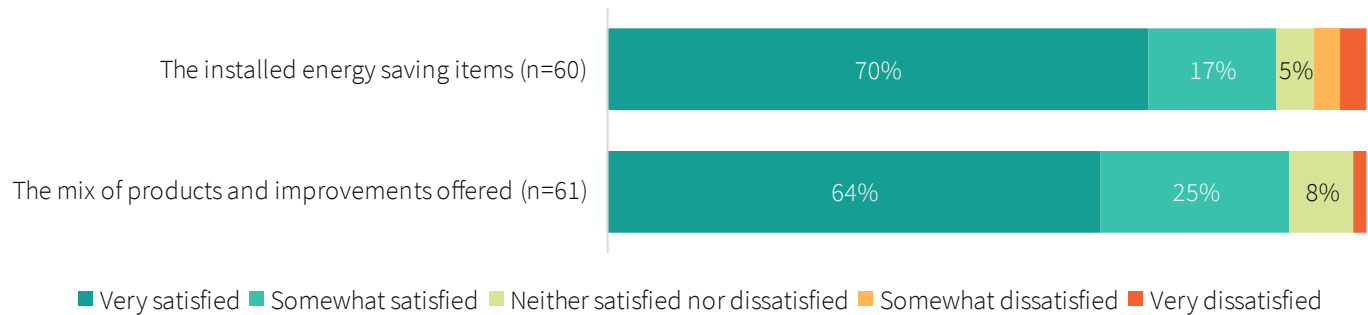
In 2024, the only respondent who said they were “very dissatisfied” with the assessment was the same person whose auditor incorrectly installed the thermostat, as mentioned in the next section.

¹⁰ The evaluation team is not including 2020 respondent program satisfaction, since the number of respondents from the 2020 virtual program is too low to draw a meaningful comparison.

Direct-Install Measures

According to the program tracking data, 98% of respondents who received an energy assessment also received direct-install measures in their home during the assessment. Respondents were generally satisfied with the energy-saving items they received, with 87% responding that they were either “very satisfied” or “somewhat satisfied” with the products (Figure 35). A majority (89%) of respondents were “very satisfied” or “somewhat satisfied” with the mix of products and improvements offered.

Figure 35. Satisfaction with installed items and mix of products and improvements offered

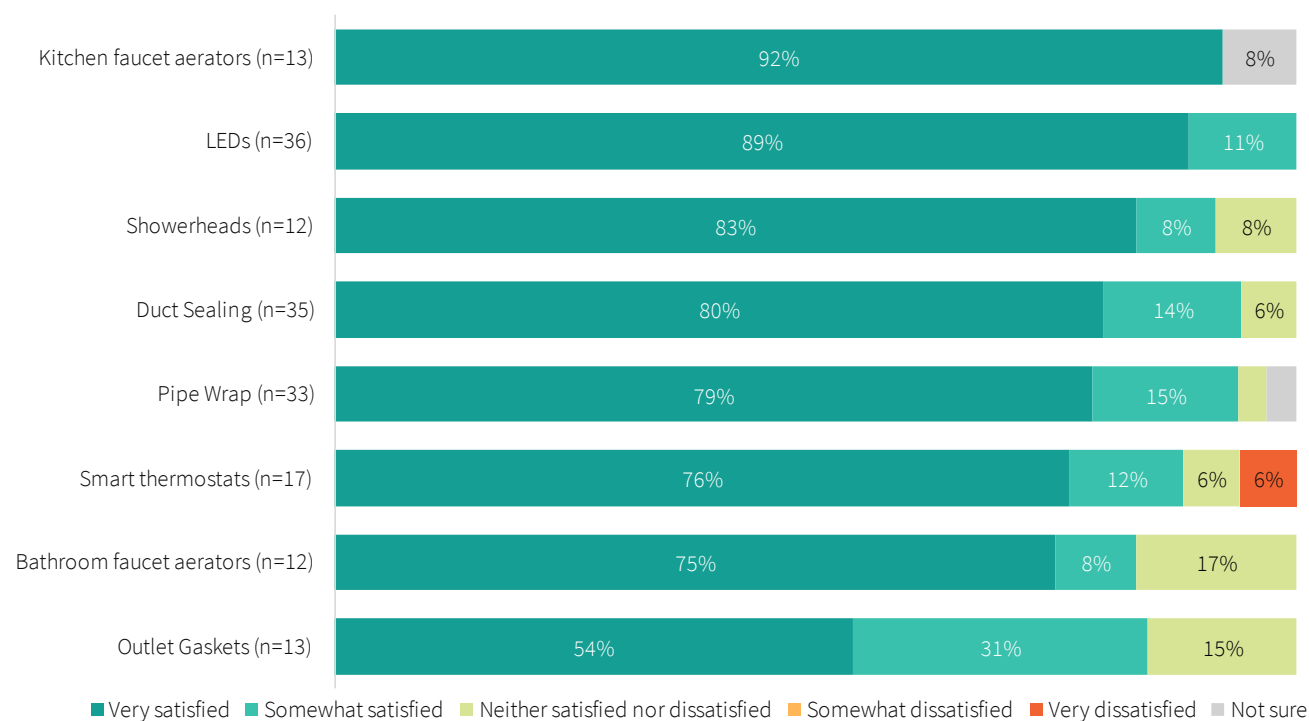


Source: HEA Participant Survey. Question E.12g, E.12e: “How satisfied were you with each of the following? The energy-saving items that were directly installed in your home. The mix of products and improvements offered.”

Regarding satisfaction with specific measures, all respondents who received LEDs were “very satisfied” (89%) or “somewhat satisfied” (11%) with them. Respondents were also “very satisfied” or “somewhat satisfied” with the duct sealing (94%), and the pipe wrap (94%). While fewer respondents received other measures, they reflected that they were generally satisfied (Figure 36).

While most respondents were satisfied with the measures installed, open-ended responses revealed a couple concerns regarding the thermostat. One respondent who said they were “very dissatisfied” with the smart thermostat reported an installation issue, stating, “The thermostat that was installed was wired wrong, using both the AC and furnace at the same time... increasing my NIPSCO bill to a ridiculous amount.” This respondent also noted that they never received a call back from the technician or any help with the issue. Another respondent from the Income-Qualified Weatherization survey also reported the same issue with their program-installed thermostat. Relatedly, a separate respondent from the HEA program said they wished they had received a hard copy of the thermostat manual and wanted someone to explain how to operate and program it.

Figure 36. Satisfaction with specific direct-install measures



Source: HEA Participant Survey. Questions F.5, F.11, F.16, F.24, F.31, F.35, F.37, F.48: “How satisfied are you with the [measure(s)] installed? Are you...”

Some respondents reported removing one or two LEDs (four of 36 recipients), with four respondents saying the LEDs didn’t work and one respondent saying they didn’t like the color.

“I don’t understand why the LED lightbulbs failed. They lasted less than 6 months.”

Very few respondents reported removing bathroom aerators or kitchen aerators. Those who did said they replaced their entire faucet as parts of larger remodels, subsequently removing the aerator. Unlike 2022 where 15% of respondents reported they removed their showerhead, no participants said they did this in the 2024 survey.

Some respondents did not have certain measures installed and shared information as to why they did not receive them. The top reason respondents did not receive LEDs and water saving measures was because they already had them or did not need them. About one-third of the respondents who did not receive water saving measures reported that the technicians did not offer them: 35% for showerheads, 39% for bathroom faucet aerators, and 33% for kitchen faucet aerators. Table 61 provides additional details on the reasons for not receiving measures.

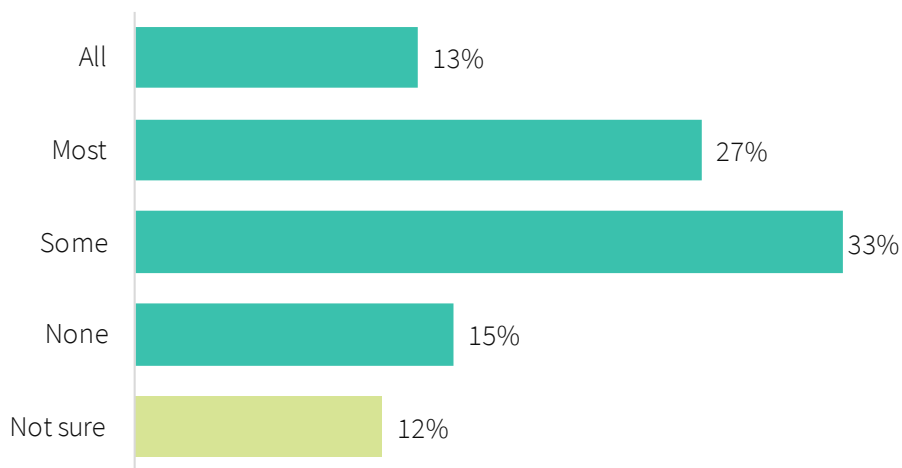
Table 61. Reasons direct-install measures were not installed

REASON	LEDS (N=20)	BATHROOM FAUCET AERATORS (N=47)	KITCHEN FAUCET AERATORS (N=46)	SHOWERHEADS (N=51)
Already had one/ didn't need one	60%	41%	39%	43%
Wasn't offered one	15%	39%	33%	35%
Concerned about light quality	15%	-	-	-
Didn't fit on fixture	-	5%	13%	2%
Didn't match current fixture color	-	2%	7%	2%
Concerned about changes in water pressure	-	2%	-	4%
Don't like them	-	-	-	4%
Not sure	5%	11%	4%	8%

Post-Assessment Improvements

Most respondents (73%) made at least some of the energy-saving improvements recommended in their assessment report (Figure 37). A small portion of respondents (27%) reported that they either did not make any of the improvements or were not sure if they made improvements. Of those who had not made any recommended improvements (n=11), four respondents said they were still planning on making them, two said they were too expensive, two said they were not relevant, and one said they had no time to do them.

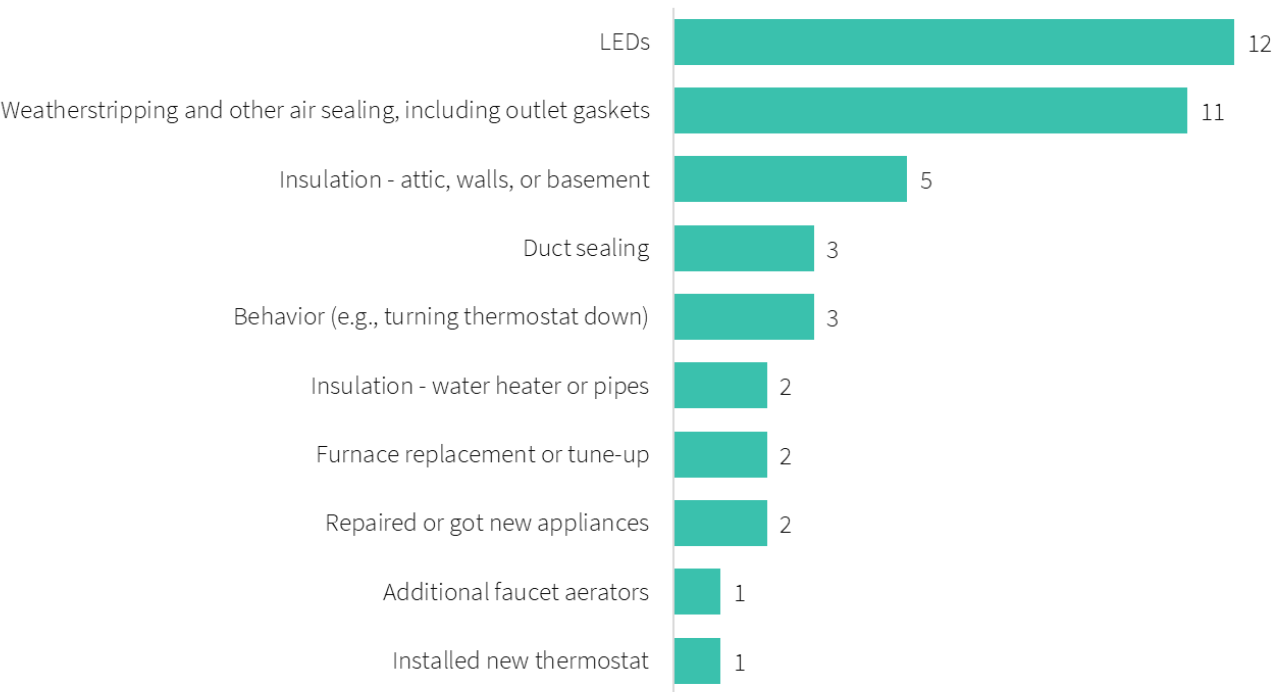
Figure 37. Extent to which respondents followed through on recommended improvements



Source: HEA Participant Survey. Question I.1: "After participating in NIPSCO's Home Energy Assessment program, would you say you have made all, most, some, or none of the energy-saving recommendations made in the assessment report you received?" (n=61)

For respondents who had followed through on the recommended improvements (n=33), the most common improvement made was installing LEDs (n=12), followed by adding weatherstripping, including the leave-behind outlet gaskets, or insulation (n=11; Figure 38). A few respondents made behavioral changes, like turning down their thermostat or reducing the use of their space heater.

Figure 38. Recommended measures installed by participants



Source: HEA Participant survey. Question I.2: “What improvements did you make?” (n=44) Note: One respondent said they performed “all” improvements listed in their report and did not indicate what those specific improvements were. Numbers of actual improvements made may be higher.

Additional Program Participation

Like in 2022, just over a third of HEA program respondents (34%) were aware that NIPSCO offers other energy efficiency programs. For those familiar with other NIPSCO programs (n=21), respondents were most likely to know about the Appliance Recycling (48%) and Home Rebates (48%) programs, as well as discounts on energy efficient retail products (43%). Only one respondent was familiar with the Home Online Marketplace program and similarly, one respondent was familiar with the Residential New Construction program.

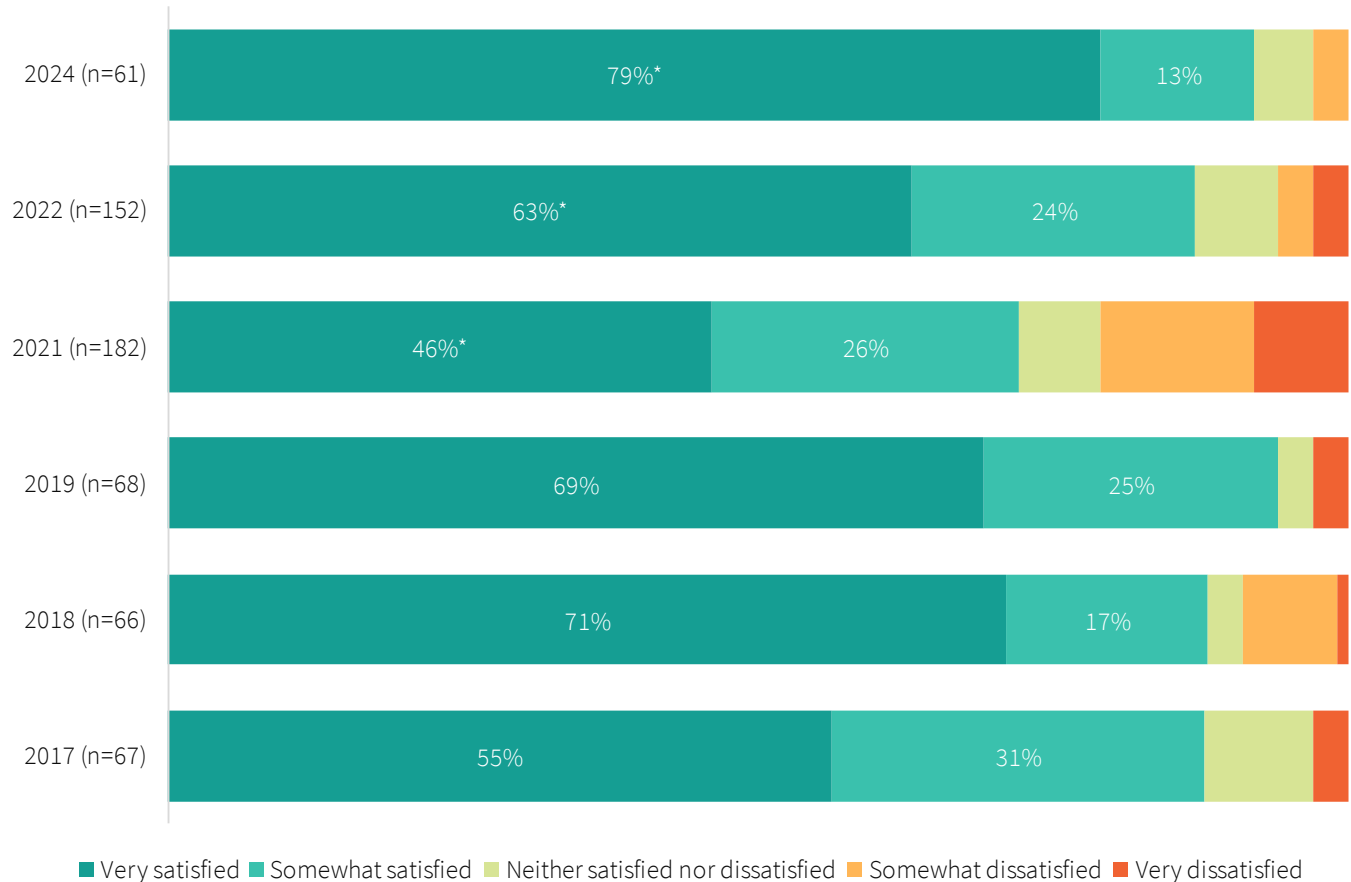
Four respondents participated in other NIPSCO energy efficiency programs, including Home Rebates (n=3), the Home Online Marketplace (n=1), and Appliance Recycling (n=1). One of these respondents participated in two different programs: Home Rebates and the Home Online Marketplace.

Satisfaction With Program and NIPSCO

Overall Program Satisfaction

Most respondents (92%) said they were either “very satisfied” or “somewhat satisfied” with the program, an increase from 2022 (87%).

Figure 39. Satisfaction with the HEA Program¹¹



Note: * indicates difference between program years is significant at $p \leq 0.10$ (90% confidence).

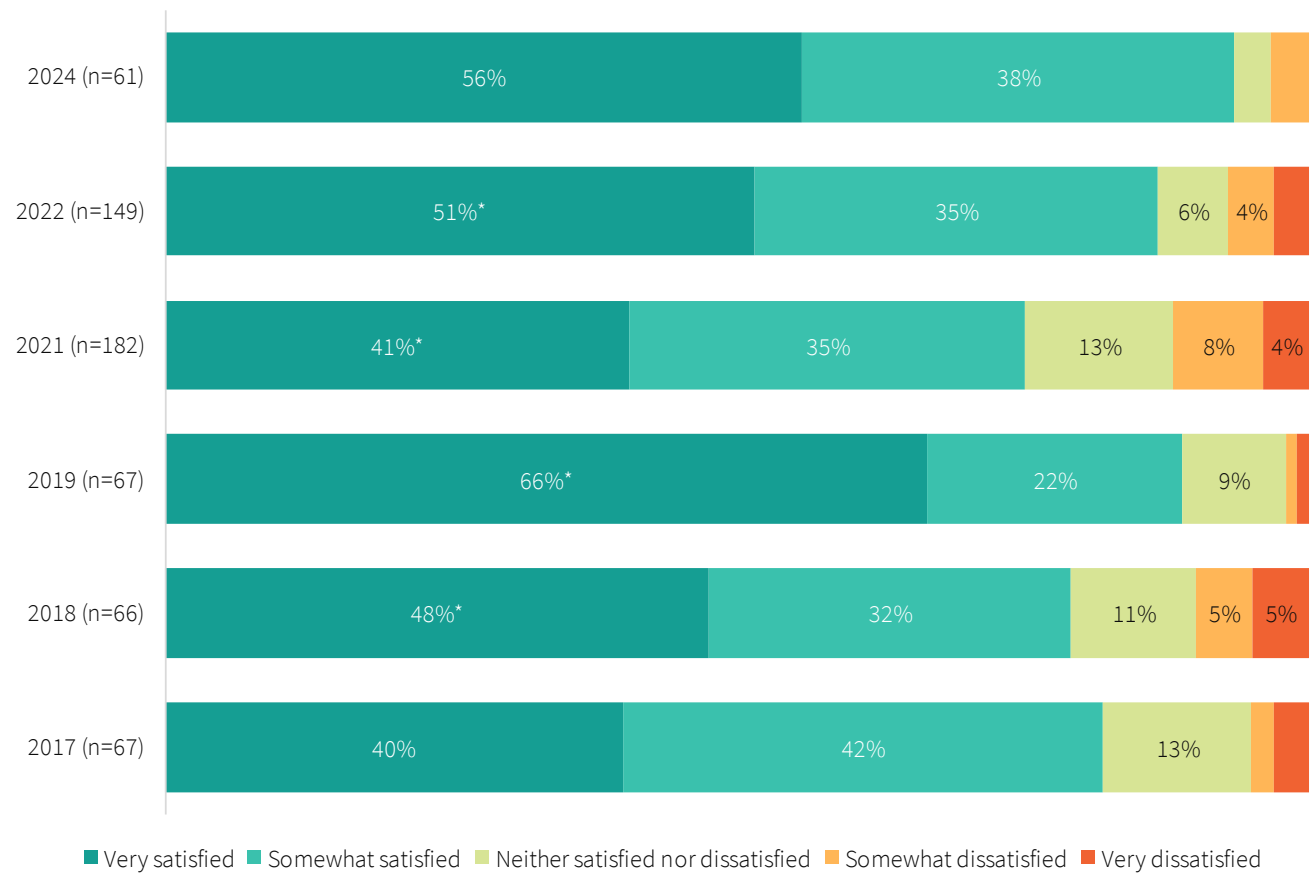
Source: HEA Participant survey. Question J.1: “How satisfied are you with NIPSCO’s HEA program?”

NIPSCO Satisfaction

Most respondents were satisfied with NIPSCO as their utility service provider, with 93% of respondents reporting they were either “very satisfied” or “somewhat satisfied” (Figure 40. Satisfaction with NIPSCO). The evaluation team only collected comments for respondents with a low satisfaction level. There was a slight increase in satisfaction with NIPSCO compared to 2022; however, the change was not large enough to be statistically significant.

¹¹ The evaluation team is not including 2020 respondent program satisfaction, since the number of respondents from the 2020 virtual program is too low to draw a meaningful comparison.

Figure 40. Satisfaction with NIPSCO¹²



Note: * indicates differences between program years that are significant at $p \leq 0.10$ (90% confidence).

Source: HEA Participant survey. Question J.4: “How satisfied are you with NIPSCO overall as your utility service provider?”

The two respondents who said they were “somewhat dissatisfied” with NIPSCO as a service provider mentioned high rates and bills despite having energy efficient equipment or making energy-saving improvements. One of these respondents also said they had a meter issue that they have been waiting for NIPSCO to fix for five years.

Suggestions for Improvement

Twelve respondents (20%) provided suggestions to improve NIPSCO’s HEA program. Most commonly, respondents said more advertising and awareness could increase the program’s participation. One respondent requested a blower door test as part of the standard assessment. This same respondent suggested that the assessment include a review of their energy bill to find more opportunities for improvement. Another respondent asked if they could purchase additional LED lights beyond the program’s allocation per participant at the time of the audit.

One customer had issues with the follow-up air sealing rebate saying:

¹² The evaluation team is not including 2020 respondent satisfaction with NIPSCO, since the number of respondents from the 2020 virtual program is too low to draw a meaningful comparison.

“The person who came talked about further tests... it took weeks for a follow-up call.”

Participant Survey Demographics

Most HEA program respondents live in single-family detached homes (88%) and all (100%) own their homes. Half of respondents (50%) have lived in their home for over 10 years and most live in households of one or two people (72%). While 20% of respondents declined to provide their income, half of those who did report incomes made between \$50,000 and \$150,000 (55%). Only a few respondents (n=5) reported receiving any type of government assistance. Respondents were also older with over half (55%) born before 1960 (ages 65 and older), and the majority were white (74%). All respondents reported speaking English at home, and over half had a two-year college degree or greater (61%). Table 62. 2024 HEA Program contains more details on respondents’ home characteristics, and Table 63. 2024 HEA Survey Participant Demographics contains more information on respondents’ demographics.

Table 62. 2024 HEA Program Survey Participant Housing Characteristics

DEMOGRAPHICS	PERCENTAGE
Type of Residence (n=60)	
Single-family detached home	88%
Multi-Family apartment or condo building (with 4 or more units)	3%
Attached house (townhouse, row house, or twin)	7%
Not sure	2%
Home Ownership (n=60)	
Own	100%
Rent	0%
Years Lived in Current Home (n=60)	
One year or less	15%
2-3 years	17%
4-5 years	10%
6-10 years	8%
More than 10 years	50%
Number of People in the Home (n=58)	
One	19%
Two	53%
Three	10%
Four	10%
Five or more	5%
Not Sure	2%

DEMOGRAPHICS	PERCENTAGE
Year Home Built (n=60)	
Before 1900	5%
1900 to 1939	8%
1940 to 1959	13%
1960 to 1979	28%
1980 to 1989	2%
1990 to 1999	10%
2000 to 2004	10%
2005 or later	22%
Not sure	2%

Table 63. 2024 HEA Survey Participant Demographics

DEMOGRAPHICS	PERCENTAGE
Income (n=49)	
\$25,000 to under \$35,000	4%
\$35,000 to under \$50,000	8%
\$50,000 to under \$75,000	18%
\$75,000 to under \$100,000	18%
\$100,000 to under \$150,000	18%
Over \$150,000	12%
Not sure	20%
Government Support (n=57)	
Social Security Disability Insurance (SSDI)	4%
Low-Income Home Energy Assistance (LIHEAP or EAP)	2%
Supplemental Security Income (SSI)	2%
Temporary Assistance for Needy Families (TANF)	2%
None of the above	75%
Not sure	16%
Respondent Age (n=57)	
1900 to 1939	2%
1940 to 1959	53%
1960 to 1979	21%
1980 to 1989	16%
1990 to 1999	5%

Not sure	4%
Race (n=58)	
White (for example, German, Irish, English, Italian, Polish, or French)	74%
Black or African American (for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, or Somali)	14%
Hispanic, Latino, or Spanish origin (for example, Mexican or Mexican American, Puerto Rican, Cuban, Salvadorian, Dominican)	3%
American Indian or Alaska Native (for example, Navajo Nation, Blackfeet Tribe, Mayan, Aztec, Native Village of Barrow In	2%
Asian (for example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, or Japanese)	2%
Middle Eastern or North African (for example, Lebanese, Iranian, Egyptian, Syrian, Moroccan, or Algerian)	2%
Other	3%
Language spoken at home (n=57)	
English	100%
Education (n=57)	
High school graduate or equivalent	19%
Some college, no degree	12%
Technical college degree or certificate	5%
Two-year college degree	5%
Four-year college degree	21%
Graduate or professional degree	35%
Not sure	2%

Source: HEA Participant survey. Section K. Demographics: “What type of residence do you live in?” “Do you own or rent your residence?” “How many years have you lived in your current home?” “Including yourself, how many people live in your home?” “About how many square feet is your home? Use your best guess.” “When was your home built?” “Which of the following best represents your annual household income from all sources in 2024 before taxes?” “Does anyone in your household qualify for the following?” “In what year were you born?” “Which categories describe you?” “What language(s) do you primarily speak at home?” “What is the highest level of education you have completed?”

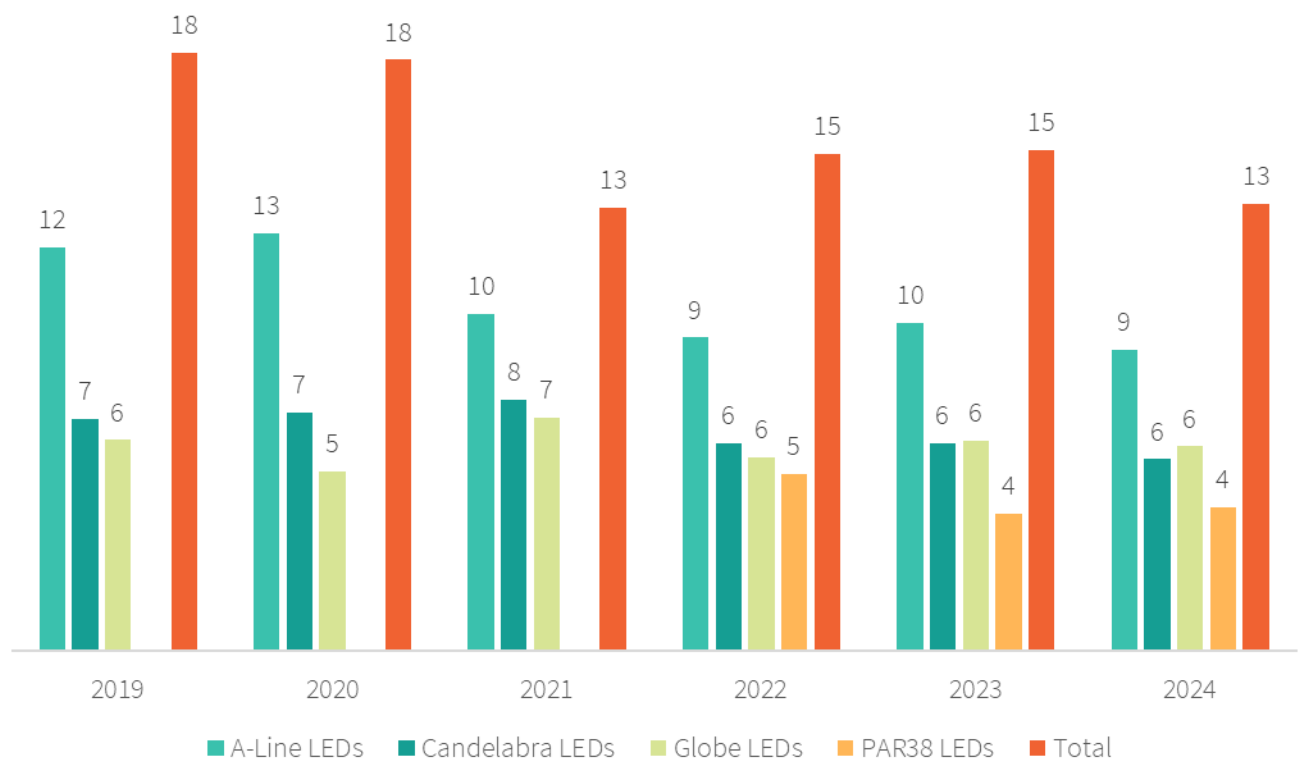
Lighting Analysis

The Illinois TRM explicitly limits LED retrofit savings to direct-install programs where “it can be shown that the LED is replacing inefficient lighting” and that programs “should continue to use the existing inefficient lighting as a baseline and also assume a measure life of two years.” Since screw-in lighting accounts for about half of electric savings through the HEA program, NIPSCO looked to the evaluation team to investigate trends in light bulb replacements to inform future program planning.

To do this, the evaluation team analyzed HEA program participant data from 2019 to 2024 to determine the average number of bulbs installed per home over time (Figure 41). The team reviewed bulb installations by type and by year to determine any bulb-specific trends.

While there is variability by year, in general the analysis indicates decreasing potential for lighting within homes targeted by the HEA program. Since 2019, the average number of total bulbs installed per home decreased from 18 in 2019 and 2020 to 13 in 2024. A-line LEDs are the primary driver of this trend; they are the program’s most frequently installed bulb and have steadily decreased in installation incidence since 2020 (from an average of 13 bulbs to nine bulbs per home in 2024). Installations of candelabra, globe, and PAR38 LEDs (introduced to the program in 2022) have remained relatively consistent over the years, as shown in Figure 14, below. It will be important to continue to monitor this downward trend as the market becomes more saturated with LEDs and opportunities to replace inefficient lighting diminishes.

Figure 41. Average Number of Lightbulbs Installed per Home (2019 – 2024)



Source: Program tracking data.

Conclusions and Recommendations

CONCLUSION 1: THE HEA PROGRAM EXCEEDED ALL OF ITS SAVINGS AND DEMAND REDUCTION GOALS AND HAS HAD CONSISTENT INCREASES IN PARTICIPANT SATISFACTION SINCE 2021.

The HEA program achieved and surpassed all its goals including energy electric savings (137%), peak demand reduction (201%), and natural gas energy savings (123%) in 2024. Simultaneously, program updates made over the years appear to have had a positive effect on participant satisfaction. Following a large drop in satisfaction in 2021, the proportion of respondents who reported that they were “very satisfied” or “somewhat satisfied” with the program increased from 72% in 2021 to 87% in 2022 and to 92% in 2024.

This year’s survey respondents expressed high satisfaction with the assessment itself, the quality of work completed, and the measures installed. There were a few instances where respondents said they were “somewhat dissatisfied” or “very dissatisfied” throughout the survey including a respondent who had an unresolved meter issue, a respondent with high energy bills, and a respondent whose technician installed the thermostat was installed incorrectly through the HEA program.

Notably, when given the opportunity to offer feedback on future program improvements, six of 12 respondents who provided feedback said NIPSCO should more actively promote the program, implying they were satisfied with the program and want others to participate. Only a few participants suggested changing measures or assessment techniques.

Recommendations:

- Ensure that auditors have proper training in how to install all measures. Consider developing an installation quality assurance checklist for auditors to help deliver consistent service.
- Remind auditors to leave behind any relevant documentation, such as operation manuals, for all equipment they install. If physical operation manuals are not available, consider developing leave-behind materials with QR codes and/or URLs to help participants access online versions.
- Consider developing a referral program as several respondents suggested expanding marketing efforts and word of mouth was the second most likely way respondents learned about the HEA program.

CONCLUSION 2: THE ASSESSMENT REPORT WAS UNDERSTANDABLE, USEFUL, AND ENCOURAGED PARTICIPANTS TO INSTALL ADDITIONAL RECOMMENDED MEASURES.

Nearly all respondents (98%) found the assessment report to be “very easy” or “somewhat easy” to understand and found its information to be “very useful” or “somewhat useful” (97%). Over one-third of respondents (37%) said the most useful information was information on ways to make their home more energy efficient.

Relatedly, nearly three-quarters (73%) of respondents said they had followed through on some, most, or all recommendations in their report. The most common respondent-installed measures were additional LEDs, weatherstripping, or insulation, possibly building upon work that the auditor began during the assessment.

Recommendations:

- Cross-promote the Home Online Marketplace in the digital reports participants receive for the HEA program to encourage participants to purchase and install additional energy efficient equipment. Educate auditors on this program and its discounts, especially if a participant's recommendations include a product available on the marketplace.

CONCLUSION 3: *EX POST* GROSS SAVINGS WERE HIGHER THAN *EX ANTE* SAVINGS FOR ATTIC INSULATION AND AIR SEALING MEASURES BECAUSE *EX ANTE* CALCULATIONS USED DEEMED HVAC SATURATION VALUES MEANT FOR UNKNOWN HEATING AND COOLING SYSTEMS.

Through the engineering review, the evaluation team identified notable measure-level differences between *ex ante* and *ex post* savings for attic insulation and air sealing measures. The driver of these differences was that *ex ante* savings used the deemed percent cooling, percent electric heating, and percent gas heating values that the Illinois TRM v12 provides for calculating savings when HVAC types are unknown. These saturation values represent the likelihood that a house with unknown HVAC systems will have a cooling system, an electric heating system, or a gas heating system. However, the tracking data reports HVAC types at the project level, so calculations should use a 100% heating/cooling value for known HVAC types.

Recommendations:

- Update *ex ante* savings to use 100% HVAC saturation values when the technician determines the HVAC type on site.

CONCLUSION 4: THE USE OF 2022 EM&V PROGRAM AVERAGES IN *EX ANTE* SAVINGS LED TO LARGE DIFFERENCES BETWEEN *EX ANTE* AND *EX POST* SAVINGS FOR SOME MEASURES, RESULTING IN PROGRAM LEVEL REALIZATION RATES OVER 100% FOR BOTH KWH AND KW AND UNDER 100% FOR THERMS.

The evaluation team identified notable measure-level differences between *ex ante* and *ex post* savings for faucet aerators, showerheads, duct sealing, and thermostat measures through an engineering review, which resulted in greater than 100% realization rates. The driver of these measure-level differences was that *ex ante* savings used now-outdated inputs from the 2022 EM&V report when deemed values existed in the Illinois TRM. The EM&V reports from past program years used now-outdated inputs from the Indiana TRM v2.2 for many calculations. Additionally, the Illinois TRM is updated each year, which could cause some previous EM&V values to no longer be the best input for estimating savings.

Recommendations:

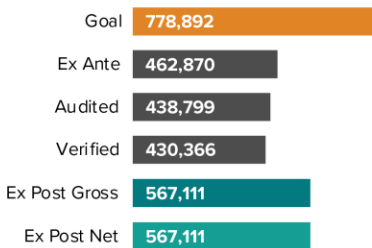
- To ensure the most up-to-date savings values, update *ex ante* savings use deemed values from the current Illinois TRM when available instead of using older values from previous EM&V reports. Continue to use values from EM&V reports for metrics collected via primary data collection, such as ISRs.

INCOME QUALIFIED WEATHERIZATION (IQW)

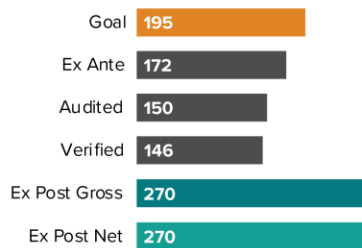


- The IQW program did not meet electric energy savings but exceeded goals for peak demand reduction and natural gas savings.
- Ex post gross savings were higher than ex ante savings for attic insulation and air sealing measures because ex ante calculations used deemed HVAC saturation values meant for unknown heating and cooling systems.
- The use of 2022 EM&V Program averages in ex ante savings led to large differences between ex ante and ex post savings for some measures, resulting in program level realization rates over 100% for kWh and kW and under 100% for Therms.heating and cooling Systems.

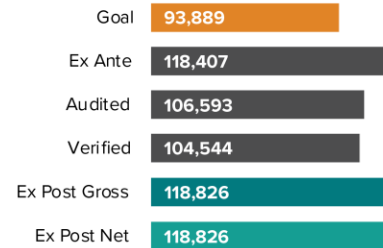
⚡ Electric Savings (kWh)



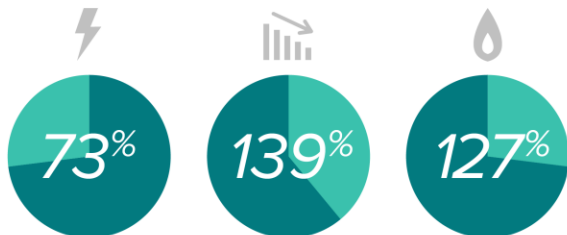
📊 Peak Demand Reduction (kW)



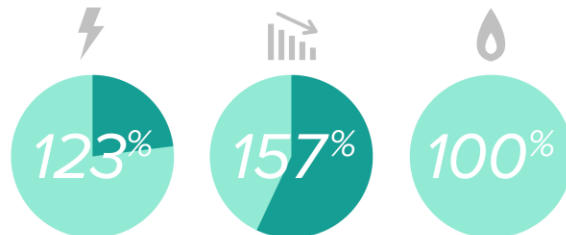
💧 Natural Gas Savings (Therms)



Ex Post Gross Achieved to Gross Goal



Realization Rate



Budget



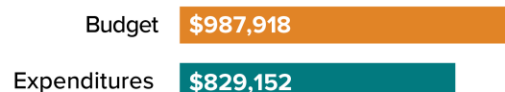
Electric and Peak Demand



Spent **53%**



Natural Gas



Spent **84%**

Program Design and Delivery

Through the Income-Qualified Weatherization (IQW) program, NIPSCO provides a Comprehensive Home Assessment (CHA) and direct installations of energy efficiency measures to income-qualified, single-family homeowners or renters (with landlord approval). To participate in the IQW program, a customer must have an active NIPSCO natural gas and/or electric account and must not have previously participated in the Home Energy Assessment (HEA) program or IQW program with NIPSCO in the past three years at the same address. Customers must also be Income-Qualified. To be Income-Qualified, the NIPSCO account holder must have a total household income at or below 200% of current federal poverty guidelines or must receive one of the following:

- Low-income Home Energy Assistance Program (LIHEAP or EAP), or
- Temporary Assistance for Needy Families (TANF), or
- Supplemental Security Income (SSI).

Income-qualified residents of manufactured homes/mobile homes are also eligible, but the home must be individually metered.

TRC administers the IQW program and is responsible for the program's design and management, processing incentive payments, quality assurance and quality control (QA/QC), and technical training, as well as for providing subcontractor support to facilitate the quality installation of energy efficiency measures. TRC partners with subcontractors Threshold Energy Solutions (Threshold) and Home Depot to implement the IQW program. TRC trains the subcontractors to ensure that the work quality and customer service meet program standards. Threshold performs the in-home assessments and direct installation of measures. Home Depot is responsible for managing a call center to handle customer calls about refrigerator replacements, scheduling refrigerator replacement appointments, delivering and installing the new refrigerator, properly removing and disposing of the old refrigerator, and providing customers with the owner's manual and warranty information for their new refrigerator.

TRC markets the program through a variety of channels including word –of –mouth; direct outreach from the utility; posted flyers in community centers, libraries, and targeted retail stores. To encourage participation in hard-to-reach areas, the implementer deploys marketing tactics such as outreach at community events and yard signs placed in customers' front yards (with their permission) during assessment. The implementer also engages customers through direct mail, email, program collateral, social media, and the NIPSCO website.

An energy advisor conducts the home assessment and will stop immediately if they identify any critical health and safety issues such as a gas leak or high ambient CO levels. In this case, the energy advisor provides the customer with a Notice of Health and Safety Concerns form to sign and informs the customer that they must remediate the issues before the assessment or additional work can resume. The customer is responsible for calling to reschedule once the issues are addressed. Energy advisors will also identify any non-critical health and safety issues that the program may be able to address.¹³

¹³ Health and safety measures include attic subfloor installation/repair, cracked heat exchanger repair, dryer vent installation /repair, duct work reconnection, bathroom exhaust fan ventilation, and custom measures that TRC evaluates on a case-by-case basis.

The assessment concludes with the energy advisor providing a report of their findings and energy-saving recommendations. Depending on the conditions, account type (i.e., combo, gas only, or electric only), and current equipment in the home, the energy advisor installs any or all the following measures during the assessment:

- ENERGY STAR-certified light bulbs (9W A-Line, 4.5W Candelabra, 6W Globe, 14.5W Par 38)—up to 22 units
- Bathroom faucet aerator (1.0 gpm)—up to two units
- Kitchen aerator (1.5 gpm)—up to one unit
- Low-flow showerhead (1.5 gpm), shower start (valve only), low-flow showerhead/shower start combo—any combination of measures but up to two units only
- Pipe wrap—up to 10 feet
- Water heater wrap (electric only)—up to one unit
- Duct sealing— \$150 value
- Smart Wi-Fi Programmable thermostat—up to one unit
- Outlet gaskets (leave behinds only)—up to one unit (10 gaskets)

Participants may also qualify for a refrigerator replacement, air sealing, and/or attic insulation after the assessment, provided the baseline refrigerator, infiltration reduction, and insulation meet specific criteria:

- Air sealing (20% infiltration reduction) – \$400 value
- Attic insulation (uninsulated hatch; R-38 insulation replacing < R-11)
- Refrigerators: IQW program customers with a primary refrigerator that is 10 years old or more and not an Energy Star model may also qualify for a replacement refrigerator. The new refrigerator will be an Energy Star model that is closest in size to the original unit. All replacement refrigerators are a white base model with a top freezer. The refrigerator must have adequate clearance and stable flooring and be plugged into a properly grounded outlet to ensure safety and compliance with warranty provisions.

Changes from the 2023 Design

In 2024, NIPSCO added leave-behind outlet gaskets as a measure. There were no other significant changes in the program design.

Program Performance

In 2024, the IQW program fell short of its goals for electric energy savings but exceeded its goals for peak demand reduction and natural gas energy savings. The implementation staff report that while they are achieving their desired participation levels for assessments, they have encountered fewer opportunities to implement electric-saving measures. Table 64 summarizes savings for the full year of program performance, including program savings goals.

Table 64. 2024 IQW Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	778,891.57	462,869.55	438,798.51	430,365.87	567,110.85	567,110.85	73%
Peak Demand Reduction (kW)	194.627	171.876	149.971	145.891	269.958	269.958	139%
Natural Gas Energy Savings (therms/yr.)	93,888.93	118,406.80	106,593.26	104,543.88	118,826.21	118,826.21	127%

As documented in Table 65, below, audited savings are lower than *ex ante* savings because the evaluation team made an adjustment to the gasket savings, which resulted in lower audited savings. The team made this adjustment because the *ex ante* savings incorrectly counted the number of gaskets. Verified savings were lower than claimed values due to in-service rates (ISRs) for select measures. The engineering analysis completed for the *ex post* gross analysis increased the savings for electric energy, peak demand savings, and natural gas savings. *Ex post* gross savings exceeded program goals for all savings types. Finally, the net-to-gross (NTG) analysis reduced *ex post* net results due to the calculated NTG values.

Table 65. 2024 IQW Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPIILLOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	123%	0%	0%	100%
Peak Demand Reduction (kW)	157%	0%	0%	100%
Natural Gas Energy Savings (therms/yr.)	100%	0%	0%	100%

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

Despite achieving its peak demand and natural gas savings goals, the IQW program in 2024 spent less than its budgets for both its electric and gas savings. The program spent 53% of its electric budget, compared to *ex post* electric savings of 73% and peak demand reduction of 131%. For natural gas, the program spent only 84% of its budget and achieved 127% of its *ex post* goal. Table 66 lists the 2024 program budget and expenditures by fuel type.

Table 66. 2024 IQW Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$969,624.00	\$512,299.18	53%
Natural Gas	\$987,918.14	\$829,151.54	84%

Evaluation Methodology

To inform the 2024 NIPSCO IQW impact and process evaluation, the evaluation team completed the following research activities:

- **Program staff interviews and discussions** to understand the program process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program participation data.
- **Engineering analysis** to review program savings assumptions and algorithms for reasonableness and accuracy.
- **Participant surveys (n=54)** to understand the participant experience in the program and to gather information to calculate freeridership and spillover rates.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions did the program use to develop savings estimates? Are there any updates the program should make?
- What are *ex post* program savings? Do these suggest any needed updates to program design, delivery, or savings assumptions?
- Did the program meet its participation and savings goals?

For all measure types, the evaluation team compared its engineering calculations to NIPSCO's *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: standard engineering practices and relevant building codes, the Indiana TRM Workbook v1.0, the Illinois TRM v12.0, and NIPSCO's program tracking database.

Per the Indiana TRM Workbook v1.0, the Indiana TRM "is intended to be used as an accompaniment to [the Illinois TRM], automatically incorporating the most recent and effective version of the IL TRM, including measures newly added to the IL TRM." For each measure, the evaluation team first prioritized the Indiana TRM, which directly references the Illinois TRM for most measures. The team prioritized the VEIC Proposed Indiana Assumptions on the "Code Baseline Measures" tab of the Indiana TRM, for specific measures where provided, as a source for baseline assumptions. Additionally, the evaluation team used the "Weather Zone Mapping" tab to map cities in NIPSCO's territory to the appropriate Illinois city to estimate weather impacts. Where provided, we used coincidence factors from the "Loadshapes" tab of the Indiana TRM.

Audited and Verified Savings

Audited Savings

The evaluation team performed a tracking data audit review by looking for duplicate records and ensuring that measures followed program guidelines. The evaluation team found that no measures were duplicative and all followed program guidelines. As a result, the evaluation team did not remove any measures as part of the tracking data audit.

We did, however, identify an error in the outlet gaskets savings, which we corrected at the audited step. The gaskets were distributed as 10-packs and the per-unit savings values for this measure took that into account, multiplying the per-gasket savings by 10. However, in the program tracking data, the savings value for the 10-pack was also multiplied by 10, resulting in *ex ante* gasket savings that were 10 times higher than they should have been. We adjusted the audited per-unit values to reflect a single gasket and applied that to the total quantity of individual gaskets from the tracking data, ultimately reducing audited savings for all fuel types.

The evaluation team also found that some measures used savings values from 2023, which are located in the NIPSCO Residential 22-23 Program Design workbook. This chapter refers to these measures, which were incentivized before the 2024 program design went into effect in April of that year, as “2023 Legacy Measures.”

Verified Savings

The evaluation team calculated ISRs from the 2024 participant survey. Some ISRs fell below 100% because some respondents reported removing items after the program installed them. The 93% ISR for assessment recommendations is based on the proportion of 2024 survey respondents who indicated they received an assessment report. Outlet gaskets were a leave-behind measure and only counted when installed on an exterior wall, resulting in an ISR of 12%. Table 67 lists the ISRs for all program-installed measures. This does not include ISRs for 2023 Legacy Measures, which are located in the 2023 DSM Portfolio Evaluation report.

Table 67. 2024 IQW Program ISR Ratios by Measure

MEASURE	ISR	SOURCE
Air Sealing	100%	Deemed
Assessment Recommendations	93%	2024 HEA/IQW Survey
Attic Insulation	100%	Deemed
Bathroom Aerators	96%	2024 HEA/IQW Survey
Duct Sealing	100%	Deemed
Kitchen Aerators	90%	2024 HEA/IQW Survey
LEDs	93%	2024 HEA/IQW Survey
Low-Flow Showerheads/Shower Start	90%	2024 HEA/IQW Survey
Outlet Gaskets	12%	2024 HEA/IQW Survey
Pipe Wrap	100%	Deemed
Thermostats	89%	2024 HEA/IQW Survey
Refrigerators	100%	Deemed

In 2024, TRC fully switched to using the Illinois TRM for *ex ante* calculations, which includes an embedded ISR for most measures or considers it to be 100% for measures such as attic insulation and duct sealing. The evaluation team took two different approaches to calculating verified savings per measure depending on whether there was an ISR embedded in the *ex ante* savings calculation.

- In the cases where the savings calculation **included** an ISR embedded in the *ex ante* savings calculation, the evaluation team updated the calculation with the ISR from the 2024 participant survey to determine verified per-unit savings.¹⁴ Then, the evaluation team applied the verified per-unit savings to the audited unit count to determine total verified savings.
- In cases where the savings calculation **did not include** an ISR embedded in the *ex ante* savings calculation, the evaluation team applied the ISR from the 2024 participant survey to the audited unit count to determine the verified unit count.¹⁵ Then, the evaluation team applied the verified unit count to the audited per-unit savings to determine the total verified savings.

For Legacy 2023 Measures, the evaluation team applied 2023 per-unit verified savings to the audited unit count, except for Assessment Recommendations where the evaluation team applied the 2023 ISR to the audited unit count to determine the verified unit count. Then, the evaluation team multiplied the verified unit count by the audited per-unit savings to determine the total measure savings.

Table 68. 2024 IQW Program Ex Ante & Verified Per-Unit Savings

MEASURE	EX ANTE ISR	EX ANTE SAVINGS			VERIFIED ISR	VERIFIED SAVINGS		
		KWH	KW	THERMS		KWH	KW	THERMS
Air Sealing - Electric Cooling and Gas Heating Savings	n/a	130.09	0.125	31.25	100%	130.09	0.125	31.25
Air Sealing - Electric Cooling Only Savings	n/a	73.67	0.071	0.00	100%	73.67	0.071	0.00
Air Sealing - Electric Heating Only Savings	n/a	229.96	0.000	0.00	100%	229.96	0.000	0.00
Air Sealing - Gas Heating Only Savings (Gas Only Customer)	n/a	0.00	0.000	32.14	100%	0.00	0.000	32.14
A-Line LEDs - Electric and Gas Savings	97%	38.07	0.005	0.00	93%	36.50	0.004	0.00
A-Line LEDs - Electric Only Savings	97%	38.07	0.005	0.00	93%	36.50	0.004	0.00
Assessment Recommendations - Electric and Gas Savings	n/a	21.60	0.012	2.74	93%	21.60	0.012	2.74
Assessment Recommendations - Electric Only	n/a	21.60	0.012	0.00	93%	21.60	0.012	0.00
Assessment Recommendations - Gas Only	n/a	0.00	0.000	2.74	93%	0.00	0.000	2.74
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	n/a	208.18	0.141	59.18	100%	208.18	0.141	59.18
Attic Insulation (Uninsulated Hatch) - Electric Cooling Only Savings	n/a	146.65	0.141	0.00	100%	146.65	0.141	0.00
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings	n/a	676.62	0.000	0.00	100%	676.62	0.000	0.00

¹⁴ Measures with embedded ISRs included: LEDs, Bathroom Aerators, Kitchen Aerators, Low-Flow Showerheads, Low-Flow Showerhead with Shower Starts, Programmable Thermostats, and Smart Wi-Fi Programmable Thermostats.

¹⁵ Measures without embedded ISRs included: Air Sealing, Assessment Recommendations, Attic Insulation, Duct Sealing, ENERGY STAR Refrigerators, Outlet Gaskets, and Pipe Wrap.

MEASURE	EX ANTE ISR	EX ANTE SAVINGS			VERIFIED ISR	VERIFIED SAVINGS		
		KWH	KW	THERMS		KWH	KW	THERMS
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	n/a	0.00	0.000	108.50	100%	0.00	0.000	108.50
Bathroom Aerator 1.0 gpm - Electric	96%	17.37	0.024	0.00	96%	17.37	0.024	0.00
Bathroom Aerator 1.0 gpm - Gas	96%	0.00	0.000	0.74	96%	0.00	0.000	0.74
Candelabra LEDs - Electric and Gas Savings	97%	28.24	0.004	0.00	93%	27.08	0.004	0.00
Candelabra LEDs - Electric Only Savings	97%	28.24	0.004	0.00	93%	27.08	0.004	0.00
Duct Sealing Package - Electric Cooling and Gas Heating Savings	n/a	99.66	0.076	56.40	100%	99.66	0.076	56.40
Duct Sealing Package - Electric Cooling Only Savings	n/a	47.77	0.076	0.00	100%	47.77	0.076	0.00
Duct Sealing Package - Electric Heating Only Savings	n/a	994.46	0.000	0.00	100%	994.46	0.000	0.00
Duct Sealing Package - Gas Heating Only Savings	n/a	0.00	0.000	56.40	100%	0.00	0.000	56.40
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 16 CF)	n/a	437.15	0.054	0.00	100%	437.15	0.054	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 18 CF)	n/a	425.01	0.053	0.00	100%	425.01	0.053	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 20 CF)	n/a	405.34	0.050	0.00	100%	405.34	0.050	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 18 CF)	n/a	407.18	0.051	0.00	100%	407.18	0.051	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 20 CF)	n/a	388.00	0.048	0.00	100%	388.00	0.048	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: Before 1990, New Capacity: 20 CF)	n/a	928.41	0.115	0.00	100%	928.41	0.115	0.00
Globe LEDs - Electric and Gas Savings	97%	26.67	0.004	0.00	93%	25.57	0.004	0.00
Globe LEDs - Electric Only Savings	97%	26.67	0.004	0.00	93%	25.57	0.004	0.00
Kitchen Aerator 1.5 gpm - Electric	93%	34.04	0.007	0.00	90%	32.94	0.006	0.00
Kitchen Aerator 1.5 gpm - Gas	93%	0.00	0.000	1.57	90%	0.00	0.000	1.57

MEASURE	EX ANTE ISR	EX ANTE SAVINGS			VERIFIED ISR	VERIFIED SAVINGS		
		KWH	KW	THERMS		KWH	KW	THERMS
Low-Flow Showerhead 1.5 gpm - Electric	86%	169.80	0.017	0.00	90%	177.70	0.018	0.00
Low-Flow Showerhead 1.5 gpm - Gas	86%	0.00	0.000	7.28	90%	0.00	0.000	7.62
Low-Flow Showerhead with Shower Start - Electric	86%	228.45	0.021	0.00	90%	239.07	0.022	0.00
Low-Flow Showerhead with Shower Start - Gas	86%	0.00	0.000	9.79	90%	0.00	0.000	10.25
Outlet Gaskets - Electric Cooling and Gas Heating Savings ^a	100%	9.60	0.009	3.76	12%	0.96	0.001	0.37
Outlet Gaskets - Electric Cooling and Heating Savings ^a	100%	91.20	0.087	0.00	12%	9.12	0.009	0.00
Outlet Gaskets - Electric Cooling Only Savings ^a	100%	9.60	0.009	0.00	12%	0.96	0.001	0.00
Outlet Gaskets - Electric Heating Only Savings ^a	100%	81.60	0.000	0.00	12%	8.16	0.000	0.00
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer) ^a	100%	0.00	0.000	3.76	12%	0.00	0.000	0.38
PAR38 LEDs - Electric and Gas Savings	97%	82.77	0.012	0.00	93%	79.35	0.012	0.00
Pipe Wrap - Electric (per foot)	n/a	59.47	0.007	0.00	100%	59.47	0.007	0.00
Pipe Wrap - Gas (per foot)	n/a	0.00	0.000	2.55	100%	0.00	0.000	2.55
Programmable Thermostat - Electric Cooling and Gas Heating Savings	100%	57.33	0.000	62.31	89%	57.33	0.000	62.31
Programmable Thermostat - Gas Heating Only Savings	100%	0.00	0.000	62.31	89%	0.00	0.000	55.46
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	100%	96.62	0.174	68.86	89%	95.55	0.172	68.86
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	90%	1,434.82	0.089	0.00	89%	1,420.58	0.088	0.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	90%	96.62	0.174	0.00	89%	95.55	0.172	0.00
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	100%	0.00	0.000	68.86	89%	0.00	0.000	61.28

^a Ex ante savings for gasket measures represent the savings value for a 10-pack which is how these measures were reflected in program tracking data. The verified savings in this table represent per-unit audited savings for a single gasket. To calculate verified savings, we applied the 12% ISR to the quantity of individual gaskets distributed through the program and multiplied that quantity by the audited per-gasket savings.

Ex Post Gross Savings

The evaluation team reviewed the program's *ex ante* assumptions, sources, and algorithms for reasonableness and updates. Below are detailed *ex post* gross analysis results.

Engineering Reviews

The evaluation team primarily referred to the Illinois TRM v12.0 for evaluation methodology and variable assumptions to calculate *ex post* gross electric energy savings, demand reduction, and natural gas savings. The new Indiana TRM v1.0 supported this approach, and we followed the guidelines with respect to heating and cooling hours laid out by the Indiana TRM. *Appendix 4. IQW Program*

Algorithms and Assumptions contains more specific details on the algorithms, variable assumptions, and references for all program measure *ex post* gross calculations.

At the program level, realization rates were 123%, 157%, and 100% for electric, demand, and gas savings, respectively, though they varied at the measure level. Through the engineering review, the evaluation team identified notable differences between *ex ante* and *ex post* savings for all measures. The following factors primarily drove the differences:

- The 2024 *ex ante* savings used 2022 EM&V values in savings calculations when it would have been more appropriate to use the default values in the Illinois TRM v12.0 because past EM&V reports may include outdated assumptions from previous Illinois TRM versions or different TRMs depending on the year. This discrepancy occurred for faucet aerators, low-flow showerheads, duct sealing, and advanced thermostats.
- For attic insulation and air sealing measures, the *ex ante* savings multiplied heating and cooling savings by a percentage value meant to be used when the heating and cooling equipment is unknown. However, the heating and cooling equipment was known as it was included in the program tracking data. These discrepancies resulted in >100% realization rates.
- For refrigerator replacement, most refrigerators received near 100% realization rates, but due to *ex ante* savings using generic values and *ex post* using specific refrigerator specifications, realization rates varied.
- For the outlet gasket measure, the evaluation team multiplied the quantity of gaskets (n=10) by the savings twice in *ex ante* savings. Adjusting this to the actual quantity of gaskets resulted in a 10% realization rate.

As described in the *Audited Savings* section, there were measures incentivized at the beginning of 2024 that used 2023 *ex ante* savings assumptions. These Legacy Measures all had discrepancies between *ex ante* and *ex post* savings. For more specific details into these discrepancies, see the 2023 DSM Portfolio Evaluation Report.

Ex Post Gross Savings Summary

Table 97 shows the *ex ante* deemed savings and *ex post* gross per-measure savings for 2024 IQW program measures. A key driver in the realization rates was the use of non-100% HVAC modifiers for many measures that included cooling and heating savings. Additionally, *ex ante* savings for many measures used the 2022

EM&V report to inform some savings inputs when deemed values were listed in the Illinois TRM v12.0. These differences are explained in greater detail in Table 69, below.

Table 69. 2024 IQW Program *Ex Ante* & *Ex Post* Gross Per-Measure Savings Values

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Air Sealing - Electric Cooling and Gas Heating Savings	Home	130.09	0.125	31.25	345.04	0.250	92.68
Air Sealing - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	Home	104.78	0.054	123.27	386.85	0.637	80.97
Air Sealing - Electric Cooling and Heating Savings - Legacy 2023 Measure	Home	2,259.93	0.125	0.00	1,279.91	0.533	0.00
Air Sealing - Electric Cooling Only Savings	Home	73.67	0.071	0.00	188.89	0.181	0.00
Air Sealing - Electric Heating Only Savings	Home	229.96	0.000	0.00	999.82	0.000	0.00
Air Sealing - Electric Heating Only Savings - Legacy 2023 Measure	Home	2,127.31	0.000	0.00	81.59	0.000	0.00
Air Sealing - Gas Heating Only Savings (Combo Customer) - Legacy 2023 Measure	Home	53.89	0.000	215.07	81.59	0.000	88.68
Air Sealing - Gas Heating Only Savings (Gas Only Customer)	Home	0.00	0.000	32.14	0.00	0.000	92.82
Air Sealing - Gas Heating Only Savings (Gas Only Customer) - Legacy 2023 Measure	Home	0.00	0.000	133.10	0.00	0.000	85.25
A-Line LEDs - Electric and Gas Savings	Lamp	38.07	0.005	0.00	39.25	0.005	0.00
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	Lamp	28.52	0.004	0.00	28.51	0.004	0.00
A-Line LEDs - Electric Only Savings	Lamp	38.07	0.005	0.00	39.25	0.005	0.00
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	Lamp	28.42	0.004	0.00	28.47	0.004	0.00
Assessment Recommendations - Electric and Gas Savings	Home	21.60	0.012	2.74	21.26	0.010	2.69
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	Home	21.26	0.012	2.69	21.26	0.012	2.69
Assessment Recommendations - Electric Only	Home	21.6	0.012	0.00	21.28	0.010	0.00
Assessment Recommendations - Electric Only - Legacy 2023 Measure	Home	21.28	0.012	0.00	21.28	0.012	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Assessment Recommendations - Gas Only	Home	0.00	0.000	2.74	0.00	0.000	2.70
Assessment Recommendations - Gas Only - Legacy 2023 Measure	Home	0.00	0.000	2.70	0.00	0.000	2.70
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	Per ksf	208.18	0.141	59.18	446.23	0.253	175.93
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	Per ksf	236.05	0.116	206.75	339.25	0.405	142.63
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Heating Savings - Legacy 2023 Measure	Per ksf	4,942.52	0.068	0.00	2,020.56	0.485	0.00
Attic Insulation (Uninsulated Hatch) - Electric Cooling Only Savings	Per ksf	146.65	0.141	0.00	2,430.37	0.300	0.00
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings	Per ksf	676.62	0.000	0.00	2,119.41	0.000	0.00
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings - Legacy 2023 Measure	Per ksf	4,706.47	0.000	0.00	2,119.41	0.000	0.00
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Combo Customer) - Legacy 2023 Measure	Per ksf	102.15	0.000	210.31	140.53	0.000	142.76
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	Per ksf	0.00	0.000	108.50	0.00	0.000	171.24
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer) - Legacy 2023 Measure	Per ksf	0.00	0.000	213.37	0.00	0.000	137.57
Bathroom Aerator 1.0 gpm - Electric	Aerator	17.37	0.024	0.00	24.69	0.030	0.00
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	Aerator	33.80	0.003	0.00	20.63	0.002	0.00
Bathroom Aerator 1.0 gpm - Gas	Aerator	0.00	0.000	0.74	0.00	0.000	1.06
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	Aerator	0.00	0.000	1.49	0.00	0.000	0.88
Candelabra LEDs - Electric and Gas Savings	Lamp	28.24	0.004	0.00	29.12	0.004	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	Lamp	30.20	0.004	0.00	29.77	0.004	0.00
Candelabra LEDs - Electric Only Savings	Lamp	28.24	0.004	0.00	29.12	0.004	0.00
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	Lamp	30.20	0.004	0.00	29.78	0.004	0.00
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	Lamp	51.53	0.007	0.00	50.16	0.007	0.00
Duct Sealing Package - Electric Cooling and Gas Heating Savings	Home	99.66	0.076	56.40	219.80	0.210	65.88
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	Home	61.39	0.138	56.43	130.78	0.268	50.62
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	Home	1,189.56	0.354	0.00	1,148.48	0.268	0.00
Duct Sealing Package - Electric Cooling Only Savings	Home	47.77	0.076	0.00	720.57	0.153	0.00
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	Home	49.02	0.112	0.00	258.26	0.268	0.00
Duct Sealing Package - Electric Heating Only Savings	Home	994.46	0.000	0.00	1,285.26	0.153	0.00
Duct Sealing Package - Electric Heating Only Savings - Legacy 2023 Measure	Home	1,245.82	0.000	0.00	1,339.65	0.200	0.00
Duct Sealing Package - Gas Heating Only Savings	Home	0.00	0.000	56.40	0.00	0.000	65.75
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	Home	0.00	0.000	56.43	0.00	0.000	50.07
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: <1993, New Capacity: 20 CF) - HD - Legacy 2023 Measure	Refrigerator	1,618.24	0.238	0.00	513.52	0.077	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 16 CF)	Refrigerator	437.15	0.054	0.00	421.11	0.064	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 18 CF)	Refrigerator	425.01	0.053	0.00	450.26	0.068	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 20 CF)	Refrigerator	405.34	0.050	0.00	480.42	0.072	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 14 CF) - HD - Legacy 2023 Measure	Refrigerator	395.94	0.058	0.00	413.96	0.062	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 16 CF) - HD - Legacy 2023 Measure	Refrigerator	379.94	0.056	0.00	421.11	0.064	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 18 CF) - HD - Legacy 2023 Measure	Refrigerator	439.87	0.065	0.00	450.26	0.068	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 20 CF) - HD - Legacy 2023 Measure	Refrigerator	473.62	0.070	0.00	480.42	0.072	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 18 CF)	Refrigerator	407.18	0.051	0.00	450.26	0.068	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 20 CF)	Refrigerator	388.00	0.048	0.00	480.42	0.072	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: Before 1990, New Capacity: 20 CF)	Refrigerator	928.41	0.115	0.00	480.42	0.072	0.00
Globe LEDs - Electric and Gas Savings	Lamp	26.67	0.004	0.00	27.50	0.004	0.00
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	Lamp	28.52	0.004	0.00	28.50	0.004	0.00
Globe LEDs - Electric Only Savings	Lamp	26.67	0.004	0.00	27.50	0.004	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	Lamp	28.52	0.004	0.00	28.39	0.004	0.00
Kitchen Aerator 1.5 gpm - Electric	Aerator	34.04	0.007	0.00	229.46	0.050	0.00
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	Aerator	180.09	0.008	0.00	199.82	0.006	0.00
Kitchen Aerator 1.5 gpm - Gas	Aerator	0.00	0.000	1.57	0.00	0.000	9.84
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	Aerator	0.00	0.000	7.92	0.00	0.000	8.54
Low-Flow Showerhead 1.5 gpm - Electric	Showerhead	169.80	0.017	0.00	226.69	0.020	0.00
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	Showerhead	306.39	0.017	0.00	136.61	0.002	0.00
Low-Flow Showerhead 1.5 gpm - Gas	Showerhead	0.00	0.000	7.28	0.00	0.000	6.58
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	Showerhead	0.00	0.000	13.48	0.00	0.000	5.86
Low-Flow Showerhead with Shower Start - Electric	Showerhead	228.45	0.021	0.00	262.18	0.030	0.00
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	Showerhead	408.32	0.046	0.00	167.68	0.002	0.00
Low-Flow Showerhead with Shower Start - Gas	Showerhead	0.00	0.000	9.79	0.00	0.000	8.10
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	Showerhead	0.00	0.000	17.96	0.00	0.000	7.19
Outlet Gaskets - Electric Cooling and Gas Heating Savings	Gasket	9.60	0.009	3.76	0.99	0.001	0.38
Outlet Gaskets - Electric Cooling and Heating Savings	Gasket	91.20	0.087	0.00	9.12	0.001	0.00
Outlet Gaskets - Electric Cooling Only Savings	Gasket	9.60	0.009	0.00	0.96	0.001	0.00
Outlet Gaskets - Electric Heating Only Savings	Gasket	81.60	0.000	0.00	8.16	0.000	0.00
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	Gasket	0.00	0.000	3.76	0.00	0.000	0.37
PAR38 LEDs - Electric and Gas Savings	Lamp	82.77	0.012	0.00	85.33	0.013	0.00
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	Lamp	103.36	0.014	0.00	88.08	0.012	0.00
Pipe Wrap - Electric (per foot)	Per foot	59.47	0.007	0.00	55.76	0.010	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	Per foot	24.82	0.003	0.00	60.66	0.007	0.00
Pipe Wrap - Gas (per foot)	Per foot	0.00	0.000	2.55	0.00	0.000	2.39
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	Per foot	0.00	0.000	1.11	0.00	0.000	2.60
Programmable Thermostat - Electric Cooling and Gas Heating Savings	Home	57.33	0.000	62.31	49.11	0.000	53.38
Programmable Thermostat - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	Home	98.15	0.000	74.35	57.33	0.000	62.31
Programmable Thermostat - Electric Cooling and Heating Savings - Legacy 2023 Measure	Home	2,190.44	0.000	0.00	1,288.17	0.000	0.00
Programmable Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	Home	98.15	0.000	0.00	0.00	0.000	0.00
Programmable Thermostat - Gas Heating Only Savings	Home	0.00	0.000	62.31	0.00	0.000	52.88
Programmable Thermostat - Gas Heating Only Savings - Legacy 2023 Measure	Home	0.00	0.000	74.35	0.00	0.000	61.93
Smart WiFi Programmable Thermostat - Electric Cooling and Gas Heating Savings	Home	96.62	0.174	68.86	253.68	0.190	85.42
Smart WiFi Programmable Thermostat - Electric Cooling and Heating Savings	Home	1,434.82	0.089	0.00	1,941.58	0.190	0.00
Smart WiFi Programmable Thermostat - Electric Cooling Only Savings	Home	96.62	0.174	0.00	167.51	0.000	0.00
Smart WiFi Programmable Thermostat - Gas Heating Only Savings	Home	0.00	0.000	68.86	0.00	0.000	83.81

Table 70 highlights notable differences between *ex ante* and *ex post* gross estimates.

Table 70. 2024 IQW Notable Differences Between *Ex Ante* & *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Faucet Aerators	Uses Illinois TRM, 2022 EM&V values, rated flow of aerator	Uses the Illinois TRM (v12.0) for all inputs	<i>Ex ante</i> supply temperature is informed by the 2022 EM&V Report whereas <i>ex post</i> savings use the Illinois TRM (v12.0). <i>Ex ante</i>

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
			savings use the rated flow of the faucet for Low-Flow GPM, but <i>ex post</i> savings use the Illinois TRM (v12.0) value.
Low-Flow Showerhead	Uses Illinois TRM, 2022 EM&V values, assumed 1.5 gpm-eff.	Illinois TRM (v12.0) and participant survey; cold water inlet temperature from IL TRM; gpm-eff from IL TRM.	<i>Ex ante</i> supply temperature is informed by the 2022 EM&V Report whereas <i>ex post</i> savings use the Illinois TRM (v12.0). <i>Ex ante</i> savings use the rated flow of the faucet for Low-Flow GPM, but <i>ex post</i> savings use the Illinois TRM (v12.0) value. Additionally, <i>ex post</i> savings leverage the 2024 participant survey to inform the number of showers per person.
Attic Insulation	Uses IL TRM (v12.0) for all inputs, uses %cool and %heat when cooling and equipment types are known.	Uses IL TRM (v12.0) for all inputs, uses 100% or 0% for %cool and %heat depending on project HVAC.	<i>Ex ante</i> savings incorporate %heat and %cool despite having information as to the HVAC systems of each project.
Duct Sealing	Uses IL TRM (v12.0) for electric and demand savings, uses deemed gas savings. Uses 2022 EM&V report for Distribution Efficiency (DE) values and hours.	Uses IL TRM (v12.0) for all inputs and savings algorithms.	<i>Ex ante</i> therm savings are deemed from a previous evaluation year; <i>ex post</i> therm savings are calculated using the IL TRM (v12.0). Additionally, <i>ex ante</i> savings inform DE and hours values from the 2022 EM&V report, <i>ex post</i> uses the Illinois TRM (v12.0).
Refrigerator Replacement	Uses IL TRM (v12.0) for savings calculations. Uses generic refrigerator specs for all measures.	Uses IL TRM (v12.0) for savings calculations. Uses specific refrigerator specs for each line item.	<i>Ex ante</i> savings use generic refrigerator specs, causing a difference in <i>ex post</i> savings.
Pipe Wrap	Illinois TRM (v12.0), pipe length does not use the IL TRM guidelines with alpha value to assume a vertical section of pipe.	Illinois TRM (v12.0), pipe length used IL TRM guidelines with alpha value to assume a vertical section of pipe.	The Illinois TRM (v12) dictates that the first 3 inches of pipe is vertical, and vertical pipes have lower savings than horizontal. <i>Ex ante</i> savings assume the whole pipe is horizontal.
Outlet Gaskets	Uses IL TRM (v12.0) for all inputs, mistakenly accounts	Uses IL TRM(v12.0) for all inputs, updates quantity to	<i>Ex ante</i> savings mistakenly multiplies per unit savings by the quantity of gaskets twice.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
	for 100 gaskets instead of 10.	10 gaskets per project.	
Advanced Thermostats	Uses IL TRM (v12.0) for most inputs. Uses 2022 EM&V report for hours	Uses IL TRM (v12.0) for all inputs and savings algorithms.	<i>Ex ante</i> savings use hours from the 2022 EM&V reports, <i>ex post</i> savings use the Illinois TRM (v12).
Air Sealing	Uses IL TRM (v12.0) for all inputs, uses %cool and %heat when cooling and equipment types are known.	Uses IL TRM (v12.0) for all inputs, uses 100% or 0% for %cool and %heat depending on project HVAC.	<i>Ex ante</i> savings incorporate %heat and %cool despite having information as to the HVAC systems of each project.
Programmable Thermostats	Uses IL TRM (v12.0) for most inputs. Uses 2022 EM&V report for hours	Uses IL TRM (v12.0) for all inputs and savings algorithms.	<i>Ex ante</i> savings use hours from the 2022 EM&V reports, <i>ex post</i> savings use the Illinois TRM (v12).

Waste Heat Factor – Therm Penalties

The evaluation team did not include therm penalties when calculating evaluated savings for the 2024 IQW program. However, cost-effectiveness results for both the gas and electric programs will include these penalties. The evaluation team believes this approach is appropriate as it accounts for the penalty on the electric side (where it is generated) and allows the evaluation team to show gas program performance and measure performance more clearly.

These values are not included in the *ex post* analysis; the evaluation team reports them below to be used in the cost-effectiveness analysis. *Ex ante* therm penalties from lighting totaled -3,947.18 therms (from the tracking data). In total, the therm penalty for the cost-effectiveness analysis is -4,427.43 therms (Table 71).

Table 71. IQW Program Waste Heat Factor Therm Penalty

MEASURE	WASTE HEAT FACTOR THERM PENALTY
A-Line LEDs - Electric and Gas Savings	(2,856.38)
Candelabra LEDs - Electric and Gas Savings	(627.18)
Downlight Fixture and Retrofit Kit	(23.97)
Globe LEDs - Electric and Gas Savings	(421.95)
PAR38 LEDs - Electric and Gas Savings	(497.95)
Total	(4,427.43)

Realization Rates

The next three tables (Table 72 through Table 74) show the program's *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms. Air sealing, attic insulation, and duct sealing had high participation and realization rates, driving the high electric and demand realization rates.

Table 72. 2024 IQW Program *Ex Ante* & *Ex Post* Gross Electric Energy Savings

MEASURE	<i>EX ANTE</i> ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	<i>EX POST</i> GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Air Sealing - Electric Cooling and Gas Heating Savings	9,756.75	9,756.75	9,756.75	25,878.00
Air Sealing - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	5,448.56	5,448.56	5,448.56	20,116.20
Air Sealing - Electric Cooling and Heating Savings - Legacy 2023 Measure	2,259.93	2,259.93	2,259.93	1,279.91
Air Sealing - Electric Cooling Only Savings	73.67	73.67	73.67	188.89
Air Sealing - Electric Heating Only Savings	229.96	229.96	229.96	999.82
Air Sealing - Electric Heating Only Savings - Legacy 2023 Measure	2,127.31	2,127.31	2,127.31	81.59
Air Sealing - Gas Heating Only Savings (Combo Customer) - Legacy 2023 Measure	107.78	107.78	107.78	163.17
Air Sealing - Gas Heating Only Savings (Gas Only Customer)	0.00	0.00	0.00	0.00
Air Sealing - Gas Heating Only Savings (Gas Only Customer) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
A-Line LEDs - Electric and Gas Savings	74,655.27	74,655.27	71,576.95	76,969.25
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	36,191.88	36,191.88	36,191.88	36,179.19
A-Line LEDs - Electric Only Savings	1,789.29	1,789.29	1,715.51	1,844.75
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	1,477.84	1,477.84	1,477.84	1,480.44
Assessment Recommendations - Electric and Gas Savings	8,899.20	8,899.20	8,276.26	8,145.98
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	4,443.34	4,443.34	4,087.87	4,087.87
Assessment Recommendations - Electric Only	194.40	194.40	180.79	178.11
Assessment Recommendations - Electric Only - Legacy 2023 Measure	106.40	106.40	97.89	97.89
Assessment Recommendations - Gas Only	0.00	0.00	0.00	0.00
Assessment Recommendations - Gas Only - Legacy 2023 Measure	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	12,050.34	12,050.34	12,050.34	25,829.32
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	12,461.35	12,461.35	12,461.35	17,909.35
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Heating Savings - Legacy 2023 Measure	5,071.03	5,071.03	5,071.03	2,073.09
Attic Insulation (Uninsulated Hatch) - Electric Cooling Only Savings	418.10	418.10	418.10	6,928.98
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings	466.87	466.87	466.87	1,462.39
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings - Legacy 2023 Measure	6,466.69	6,466.69	6,466.69	2,912.07
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Combo Customer) - Legacy 2023 Measure	523.82	523.82	523.82	720.64
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	0.00	0.00	0.00	0.00
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Electric	104.22	104.22	104.22	148.14
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	371.80	371.80	371.80	226.93
Bathroom Aerator 1.0 gpm - Gas	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric and Gas Savings	16,181.52	16,181.52	15,515.67	16,685.76
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	11,566.60	11,566.60	11,566.60	11,401.91
Candelabra LEDs - Electric Only Savings	367.12	367.12	352.01	378.56
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	90.60	90.60	90.60	89.34
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	1,133.66	1,133.66	1,133.66	1,103.52
Duct Sealing Package - Electric Cooling and Gas Heating Savings	28,702.08	28,702.08	28,702.08	63,302.40
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	7,305.41	7,305.41	7,305.41	15,562.82
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	2,379.12	2,379.12	2,379.12	2,296.96
Duct Sealing Package - Electric Cooling Only Savings	238.85	238.85	238.85	3,602.83

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	392.16	392.16	392.16	2,066.08
Duct Sealing Package - Electric Heating Only Savings	994.46	994.46	994.46	1,285.26
Duct Sealing Package - Electric Heating Only Savings - Legacy 2023 Measure	2,491.64	2,491.64	2,491.64	2,679.30
Duct Sealing Package - Gas Heating Only Savings	0.00	0.00	0.00	0.00
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: <1993, New Capacity: 20 CF) - HD - Legacy 2023 Measure	1,618.24	1,618.24	1,618.24	513.52
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 16 CF)	1,311.45	1,311.45	1,311.45	1,263.33
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 18 CF)	14,025.33	14,025.33	14,025.33	14,858.71
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 20 CF)	13,781.56	13,781.56	13,781.56	16,334.25
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 14 CF) - HD - Legacy 2023 Measure	791.88	791.88	791.88	827.92
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 16 CF) - HD - Legacy 2023 Measure	5,699.10	5,699.10	5,699.10	6,316.64
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 18 CF) - HD - Legacy 2023 Measure	21,553.63	21,553.63	21,553.63	22,062.94
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 20 CF) - HD - Legacy 2023 Measure	25,101.86	25,101.86	25,101.86	25,462.21
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 18 CF)	4,886.16	4,886.16	4,886.16	5,403.17
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 20 CF)	5,044.00	5,044.00	5,044.00	6,245.45
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: Before 1990, New Capacity: 20 CF)	1,856.82	1,856.82	1,856.82	960.84
Globe LEDs - Electric and Gas Savings	11,254.74	11,254.74	10,792.07	11,605.00
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	7,386.68	7,386.68	7,386.68	7,381.50

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Globe LEDs - Electric Only Savings	106.68	106.68	102.29	110.00
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	513.36	513.36	513.36	511.02
Kitchen Aerator 1.5 gpm - Electric	204.24	204.24	197.63	1,376.76
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	1,260.63	1,260.63	1,260.63	1,398.74
Kitchen Aerator 1.5 gpm - Gas	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Electric	339.60	339.60	355.39	453.38
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	919.17	919.17	919.17	409.83
Low-Flow Showerhead 1.5 gpm - Gas	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Low-Flow Showerhead with Shower Start - Electric	456.90	456.90	478.14	524.36
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	2,858.24	2,858.24	2,858.24	1,173.76
Low-Flow Showerhead with Shower Start - Gas	0.00	0.00	0.00	0.00
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Outlet Gaskets - Electric Cooling and Gas Heating Savings	23,721.60	2,372.16	284.66	294.74
Outlet Gaskets - Electric Cooling and Heating Savings	1,824.00	182.40	21.89	21.89
Outlet Gaskets - Electric Cooling Only Savings	384.00	38.40	4.61	4.61
Outlet Gaskets - Electric Heating Only Savings	816.00	81.60	9.79	9.79
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	0.00	0.00	0.00	0.00
PAR38 LEDs - Electric and Gas Savings	14,319.21	14,319.21	13,728.15	14,762.09
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	8,888.96	8,888.96	8,888.96	7,574.88
Pipe Wrap - Electric (per foot)	6,839.05	6,839.05	6,839.05	6,412.40
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	1,886.32	1,886.32	1,886.32	4,610.16
Pipe Wrap - Gas (per foot)	0.00	0.00	0.00	0.00
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Programmable Thermostat - Electric Cooling and Gas Heating Savings	57.33	57.33	51.02	43.71
Programmable Thermostat - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	4,024.15	4,024.15	4,024.15	2,350.53

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Programmable Thermostat - Electric Cooling and Heating Savings - Legacy 2023 Measure	2,190.44	2,190.44	2,190.44	1,288.17
Programmable Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	196.30	196.30	196.30	0.00
Programmable Thermostat - Gas Heating Only Savings	0.00	0.00	0.00	0.00
Programmable Thermostat - Gas Heating Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	17,294.98	17,294.98	17,103.13	45,408.72
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	1,434.82	1,434.82	1,420.58	1,941.58
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	483.10	483.10	477.74	837.55
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	0.00	0.00	0.00	0.00
Total Savings	462,869.55	438,798.51	430,365.87	567,110.85
Total Program Realization Rate				123%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 73. 2024 IQW Program *Ex Ante* & *Ex Post* Gross Peak Demand Reduction

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Air Sealing - Electric Cooling and Gas Heating Savings	9.375	9.375	9.375	18.750
Air Sealing - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	2.808	2.808	2.808	33.124
Air Sealing - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.125	0.125	0.125	0.533
Air Sealing - Electric Cooling Only Savings	0.071	0.071	0.071	0.181
Air Sealing - Electric Heating Only Savings	0.000	0.000	0.000	0.000
Air Sealing - Electric Heating Only Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Air Sealing - Gas Heating Only Savings (Combo Customer) - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Air Sealing - Gas Heating Only Savings (Gas Only Customer)	0.000	0.000	0.000	0.000
Air Sealing - Gas Heating Only Savings (Gas Only Customer) - Legacy 2023 Measure	0.000	0.000	0.000	0.000
A-Line LEDs - Electric and Gas Savings	9.805	9.805	8.810	9.473
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	5.076	5.076	5.076	5.076
A-Line LEDs - Electric Only Savings	0.235	0.235	0.211	0.227
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	0.208	0.208	0.208	0.208
Assessment Recommendations - Electric and Gas Savings	4.944	4.944	4.598	3.832
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	2.508	2.508	2.307	2.307
Assessment Recommendations - Electric Only	0.108	0.108	0.100	0.084
Assessment Recommendations - Electric Only - Legacy 2023 Measure	0.060	0.060	0.055	0.055
Assessment Recommendations - Gas Only	0.000	0.000	0.000	0.000
Assessment Recommendations - Gas Only - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	8.161	8.161	8.161	14.636
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	6.125	6.125	6.125	21.380
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.070	0.070	0.070	0.498
Attic Insulation (Uninsulated Hatch) - Electric Cooling Only Savings	0.402	0.402	0.402	0.855
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings	0.000	0.000	0.000	0.000
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Combo Customer) - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	0.000	0.000	0.000	0.000
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer) - Legacy 2023 Measure	0.000	0.000	0.000	0.000

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Bathroom Aerator 1.0 gpm - Electric	0.144	0.144	0.144	0.180
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	0.033	0.033	0.033	0.022
Bathroom Aerator 1.0 gpm - Gas	0.000	0.000	0.000	0.000
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Candelabra LEDs - Electric and Gas Savings	2.292	2.292	2.321	2.496
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	1.532	1.532	1.532	1.532
Candelabra LEDs - Electric Only Savings	0.052	0.052	0.053	0.057
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	0.012	0.012	0.012	0.012
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	0.154	0.154	0.154	0.154
Duct Sealing Package - Electric Cooling and Gas Heating Savings	21.888	21.888	21.888	60.480
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	16.422	16.422	16.422	31.892
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.708	0.708	0.708	0.536
Duct Sealing Package - Electric Cooling Only Savings	0.380	0.380	0.380	0.766
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	0.896	0.896	0.896	2.144
Duct Sealing Package - Electric Heating Only Savings	0.000	0.000	0.000	0.153
Duct Sealing Package - Electric Heating Only Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.400
Duct Sealing Package - Gas Heating Only Savings	0.000	0.000	0.000	0.000
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: <1993, New Capacity: 20 CF) - HD - Legacy 2023 Measure	0.238	0.238	0.238	0.077
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 16 CF)	0.162	0.162	0.162	0.191
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 18 CF)	1.749	1.749	1.749	2.241
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 20 CF)	1.700	1.700	1.700	2.464

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 14 CF) - HD - Legacy 2023 Measure	0.116	0.116	0.116	0.125
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 16 CF) - HD - Legacy 2023 Measure	0.840	0.840	0.840	0.953
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 18 CF) - HD - Legacy 2023 Measure	3.185	3.185	3.185	3.328
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 20 CF) - HD - Legacy 2023 Measure	3.710	3.710	3.710	3.840
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 18 CF)	0.612	0.612	0.612	0.815
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 20 CF)	0.624	0.624	0.624	0.942
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: Before 1990, New Capacity: 20 CF)	0.230	0.230	0.230	0.145
Globe LEDs - Electric and Gas Savings	1.688	1.688	1.614	1.736
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	1.036	1.036	1.036	1.036
Globe LEDs - Electric Only Savings	0.016	0.016	0.015	0.016
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	0.072	0.072	0.072	0.072
Kitchen Aerator 1.5 gpm - Electric	0.042	0.042	0.039	0.300
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	0.056	0.056	0.056	0.042
Kitchen Aerator 1.5 gpm - Gas	0.000	0.000	0.000	0.000
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Low-Flow Showerhead 1.5 gpm - Electric	0.034	0.034	0.036	0.040
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	0.051	0.051	0.051	0.006
Low-Flow Showerhead 1.5 gpm - Gas	0.000	0.000	0.000	0.000
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Low-Flow Showerhead with Shower Start - Electric	0.042	0.042	0.045	0.060
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	0.322	0.322	0.322	0.014
Low-Flow Showerhead with Shower Start - Gas	0.000	0.000	0.000	0.000

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Outlet Gaskets - Electric Cooling and Gas Heating Savings	22.239	2.224	0.267	0.343
Outlet Gaskets - Electric Cooling and Heating Savings	1.740	0.174	0.021	0.003
Outlet Gaskets - Electric Cooling Only Savings	0.360	0.036	0.004	0.006
Outlet Gaskets - Electric Heating Only Savings	0.000	0.000	0.000	0.000
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	0.000	0.000	0.000	0.000
PAR38 LEDs - Electric and Gas Savings	2.076	2.076	2.054	2.208
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	1.204	1.204	1.204	1.032
Pipe Wrap - Electric (per foot)	0.805	0.805	0.805	1.150
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	0.228	0.228	0.228	0.532
Pipe Wrap - Gas (per foot)	0.000	0.000	0.000	0.000
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Programmable Thermostat - Electric Cooling and Gas Heating Savings	0.000	0.000	0.000	0.000
Programmable Thermostat - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Programmable Thermostat - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Programmable Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Programmable Thermostat - Gas Heating Only Savings	0.000	0.000	0.000	0.000
Programmable Thermostat - Gas Heating Only Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	31.146	31.146	30.860	34.010
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	0.089	0.089	0.088	0.190
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	0.870	0.870	0.862	0.000
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	0.000	0.000	0.000	0.000
Total Savings	171.876	149.971	145.892	269.958
Total Program Realization Rate				157%

Note: Totals may not sum properly due to rounding.

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 74. 2024 IQW Program *Ex Ante* & *Ex Post* Gross Natural Gas Savings

MEASURE	EX ANTE ^A NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Air Sealing - Electric Cooling and Gas Heating Savings	2,343.75	2,343.75	2,343.75	6,951.00
Air Sealing - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	6,410.04	6,410.04	6,410.04	4,210.44
Air Sealing - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Air Sealing - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Air Sealing - Electric Heating Only Savings	0.00	0.00	0.00	0.00
Air Sealing - Electric Heating Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Air Sealing - Gas Heating Only Savings (Combo Customer) - Legacy 2023 Measure	430.14	430.14	430.14	177.36
Air Sealing - Gas Heating Only Savings (Gas Only Customer)	385.68	385.68	385.68	1,113.84
Air Sealing - Gas Heating Only Savings (Gas Only Customer) - Legacy 2023 Measure	665.50	665.50	665.50	426.25
A-Line LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
A-Line LEDs - Electric and Gas Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
A-Line LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
A-Line LEDs - Electric Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Assessment Recommendations - Electric and Gas Savings	1,128.88	1,128.88	1,049.86	1,030.70
Assessment Recommendations - Electric and Gas Savings - Legacy 2023 Measure	562.21	562.21	517.23	517.23
Assessment Recommendations - Electric Only	0.00	0.00	0.00	0.00
Assessment Recommendations - Electric Only - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Assessment Recommendations - Gas Only	380.86	380.86	354.20	349.03

MEASURE	EX ANTE ^A NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Assessment Recommendations - Gas Only - Legacy 2023 Measure	78.30	78.30	72.04	72.04
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings	3,425.56	3,425.56	3,425.56	10,183.32
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	10,914.55	10,914.55	10,914.55	7,529.58
Attic Insulation (Uninsulated Hatch) - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Attic Insulation (Uninsulated Hatch) - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings	0.00	0.00	0.00	0.00
Attic Insulation (Uninsulated Hatch) - Electric Heating Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Combo Customer) - Legacy 2023 Measure	1,078.47	1,078.47	1,078.47	732.07
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer)	1,964.94	1,964.94	1,964.94	3,101.16
Attic Insulation (Uninsulated Hatch) - Gas Heating Only Savings (Gas Only Customer) - Legacy 2023 Measure	2,204.54	2,204.54	2,204.54	1,421.37
Bathroom Aerator 1.0 gpm - Electric	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Gas	122.84	122.84	122.84	175.96
Bathroom Aerator 1.0 gpm - Gas - Legacy 2023 Measure	135.59	135.59	135.59	80.08
Candelabra LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric and Gas Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Downlight Fixture and Retrofit Kit - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Cooling and Gas Heating Savings	16,243.20	16,243.20	16,243.20	18,973.44

MEASURE	EX ANTE ^A NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Duct Sealing Package - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	6,715.17	6,715.17	6,715.17	6,023.78
Duct Sealing Package - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Cooling Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Heating Only Savings	0.00	0.00	0.00	0.00
Duct Sealing Package - Electric Heating Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Duct Sealing Package - Gas Heating Only Savings	9,024.00	9,024.00	9,024.00	10,520.00
Duct Sealing Package - Gas Heating Only Savings - Legacy 2023 Measure	3,498.66	3,498.66	3,498.66	3,104.34
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: <1993, New Capacity: 20 CF) - HD - Legacy 2023 Measure	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 16 CF)	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 18 CF)	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1990-2009, New Capacity: 20 CF)	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 14 CF) - HD - Legacy 2023 Measure	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 16 CF) - HD - Legacy 2023 Measure	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 18 CF) - HD - Legacy 2023 Measure	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 1993-2010, New Capacity: 20 CF) - HD - Legacy 2023 Measure	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^A NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 18 CF)	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: 2009-2014, New Capacity: 20 CF)	0.00	0.00	0.00	0.00
ENERGY STAR Refrigerator replace non-ENERGY STAR refrigerator (Old Model Year: Before 1990, New Capacity: 20 CF)	0.00	0.00	0.00	0.00
Globe LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
Globe LEDs - Electric and Gas Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Globe LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
Globe LEDs - Electric Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Electric	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Gas	208.81	208.81	208.67	1,308.72
Kitchen Aerator 1.5 gpm - Gas - Legacy 2023 Measure	657.36	657.36	657.36	708.82
Low-Flow Showerhead 1.5 gpm - Electric	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Gas	334.88	334.88	350.41	302.68
Low-Flow Showerhead 1.5 gpm - Gas - Legacy 2023 Measure	444.84	444.84	444.84	193.38
Low-Flow Showerhead with Shower Start - Electric	0.00	0.00	0.00	0.00
Low-Flow Showerhead with Shower Start - Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Low-Flow Showerhead with Shower Start - Gas	949.63	949.63	994.13	785.70
Low-Flow Showerhead with Shower Start - Gas - Legacy 2023 Measure	1,041.68	1,041.68	1,041.68	417.02
Outlet Gaskets - Electric Cooling and Gas Heating Savings	9,290.96	929.10	111.49	113.13
Outlet Gaskets - Electric Cooling and Heating Savings	0.00	0.00	0.00	0.00
Outlet Gaskets - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Outlet Gaskets - Electric Heating Only Savings	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^A NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Outlet Gaskets - Gas Heating Only Savings (Gas Only Customer)	3,835.20	383.52	46.02	44.97
PAR38 LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
PAR38 LEDs - Electric and Gas Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Pipe Wrap - Electric (per foot)	0.00	0.00	0.00	0.00
Pipe Wrap - Electric (per foot) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Pipe Wrap - Gas (per foot)	8,573.10	8,573.10	8,573.10	8,035.18
Pipe Wrap - Gas (per foot) - Legacy 2023 Measure	1,066.71	1,066.71	1,066.71	2,498.60
Programmable Thermostat - Electric Cooling and Gas Heating Savings	62.31	62.31	55.46	47.51
Programmable Thermostat - Electric Cooling and Gas Heating Savings - Legacy 2023 Measure	3,048.35	3,048.35	3,048.35	2,554.71
Programmable Thermostat - Electric Cooling and Heating Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Programmable Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Programmable Thermostat - Gas Heating Only Savings	373.86	373.86	296.13	282.38
Programmable Thermostat - Gas Heating Only Savings - Legacy 2023 Measure	2,007.45	2,007.45	2,007.45	1,672.11
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings	12,325.94	12,325.94	12,325.51	15,290.18
Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings	0.00	0.00	0.00	0.00
Smart Wi-Fi Programmable Thermostat - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Smart Wi-Fi Programmable Thermostat - Gas Heating Only Savings	6,472.84	6,472.84	5,760.62	7,878.14
Total Savings	118,406.80	106,593.26	104,543.88	118,826.21
Total Program Realization Rate				100%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Process Evaluation

The evaluation team performed participant surveys with 2024 IQW program participants to answer the following research questions:

- How has the program changed since 2023?
- How do participants become aware of the program? Has this changed over time?
- What drives participation in the program?
- What was the customer's experience with the audit like?
- How easy was it to schedule the audit and complete the application?
- How do contractors provide findings and recommendations from the audit to the participant? How do they discuss and provide the report?
- How do customers decide to move on and install additional measures? What is their experience like?
- How useful are the information and recommendations provided through the program?
- What energy-savings actions, if any, do participants take because of the assessment? Did they participate in any other programs?
- What are customer experiences with the direct-install measures? Are customers satisfied with the quality of work provided by the contractors?
- How satisfied were participants with the program, including the participation process and audit experience, as well as their level of satisfaction with the equipment they received?
- How satisfied are customers with NIPSCO?
- Do participants have any recommendations for program improvement?
- How has the number of replaced lightbulbs per home changed over time?

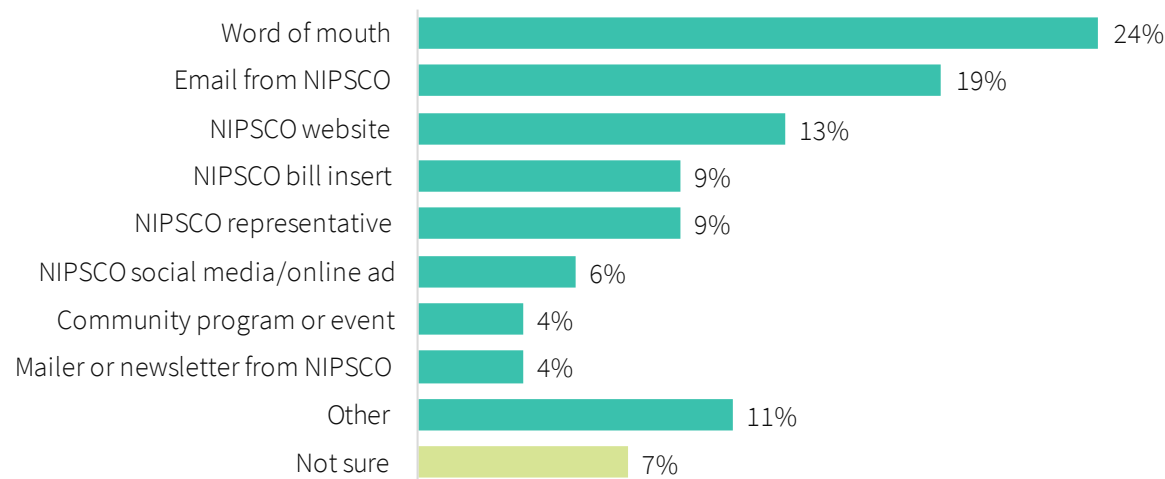
Participant Feedback

The evaluation team invited a census of 557 IQW program participants (from January 2024 until the end of December 2024) to complete the survey and received 54 responses. The team fielded the survey via phone (82%) and web (18%) in January 2025. The following sections describe the results related to participants' source of awareness, reasons for participation, experience with the in-home assessment, and satisfaction with the program, as well as program impacts on customers.

Energy Efficiency Awareness and Marketing

Respondents most frequently learned about the IQW program via word of mouth (24%) or an email from NIPSCO (19%) (Figure 42). The NIPSCO website was more popular in previous years, falling from 28% in 2022, when the evaluation team last surveyed IQW participants, to 13% in 2024. Two respondents also noted they learned about the program through the Energy Assistance program, and one said they saw a notification about it on the NIPSCO app.

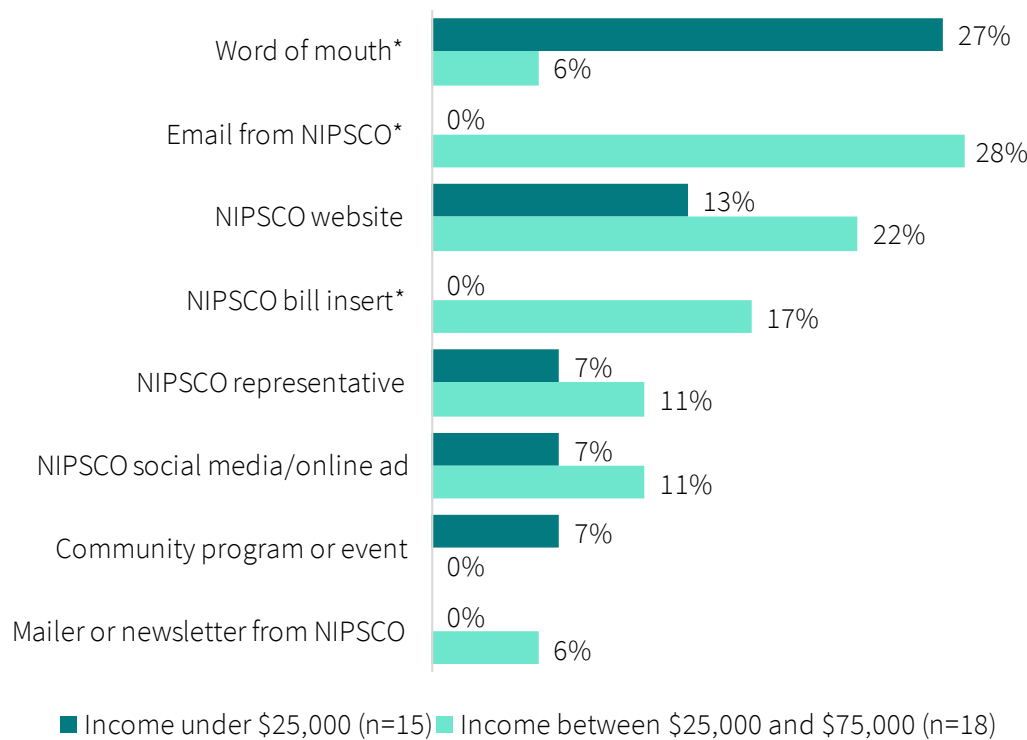
Figure 42. 2024 IQW Program Sources of Awareness



Source: IQW Participant Survey Question C.1. “How did you learn about NIPSCO’s IQW program?”
(Multiple responses allowed) (n=54).

There were some notable differences in how customers with an income below \$25,000 (n=15) learned about the program compared to those with an income of \$25,000 to \$75,000 (n=18) (Figure 43). Those with an income below \$25,000 were more likely to learn about the program through word of mouth (27% vs. 6%), while respondents with an income between \$25,000 and \$75,000 were more likely to learn about the program through digital means such as an email from NIPSCO (28% vs. 0%).

Figure 43. How Participants Learned About the IQW Program by Income Level

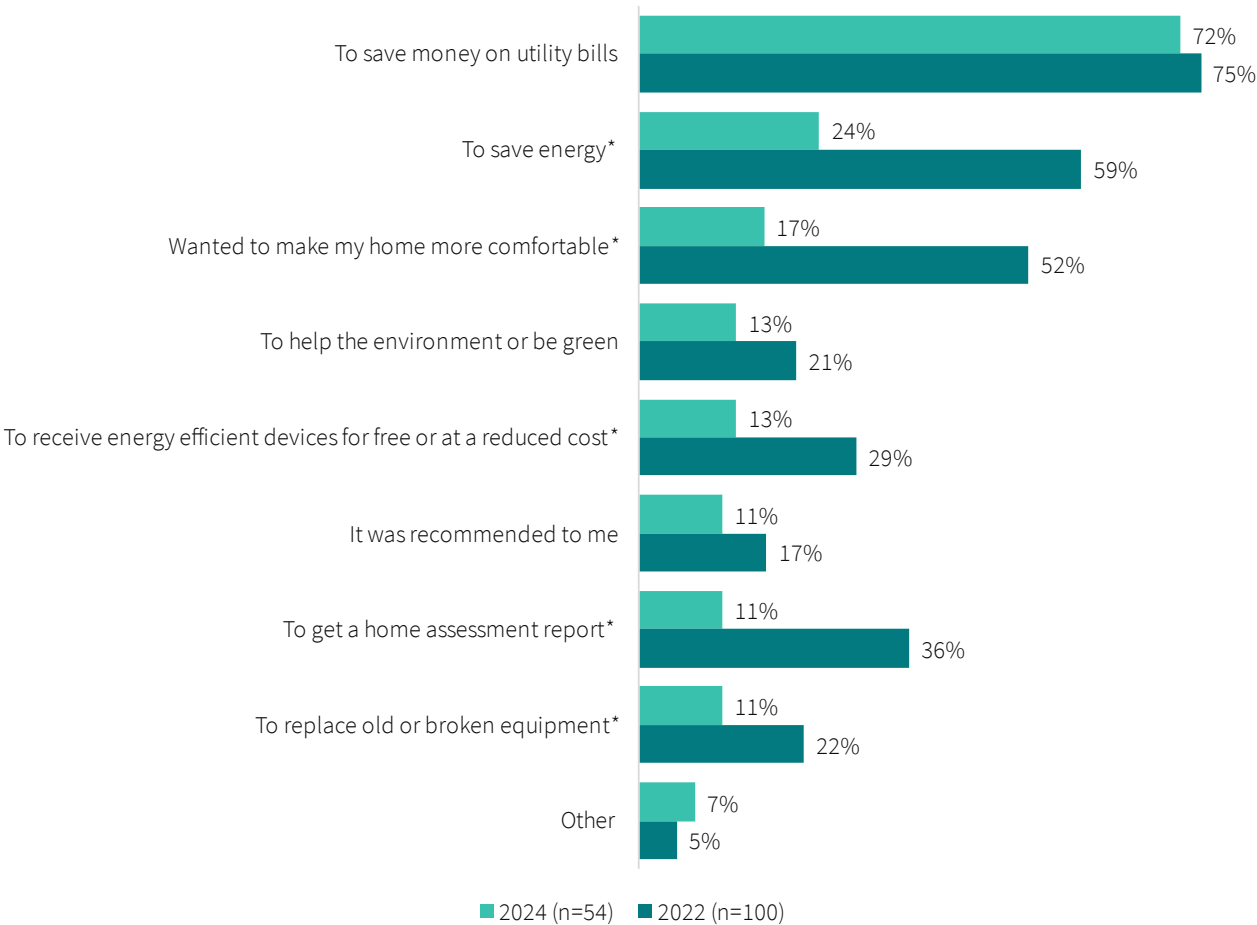


Source: IQW Participant Survey Question C.1. “How did you learn about NIPSCO’s IQW program?” (Multiple responses allowed).
*Difference between groups is significant at $p \leq 0.10$ (90% confidence).

Participation Drivers

Respondents indicated that they most often participated in the IQW program to save money on utility bills (72%) (Figure 44). This has consistently been the top participation driver for the last six years of program surveys; however, this year, bill savings were especially top of mind for most respondents. Respondents were far less likely to say they participated to save energy (24% in 2024 vs. 59% in 2022) or to make their home more comfortable (17% in 2024 vs. 52% in 2022) than in previous years.

Figure 44. Reasons for Participating in the IQW Program



Source: IQW Participant survey. Question D.1: “Why did you decide to participate in NIPSCO’s IQW program?” (Multiple responses allowed).

Note: * indicates difference between groups is significant at $p \leq 0.10$ (90% confidence).

Assessment Experience

Most respondents were “very satisfied” with the time between scheduling and when the assessment took place (85%) (Figure 45). In addition, nearly all respondents found the scheduling process *very easy* or *somewhat easy* (89%). One respondent had some trouble, stating, “It took a while to get an appointment, the phone number that you have to call made it troublesome to get a hold of anyone.”

Figure 45. Scheduling experience satisfaction

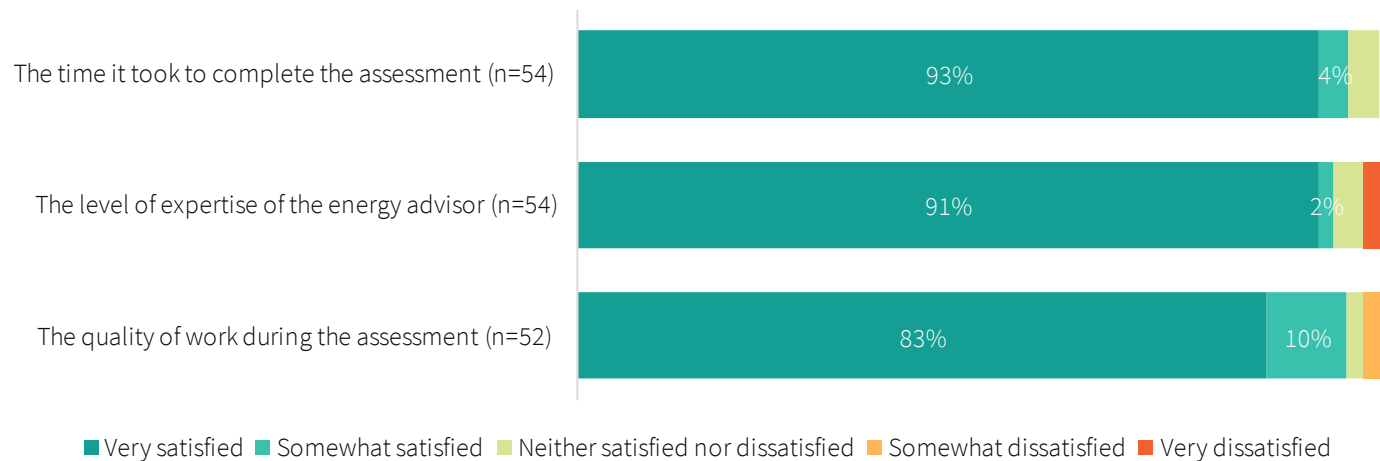


Source: IQW Participant survey E.12a. Question: “How satisfied were you with each of the following? The amount of time between scheduling and when the assessment took place. (n=54)

Many respondents were “very satisfied” or “somewhat satisfied” with the time it took to complete the assessment (97%), the level of expertise of the energy advisor (93%), and the quality of work completed during the assessment (93%).

However, one respondent was “very dissatisfied” with the level of expertise of the energy advisor (Figure 46). As was also noted by an HEA program participant, this respondent said, “After the representative installed the new energy efficient thermostat, my bills skyrocketed. The wrong settings were installed.”

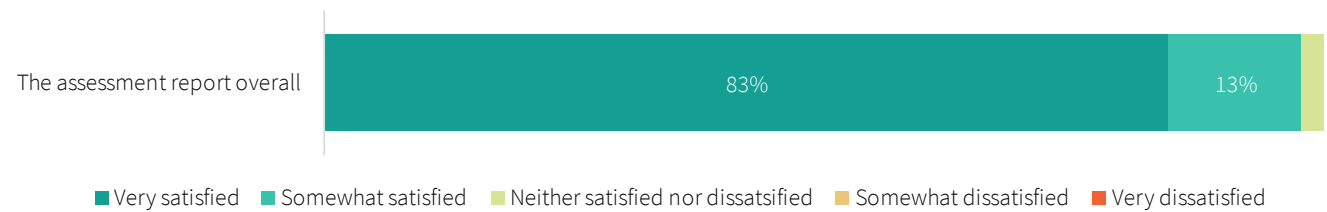
Figure 46. Satisfaction with assessment length, expertise of auditor, and quality of work



Source: IQW Participant survey. Questions E.12b, E.12d, E.12f: “How satisfied were you with each of the following? The time it took to complete the assessment. The level of expertise of the energy advisor. The quality of the work performed during the assessment.”

Per the program abstract, participants should receive a report via email during the assessment, or a physical copy in the mail if they do not have an email address, after the assessment is complete. Most respondents (91%) reported their energy advisor discussed the findings and recommendations with them and over three-fourths of respondents (85%) reported receiving the report itself. As seen in Figure 47, most respondents who received the report (83%) were *very satisfied* with it. This represents an increase in assessment report satisfaction compared to the 2022 IQW survey (73% *very satisfied*, n=77).

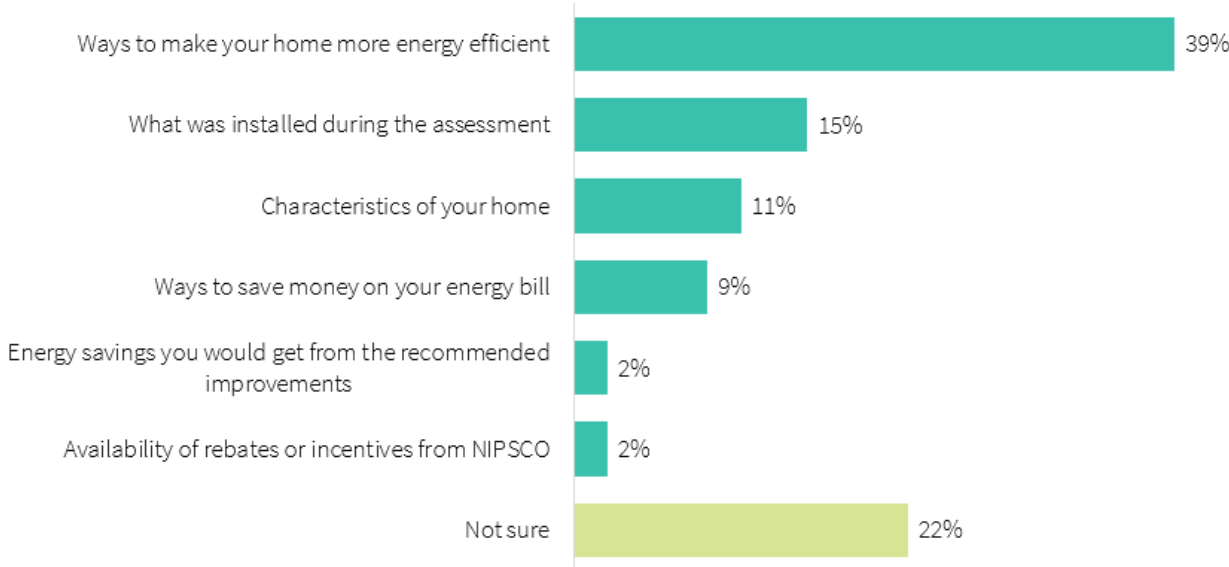
Figure 47. Satisfaction with assessment report



Source: IQW Participant survey. Question E.12c: “How satisfied were you with each of the following? The assessment report overall” (n=46)

Most respondents who received a report (87%) felt that the information included in the report was *very* or *somewhat easy* to understand. No respondents said that the information was *not very easy* or *not at all easy* to understand. Like 2022, respondents reported that the most useful information in the report was ways to make their homes more energy efficient (39%) (Figure 48). Notably, nearly a quarter of respondents were unsure what was useful in the report despite most reporting that it was easy to understand.

Figure 48. Usefulness rating of information in the report



Source: IQW Participant survey. Question E.10: “What information in the report did you find most useful?” (n=46)

One respondent said that they did not receive a report, and three other respondents felt like the auditors did not do much to their home or offer useful information. One of these respondents said:

“He claimed he changed out lightbulbs and I don’t see any evidence.”

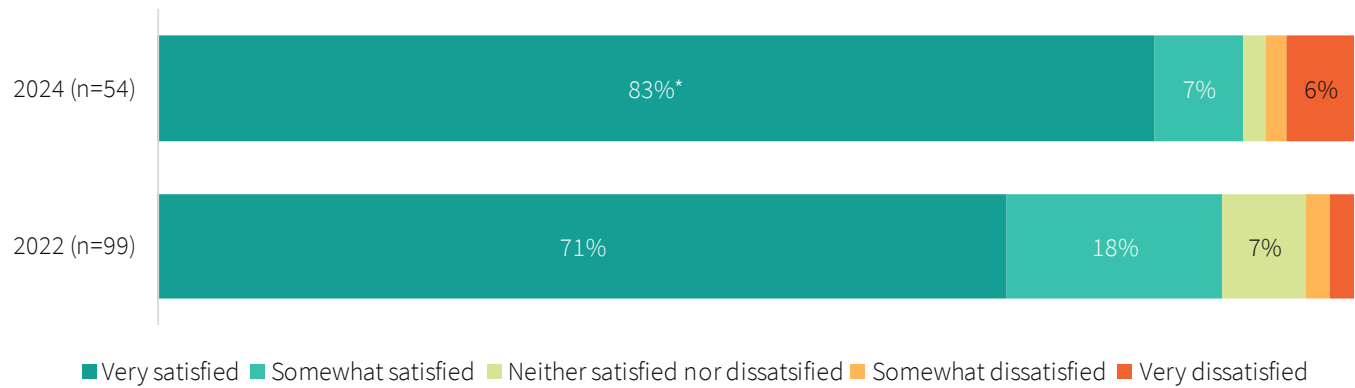
Another respondent said the advice did not feel actionable to them.

“The information provided was very basic and I know how to do it all, but I don’t have the funds to update everything in my household like doors, and windows and such. I wish there was some sort of assistance to accomplish this rather than just advice.”

A few respondents offered suggestions for improving information that was provided during the assessment or in the report. One noted that plainly stating what would use energy (more or less) would simplify the explanations given during the assessment.

Overall, most respondents (90%) were *very* or *somewhat satisfied* with the assessment. As shown in Figure 49, there was a significant increase in the proportion of 2024 respondents who said they were *very satisfied* (83%) compared to 2022 (71%).

Figure 49. Satisfaction with energy assessment



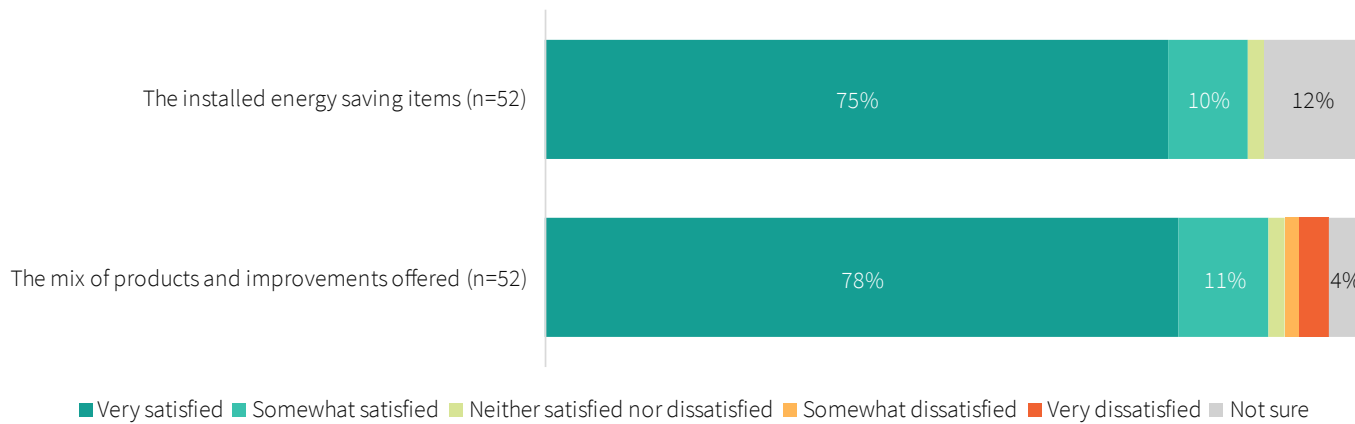
Source: IQW Participant survey. Question E.12i: “How satisfied were you with each of the following? The in-person assessment overall.”

Note: * indicates difference from previous year is significant at $p \leq 0.10$ (90% confidence).

Direct Install Measures

According to the program tracking data, 96% of respondents received direct-install measures in their home during the assessment. Respondents who received direct-install measures or services were generally satisfied with the installed energy saving items and the mix of products and improvements offered (Figure 50).

Figure 50. Satisfaction with installed items and mix of products and improvements offered



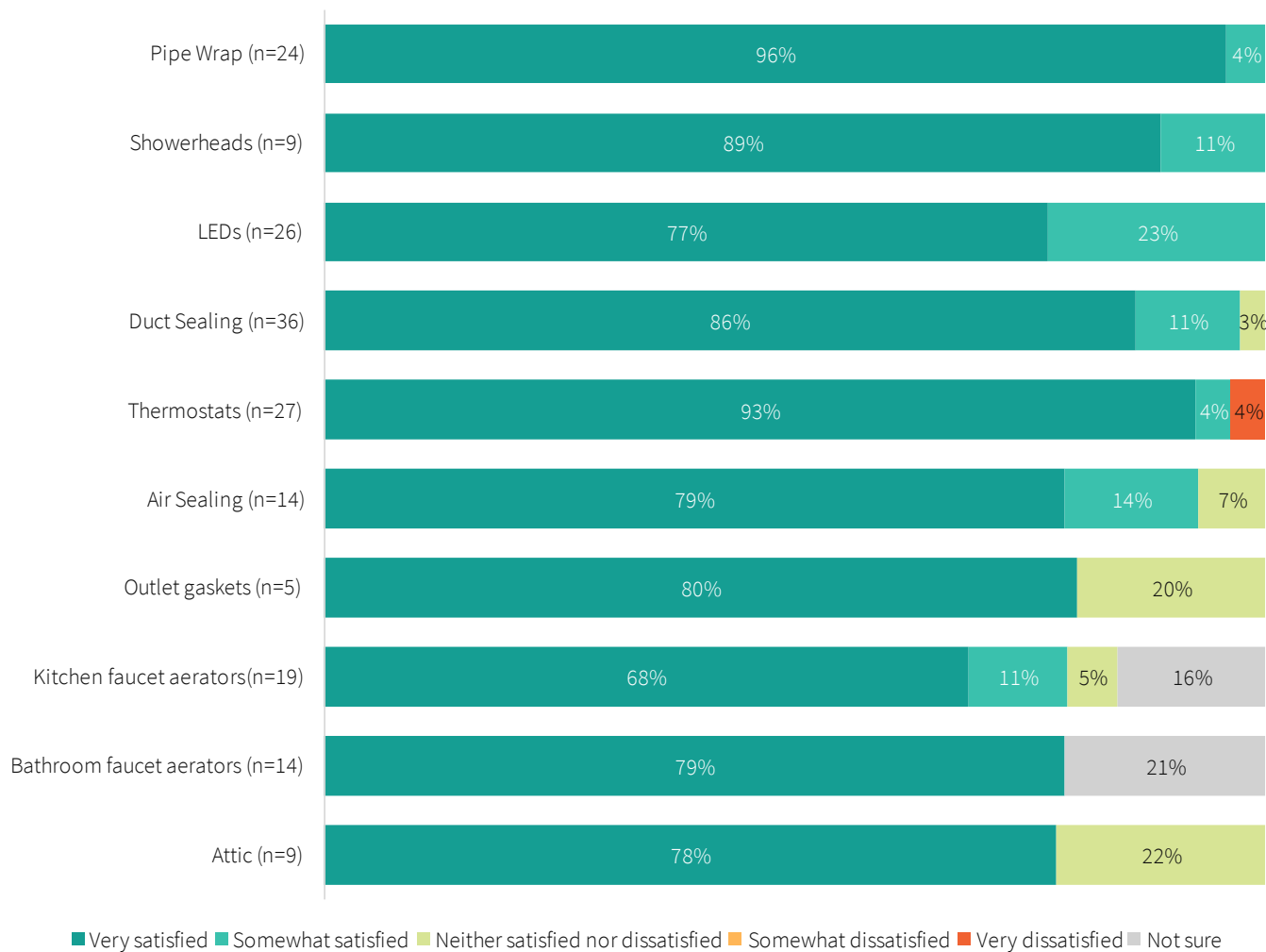
Source: IQW Participant survey. Questions E.12g, E.12e: “How satisfied were you with each of the following? The energy saving items that were directly installed in your home. The mix of home energy-savings products and efficiency improvements offered.”

Satisfaction with most direct-install measures was high, with “very satisfied” or “somewhat satisfied” ratings ranging from 78% for kitchen faucet aerators to 100% for pipe wrap (Figure 51). The only respondent who said they were “very dissatisfied” with their thermostat was the same respondent in prior sections who said incorrect installation resulted in large energy bills.

Eight respondents also received a refrigerator through the IQW program, but due to a survey programming error, the evaluation team was unable to ask them about their satisfaction ratings with this measure. One respondent did note:

“I am delighted to have received a refrigerator due to this program and appreciate NIPSCO very much.”

Figure 51. Satisfaction with specific direct install measures



Source: IQW Participant survey. Questions F.5, F.11 F.16, F.24, F.31, F.35, F.37, F.39, F.41, F.48: “How satisfied are you with the [measure(s)] installed? Are you...”

Approximately one-quarter of respondents who received LEDs (seven of 26) said they removed some LEDs, with most (six of seven) stating they had stopped working. One respondent removed all 16 LEDs they had received for the same reason.

For the remaining measures, few reported removing them. Two respondents removed bathroom faucet aerators, citing low water pressure, and one respondent removed their kitchen faucet aerator because they had replaced their sink. No respondents removed their thermostats or pipe wrap.

Half of respondents said they did not receive LEDs because they already had them or did not need them. A third of respondents said their technician did not offer bathroom faucet aerators (33%), kitchen faucet aerators (36%), or showerheads (32%). Across all measures, about a quarter (22% to 28%) of respondents who did not receive certain measures said they were unsure why they had not received them. Table 75. Reasons direct install measures were not provides additional details on the reasons technicians did not install measures.

Table 75. Reasons direct install measures were not installed

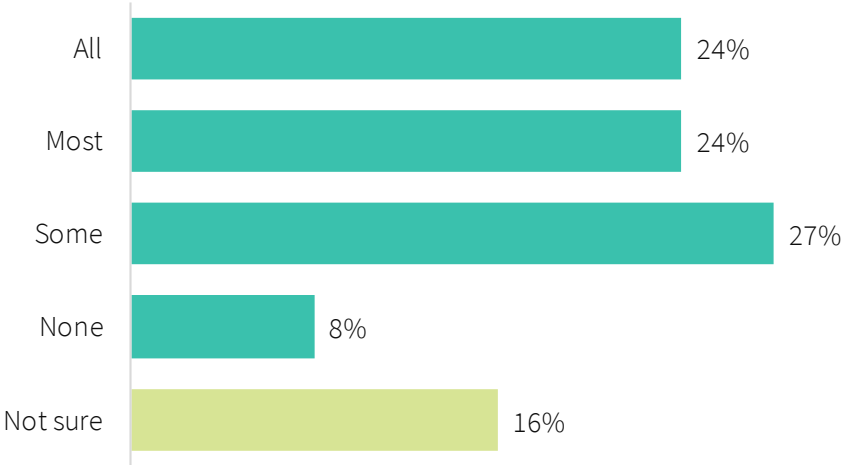
REASON	LEDS (N=20)	BATHROOM FAUCET AERATORS (N=47)	KITCHEN FAUCET AERATORS (N=46)	SHOWERHEADS (N=51)
Already had one/ didn't need one	50%	28%	24%	31%
Wasn't offered one	17%	33%	36%	32%
Didn't fit on fixture	-	5%	6%	2%
Concerned about changes in water pressure	-	-	3%	5%
Not sure	22%	28%	24%	25%

Post-Assessment Improvements

Three-quarters of respondents said they made at least some of the energy-saving improvements recommended in the assessment report they received (Figure 52.). A small number of respondents (five of 51) said they had not implemented any of the recommendations. Two of them said they were still planning on making improvements, and two said the recommendations were too expensive. Another respondent said:

"I am disabled and unable to do the recommendations, as well as I can't afford them."

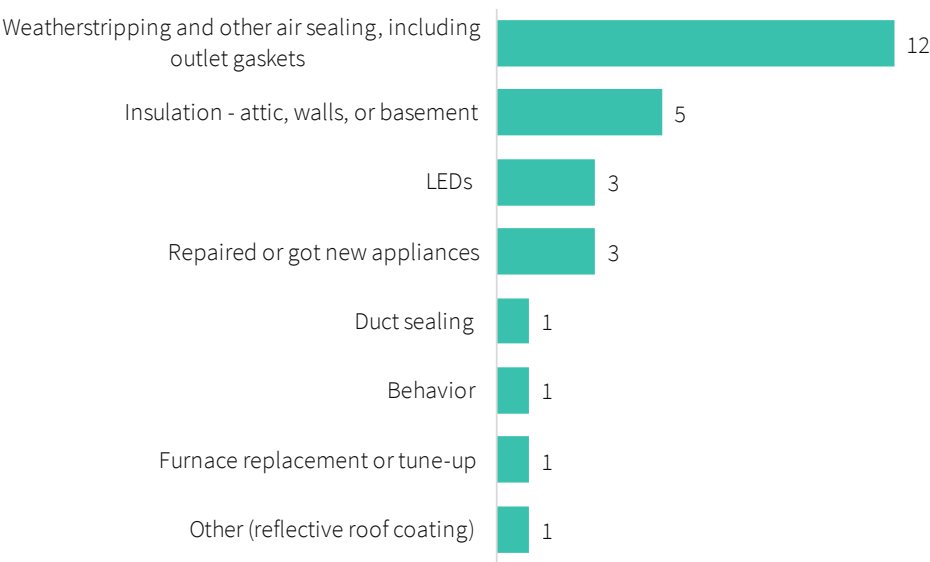
Figure 52. Extent to which respondents followed through on recommended improvements



Source: IQW Participant survey. Question I.1: “After participating in NIPSCO’s Income-Qualified Weatherization program, would you say you have made all, most, some, or none of the energy-saving recommendations made in the assessment report you received?” (n=51)

Like the responses seen in 2022, the most common improvements respondents made included installing weatherstripping and other air sealing, insulation, and lighting (Figure 53). One customer also reported putting a reflective coating on the roof of their mobile home.

Figure 53. Recommended measures installed by participants



IQW Participant survey. Question I.2: “What improvements did you make?” (n=23)

Additional Program Participation

About one-quarter (24%) of respondents were aware that NIPSCO offered other energy efficiency programs in 2024, which was like the level of awareness in 2022 (25%). These respondents (n=22) were most often aware

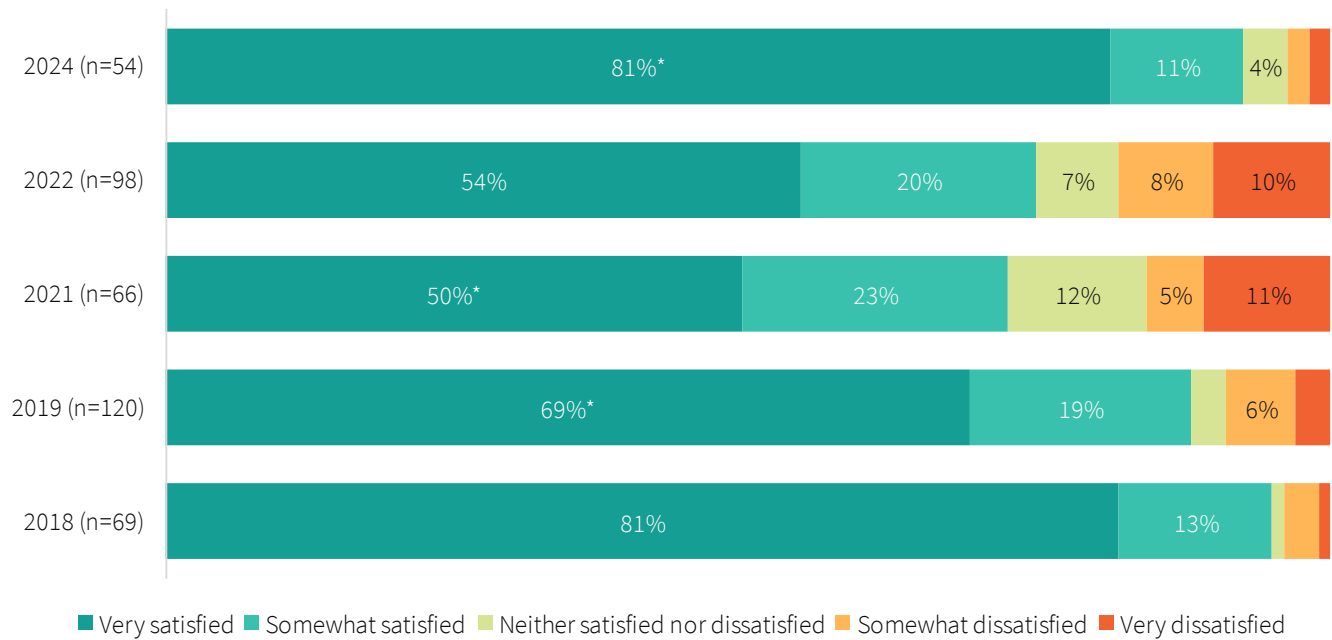
of the HEA program (n=4) or discounts on energy efficient retail products (n=3). No respondents reported participating in any other NIPSCO programs.

Satisfaction With Program and NIPSCO

Overall Program Satisfaction

Most respondents (92%) were “very satisfied” or “somewhat satisfied” with the overall program, a significant increase from program satisfaction level reported in 2022 (74%).

Figure 54. Satisfaction with the IQW Program



Source: IQW Participant survey. Question J.1: “How satisfied are you with NIPSCO’s HEA program?”

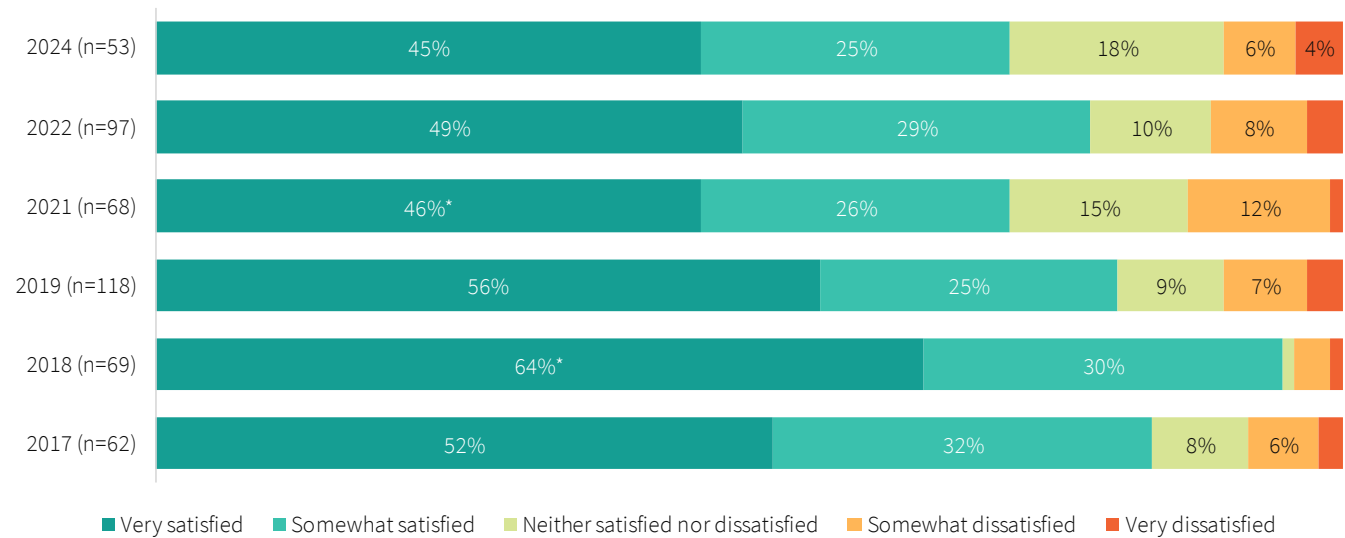
Note: * indicates difference between program years is significant at $p \leq 0.10$ (90% confidence).

Satisfied respondents were very appreciative of the services they received, with one respondent saying, “It really works and helps a lot.” In one instance, a respondent noted that the installation process damaged their bathroom ceiling causing moisture problems in an adjoining closet. However, they also mentioned that the contractor rectified this to their satisfaction.

NIPSCO Satisfaction

Most respondents (70%) were “very satisfied” or “somewhat satisfied” with NIPSCO as their energy service provider (Figure 55). This is a slight decrease from 2022 responses where 78% of respondents said they were “very satisfied” or “somewhat satisfied” with NIPSCO as their service provider.

Figure 55. Satisfaction with NIPSCO



Note: * indicates difference between program years is significant at $p \leq 0.10$ (90% confidence).

Source: IQW Participant survey. Question J.4: “How satisfied are you with NIPSCO overall as your utility service provider?”

Of the 2024 survey respondents that gave a rating of “very dissatisfied” or “somewhat dissatisfied” with NIPSCO (n=5), most said their bills were too high; this was especially true for people on a fixed income. Another dissatisfied respondent was frustrated with how long it took to finally participate, stating:

“I’ve talked to multiple people for years about this program. Nobody ever gave me any information about the program.”

Suggestions for Improvement

Eleven respondents had suggestions to improve the program. Four of these respondents mentioned wanting more air sealing done to their home, with one noticing visible gaps around their doorway that the auditor did not address. Respondents in 2022 voiced similar suggestions, requesting that more be done to assess heat loss, particularly with weatherstripping or caulking around windows.

Two other respondents suggested clearer advertising on the full scope of what products or services the program could provide, and one suggested a raffle for large appliances like furnaces. Lastly, one respondent said that, despite the home assessment, their utility bills did not decrease.

Participant Survey Demographics

The majority of the IQW program respondents live in single-family detached homes (79%), followed by 10% who live in mobile or manufactured homes. Most respondents reported owning their homes (96%). Almost half of the IQW program respondents (47%) have lived in their current home for more than 10 years. Many respondents live in homes with one or two occupants (59%), and 69% live in homes built before 1980. Over half of respondents (68%) reported incomes below \$50,000.

Additionally, half of respondents (48%) reported being on some sort of government assistance, including LIHEAP, SSI, or Social Security Disability Insurance. Respondents were also older, with 65% being born between 1940 and 1979 (ages 46-85). Over half of respondents were white (63%), followed by Black (27%) and Hispanic (7%). Almost all respondents reported speaking English at home, and about half had a two-year college degree or greater (48%). Table 76 contains more details on respondent's home characteristics and Table 77 contains more information on respondent demographics.

Table 76. 2024 IQW Survey Participant Housing Characteristics

HOUSING CHARACTERISTICS	PERCENTAGE
Type of Residence (n=48)	
Single-family detached home	79%
Multi-Family apartment or condo building (with 4 or more units)	2%
Attached house (townhouse, row house, or twin)	2%
Mobile or manufactured home	10%
Other	4%
Not sure	2%
Home Ownership (n=47)	
Own	96%
Rent	2%
Not sure	2%
Years Lived in Current Home (n=47)	
One year or less	11%
2-3 years	23%
4-5 years	4%
6-10 years	13%
More than 10 years	47%
Not sure	2%
Number of People in the Home (n=47)	
One	45%
Two	14%
Three	16%
Four	9%
Five or more	14%
Not Sure	2%

HOUSING CHARACTERISTICS	PERCENTAGE
Year Home Built (n=47)	
1900 to 1939	9%
1940 to 1959	28%
1960 to 1979	32%
1980 to 1989	2%
1990 to 1999	0%
2000 to 2004	9%
2005 or later	6%
Not sure	15%

Table 77. 2024 IQW Survey Participant Demographics

DEMOGRAPHICS	PERCENTAGE
Income (n=41)	
Under \$25,000	37%
\$25,000 to under \$35,000	15%
\$35,000 to under \$50,000	17%
\$50,000 to under \$75,000	12%
\$75,000 to under \$100,000	2%
\$100,000 to under \$150,000	2%
Not sure	15%
Government Support (n=46)	
Social Security Disability Insurance (SSDI)	24%
Low-Income Home Energy Assistance (LIHEAP or EAP)	20%
Supplemental Security Income (SSI)	4%
None of the above	43%
Not sure	9%
Respondent Age (n=43)	
1940 to 1959	23%
1960 to 1979	42%
1980 to 1989	16%
1990 to 1999	9%
Not sure	5%

DEMOGRAPHICS	PERCENTAGE
Race (n=41)	
White (for example, German, Irish, English, Italian, Polish, or French)	63%
Black or African American (for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, or Somali)	27%
Hispanic, Latino, or Spanish origin (for example, Mexican or Mexican American, Puerto Rican, Cuban, Salvadorian, Dominican)	7%
Asian (for example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, or Japanese)	2%
Language spoken at home (n=45)	
English	96%
Spanish	2%
Urdu	2%
Education (n=42)	
High school graduate or equivalent	26%
Some college, no degree	19%
Technical college degree or certificate	7%
Two-year college degree	14%
Four-year college degree	31%
Graduate or professional degree	2%

Source: IQW Participant survey. Section K. Demographics: “What type of residence do you live in?” “Do you own or rent your residence?” “How many years have you lived in your current home?” “Including yourself, how many people live in your home?” “About how many square feet is your home? Use your best guess.” “When was your home built?” “Which of the following best represents your annual household income from all sources in 2024 before taxes?” “Does anyone in your household qualify for the following?” “In what year were you born?” “Which categories describe you?” “What language(s) do you primarily speak at home?” “What is the highest level of education you have completed?”

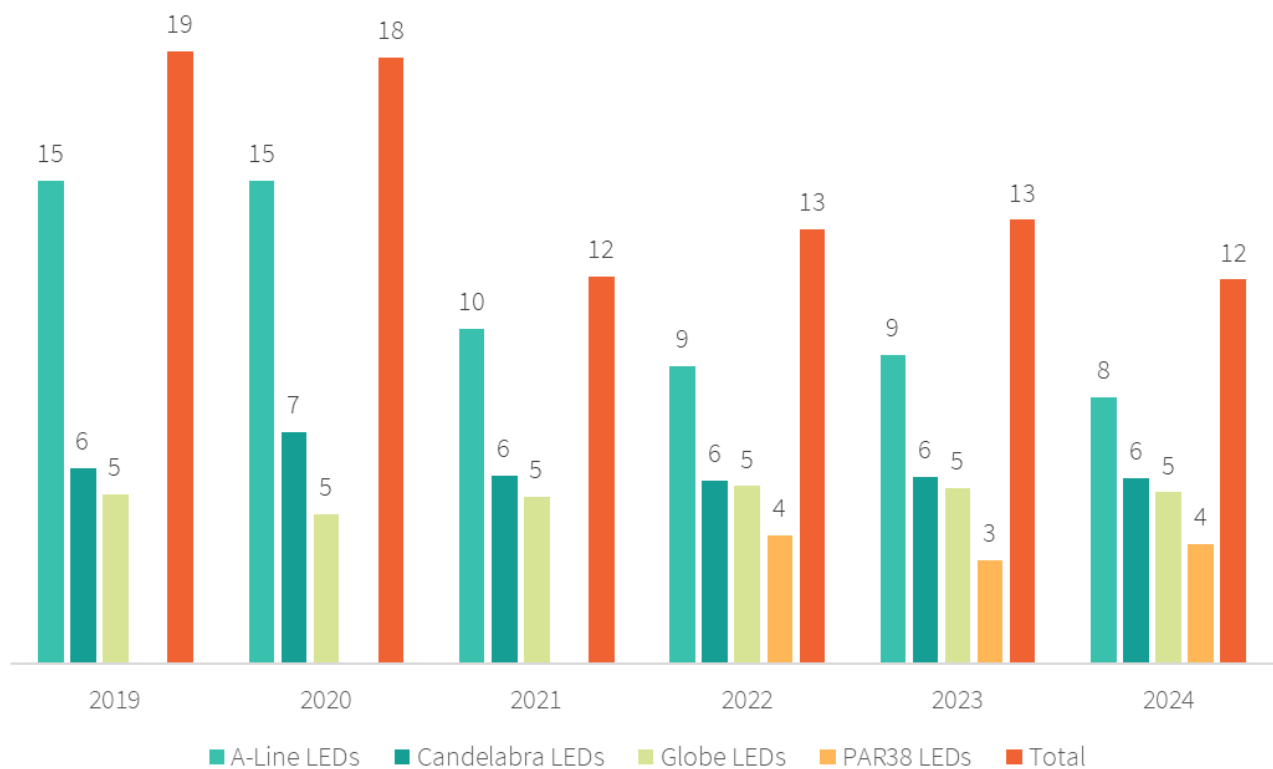
Lighting Analysis

The Illinois TRM explicitly limits LED retrofit savings to direct-install programs where “it can be shown that the LED is replacing inefficient lighting” and states that programs “should continue to use the existing inefficient lighting as a baseline and also assume a measure life of [two] years.” Since screw-in lighting accounts for about half of electric savings through the HEA program, NIPSCO looked to the evaluation team to investigate trends in light bulb replacements to inform future program planning.

To do this, the evaluation team analyzed the IQW program participant data from 2019 to 2024 to determine the average number of bulbs installed per home over time. The team reviewed bulb installations by type and by year to determine any bulb-specific trends.

While there is variability by year, in general the analysis indicates decreasing potential for lighting within homes targeted by the IQW program. Since 2019, the average number of total bulbs installed per home decreased from 19 in 2019 to 12 in 2024. A-line LEDs are the primary driver of this trend; the program installs these most frequently and saw a decrease in installation incidence after 2020 (from an average of 18 bulbs to 12 per home in 2024). Installations of candelabra, globe and PAR38 LEDs (introduced to the program in 2022) have remained relatively consistent over the years, as shown in Figure 56, below. It will be important to continue to monitor this downward trend as the market becomes more saturated with LEDs and opportunities to replace inefficient lighting diminishes.

Figure 56. Average Number of Lightbulbs Installed per Home (2019-2024)



Source: Program tracking data.

Conclusions and Recommendations

CONCLUSION 1: THE IQW PROGRAM DID NOT MEET ELECTRIC ENERGY SAVINGS BUT EXCEEDED GOALS FOR PEAK DEMAND REDUCTION AND NATURAL GAS SAVINGS.

In 2024, the IQW program fell short of program goals for electric energy savings (73% of goal) but exceeded its goals for peak demand reduction (139% of goal) and natural gas energy savings (127% of goal). Implementation staff report that while they are achieving their desired participation levels for assessments, they have encountered fewer opportunities to implement electric-saving measures.

CONCLUSION 2: PARTICIPANT SATISFACTION SIGNIFICANTLY INCREASED FROM 2022 WITH PARTICIPANTS MOTIVATED TO SAVE MONEY ON THEIR BILL.

Participants who were “very satisfied” or “somewhat satisfied” with the overall program increased significantly from 74% in 2022 to 92% in 2024. This year’s survey respondents expressed a high level satisfaction with the assessment itself, the quality of work completed, and the measures program staff installed. There were only a few instances where respondents said they were “somewhat dissatisfied” or “very dissatisfied” throughout the survey, including respondents who did not find the assessment to be very useful and one who had the program install their thermostat incorrectly. A few respondents who suggested areas for program improvement mentioned wanting a more robust assessment, including air sealing.

High energy bills and economic stress seem top of mind for this year’s respondents as many respondents said they participated solely to save money on energy bills. Saving money has been a consistent motivator for program participation (72% in 2024 vs. 75% in 2022); however other motivators, like saving energy (24% in 2024 vs. 59% in 2022) or making their home comfortable (17% in 2024 vs. 52% in 2022), were less relevant for participants this year.

Recommendations:

- Ensure that auditors are properly trained in how to install all measures. Consider developing an installation quality assurance checklist for auditors to help deliver consistent service.

CONCLUSION 3: EX POST GROSS SAVINGS WERE HIGHER THAN EX ANTE SAVINGS FOR ATTIC INSULATION AND AIR SEALING MEASURES BECAUSE EX ANTE CALCULATIONS USED DEEMED HVAC SATURATION VALUES MEANT FOR UNKNOWN HEATING AND COOLING SYSTEMS.

Through the engineering review, the evaluation team identified notable measure-level differences between *ex ante* and *ex post* savings for attic insulation and air sealing measures. The driver of these differences was that *ex ante* savings used the deemed percent cooling, percent electric heating, and percent gas heating values that the TRM provides for calculating savings when HVAC types are unknown. These saturation values represent the likelihood that a house with unknown HVAC systems will have a cooling system, an electric heating system, or a gas heating system. However, the tracking data reports HVAC types at the project level, so calculations should use a 100% heating/cooling value for known HVAC types.

Recommendations:

- Update *ex ante* savings to use 100% HVAC saturation values when the technician determines the HVAC type on site.

CONCLUSION 4: THE USE OF 2022 EM&V PROGRAM AVERAGES IN *EX ANTE* SAVINGS LED TO LARGE DIFFERENCES BETWEEN *EX ANTE* AND *EX POST* SAVINGS FOR SOME MEASURES, RESULTING IN PROGRAM LEVEL REALIZATION RATES OVER 100% FOR KWH AND KW AND UNDER 100% FOR THERMS.

The evaluation team identified notable measure level differences between *ex ante* and *ex post* savings for faucet aerators, showerheads, duct sealing, and thermostat measures through engineering review, which resulted in greater than 100% realization rates. The driver of these measure-level differences was that *ex ante* savings used now-outdated inputs from the 2022 EM&V report when deemed values existed in the Illinois TRM. The EM&V reports from past program years used now-outdated inputs from the Indiana TRM v2.2 for many calculations. Additionally, the Illinois TRM is updated each year, which could cause some previous EM&V values to no longer be the best input for estimating savings.

Recommendations:

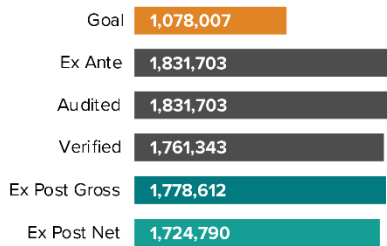
- To ensure the most up-to-date savings values, update *ex ante* savings use deemed values from the current Illinois TRM when available instead of using older values from previous EM&V reports. Continue to use values from EM&V reports for metrics collected via primary data collection, such as ISRs.

MULTIFAMILY DIRECT INSTALL

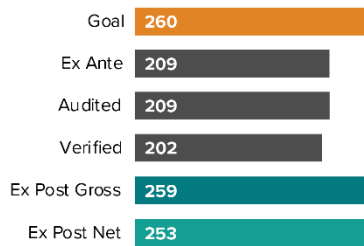


- The MFDI program met its electricity and demand goals for 2024 but fell short of its natural gas goals.
- The use of assumptions from outside of the Illinois TRM in ex ante savings led to savings discrepancies for some measures.

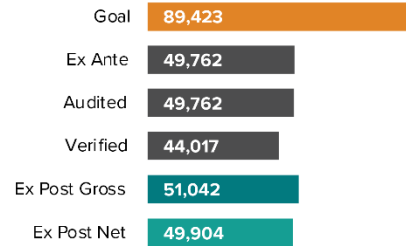
⚡ Electric Savings (kWh)



📊 Peak Demand Reduction (kW)



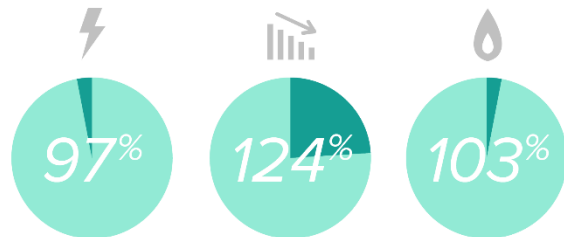
💧 Natural Gas Savings (Therms)



Ex Post Gross Achieved to Gross Goal



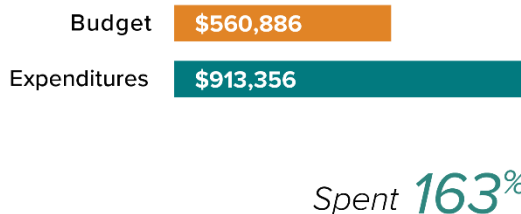
Realization Rate



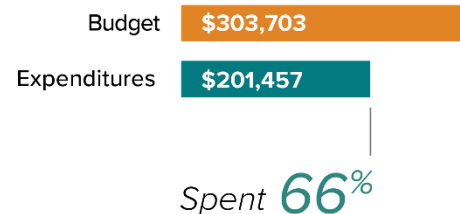
Budget



Electric and Peak Demand



Natural Gas



Program Design and Delivery

The Multi-Family Direct Install (MFDI) program provides property owners and building managers of Multi-Family buildings with a full-building energy assessment, including both commercially metered common areas and residentially metered tenant units, at no cost. After the assessment, the program provides direct installation of no-cost energy efficient measures in the residential tenant units. Commercially metered common area improvements identified in the assessment are eligible for rebates through the existing C&I Small Business Direct Install (SBDI) program. The MFDI and SBDI programs maintain separate budgets and savings goals, but the MFDI program allows customers to submit for SBDI program rebates directly through the MFDI application. NIPSCO designed the MFDI program to be a single-stop program for property owners and building managers to improve the efficiency and comfort of their buildings.

TRC is the program administrator, and it subcontracts with Threshold Energy Solutions for the direct install measures. TRC's responsibilities include program design and management, processing contractor payments, quality assurance and quality control (QA/QC), technical training, and providing contractor support to facilitate the quality installation of energy efficient measures.

The program is available on a first-come, first-served basis to qualified Multi-Family buildings that meet the following criteria:

- Have three or more residential units;
- Are a NIPSCO electric and/or natural gas customer with active, individually metered residential unit service (master metered residential buildings do not qualify);
- Are more than five years old; and
- Did not receive a utility-sponsored energy assessment in the past three years.

Eligibility to receive SBDI program measures is outlined by that program's rules.

Marketing for the MFDI program occurs via various channels including direct outreach, industry events, word-of-mouth, the NIPSCO website, program cross-promotion, and advertising.

Once a property owner engages with the program, TRC conducts the initial energy assessment of the property, which includes a walk-through of each type of residential unit and the building's common areas. If the property owner chooses to proceed, a subcontractor executes the direct install portion of the MFDI program. Participating building owners/managers are responsible for communicating to tenants that they are installing direct installation measures in their units. TRC will help facilitate that communication at no cost by providing resources including door hangers, posters, yard signs, email templates, and tenant leave-behind postcards.

Direct install measures for each tenant unit include the following:

- ENERGY STAR certified light bulbs (9W A-Line, 4.5W Candelabra, 6W Globe, 14.5W PAR 38) – up to 22 units.
- Bathroom faucet aerator (1.0 gpm) – up to two units.
- Kitchen aerator (1.5 gpm) – up to one unit.
- Low-flow showerhead (1.5 gpm)* – up to two units.
- Shower Start (valve only)* – up to two units.
- Low-flow showerhead/shower start combo* – up to two units.
- Pipe wrap – up to 10 feet.
- Programmable thermostat or smart Wi-Fi programmable thermostat – up to one unit.
- Outlet gaskets (outside facing walls) – up to 10 units.

**This can be a combination of the following measures: low-flow showerhead, low-flow showerhead/shower start combo, and/or shower start valve. However, the maximum number of units installed is two.*

Program Performance

The MFDI program met its electricity and demand reduction goals for PY2024 but fell short of its natural gas goals as the program did not specifically target any Multi-Family buildings that receive gas-only service from NIPSCO. This is an improvement from 2023, which saw limited participation and the program did not meet its goals.¹⁶

Table 78 summarizes savings for the full year of program performance, including program savings goals.

Table 78. 2024 MFDI Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	1,078,007.15	1,831,702.90	1,831,702.90	1,761,343.47	1,778,612.04	1,724,789.97	165%
Peak Demand Reduction (kW)	259.655	208.721	208.721	201.659	259.216	252.848	100%
Natural Gas Energy Savings (therms/yr.)	89,423.15	49,761.80	49,761.80	44,017.19	51,041.73	49,903.76	57%

¹⁶ In 2023, the program reported *ex ante* savings of 1,333,235.56 kWh, 117.013 kW, and 59,667.70 therms, and achieved 60%, 48%, and 35% of goals, respectively.

As documented in the table above, audited savings aligned with the claimed *ex ante* savings; the evaluation team did not identify any issues through the tracking system analysis that warranted adjustments to either the savings or quantity. Verified savings were lower than claimed values due to the applied in-service rates (ISRs) of select measures. *Ex post* gross electric, demand, and gas savings differed from *ex ante* savings for various reasons. (This is documented in more detail in the *Ex Post Gross Savings* section). Table 79 outlines the *ex post* and NTG adjustment factors.

Table 79. 2024 MFDI Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILLOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	97%	3%	0%	97%
Peak Demand Reduction (kW)	124%	3%	0%	98%
Natural Gas Energy Savings (therms/yr.)	103%	3%	1%	98%

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

Electric spending exceeded the planned budgets, and natural gas spending was below planned budgets, which aligns with goal attainment. Table 80 lists the 2024 program budget and expenditures by fuel type.

Table 80. 2024 MFDI Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$560,885.89	\$913,355.84	163%
Natural Gas	\$303,702.62	\$201,457.34	66%

Evaluation Methodology

To inform the 2024 NIPSCO MFDI evaluation, the evaluation team completed the following research activities:

- **Program staff interviews and discussions** to understand the program process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program participation data.
- **Engineering analysis** to review program savings assumptions and algorithms for reasonableness and accuracy.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop savings estimates? Are there any updates that should be made based on other, similar programs?
- What are the *ex post* program savings? Do these suggest any needed updates to the program’s design, delivery, or savings assumptions?
- Did the program meet its participation and savings goals?

For all measure types, the evaluation team compared its engineering calculations to NIPSCO’s *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: standard engineering practices and relevant building codes, the Indiana TRM Workbook v1.0, the Illinois TRM v12.0, and NIPSCO’s program tracking database.

Per the Indiana TRM Workbook v1.0, the Indiana TRM “is intended to be used as an accompaniment to [the Illinois TRM], automatically incorporating the most recent and effective version of the [Illinois] TRM, including measures newly added to the [Illinois] TRM.” For each measure, the evaluation team first prioritized the Indiana TRM, which directly references the Illinois TRM for most measures. The team prioritized the VEIC Proposed Indiana Assumptions on the “Code Baseline Measures” tab of the Indiana TRM as a source for baseline assumptions, where provided for specific measures.

Audited and Verified Savings

To develop audited measure quantities and savings, the evaluation team first checked the program tracking data for duplicates or other data quality issues and ensured the program had applied documented deemed savings correctly. The evaluation team also looked for any discrepancies between program tracking data and the program scorecard but did not identify any issues during the tracking data audit.

As part of the 2022 evaluation, the evaluation team conducted a secondary literature review of recent evaluations of Multi-Family programs to inform both impact inputs and process findings. Due to limited participation in the program since 2022, we sourced ISRs and net-to-gross (NTG) ratios from secondary sources to provide more useful values for future program planning. For the 2022, 2023, and 2024 evaluations, the evaluation team referenced ISRs from the NYSEG/RG&E PY2019 – 2020 Impact and Process Evaluation for all measures except for pipe wrap, which we sourced from the NIPSCO HEA 2022 evaluation. The evaluation team utilized this source because of its recency and because the evaluation reported ISRs for in-unit measures relevant to MFDI. ISRs for direct install measures might be less than 100% in certain cases. For example, tenants might have removed lighting measures or faucet aerators after the initial installation or requested that property management remove a programmable thermostat. Additionally, ISRs might be less than 100% due to equipment failure.

Table 81 lists the ISRs for all program-installed measures.

Table 81. 2024 MFDI Program ISRs by Measure

MEASURE	ISR
LED Bulb	87%
Bathroom Aerator	91%
Kitchen Aerator	91%
Low-Flow Showerhead	100%
Low-Flow Showerhead with Shower Start	100%
Thermostat	80%
Pipe Wrap	95%

To calculate per-unit verified savings, the evaluation team replaced the *ex ante* ISR with the verified ISR using the *ex ante* savings methodology. This updated data provides a more accurate representation of actual ISRs among the current program year participants. Table 82 summarizes the audited and verified savings per unit. Since the evaluation team has not been able to reassess ISRs since 2022, most ISRs embedded into *ex ante* savings aligned with the verified ISR and, therefore, verified savings.

Table 82. 2024 MFDI Program Audited and Verified Per-Unit Savings

MEASURE	EX ANTE ISR	EX ANTE SAVINGS			VERIFIED ISR	VERIFIED SAVINGS		
		KWH	KW	THERMS		KWH	KW	THERMS
Assessment Recommendations - Electric and Gas Savings	n/a	0.00	0.000	0.00	n/a	0.00	0.000	0.00
Assessment Recommendations - Electric Only	n/a	0.00	0.000	0.00	n/a	0.00	0.000	0.00
Bathroom Aerator 1.0 gpm - Electric	91%	25.30	0.023	0.00	91%	25.30	0.023	0.00
Bathroom Aerator 1.0 gpm - Gas	91%	0.00	0.000	1.08	91%	0.00	0.000	1.08
Kitchen Aerator 1.5 gpm - Electric	91%	27.16	0.007	0.00	91%	27.16	0.007	0.00
Kitchen Aerator 1.5 gpm - Gas	91%	0.00	0.000	1.28	91%	0.00	0.000	1.28
A-Line LEDs - Electric and Gas Savings	87%	33.50	0.004	0.00	87%	33.50	0.004	0.00
A-Line LEDs - Electric Only Savings	87%	33.50	0.004	0.00	87%	33.50	0.004	0.00
Candelabra LEDs - Electric and Gas Savings	87%	24.85	0.004	0.00	87%	24.85	0.004	0.00
Candelabra LEDs - Electric Only Savings	87%	24.85	0.004	0.00	87%	24.85	0.004	0.00
Globe LEDs - Electric and Gas Savings	87%	23.47	0.003	0.00	87%	23.47	0.003	0.00
Globe LEDs - Electric Only Savings	87%	23.47	0.003	0.00	87%	23.47	0.003	0.00
PAR38 LEDs - Electric Only Savings	87%	72.83	0.011	0.00	87%	72.83	0.011	0.00
Pipe Wrap - Electric (per foot)	n/a	55.50	0.006	0.00	95%	52.73	0.006	0.00
Pipe Wrap - Gas (per foot)	n/a	0.00	0.000	2.38	95%	0.00	0.000	2.26
Low-Flow Showerhead 1.5 gpm - Electric	100%	221.94	0.028	0.00	100%	221.94	0.028	0.00
Low-Flow Showerhead 1.5 gpm - Gas	100%	0.00	0.000	9.51	100%	0.00	0.000	9.51
Low-Flow Showerhead with Shower Start - Gas	100%	0.00	0.000	12.80	100%	0.00	0.000	12.80
Programmable Thermostat - Electric Cooling and Gas Heating Savings	100%	37.26	0.000	40.50	80%	29.81	0.000	32.40
Smart WiFi Programmable Thermostat - Electric Cooling and Heating Savings	90%	1046.29	0.089	0.00	80%	950.40	0.079	0.00
Smart WiFi Programmable Thermostat - Gas Heating Only Savings	100%	0.00	0.000	46.38	80%	0.00	0.000	37.10

Ex Post Gross Savings

The evaluation team reviewed the program's *ex ante* assumptions, sources, and algorithms for reasonableness and updates. Below are detailed *ex post* gross analysis results.

Engineering Reviews

The evaluation team referred to the Illinois TRM v12.0 for variable assumptions to calculate *ex post* gross electric energy, demand reduction, and natural gas energy savings.

The evaluation team also used data from the ENERGY STAR Qualified Product List (QPL), equipment specifications verified by the implementor, and the National Renewable Energy Laboratory (NREL) Residential Lighting Evaluation Protocol to calculate savings for lighting measures. The evaluation team revised assumptions for savings estimates applicable to the NIPSCO service territory as needed.

Appendix 5. MFDI Program contains details on specific algorithms, variable assumptions, and references used for all program measure *ex post* gross calculations.

Ex Post Gross Savings Summary

Table 83 shows the *ex ante* deemed savings and *ex post* gross per-measure savings for the 2024 MFDI program measures. We explain these differences in greater detail in Table 84, below.

Table 83. 2024 MFDI Program *Ex Ante* and *Ex Post* Gross Per-Measure Savings Values

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Assessment Recommendations - Electric and Gas Savings	Home	0.00	0.000	0.00	0.00	0.000	0.00
Assessment Recommendations - Electric Only	Home	0.00	0.000	0.00	0.00	0.000	0.00
Bathroom Aerator 1.0 gpm - Electric	Aerator	25.30	0.023	0.00	34.77	0.035	0.00
Bathroom Aerator 1.0 gpm - Gas	Aerator	0.00	0.000	1.08	0.00	0.000	1.74
Kitchen Aerator 1.5 gpm - Electric	Aerator	27.16	0.007	0.00	171.29	0.038	0.00
Kitchen Aerator 1.5 gpm - Gas	Aerator	0.00	0.000	1.28	0.00	0.000	8.55
A-Line LEDs - Electric and Gas Savings	Lamp	33.50	0.004	0.00	33.50	0.004	0.00
A-Line LEDs - Electric Only Savings	Lamp	33.50	0.004	0.00	33.50	0.004	0.00
Candelabra LEDs - Electric and Gas Savings	Lamp	24.85	0.004	0.00	24.51	0.004	0.00
Candelabra LEDs - Electric Only Savings	Lamp	24.85	0.004	0.00	24.51	0.004	0.00
Globe LEDs - Electric and Gas Savings	Lamp	23.47	0.003	0.00	23.47	0.003	0.00
Globe LEDs - Electric Only Savings	Lamp	23.47	0.003	0.00	23.47	0.003	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
PAR38 LEDs - Electric Only Savings	Lamp	72.83	0.011	0.00	72.49	0.011	0.00
Pipe Wrap - Electric (per foot)	Per foot	55.50	0.006	0.00	41.30	0.005	0.00
Pipe Wrap - Gas (per foot)	Per foot	0.00	0.000	2.38	0.00	0.000	1.77
Low-Flow Showerhead 1.5 gpm - Electric	Showerhead	221.94	0.028	0.00	256.05	0.032	0.00
Low-Flow Showerhead 1.5 gpm - Gas	Showerhead	0.00	0.000	9.51	0.00	0.000	12.78
Low-Flow Showerhead with Shower Start - Gas	Showerhead	0.00	0.000	12.80	0.00	0.000	15.73
Programmable Thermostat - Electric Cooling and Gas Heating Savings	Thermostat	37.26	0.000	40.50	137.96	0.125	37.10
Smart WiFi Programmable Thermostat - Electric Cooling and Heating Savings	Thermostat	1,046.29	0.089	0.00	870.90	0.125	0.00
Smart WiFi Programmable Thermostat - Gas Heating Only Savings	Thermostat	0.00	0.000	46.38	34.14	0.000	37.10

Table 84 highlights notable differences between *ex ante* and *ex post* gross estimates.

Table 84. 2024 MFDI Program Notable Differences Between *Ex Ante* and *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
LEDs	<i>Ex ante</i> savings use IL TRM v12.0 with some assumptions from the 2022 EM&V report.	<i>Ex post</i> savings use IL TRM v12.0 assumptions with actual wattage looked up in the ENERGY STAR database.	<i>Ex post</i> energy savings align closely with <i>ex ante</i> . The candelabra's actual wattage is 4.5W but <i>ex ante</i> uses 4W. <i>Ex ante</i> demand savings is rounded to three decimal places causing inconsistent realization rates.
Low-Flow Showerheads	<i>Ex ante</i> savings use IL TRM v12.0 with some assumptions from the 2022 EM&V report.	<i>Ex post</i> savings use IL TRM v12.0 assumptions.	<i>Ex post</i> uses updated IL TRM v12.0 water supply temperature, which is higher than the <i>ex ante</i> value from the IN TRM v2.2.
Faucet Aerators	<i>Ex ante</i> savings use IL TRM v12.0 with some assumptions from the 2022 EM&V report.	<i>Ex post</i> savings use IL TRM v12.0 assumptions.	<i>Ex post</i> uses TRM value for flow rate of efficient fixture, while <i>ex ante</i> uses actual, and updated IL TRM v12.0 water supply temperature, which is higher than the <i>ex ante</i> value from the IN TRM v2.2.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Pipe Wrap	<i>Ex ante</i> savings use IL TRM v12.0 with some assumptions from the 2022 EM&V report.	<i>Ex post</i> savings use IL TRM v12.0 assumptions. Assuming six feet of insulation per participant with three feet installed horizontally and three feet installed vertically.	<i>Ex ante</i> assumes a ¾" pipe. <i>Ex post</i> uses the simple average between ½" and ¾" pipes. <i>Ex ante</i> uses the incorrect R-value for the installed pipe wrap and does not correctly calculate the new R-value factoring in the existing R-value or adjust for effective length.
Thermostats	<i>Ex ante</i> savings use IL TRM v12.0 with some assumptions from the 2022 EM&V report.	<i>Ex post</i> savings use IL TRM v12.0 assumptions.	<i>Ex ante</i> applies the IL TRM v12.0 cooling ISR (90%) to heating as well as cooling. <i>Ex post</i> uses an 80% ISR. ¹⁷ <i>Ex ante</i> is attributing additional electric savings based on therm savings which should be zero for electrically heated homes. These savings should only be claimed for non-electrically heated homes, as they are based on furnace fan energy and are already included in the heating reduction parameter for electrically heated homes. The incorrect cooling reduction factor was used to calculate <i>ex ante</i> demand.

Waste Heat Factor—Therm Penalties

The evaluation team did not include therm penalties when calculating evaluated savings for the 2024 MFDI program. However, cost-effectiveness results for both the gas and electric programs will include these penalties. The evaluation team believes this approach is appropriate as it accounts for the penalty on the electric side (where it is generated) and allows the evaluation team to show gas program performance and measure performance more clearly. The *ex ante* therm penalties estimated in the tracking data are -12,952.64 therms. In total, the *ex post* therm penalty for cost-effectiveness analysis is -12,932.30 therms (Table 85).

Table 85. 2024 MFDI Program Waste Heat Factor Therm Penalty

MEASURE	EX ANTE WHF THERM PENALTY	EX POST GROSS WHF THERM PENALTY
A-Line LEDs - Electric and Gas Savings	-9,954.56	-9,946.37
Candelabra LEDs - Electric and Gas Savings	-636.12	-628.12
Globe LEDs - Electric and Gas Savings	-2,361.96	-2,357.81
Total	-12,952.64	-12,932.30

Realization Rates

The next three tables (Table 86 through Table 88) show the program's *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms. Realization rates

¹⁷ Source: NYSEG/RG&E PY2019 – 2020 Impact and Process Evaluation

deviated from 100% primarily due to differences in *ex ante* and *ex post* assumptions. For water-using measures, we calculated *ex post* savings using the Illinois TRM v12.0 default water supply temperature, while *ex ante* savings used the value from the Indiana TRM v2.2. For pipe insulation, the evaluation team used the actual R-value of the pipe insulation according to the manufacturer spec sheet and assumed an even split of ½ inch and ¾ inch pipes, while *ex ante* assumed a default R-value and solely ¾ inch pipes. Finally, *ex ante* savings for thermostats included therm savings for electrically heated homes (calculated in the program design file but not claimed on the scorecard), which translates into additional, erroneous electric savings and a lower realization rate for energy. The thermostat realization rate for demand is higher because *ex ante* savings were calculated using the cooling reduction factor for energy rather than the cooling reduction factor for demand.

Table 86. 2024 MFDI Program *Ex Ante* and *Ex Post* Gross Electric Energy Savings

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (kWh/yr.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)
Assessment Recommendations - Electric and Gas Savings	0.00	0.00	0.00	0.00
Assessment Recommendations - Electric Only	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Electric	13,206.60	13,206.60	13,206.60	18,148.02
Bathroom Aerator 1.0 gpm - Gas	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Electric	8,799.84	8,799.84	8,799.84	55,496.94
Kitchen Aerator 1.5 gpm - Gas	0.00	0.00	0.00	0.00
A-Line LEDs - Electric and Gas Savings	433,088.00	433,088.00	433,088.00	433,102.54
A-Line LEDs - Electric Only Savings	229,140.00	229,140.00	229,140.00	229,147.69
Candelabra LEDs - Electric and Gas Savings	27,732.60	27,732.60	27,732.60	27,350.78
Candelabra LEDs - Electric Only Savings	14,984.55	14,984.55	14,984.55	14,778.24
Globe LEDs - Electric and Gas Savings	102,657.78	102,657.78	102,657.78	102,667.93
Globe LEDs - Electric Only Savings	89,209.47	89,209.47	89,209.47	89,218.29
PAR38 LEDs - Electric Only Savings	1,092.45	1,092.45	1,092.45	1,087.32
Pipe Wrap - Electric (per foot)	90,187.50	90,187.50	85,678.13	67,114.58
Pipe Wrap - Gas (per foot)	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Electric	105,199.56	105,199.56	105,199.56	121,366.82
Low-Flow Showerhead 1.5 gpm - Gas	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (kWh/yr.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)
Low-Flow Showerhead with Shower Start - Gas	0.00	0.00	0.00	0.00
Programmable Thermostat - Electric Cooling and Gas Heating Savings	1,788.48	1,788.48	1,430.87	6,621.84
Smart WiFi Programmable Thermostat - Electric Cooling and Heating Savings	714,616.07	714,616.07	649,123.62	594,828.08
Smart WiFi Programmable Thermostat - Gas Heating Only Savings	0.00	0.00	0.00	17,682.95
Total Savings	1,831,702.90	1,831,702.90	1,761,343.47	1,778,612.04
Total Program Realization Rate				97%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 87. 2024 MFDI Program *Ex Ante* and *Ex Post* Gross Peak Demand Reduction

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Assessment Recommendations - Electric and Gas Savings	0.000	0.000	0.000	0.000
Assessment Recommendations - Electric Only	0.000	0.000	0.000	0.000
Bathroom Aerator 1.0 gpm - Electric	12.006	12.006	12.006	18.158
Bathroom Aerator 1.0 gpm - Gas	0.000	0.000	0.000	0.000
Kitchen Aerator 1.5 gpm - Electric	2.268	2.268	2.268	12.372
Kitchen Aerator 1.5 gpm - Gas	0.000	0.000	0.000	0.000
A-Line LEDs - Electric and Gas Savings	51.712	51.712	51.712	52.375
A-Line LEDs - Electric Only Savings	27.360	27.360	27.360	27.711
Candelabra LEDs - Electric and Gas Savings	4.464	4.464	4.464	4.020
Candelabra LEDs - Electric Only Savings	2.412	2.412	2.412	2.172
Globe LEDs - Electric and Gas Savings	13.122	13.122	13.122	15.090

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Globe LEDs - Electric Only Savings	11.403	11.403	11.403	13.113
PAR38 LEDs - Electric Only Savings	0.165	0.165	0.165	0.160
Pipe Wrap - Electric (per foot)	9.750	9.750	9.263	7.656
Pipe Wrap - Gas (per foot)	0.000	0.000	0.000	0.000
Low-Flow Showerhead 1.5 gpm - Electric	13.272	13.272	13.272	15.085
Low-Flow Showerhead 1.5 gpm - Gas	0.000	0.000	0.000	0.000
Low-Flow Showerhead with Shower Start - Gas	0.000	0.000	0.000	0.000
Programmable Thermostat - Electric Cooling and Gas Heating Savings	0.000	0.000	0.000	5.995
Smart WiFi Programmable Thermostat - Electric Cooling and Heating Savings	60.787	60.787	54.212	85.308
Smart WiFi Programmable Thermostat - Gas Heating Only Savings	0.000	0.000	0.000	0.000
Total Savings	208.721	208.721	201.659	259.216
Total Program Realization Rate				124%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 88. 2024 MFDI Program *Ex Ante* and *Ex Post* Gross Natural Gas Savings

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Assessment Recommendations - Electric and Gas Savings	0.00	0.00	0.00	0.00
Assessment Recommendations - Electric Only	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Electric	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 gpm - Gas	1,161.00	1,161.00	1,161.00	1,865.21
Kitchen Aerator 1.5 gpm - Electric	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 gpm - Gas	915.20	915.20	915.20	6,112.10

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
A-Line LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
A-Line LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
Candelabra LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
Globe LEDs - Electric and Gas Savings	0.00	0.00	0.00	0.00
Globe LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
PAR38 LEDs - Electric Only Savings	0.00	0.00	0.00	0.00
Pipe Wrap - Electric (per foot)	0.00	0.00	0.00	0.00
Pipe Wrap - Gas (per foot)	11,024.16	11,024.16	10,472.95	8,201.11
Low-Flow Showerhead 1.5 gpm - Electric	0.00	0.00	0.00	0.00
Low-Flow Showerhead 1.5 gpm - Gas	6,276.60	6,276.60	6,276.60	8,433.85
Low-Flow Showerhead with Shower Start - Gas	4,416.00	4,416.00	4,416.00	5,428.26
Programmable Thermostat - Electric Cooling and Gas Heating Savings	1,944.00	1,944.00	1,555.26	1,781.02
Smart WiFi Programmable Thermostat - Electric Cooling and Heating Savings	0.00	0.00	0.00	0.00
Smart WiFi Programmable Thermostat - Gas Heating Only Savings	24,024.84	24,024.84	19,220.18	19,220.18
Total Savings	49,761.80	49,761.80	44,017.19	51,041.73
Total Program Realization Rate				103%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Ex Post Net Savings

The *ex post* net savings values reflect savings attributed to the program after adjusting for free-ridership and spillover by applying an NTG ratio. Evaluators typically calculate NTG using survey participants' self-reported responses to questions related to what they would have done in the absence of the program (free-ridership)

and the influence the program had on their decision to implement additional energy efficiency projects after participating (spillover). Because of the limited number of unique property managers that have historically participated in the MFDI program and since evaluators did not survey 2024 participants, we could not perform a full NTG analysis for this program for this evaluation. The evaluation team used the NTG values that we developed in 2022 from other evaluation reports. In 2022, the team chose NTG values from various reports based on how closely the measures in those reports aligned with measures in the MFDI program. See the 2022 DSM Portfolio Evaluation report for more detail on how we developed these NTG ratios.

Table 98 shows the NTG ratios by measure along with their source.

Table 89. 2024 MFDI Program NTG Ratios by Measure

MEASURE	NTG	SOURCE
Assessment	100%	Deemed
Bathroom Aerators	103%	ComEd, Nicor, Peoples, Northshore 2018 ¹⁸
Kitchen Aerators	103%	ComEd, Nicor, Peoples, Northshore 2018
LEDs	96%	Ameren Illinois 2018 ¹⁹
Pipe Wrap	87%	NIPSCO HEA 2022 Participant Survey
Showerheads	101%	Nicor, Peoples, Northshore 2018 ²⁰
Thermostats	98%	Ameren Illinois 2018

Table 90 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 90. 2024 MFDI Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Assessment Recommendations - Electric and Gas Savings	0.00	0.000	0.00	100%	0.00	0.000	0.00
Assessment Recommendations - Electric Only	0.00	0.000	0.00	100%	0.00	0.000	0.00
Bathroom Aerator 1.0 gpm - Electric	18,148.02	18.158	0.00	103%	18,692.46	18.703	0.00
Bathroom Aerator 1.0 gpm - Gas	0.00	0.000	1,865.21	103%	0.00	0.000	1,921.17
Kitchen Aerator 1.5 gpm - Electric	55,496.94	12.372	0.00	103%	57,161.85	12.744	0.00
Kitchen Aerator 1.5 gpm - Gas	0.00	0.000	6,112.10	103%	0.00	0.000	6,295.46
A-Line LEDs - Electric and Gas Savings	433,102.54	52.375	0.00	96%	415,778.44	50.280	0.00
A-Line LEDs - Electric Only Savings	229,147.69	27.711	0.00	96%	219,981.79	26.602	0.00

¹⁸ ComEd. Net-to-Gross Research Results for ComEd Multifamily Market Rate Program PY9 and CY2018. September 12, 2019.

¹⁹ Ameren Illinois Company. 2018 Multifamily Initiative Tenant and Property Manager Survey NTGR Results. September 4, 2019.

²⁰ Nicor Gas, Peoples Gas, North Shore Gas. Net-to-Gross Research Results for the Market Rate Multifamily Program for Nicor Gas, Peoples Gas, and North Shore Gas GPY6 and CY2018. August 28, 2019.

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Candelabra LEDs - Electric and Gas Savings	27,350.78	4.020	0.00	96%	26,256.75	3.859	0.00
Candelabra LEDs - Electric Only Savings	14,778.24	2.172	0.00	96%	14,187.11	2.085	0.00
Globe LEDs - Electric and Gas Savings	102,667.93	15.090	0.00	96%	98,561.22	14.486	0.00
Globe LEDs - Electric Only Savings	89,218.29	13.113	0.00	96%	85,649.56	12.589	0.00
PAR38 LEDs - Electric Only Savings	1,087.32	0.160	0.00	96%	1,043.83	0.153	0.00
Pipe Wrap - Electric (per foot)	67,114.58	7.656	0.00	87%	58,146.26	6.633	0.00
Pipe Wrap - Gas (per foot)	0.00	0.000	8,201.11	87%	0.00	0.000	7,105.22
Low-Flow Showerhead 1.5 gpm - Electric	121,366.82	15.085	0.00	101%	122,580.49	15.236	0.00
Low-Flow Showerhead 1.5 gpm - Gas	0.00	0.000	8,433.85	101%	0.00	0.000	8,518.19
Low-Flow Showerhead with Shower Start - Gas	0.00	0.000	5,428.26	101%	0.00	0.000	5,482.55
Programmable Thermostat - Electric Cooling and Gas Heating Savings	6,621.84	5.995	1,781.02	98%	6,489.41	5.875	1,745.40
Smart WiFi Programmable Thermostat - Electric Cooling and Heating Savings	594,828.08	85.308	0.00	98%	582,931.52	83.602	0.00
Smart WiFi Programmable Thermostat - Gas Heating Only Savings	17,682.95	0.000	19,220.18	98%	17,329.29	0.000	18,835.78
Total Savings	1,778,612.04	259.216	51,041.73		1,724,789.97	252.848	49,903.76

Note: Totals may not sum properly due to rounding.

Table 91 shows the NTG results for each fuel.

Table 91. 2024 MFDI Program NTG Results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	1,831,702.90	1,778,612.04	97%	1,724,789.97
Peak Demand Reduction (kW)	208.721	259.216	98%	252.848
Natural Gas Energy Savings (therms/yr.)	49,761.80	51,041.73	98%	49,903.76

Process Evaluation

The 2024 MFDI Program Evaluation did not include a process evaluation.

Conclusions and Recommendations

CONCLUSION 1: THE MFDI PROGRAM MET ITS ELECTRICITY AND DEMAND GOALS FOR 2024 BUT FELL SHORT OF ITS NATURAL GAS GOALS.

MFDI met its electricity and demand goals for PY2024, which represents an improvement over previous years' performances. In both PY2022 and PY2023, MFDI did not meet these savings targets. This achievement in 2024 represents a positive trend for the program. However, the program did not meet its natural gas savings goals because of the program not conducting targeted outreach for Multi-Family buildings in NIPSCO's gas-only territory.

CONCLUSION 2: THE USE OF ASSUMPTIONS FROM OUTSIDE OF THE ILLINOIS TRM IN *EX ANTE* SAVINGS LED TO SAVINGS DISCREPANCIES FOR SOME MEASURES.

The evaluation team identified notable measure-level differences between *ex ante* and *ex post* savings across all measures through the engineering review. The driver of these measure-level differences was that *ex ante* savings used inputs from the 2022 EM&V report when deemed values existed in the Illinois TRM. Notable differences between *ex ante* and *ex post* savings for low-flow showerheads and faucet aerators are due to using different values for water supply temperature and flow rate. Differences in savings values for pipe wrap occurred due to *ex ante* savings using incorrect R-values and not calculating effective length, and thermostat savings discrepancies were due to differences in ISR values and a portion of *ex ante* savings calculated from therms that should be zeroed out.

Recommendations:

To improve the accuracy of *ex ante* savings estimates:

- Update all *ex ante* savings inputs for parameters not derived from program data to use the deemed values in the Illinois TRM when available instead of using older values from previous evaluations.
- Use the “as-used” value provided in the TRM for the flow rate for faucet aerators, as the Illinois TRM is also not set up to use the actual, rated flow rate.
- Remove the portion of thermostat electric savings calculated from therms for all-electric households to improve the accuracy of savings for these households.
- Use the “Cooling_DemandReduction” factor instead of the “Cooling_Reduction” factor to calculate demand savings for thermostats.

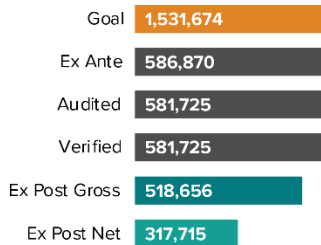
APPLIANCE RECYCLING



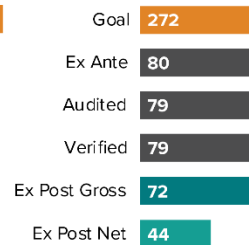
- While the program fell short of its savings goals, primarily due to the delay in program launch, the transition to the new recycling subcontractor has been smooth, and program staff noted an uptick in program participation after NIPSCO's marketing efforts.
- Ex Ante savings aligned closely with Ex Post savings, leading to realization rates close to 100%.
- An unusually high number of records with missing appliance characteristics left the evaluation team missing key inputs to Ex Post energy savings and Ex Post peak demand reduction calculations for a large portion of appliances.



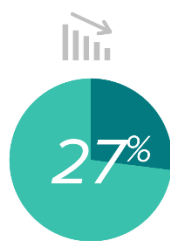
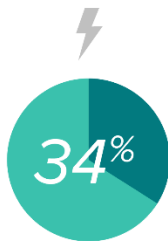
Electric Savings (kWh)



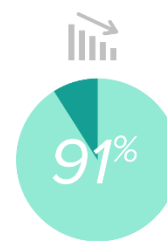
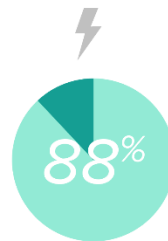
Peak Demand Reduction (kW)



Ex Post Gross Achieved to Gross Goal



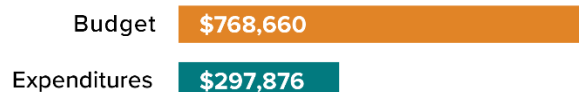
Realization Rate



Budget



Electric and Peak Demand



Spent **39%**

Program Design and Delivery

NIPSCO offers the Appliance Recycling program to incentivize customers to remove their inefficient secondary refrigerators, freezers, dehumidifiers, and room air conditioners. Recycling these secondary units can provide long-term energy savings by removing inefficient appliances from the grid. The program implementer picks up the appliances and recycles them in an environmentally friendly manner, and customers receive a \$50 rebate for refrigerators or freezers and a \$15 rebate for room air conditioners or dehumidifiers. In the 2024 program year, the program reported recycling 687 appliances.

In the 2024 program year, TRC, who implements the program, worked with CLEAResult as their Appliance Recycling subcontractor. CLEAResult scheduled appliance collections, picked up appliances, conducted the recycling functions, and provided TRC with customer participation information.

The following describes the steps customers took to participate in the program.

1. After the customers learned about the Appliance Recycling program, they could participate by scheduling a pick-up with CLEAResult online or over the phone.
2. Customers could schedule a pick-up date and time after CLEAResult confirmed their eligibility for the program. Customers received appointment confirmation and an email with the pick-up details from CLEAResult.
3. The CLEAResult pick-up crew called customers the day before their pick-up to provide a two-hour pick-up window. On the morning of the pick-up, CLEAResult called customers one stop prior to arriving (about 10 – 15 minutes beforehand) to notify them again.
4. Once CLEAResult's pick-up crew members arrived at the customers' homes, they confirmed the appliances' eligibility (i.e., whether they are plugged in, operational, and the correct size) and then collected the unit's information, including their assessment of the appliance's age and other characteristics.
5. CLEAResult then permanently disabled the appliances and removed them for transport. They presented customers with recycling agreements to sign.
6. Customers received their rebate checks within eight weeks of pick-up.

Once the program was up and running in May of 2024, NIPSCO marketed the program through a variety of ways through the end of the year. Some of these marketing avenues included newsletter, direct mail, public relations, the NIPSCO website, and NIPSCO social media, as well as cross-promotion through other programs.

Changes from the 2023 Design

After pausing in August 2023, the Appliance Recycling program restarted during the 2024 program year with a new implementer, CLEAResult. CLEAResult began implementation in March and, after an initial kickoff period, began picking up appliances in May.

TRC sent direct mail out to customers that were on the waitlist when the program paused in 2023. These mailers let customers know to expect a call from CLEAResult to schedule their appliance pick-up.

CLEAResult followed up with a call to these customers to let them know that NIPSCO was offering the program again and offer to schedule a pick-up.

The 2024 program design was like that of the previous program. The two primary changes included:

- NIPSCO did not offer community recycling events. In 2023, the program hosted an event for customers to recycle their small appliances (air conditioners and dehumidifiers).
- The program in 2024 required that a large appliance (refrigerator or freezer) accompanied all smaller appliances (air conditioners and dehumidifiers) scheduled for pick-ups.

Program Performance

The program fell short of meeting its goals for the 2024 program year. The program was not operating for the full year because it took several months to start with the new implementer and began picking up appliances in May of 2024. The 2024 program goals for electric energy savings and peak demand reduction were lower than the 2023 goals (2,346,435.00 kWh and 524.510 kW, respectively).

Table 92 summarizes savings for the program in 2024, including the program’s savings goals.

Table 92. 2024 Appliance Recycling Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	1,531,674.16	586,869.89	581,725.42	581,725.42	518,656.16	317,714.81	34%
Peak Demand Reduction (kW)	271.874	79.934	79.226	79.226	72.450	44.440	27%

Table 93 outlines the *ex post* and net-to-gross (NTG) adjustment factors. The evaluation team used the NTG ratio calculated from the 2023 participant survey. The NTG ratio was 61% for both electric energy and demand savings.

Table 93. 2024 Appliance Recycling Program Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	88%	39%	0%	61%
Peak Demand Reduction (kW)	91%	39%	0%	61%

^a Realization Rate is defined as *ex post* gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

The program spent 39% of its budget in the 2024 program year. Table 94 lists the 2024 program budget and expenditures.

Table 94. 2024 Appliance Recycling Program Budget and Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$768,660.47	\$297,875.78	39%

Evaluation Methodology

To inform the 2024 NIPSCO impact and process evaluation, the evaluation team completed the following research activities:

- **Program staff interviews and discussions**, to understand the program’s process, delivery, and design.
- **Documentation and materials review**, to provide context on the program’s implementation.
- **Tracking data analysis**, to audit and verify the accuracy of the program’s participation data.
- **Engineering analysis**, to review the program savings assumptions and algorithms for reasonableness and accuracy.
- **Implementation staff interviews (n=3)**, to gain insight into the program implementers’ perspective on how the program is running and areas for improvement.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop the savings estimates? Are there any updates that NIPSCO should make?
- What are the *ex post* program savings? Do these suggest any needed updates to the program’s design, delivery, or savings assumptions?
- What is the average age of appliances recycled through the program? How does this compare to the average age of those recycled in 2022 and 2023?
- Did the program meet its participation and savings goals?

For all measure types, the evaluation team compared its engineering calculations to NIPSCO’s *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: the Illinois TRM v12, the Illinois TRM v13, the Indiana TRM Workbook v1.0, and the Pennsylvania TRM (2026).^{21,22,23,24,25}

Audited and Verified Savings

The evaluation team reviewed the program tracking data provided by the program implementer and audited the program savings and recycled appliances by looking for duplicate records, misapplied deemed savings calculations, and program participants or appliances that did not meet the program’s requirements. The

²¹ Illinois Energy Efficiency Stakeholder Group. 2024 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 12.0. Volume 3: Residential Measures. September 22, 2023.

²² Illinois Energy Efficiency Stakeholder Group. 2024 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 13.0. Volume 3: Residential Measures. September 20, 2024.

²³VEIC. Technical Reference Manual Workbook v1.0. August 21, 2023.

²⁴ Cadmus. Indiana Technical Reference Manual Version 2.2. July 28, 2015

²⁵ Pennsylvania Public Utility Commission. Technical Reference Manual Volume 2: Residential Measures. September 2024.

evaluation team found that all entries followed the program’s guidelines and properly deemed savings amounts. The evaluation team identified six sets of two records in which all customer and appliance information was an exact duplicate. The evaluation team removed these duplicates, including three refrigerators, two freezers, and one dehumidifier.

According to the audited program tracking data, the program recycled 681 appliances from May through December of 2024. This is 78% of what the program recycled in 2023 when it was active from January through August (871 appliances).

Table 95 summarizes the tracking data quantity, audited quantity, and resulting verified quantity per measure. In-service rates are not applicable to appliance recycling programs, but past surveys have verified that participants recall participating in the program and that the data on recycled measures is correct.

Table 95. 2024 Appliance Recycling Program *Ex Ante* Through Verified Quantities

MEASURE	UNIT OF MEASURE	TRACKING DATA QUANTITY	AUDITED QUANTITY	VERIFIED QUANTITY
Refrigerators	Recycled appliance	472	469	469
Freezers	Recycled appliance	159	157	157
Dehumidifiers	Recycled appliance	30	29	29
Room Air Conditioners	Recycled appliance	26	26	26
		687	681	681

Ex Post Gross Savings

The evaluation team calculated *ex post* gross per-measure savings for program measures using algorithms and variable assumptions from the Illinois TRM v12.0 for recycled refrigerators and freezers; both the Illinois TRM v12.0 and the Indiana TRM v1.0 for room air conditioner recycling; and the Pennsylvania TRM (2026), Indiana TRM v1.0, and Illinois TRM v12.0 for dehumidifier recycling. Refrigerator and freezer recycling drove most of the program’s *ex post* gross savings with room air conditioners and dehumidifiers making up a relatively small proportion, as shown in Table 96, below.

Table 96. 2024 Appliance Recycling Program Proportion of Verified Counts and *Ex Post* Gross Savings by Measure

MEASURE	PROPORTION OF VERIFIED COUNTS	PROPORTION OF <i>EX POST</i> GROSS SAVINGS
Refrigerators	69%	70%
Freezers	23%	23%
Dehumidifiers	4%	6%
Room Air Conditioners	4%	1%

For the *ex post* gross analysis of refrigerators and freezers, the evaluation team used 2023 participant survey results for the part-use factor, percent of refrigerators used as a primary unit, and percent of units in unconditioned spaces. Information is provided in

Algorithms and Assumptions presents algorithms, variable assumptions, and specific references for all the program measure *ex post* calculations. It also contains detailed descriptions that explain the differences between *ex ante* and *ex post* savings.

Ex Post Gross Savings Summary

Table 97 shows the *ex ante* deemed savings and *ex post* gross per-measure savings for the 2024 Appliance Recycling program measures.

Table 97. 2024 Appliance Recycling Program *Ex Ante* and *Ex Post* Gross Per-Measure Savings Values

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS		EX POST GROSS PER-MEASURE SAVINGS	
		KWH	KW	KWH	KW
Refrigerators	Recycled appliance	884.15	0.109	772.00	0.095
Freezers	Recycled appliance	890.51	0.104	766.00	0.090
Dehumidifiers	Recycled appliance	711.00	0.173	1,052.00	0.239
Room Air Conditioners	Recycled appliance	255.00	0.260	223.78	0.260

Table 98 highlights notable differences between the *ex-ante* and *ex post* gross estimates.

Table 98. 2024 Appliance Recycling Program Notable Differences Between *Ex Ante* and *Ex Post* Gross Estimates

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Refrigerators	<i>Ex ante</i> savings based on the 2022 evaluation results.	Illinois TRM v12.0 and 2023 Appliance Recycling (ARP) participant survey.	<i>Ex ante</i> savings calculations did not apply the <i>ex-post</i> part-use factor reported in the 2022 evaluation report.
Freezers	<i>Ex ante</i> savings based on the 2022 evaluation results.	Illinois TRM v12.0 and 2023 ARP participant survey.	<i>Ex ante</i> savings calculations did not apply the <i>ex-post</i> part-use factor reported in the 2022 evaluation report.
Dehumidifiers	<i>Ex ante</i> savings based on the 2022 evaluation results.	Dehumidifier recycling is not included in the Indiana TRM v1.0 or the Illinois TRM v12.0; therefore, the evaluation team used the default values from the Pennsylvania TRM (2026) to calculate <i>ex post</i> per-measure energy savings and demand reduction for recycled dehumidifiers. The evaluation team	<i>Ex ante</i> savings referenced the 2021 Pennsylvania TRM and used the default savings value for the Scranton reference city, which is lower than the default savings value for the Allentown reference

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
		used the CDD65 value for the closest Indiana TRM v1.0 reference city (all were South Bend) for dehumidifier participants to match the closest Pennsylvania TRM reference city (Allentown) CDD65 value. The team then applied the default gross savings value in the Pennsylvania TRM for the closest matched reference city (Allentown). We used Illinois TRM v12.0 new dehumidifier measure values for hours of use and coincidence factor to calculate peak demand reduction.	city in the 2026 Pennsylvania TRM. ²⁶
Room Air Conditioners	<i>Ex ante</i> savings based on the Illinois TRM v12.0 with the 2022 evaluation full load hours (FLH) <i>ex post</i> results.	Illinois TRM v12.0 and Indiana TRM v1.0.	<i>Ex ante</i> savings reference the 2022 <i>ex post</i> value of 294 for Full Load Hours (FLH); the evaluation team used an updated FLH value based on the weighted average of default FLH values in the Illinois TRM v12.0 for the Illinois reference cities matched to the closest Indiana TRM v1.0 reference city for 2024 room air conditioner recycling participants.

Appliance Age

The evaluation team identified the average appliance age from the tracking data. Table 99, below, shows that the average age of refrigerators in the 2024 tracking data was fairly consistent with this appliance's average age in the tracking data from 2023 and 2022. There was a slight increase in the average age of freezers.

The evaluation team noted that the audited tracking data did not include an appliance age for 19% of refrigerator units and 24% of freezer units. The missing age data was primarily present for appliances that the Appliance Recycling program picked up during the last quarter of 2024. CLEAResult reported that the missing ages were due to a larger number of dirty or scratched-off appliance stickers. The field team was busy in the final months of the year and did not make every effort to clean off stickers that were dirty or hard to read. Since TRC raised this issue with CLEAResult, age has been more consistently entered in subsequent tracking data.

For the 2024 impact calculations, the evaluation team applied the average age value of appliances with recorded age information to those appliances missing age data.

²⁶ The evaluation team decided to use the 2026 Pennsylvania TRM because the default savings values have been updated compared the 2021 Pennsylvania TRM.

Table 99. Average Reported and Tracking Data Ages by Program Year

MEASURE	2020 SURVEY	2020 TRACKING	2021 TRACKING	2022 TRACKING	2023 TRACKING	2023 SURVEY	2024 TRACKING
Refrigerators	17	27	20	20	20	19	22
Freezers	22	30	22	25	22	22	27
Dehumidifiers	N/A	N/A	17	15	16	8	9
Room Air Conditioners	N/A	N/A	17	15	18	12	6

Source: Tracking data and participant survey. Survey questions: “About how old was the [appliance] you recycled (in years)?”

Realization Rates

The next two tables (Table 100 and Table 101) show the program’s *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for energy savings and peak demand reduction. The key driver of total *ex post* gross energy savings and peak demand reduction being less than the *ex ante* totals is that the refrigerator and freezer *ex ante* energy savings and peak demand reduction calculations did not include a part-use factor, while the *ex post* calculations did include this.²⁷

Table 100. 2024 Appliance Recycling Program *Ex Ante* and *Ex Post* Gross Electric Energy Savings

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)
Refrigerators	417,318.80	414,666.35	414,666.35	362,068.00
Freezers	141,591.09	139,810.07	139,810.07	120,262.00
Dehumidifiers	21,330.00	20,619.00	20,619.00	30,508.00
Room Air Conditioners	6,630.00	6,630.00	6,630.00	5,818.16
Total Savings	586,869.89	581,725.42	581,725.42	518,656.16
Total Program Realization Rate				88%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent audited values since the scorecard provides only savings totals.

²⁷ The *ex post* gross energy savings and demand reduction for dehumidifiers is higher than verified gross energy savings and demand reduction due to the evaluation team applying updated deemed estimates from the 2026 Pennsylvania TRM that were calculated using newer weather data compared to the 2021 Pennsylvania TRM deemed values that *ex ante* savings were based on. Additionally, the evaluation team used the CDD65 value for the closest Indiana TRM v1.0 reference city (all were South Bend) for dehumidifier participants to match to the closest Pennsylvania TRM reference city (Allentown) CDD65 value and applied the default gross savings value in the Pennsylvania TRM for the closest matched reference city (Allentown). *Ex ante* savings reference the 2021 Pennsylvania TRM and used the default savings value for the Scranton reference city, which is lower than the default savings values for the Allentown reference city in the 2026 Pennsylvania TRM and 2021 Pennsylvania TRM.

Table 101. 2024 Appliance Recycling Program *Ex-Ante* and *Ex Post* Gross Peak Demand Reduction

MEASURE	<i>EX ANTE</i> ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	<i>EX POST</i> GROSS PEAK DEMAND REDUCTION (KW/YR.)
Refrigerators	51.448	51.121	51.121	44.642
Freezers	16.536	16.328	16.328	14.109
Dehumidifiers	5.190	5.017	5.017	6.934
Room Air Conditioners	6.760	6.760	6.760	6.765
Total Savings	79.934	79.226	79.226	72.450
Total Program Realization Rate				91%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent audited values since the scorecard provides only savings totals.

Ex Post Net Savings

The evaluation team used the 2023 participant survey results in combination with the *ex post* gross impact evaluation results to estimate the net-to-gross (NTG) ratios for both refrigerators and freezers. Using a savings weighted average of 2023 recycled refrigerator and freezers NTG estimates, the evaluation team found a total program NTG of 61% for energy savings and 61% for demand reduction. The evaluation team applied the total program NTG values as the NTG for dehumidifiers and room air conditioners. Table 102 shows the NTG ratios by measure.

Table 102. 2024 Appliance Recycling Program Net-to Gross Ratios by Measure

MEASURE	NTG
Refrigerators	64%
Freezers	53%
Dehumidifiers	61%
Room Air Conditioners	61%

Table 103 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 103. 2024 Appliance Recycling Program *Ex Post* Net Savings

MEASURE	<i>EX POST</i> GROSS SAVINGS/REDUCTION		NTG	<i>EX POST</i> NET SAVINGS/REDUCTION	
	KWH	KW		KWH	KW
Refrigerators	362,068.00	44.642	64%	231,723.52	28.571
Freezers	120,262.00	14.109	53%	63,738.86	7.478
Dehumidifier	30,508.00	6.934	61%	18,688.38	4.247
Room Air Conditioner	5,818.16	6.765	61%	3,564.05	4.144

MEASURE	EX POST GROSS SAVINGS/REDUCTION		NTG	EX POST NET SAVINGS/REDUCTION	
	KWH	KW		KWH	KW
Total Savings	518,656.16	72.450		317,714.81	44.440

Table 104 shows the net-to-gross results for each fuel.

Table 104. 2024 Appliance Recycling Program Net-to-Gross Results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	586,869.89	518,656.16	61%	317,714.81
Peak Demand Reduction (kW)	79.934	72.450	61%	44.440

Process Evaluation

The evaluation team completed documentation and materials review, tracking data analysis, and implementation staff interviews to answer the following research questions:

- How has the program changed since 2023?
- How has the transition to the new implementer gone from the contractor's perspective?
- What is participants' level of satisfaction with the program from the contractor's perspective?
- How often do contractors experience cancellations or other disruptions?
- What are contractors' experiences and level of satisfaction with the program?
- What challenges, if any, do contractors face with respect to the program?
- What are the characteristics of recycled appliances?
- What feedback do contractors have on how to improve the program?

Materials Review

To provide context on implementation, the evaluation team reviewed program materials including emails, mailers, door hangers, flyers, check inserts, and social media posts. The mailers included letters sent to customers that were on the program waitlist due to the program pause in the fall of 2023. In addition to promoting participation in the Appliance Recycling program, the materials also included a leave-behind sheet with information about the impact of the Appliance Recycling program and information on other NIPSCO residential programs.

Implementation Staff Feedback

The evaluation team interviewed three staff members at CLEAResult. One was the associate program manager, and the two others were field staff. The field staff complete appliance pick-ups and support scheduling. They also communicate with customers. The following sections describe the results related to marketing, scheduling, the pick-up process, customer feedback, and the contractor experience.

Marketing

CLEAResult staff shared that NIPSCO does a lot of marketing and that it has helped drive participation in the program and keep the team's schedule busy. They can tell when NIPSCO is marketing the program because calls to the call center increase.

Scheduling

CLEAResult schedules pick-ups in NIPSCO's service area by assigning certain zip codes to different days of the week. The staff members regularly reevaluate the scheduling process to see how they can improve it or adjust the number of days of the week devoted to certain zip codes. Customers can schedule a pick-up by calling the call center, which is operated by CLEAResult, or through CLEAResult's online portal.

Each evening, a field staff employee makes the pick-up route for the next day using a scheduling software called Optimum Route. The field staff member then calls each customer and gives them a more specific window of time when they can expect staff to arrive the following day. The call center previously told customers that the pick-up would happen between 9 a.m. and 5 p.m. on the scheduled date, leaving customers waiting all day. This led the field staff to implement a more specific time window.

Pick-Up Process

Field staff call customers in the morning on the day of their pick-up and again when they are about 10 minutes away from the customer's home. Once the field staff arrive at a customer's home, they introduce themselves and see where the appliance is located. They confirm that the appliance is eligible for the program by checking that it works and assessing whether it is safe to move out of the home.

The field staff then record data about the appliance, including whether it was a primary or secondary appliance, if it was replaced, and where it was previously located if the customer moved the appliance for pick-up. They look for information about size, age, serial number, and refrigerant type on the sticker of the appliance. If the field staff cannot find the information, or if the sticker is unreadable, they estimate as much data as they can, making an educated guess based on their experience with similar appliances, and put N/A for what they cannot estimate.

Finally, field staff share the recycling agreement with the customer to get their signature. At the time of our interviews, field staff were not leaving any materials behind with the customer to promote other NIPSCO programs. However, since the evaluation interviews, CLEAResult staff have started using the leave-behind promotional material developed by program staff. Cross-promotion is one of the marketing channels that NIPSCO uses for many of its residential programs, and using leave-behind materials for participants in the Appliance Recycling program supports this marketing channel.

Cancellations and Disruptions

CLEAResult field staff and the program manager said that the pick-up process works smoothly, though there are a few reasons for pick-up cancellations or disruptions. These include rescheduling appointments, customer no-shows, concerns about field staff legitimacy, and appliance eligibility.

Field staff help customers reschedule their appointments if their appointment date or time no longer works, though they do not have access to make changes directly to the scheduling system. Field staff mentioned

that the call center will reschedule people further out than necessary, rather than rescheduling to available times in the next couple of days or weeks.

Field staff do encounter no-show pick-up appointments, i.e., pick-ups where the customer is not home. When this happens, they leave a door tag with the time that they were there and information to reschedule. They also take a picture, if needed, as proof that they were at the house.

Field staff reported that they have occasionally come across customers with concerns about their legitimacy. Some customers have asked field staff for certification or identification to prove they are with the NIPSCO program. However, at the time of our interview, field staff did not have a business card or ID from NIPSCO. Field staff mentioned that they have identification for other programs they work with and that having this for NIPSCO would be useful. Since the evaluation interviews, the program implementer has been coordinating with CLEAResult staff to get identification badges for field staff, which will verify they are part of the NIPSCO program. The field staff also said that, currently, they pick up appliances in a plain white truck which can cause further confusion or distrust in customers, but they are working on getting magnets for the doors that will identify the truck with a NIPSCO logo. They had magnets on the side of the previous truck for identification, but their new truck does not have magnetic sides.

Some customers have requested receipts or documentation that their appliance was picked up by NIPSCO through the Appliance Recycling program. Field staff are unable to provide receipts or documentation on-site, so CLEAResult created a new process for these situations: field staff collect emails from customers requesting documentation and have the program manager email them the pick-up confirmation. However, field staff said that being able to offer documentation during the pick-up would be helpful to support a smooth pick-up process. Consistently offering pick-up documentation could also support showing legitimacy for customers that are concerned about this, further supporting field staff.

Occasionally, field staff will not be able to complete a pick-up due to appliance eligibility or safety concerns. The most common eligibility issue is that the appliance does not work. The most common safety issue is that there is not a path to remove the appliance from the home that provides adequate access, clearance, or structural safety. For example, stairs may not be strong enough or doorways may not be wide enough to safely remove the appliance. In these situations, field staff explain the issue to the customer, let them know how to address the issue, and instruct them to reschedule the pick-up if the issue is addressed. Field staff expressed that they do not like to leave without picking up an appliance and only do so in situations when they feel there is not a way to pick up the appliance safely. They said that these sorts of safety concerns are rare. However, they are more typical in Gary, Indiana, where field staff encounter more older homes with outdated stairs and small doorways.

Customer Feedback and Satisfaction

Program representatives reached out to all customers who were on the waitlist due to the program's pause in 2023. TRC sent mailers to customers' homes, and CLEAResult call center staff followed up by phone and were able to schedule appliance pick-ups with many of these customers. The program was scheduling out further than usual while working through the waitlist backlog. Some customers' pick-up dates were pushed out, which led to frustration. To accommodate the high volume of scheduled pick-ups and to move through the backlog more quickly, the program team added Saturday pick-ups to the schedule.

Field staff reported that customers are happy to get their appliances out of their homes. This was especially true for customers who were on the waitlist: “I’ve had this fridge sitting in one spot for a year now,” one such customer said. Some customers expressed to field staff that they cared more about getting old appliances removed than about the rebate.

Field staff also reported that customers are satisfied with the staff’s level of service and professionalism. The field staff said they think of themselves as “the face of the program” and take pride in their interactions with customers. Some customers ask field staff if there is a survey they can fill out or number to call to share their positive experience. Currently, there is no resource to which field staff can direct these customers.

Field staff shared that the only negative feedback they have received from customers is related to scheduling with the call center. Field staff reported hearing from customers who needed to reschedule that the call center would schedule their pick-up a few months out, rather than looking at the next couple of days or weeks. Sometimes customers reach out directly to the field staff member that gave them a reminder call for their original pick-up time to complain about how far out the rescheduled timeslot is. Field staff were typically able to fit these customers into their schedules sooner. Field staff also reported that the call center seemed to be pushing the Saturday timeslots more than other days of the week, even when it was not necessary.

Contractor Experience

Program staff expressed that the program is running smoothly and working well. Staff were satisfied with the training they received and feel supported by their team. The program manager said that TRC has been easy to work with and helps CLEAResult continue to improve the program.

Field staff have taken it upon themselves to suggest or enact improvements based on their experiences, such as streamlining the scheduling process by assigning days of the week by zip code. This has helped them pick up appliances more efficiently. Staff also created a cancellation list where, if there is a cancellation, the field staff will call other customers to try and get them a quicker rescheduled pick-up time. However, field staff must email their supervisor to move the appointment since they do not have access to the scheduling system.

CLEAResult reported that it is performing well and exceeding its targets for number of appliances recycled. The program did not meet its savings goals for the year, but TRC expressed that this was due to the late start to the program due to restarting the program mid-year with a new implementer. CLEAResult staff shared that they are busy and might have to look at expanding their team to support program participation if demand continues at its current level or grows.

As noted in the *Appliance Age* section of this chapter, the evaluation team noted that many appliances recycled in November and December did not have the appliance age recorded in the program tracking data. When asked, staff reported that there is no formal quality control process.

Conclusions and Recommendations

CONCLUSION 1: WHILE THE PROGRAM FELL SHORT OF ITS SAVINGS GOALS, PRIMARILY DUE TO THE DELAY IN PROGRAM LAUNCH, THE TRANSITION TO THE NEW RECYCLING SUBCONTRACTOR HAS BEEN SMOOTH, AND PROGRAM STAFF NOTED AN UPTICK IN PROGRAM PARTICIPATION AFTER NIPSCO'S MARKETING EFFORTS.

In the eight months of program tracking data that the team evaluated, the program saved 518,656.16 kWh (34% of its energy goal) and 72.450 kW (27% of its demand goal).

The program is running smoothly. The CLEAResult team seems to be working well together. They feel ownership over the success of the program and are working to improve the program, including the scheduling process. CLEAResult program staff also reported that they noticed an uptick in calls to the call center after NIPSCO marketing efforts.

Recommendation:

- Provide CLEAResult advance notice of NIPSCO marketing efforts for the Appliance Recycling program so it can prepare for an increased call volume.

CONCLUSION 2: EX ANTE SAVINGS ALIGNED CLOSELY WITH EX POST SAVINGS, LEADING TO REALIZATION RATES CLOSE TO 100%.

To inform the *ex post* gross savings analysis, the evaluation team applied a part-use factor based on 2023 participant survey results to calculate *ex post* gross energy savings and *ex post* gross peak demand reduction, resulting in realization rates of 88% for electric savings and 91% for demand reduction. The *ex ante* gross energy savings and *ex ante* gross peak demand reduction calculations did not include a part-use factor.

Recommendation:

- Update the program *ex ante* estimates to use the most recent 2024 *ex post* evaluation results, making sure to apply the recommended part-use factor for refrigerator and freezer recycling measures.

CONCLUSION 3: AN UNUSUALLY HIGH NUMBER OF RECORDS WITH MISSING APPLIANCE CHARACTERISTICS LEFT THE EVALUATION TEAM MISSING KEY INPUTS TO EX POST ENERGY SAVINGS AND EX POST PEAK DEMAND REDUCTION CALCULATIONS FOR A LARGE PORTION OF APPLIANCES.

The verified tracking data was missing the appliance age for 19% of refrigerator units and 24% of freezer units. Additionally, 3% of refrigerator records and 9% of freezer records were missing the size of the unit. Most missing ages were from appliances picked up at the end of the year; 83% of the refrigerator records with a missing age and 70% of the freezer records with a missing age occurred in December 2024 and were from the last two tracking data upload batches of the year. The age and size of recycled refrigerators and freezers are key inputs to *ex post* energy savings and *ex post* peak demand reduction calculations.

Field staff input data on the appliance, including age and size. They first look to use information on the appliance label. If they cannot read the label or if the information is not available, they ask the customer for any information and then make an educated guess on size and age. The field team was busy in the final

months of the year and did not have time to clean off stickers that were dirty or hard to read. Since this issue was raised with CLEAResult, age has been more consistently entered in subsequent data.

Additionally, inconsistent formatting for the age of appliances (e.g., “2015” or “15”) created an additional step for the evaluation team when using inputs from the tracking database, as the team needed to determine whether a number entered referred to the year of the appliance or the appliance’s age.

Recommendations:

- Develop program processes to improve consistent collection of information about the unit age and size of the recycled refrigerators and freezers. These processes could include:
 - Use data validation in the tracking database to ensure that staff are entering each appliance’s age and size into the tracking database in a consistently formatted manner. In addition to requiring a four-digit year and appropriate size value, this validation could require entering a value of “missing,” for unavailable data, which program staff could monitor over time and take action if the percentage of “missing” values surpasses an acceptable threshold.
 - Direct field staff to attempt to clean an appliance label before making an estimate as to whether the information cannot be read. Ensure that field staff have the proper supplies that enable them to clean appliance labels.
 - Consider adding a field to document the source of the size and age entered into the database, so program staff can know which entries came directly from an appliance sticker and which were field staff estimates.

CONCLUSION 4: THE IMPLEMENTATION TEAM HAS MADE IMPROVEMENTS TO THE SCHEDULING PROCESS, BUT THERE ARE OPPORTUNITIES FOR FURTHER IMPROVEMENT.

The implementation team has improved the scheduling process over time to pick up units more efficiently, add availability on the weekend, and give customers an understanding of when they can expect the field staff to arrive at their home. However, field staff shared some feedback on customers’ experiences scheduling with the call center. When customers need to reschedule, field staff said the call center will often reschedule further out, rather than trying to book the customer as soon as possible. Field staff could help fit these customers into the schedule sooner, but they currently do not have the permissions to add them to the schedule directly. Field staff also experienced that call center staff were pushing appointments on Saturdays more than on other days of the week.

Recommendations:

- Work with CLEAResult to further improve the scheduling process, including:
 - Recommending that CLEAResult gives field staff permission to update the schedule directly in cases where they are in direct contact with the customer.
 - Ensuring that the call center staff are offering all available days and times (not just Saturdays) and are looking for availability as soon as possible for customer reschedules.

CONCLUSION 5: FIELD STAFF IDENTIFIED SEVERAL OPPORTUNITIES FOR PROGRAM IMPROVEMENT THROUGH THEIR INTERACTIONS WITH PARTICIPANTS, THOUGH THEY REPORTED THAT CUSTOMERS ARE SATISFIED WITH THE PROGRAM.

At the time of the evaluation, field staff reported that they did not have leave-behind materials meant to educate participants about other NIPSCO energy efficiency programs, and they also did not have identification badges. However, after the evaluation team raised these issues with NIPSCO, they provided these materials to CLEAResult, and field staff have been using them during subsequent appliance pick-ups.

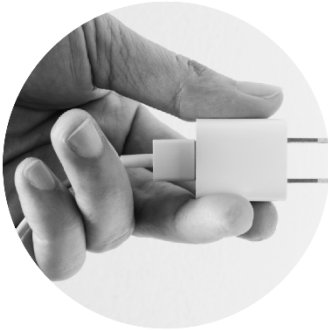
Field staff said that some customers request proof of identification from them when they arrive, which they did not have at the time of the evaluation interviews. This adds additional work for field staff to earn trust from customers without NIPSCO identification. Field staff also noted that the truck is not marked with a NIPSCO logo. In addition, field staff said that customers sometimes ask for receipts of the pick-up, and it would be helpful to be able to provide this while at a customer's home.

Field staff reported that they believe customers are satisfied with the program and that customers share positive feedback with field staff about their experiences. Field staff shared that customers sometimes ask if they can provide feedback about their positive experience with NIPSCO.

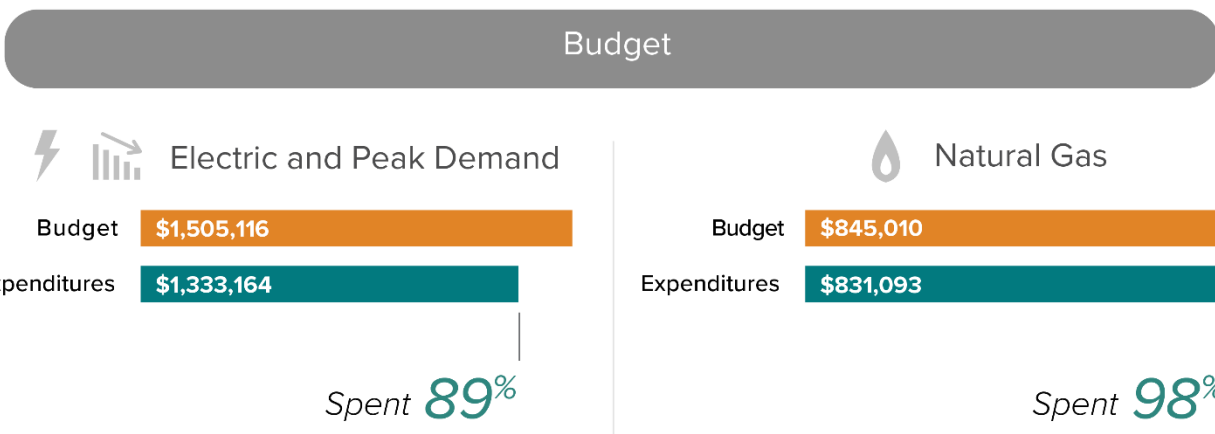
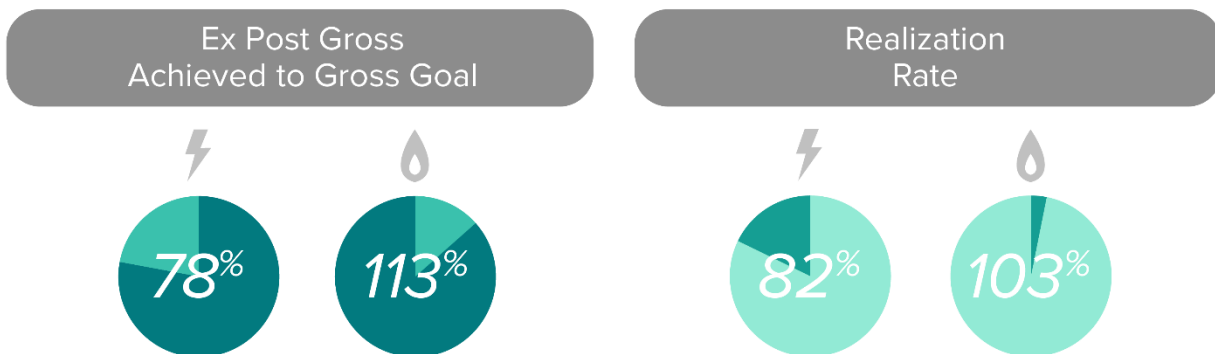
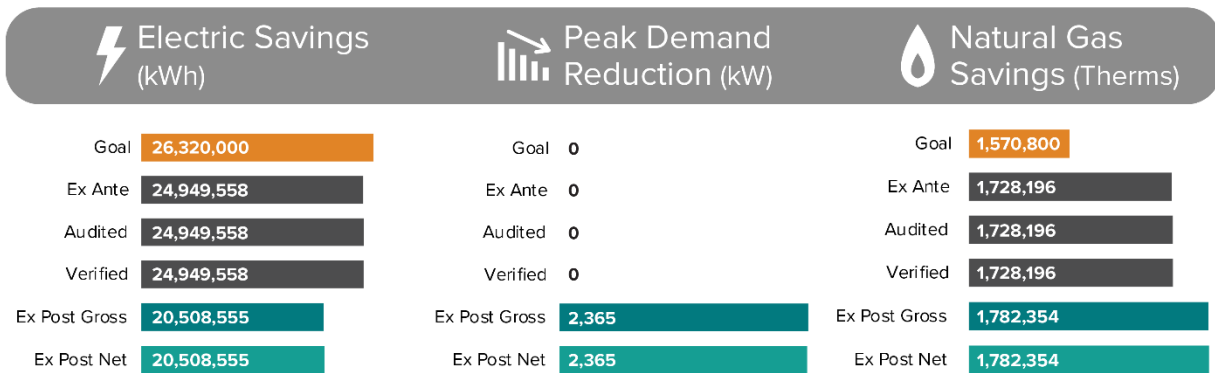
Recommendations:

- Ensure that CLEAResult staff are providing participants with the already-developed leave-behind materials that share information about NIPSCO's other energy efficiency programs and the impact of the Appliance Recycling program.
- Consider enhancing leave-behind materials to include a QR code for customers to access a survey to share their experiences with the program and a receipt that documents the appliance pick-up.
- Ensure that field staff have business cards and identification badges and that trucks are marked with the NIPSCO or CLEAResult logo to provide customers with assurance of the field staff's legitimacy.

BEHAVIORAL



- The new IQ Behavioral waves met program savings goals for electric and gas, and the non-IQ electric waves missed the program savings goal for electric.
- New IQ waves have a greater range of household savings and greater variation in seasonal savings patterns compared to their non-IQ cohorts.
- Fewer waves had statistically significant savings than in prior years, possibly due to smaller wave sizes.



Program Design and Delivery

First launched in 2011, the Behavioral program provides paper and electronic Home Energy Reports (HERs) to select NIPSCO customers. Customers can choose to opt out of receiving HER reports. HERs detail customers' energy usage—including their historical consumption data as well as a comparison to other households—and provide low-cost and no-cost tips to save energy. Customers enrolled in the program with a valid email address also receive a monthly electronic HER and access to the program-affiliated web portal to review their energy consumption and see additional energy saving tips. HERs also promote and encourage participation in other NIPSCO energy efficiency programs. Oracle administers the program for NIPSCO.

The program uses a randomized control trial (RCT) design where Oracle randomly assigns customers to a treatment or control group. Customers in the treatment group receive a HER while customers in the control group do not receive a HER. The program has 12 customer groups (waves) based on when a customer began receiving the HER (Table 105). The initial five waves have respective natural gas and electric populations, known as cohorts. NIPSCO launched a sixth wave of gas-only customers in September 2017, and a seventh wave of electric-only customers in May 2018. Five more waves (the eighth, ninth, 10th, 11th, and 13th waves) kicked off with gas and electric customers in April 2019, April 2020, April 2021, April 2022, and September 2024. The program retired Wave 10, which is not included in this report, after August 2023 due to persistent negative savings since the launch. The 12th wave also launched in April 2022 but as a separate wave with electric-only customers.

Table 105. 2024 Non Income-Qualified Behavioral Customer Counts by Wave

WAVE	FIRST REPORT	FUEL	NUMBER OF ELECTRIC CUSTOMERS		NUMBER OF GAS CUSTOMERS	
			TREATMENT	CONTROL	TREATMENT	CONTROL
Wave 1	March 2011	Dual	43,446	14,678	42,200	14,264
Wave 2	June 2012	Dual	2,600	2,646	2,621	2,666
Wave 3	July 2014	Dual	13,688	3,128	13,728	3,137
Wave 4	March 2015	Dual	9,046	2,369	9,069	2,380
Wave 5	June 2017	Dual	10,896	3,485	10,925	3,498
Wave 6	September 2017	Natural Gas	-	-	18,245	4,264
Wave 7	May 2018	Electric	7,786	3,698	-	-
Wave 8	April 2019	Dual	10,660	5,304	10,714	5,323
Wave 9	April 2020	Dual	6,793	3,339	6,813	3,360
Wave 11	April 2022	Dual	8,591	5,517	8,517	5,429
Wave 12	April 2022	Electric	8,115	4,272	-	-
Wave 13	September 2024	Dual	46,291	13,015	39,503	11,142
TOTAL			167,912	61,451	162,335	55,463

Note: For the dual fuel waves, the same group of customers receive natural gas and electric feedback. The customer counts shown are based on program data. There are differences in counts between electric and natural gas.

Participation for Wave 13 is reported for September 2024, and participation for all other waves is reported for January 2024.

Source: ILLUME analysis of data provided by Oracle

In 2024, NIPSCO began measuring program goals by Income-Qualified and non-Income-Qualified customers. Oracle divided all participating customers (treatment and control) into Income-Qualified (IQ) and non-

Income-Qualified (non-IQ) waves based on individual customer data (from Datalogix) and census tract median income. Table 106 shows the customer counts in the IQ waves. The program reported savings and participation for IQ and non-IQ waves separately. In the future, IQ waves will also receive specific messaging in HER reports.

Table 106. 2024 Income-Qualified Behavioral Customer Counts by Wave

WAVE	FIRST REPORT	FUEL	NUMBER OF ELECTRIC CUSTOMERS		NUMBER OF GAS CUSTOMERS	
			TREATMENT	CONTROL	TREATMENT	CONTROL
Wave 1 (IQ)	March 2011	Dual	25,885	8,441	24,404	7,992
Wave 2 (IQ)	June 2012	Dual	2,309	2,327	2,330	2,343
Wave 3 (IQ)	July 2014	Dual	8,028	1,772	8,080	1,789
Wave 4 (IQ)	March 2015	Dual	6,261	1,608	6,302	1,616
Wave 5 (IQ)	June 2017	Dual	5,687	1,850	5,727	1,876
Wave 6 (IQ)	September 2017	Natural Gas	-	-	12,066	2,970
Wave 7 (IQ)	May 2018	Electric	4,740	2,220	-	-
Wave 8 (IQ)	April 2019	Dual	4,270	2,009	4,319	2,026
Wave 9 (IQ)	April 2020	Dual	2,925	1,466	2,947	1,480
Wave 11 (IQ)	April 2022	Dual	4,035	2,553	3,808	2,423
Wave 12 (IQ)	April 2022	Dual	5,443	2,907	-	-
Wave 13 (IQ)	September 2024	Electric	19,775	5,632	15,951	4,522
TOTAL			89,358	65,570	85,934	29,037

Note: For the dual fuel waves, the same group of customers receive natural gas and electric feedback. The customer counts shown are based on program data. There are differences in counts between electric and natural gas.
 Participation for all waves is reported for January 2024.
 Source: ILLUME analysis of data provided by Oracle

Splitting the waves by IQ and non-IQ customers resulted in smaller treatment and control group sizes for all waves compared to previous years (Table 106). Notably, smaller base sizes can make it less likely for savings to be significant in the billing analysis. These numbers also reflect customers opting out of the program or moving (see *Customer Count Trends* for more details on opt out and moving). On average, the electric non-IQ waves have 42% fewer treatment participants than they did in 2023. The electric IQ waves have 67% fewer treatment participants than the program had in 2023. Fifteen electric waves have fewer than 10,000 customers. On average, the gas non-IQ waves have 41% fewer treatment participants than they did in 2023. The gas IQ waves have 67% fewer treatment participants than the program had in 2023. The gas control groups were smaller still with the non-IQ and IQ waves having 72% and 83% fewer control participants, respectively, than the aggregate program wave last year. Eleven gas waves have fewer than 10,000 customers.

Changes from the 2023 Design

The program teams (NIPSCO and Oracle) made five primary changes to the Behavioral program from 2023 to 2024, including the changes already described above:

1. Because the NIPSCO team is interested in exploring savings by income, the Oracle team created measurement slices for IQ and non-IQ waves based on each customer's income compared to 200% of the federal poverty level.
2. NIPSCO introduced a new dual fuel wave in 2024, which began in September. Subsequent to the wave's launch, a slice measurement to measure each sub-population's savings was created for IQ and non-IQ, similar to how the other older program waves have been sliced.
3. NIPSCO rolled out high bill alerts in March 2024. Eligible behavioral program customers received alerts when the program forecasted their usage to be at least 30% higher than their usage in the same month of the previous year.
4. Oracle sent dual and gas customers messaging to prepare for extreme cold weather in February, as seen below in Figure 57 and Figure 58.
5. Figure 57 and Figure 58 also show that the program's messaging in 2024 more heavily emphasized NIPSCO's Home Energy Assessment (HEA) program. In 2023, electric and dual fuel customers received two HER reports with HEA messaging and gas customers received one. In 2024, both groups received an additional HER report with HEA messaging in December.

Figure 57. 2024 Program Design – Electric and Dual Fuel Customers

Report Channel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
PRINT												
Marketing Module?		Be prepared for extreme cold weather				An easy way to save (AC Rebates)		Schedule a no-cost home energy assessment		Get ready for winter		
EMAIL												
Marketing Module?	How your profile helps you save	Be prepared for extreme cold weather	Get a no-cost home energy assessment	Get ready for summer	An easy way to save (AC Rebates)	Let us recycle your old appliance	An easy way to save (AC Rebates)	Get a no-cost home energy assessment	An easy way to save (Unplug devices)	3 easy ways to save this winter	Thank you for saving energy	Get a no-cost home energy assessment

Note: The program design for the December marketing module was changed to 'Get a \$250 rebate.'

Figure 58. 2024 Program Design – Gas Customers

Report Channel	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
PRINT												
Marketing Module?	Be prepared								Schedule a no-cost home energy assessment		Get ready for winter	Schedule a no-cost home energy assessment
EMAIL												
Marketing Module?	How your profile helps you save	Be prepared for extreme cold weather								3 easy ways to save this winter	Thank you for saving energy	Get a no-cost home energy assessment

Note: The program design for the December marketing module was changed to ‘Get a \$250 rebate.’

Program Performance

For the 2024 evaluation year, the team received data from January to December of 2024 for all waves. The evaluation team examined all data Oracle provided by January 31, 2025, which was 96% of all customer data on average across all waves and months of 2024. The remainder of this report includes an evaluation of the available 2024 data received.

As of 2024, NIPSCO has separate goals for the non-IQ and IQ waves participating in the residential program. When combining the non-IQ and IQ savings goals in comparison to goals of prior years, the total behavioral electric savings goal increased 12% from the goal in 2023 and 14% from the goal in 2022. When comparing the specific non-IQ program goals to goals of prior years, the 2024 electric non-IQ gross savings goal was 16% lower than the combined program goal in 2023 and the 2024 natural gas non-IQ gross savings goal was 1% lower than the goal in 2023.

For the past six program years, the evaluation team has consistently verified savings that are on goal for electric savings and considerably higher than goal for gas savings for the residential program. This year reflects a departure in this trend. The non-IQ waves achieved 67% of their electric gross savings goal and 107% of the natural gas gross savings goal. Table 92 presents a savings summary for the program, including goals. NIPSCO did not have a demand reduction goal for the program and did not track *ex ante* demand reduction. The Behavioral program accounts for a large portion of the electric and gas portfolio energy savings. As per NIPSCO’s Energy Efficiency Scorecard (as of December 31, 2024), 48% of NIPSCO’s residential electric energy portfolio goal for 2024 came from the Behavioral program and 45% of its achieved gross energy savings came from the program; for gas, 34% of the residential portfolio goal and 33% of achieved gross energy savings. Table 107 summarizes savings for the full year of program performance, including program savings goals.

Table 107. 2024 Non Income-Qualified Behavioral Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	19,673,564.00	16,629,663.14	16,629,663.14	16,629,663.14	13,112,846.27	13,112,846.27	67%
Peak Demand Reduction (kW)	0.000	0.000	0.000	0.000	1,505.607	1,505.607	n/a
Natural Gas Energy Savings (therms/yr.)	1,119,037.92	1,122,150.71	1,122,150.71	1,122,150.71	1,196,549.31	1,196,549.31	107%

Source: ILLUME analysis of data provided by NIPSCO

Note: Throughout the report, ex post data refers to implementer provided data.

The IQ program achieved 111% of its electric gross savings goal and 130% of its natural gas gross savings goal. Table 108, below, presents a savings summary for the program, including goals. NIPSCO did not have a demand reduction goal for the program and did not track *ex ante* demand reduction.

Table 108. 2024 Income-Qualified Behavioral Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	6,646,436.00	8,319,894.86	8,319,894.86	8,319,894.86	7,395,708.27	7,395,708.27	111%
Peak Demand Reduction (kW)	0.000	0.000	0.000	0.000	859.833	859.833	n/a
Natural Gas Energy Savings (therms/yr.)	451,762.08	606,045.29	606,045.29	606,045.29	585,805.18	585,805.18	130%

Source: ILLUME analysis of data provided by NIPSCO Note: Throughout the report, ex post data refers to implementer provided data.

Note: Throughout the report, ex post data refers to implementer provided data.

The following tables present the realization rates for the two programs. For electric, the realization rate for 2024 was 79% for the non-IQ program and 89% for the IQ program. These are both comparatively lower than the realization rate of the program in the last two years (99% in 2022 and 101% in 2023). For natural gas, the realization rate for 2024 was 107% for the non-IQ program and 97% for the IQ program. In the past two years, the realization rate for natural gas was 94%.

Note that the experimental design and evaluation methods (a randomized study design comparing change in energy use over time between a treatment and control group) mean that *ex post* savings are by design net savings. In this study design, participants would not receive reports in absence of the program (i.e., no freeridership), and any spillover within participants is captured in the evaluation as program savings (i.e., spillover is not applicable). The evaluation produces a net savings value with a net-to-gross (NTG) adjustment factor of 100% so the evaluation team does not make any additional adjustments. Table 109 outlines the *ex post* and NTG adjustment factors for the non-IQ program.

Table 109. 2024 Non Income-Qualified Behavioral Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILLOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	79%	0%	N/A	100%
Peak Demand Reduction (kW)	n/a	0%	N/A	100%
Natural Gas Energy Savings (therms/yr.)	107%	0%	N/A	100%

Source: ILLUME analysis of data provided by Oracle and NIPSCO

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b The appropriate NTG for HER programs is 100%.

Table 110 outlines the *ex post* and NTG adjustment factors for the IQ program.

Table 110. 2024 Income-Qualified Behavioral Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILLOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	89%	0%	N/A	100%
Peak Demand Reduction (kW)	n/a	0%	N/A	100%
Natural Gas Energy Savings (therms/yr.)	97%	0%	N/A	100%

Source: ILLUME analysis of data provided by Oracle and NIPSCO

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b The appropriate NTG for HER programs is 100%.

As of December 31, 2024, the non-IQ program spent 85% of its annual electric program budget and 96% of its annual natural gas program budget. Table 111 lists the 2024 program budget and expenditures by fuel type.

Table 111. 2024 Non Income-Qualified Behavioral Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$1,006,632.83	\$852,953.11	85%
Natural Gas	\$565,148.75	\$561,650.85	99%

Source: ILLUME analysis of data provided by NIPSCO

As of December 31, 2024, the IQ program spent 96% of its annual electric program budget and 96% of its annual natural gas program budget. Table 112 lists the 2024 program budget and expenditures by fuel type.

Table 112. 2024 Income-Qualified Behavioral Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$498,483.30	\$480,210.69	96%
Natural Gas	\$279,860.94	\$269,441.99	96%

Source: ILLUME analysis of data provided by NIPSCO

Evaluation Methodology

To inform the 2024 NIPSCO impact and process evaluation, the evaluation team completed the following research activities:

- **Program staff interviews and discussions** to understand the program changes to process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation and understand program messaging.
- **Tracking and savings data analysis** to audit and verify the accuracy of program savings and usage data.
- **Billing analysis** to forecast participant consumption in the absence of the program and to calculate energy savings as the difference between modeled and actual consumption.
- **Cross program participation analysis** to determine how the program channels customers into other NIPSCO offerings.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- For the legacy non-IQ program and new IQ program, what are *ex post* program savings? Do these suggest any needed updates to the program’s design, delivery, or savings assumptions?
- How have the legacy program savings changed across program years after terminating old waves or adding new waves?

This section details each step of the impact evaluation and its associated electric energy savings and natural gas savings. The evaluation team collected the implementer's data for monthly energy usage and savings for each wave, as well as billing data for all waves from one year prior to the start of the wave through December of the 2024 program year. The evaluation team conducted a billing analysis for the 2024 program year with a cross-program participation analysis and reviewed Oracle's estimated impacts by wave and month.

Billing Analysis

The evaluation team applied several steps for our Behavioral program billing analysis:

- **Data cleaning:** The evaluation team identified respondent data to exclude from the analysis. Reasons for exclusion include an insufficient number of pre-period or program-period months or insufficient billing days within a given month to determine a monthly average.
- **Equivalency check:** The evaluation team verified that the distribution of average monthly energy usage prior to receiving the HERs was sufficiently similar between the treatment and control groups, consistent with the random assignment of customers to treatment and control groups.
- **Regression analysis:** The evaluation team verified program impacts using two alternative statistical models: a post-program regression (PPR) analysis with lagged participant controls and a linear fixed effects regression (LFER) analysis. Both models control for individual respondent differences. However, the PPR achieves this by including lagged participant controls for each participant as an explanatory variable, while the LFER removes each participant's average energy consumption before modeling. The evaluation team applied both models to monthly energy usage data obtained from respondent bill records. The results of the PPR model are reported as the official impact estimates with the LFER model serving as a check on those results. More details are provided in *Appendix A. Residential Behavioral Program Regression Analysis and Cross Program Participation Analysis*.
- **Cross program participation analysis:** The evaluation team estimated the cross-program participation in other energy efficiency programs due to actions suggested by HERs through a post-only differences approach applied to tracking data from other programs. Post-only differences are a direct comparison of program uptake in the post-period as a percentage of respondents from treatment and control groups. More details are provided in *Appendix A. Residential Behavioral Program Regression Analysis and Cross Program Participation Analysis*.

Data Cleaning

As shown in Table 331 and Table 332 in the *Data Cleaning* section of *Appendix 7. Behavioral Program*, for electric and natural gas customers, respectively, the evaluation team cleaned the billing data to ensure that data used in the billing analysis contained sufficient pre-period (11) and post-period (two) months in the analysis periods and sufficient billing days. Customers with insufficient post-period data had either moved or disconnected service after their respective waves' inception but before this evaluation period began. As a result, some of the earlier deployment waves appear to have considerably high numbers of customers removed. Treatment and control customers have shown similar rates of attrition for both IQ and non-IQ waves. Waves 3, 4, and 9 have differences in attrition that are greater than five percentage points.

Equivalency Check

Because the program randomly assigned the treatment and control groups, pre-treatment energy use should theoretically be equivalent between the groups. The evaluation team performed an equivalency check of the energy usage patterns of the treatment and control groups of each wave in the year preceding the rollout to confirm that the data in each case was consistent with an RCT evaluation approach.

After data cleaning the 46 groups (with all waves divided between IQ and non-IQ as well as electric and gas savings), five waves failed equivalency checks for at least one month of billing data in the pre-program period (Non-IQ Wave 2, Non-IQ Wave 8, IQ Wave 9, IQ Wave 12, and IQ Wave 13). Additionally, groups of Wave 1, which continue to be modeled separately, failed equivalency checks (the email portion of gas IQ, the email portion of gas non-IQ, and the no email portion of gas IQ).

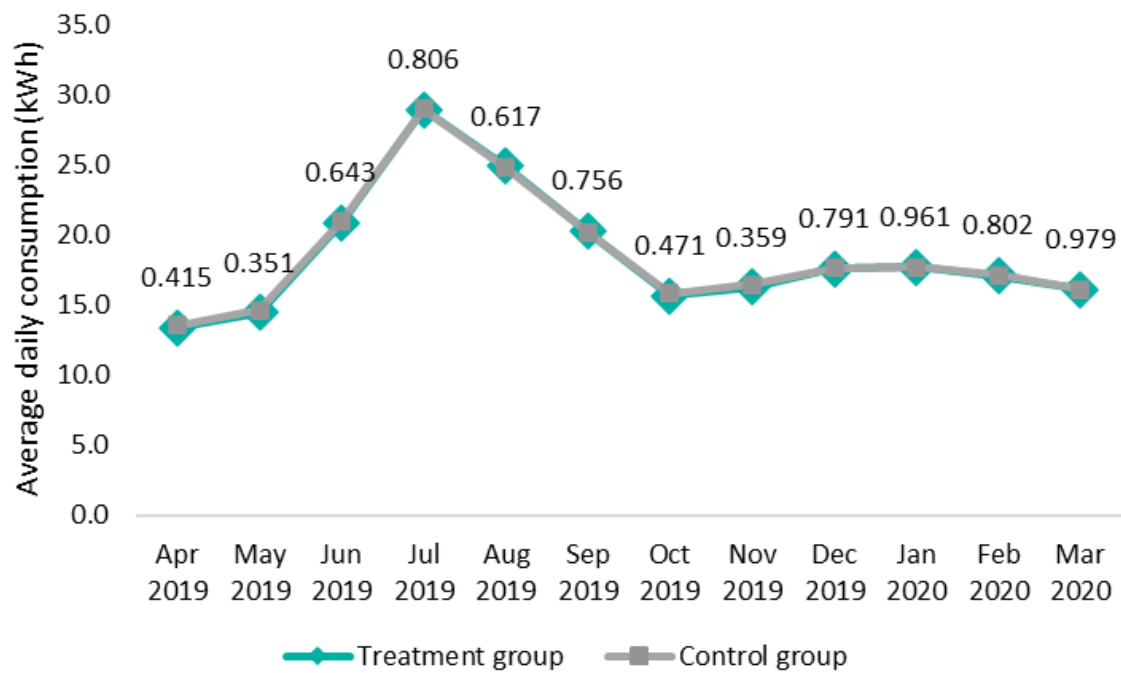
The post-period regression model helps to control for the differences between the treatment and control groups by using lagged energy use as an explanatory variable. In other words, the model frames energy use in each calendar month of the post-program period as a function of both the treatment variable and energy use in the same calendar month of the pre-program year. The underlying logic is that any small systematic differences between the control and treatment respondents that remain, despite the randomization, will be reflected in differences in their past energy use, which is highly correlated with their current energy use. Including the lagged energy use in the model serves as a control for any such differences.

The evaluation team employed two methods to assess the equivalency of treatment and control energy usage:

- Visual inspection of overlaid plots of monthly mean energy use for treatment and control groups (examples are shown in Figure 59 and Figure 60).
- T-tests of the monthly differences in mean energy use between treatment and control groups in each month. A significant difference ($p < 0.05$) indicates that pre-period usage is dissimilar between groups.²⁸

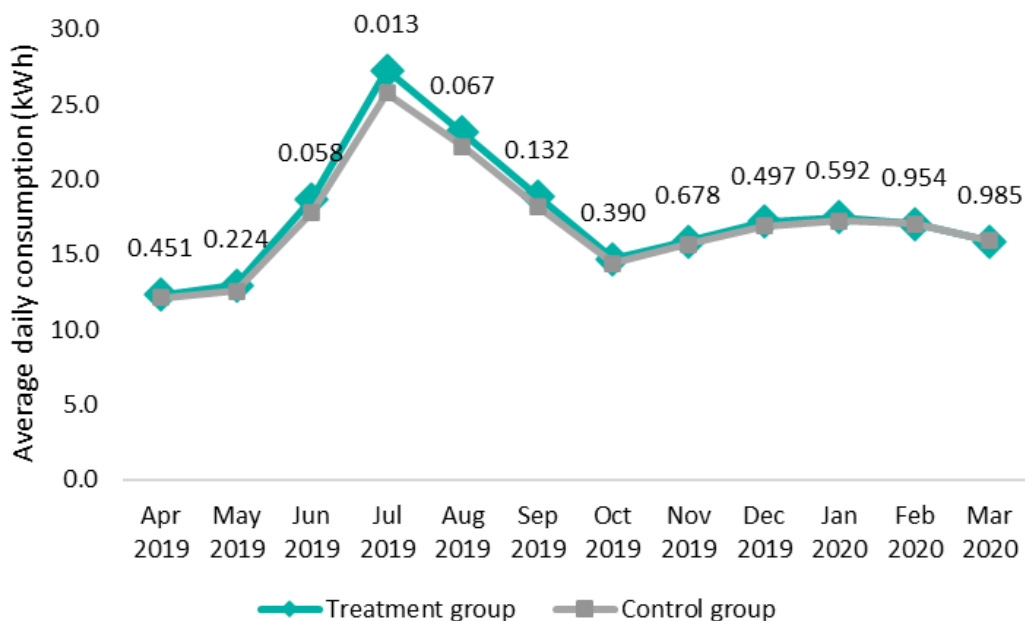
²⁸ A t-test is a statistical test of the difference between the mean values of observed characteristics between two populations. In this case, it is a test of the difference in average energy usage in each month between treatment and control group respondents.

Figure 59. Equivalency Check for Non Income-Qualified 2020 Wave



This figure represents the equivalency check for the 2019 electric usage of non-LMI customers in Wave 9, with p-values reported above the data points. The average daily consumption between treatment and control groups is highly similar.

Figure 60. Equivalency Check for Income-Qualified 2020 Wave



This figure represents the equivalency check for the 2019 electric usage of LMI customers in Wave 9, with p-values reported above the data points. The average daily consumption between treatment and control groups is highly similar.

The team also analyzed the pre-program period usage data for differences across the IQ and non-IQ programs. On average across all pre-period months for the electric participants, non-IQ average daily usage was almost 4 kWh (or almost 20%) higher than average daily usage for IQ participants. Non-IQ participants had higher usage in all months, and the summer months had the highest differences in usage, up to about 6 kWh (or about 22%) higher. On average across all pre-period months for the natural gas participants, non-IQ participants' average daily usage was about 8% higher than the average daily usage for IQ participants. The greatest differences in usage were in the summer when non-IQ participants had up to 21% higher usage than IQ participants. However, in the winter season there were some months when IQ participants had higher usage than non-IQ participants.

Regression Analysis

The ILLUME team ran a regression analysis on both IQ and non-IQ waves using the same methodology as previous years, modeling all waves separately and summing the results across waves. In 2024, the regression analysis produced savings estimates of 13,113 MWh of electricity and 1,196,549 therms of natural gas for non-IQ waves and 7,396 MWh of electricity and 585,805 therms of natural gas for IQ waves.

Modeled savings were statistically significant ($p > 0.10$) for eight electric waves (email, non-email, IQ, and non-IQ Wave 1s and non-IQ waves for Wave 2, Wave 3, Wave 4, and Wave 11) and eight natural gas waves (non-email IQ and non-IQ Wave 1s; non-IQ waves for Waves 2 and 5; and both IQ and non-IQ waves for Waves 7 and 8). The remaining 14 electric waves and 14 natural gas waves did not have statistically significant savings. Since the program is an RCT experimental design, these results are the unbiased, best estimates of true savings values. Although with insignificant waves the evaluation team cannot rule out that savings are unequal to zero, with all the waves the evaluation team cannot rule out that the savings are unequal to a different value in the confidence interval.

The evaluation team reports confidence intervals for all waves and for all waves used the point estimate as the best estimate of savings (see

Table 113 through Table 116). For example, the non-IQ Wave 3 confidence interval for electric savings ranges from 24 MWh to 3,207 MWh, yet the evaluation team reports the center point (1,616 MWh) as the evaluated savings. The evaluation team applied the same approach across all waves even if the interval included zero.

These savings values do not account for cross-program participation savings from participation in other NIPSCO offerings; the evaluation team made those adjustments through a cross-program participation analysis, and we present them in a subsequent section, *Cross Program Participation*.

In general, industry research suggests that participants of residential behavior change programs save between 1.2% and 2.2% of household electricity usage per year and save between 0.3% and 1.6% of household natural gas usage per year; most waves exhibit a one- or two-year ramp-up period with savings continuing at the ramped-up level for at least the following five years.²⁹

Within that context, the household savings percentage for five of the non-IQ electric waves, six of the IQ electric waves, one of the non-IQ gas waves, and one of the IQ gas waves fall short of these expectations.

²⁹ Sussman, R., and M. Chikumbo. 2016. "Behavior Change Programs: Status and Impact." American Council for an Energy-Efficient Economy. <https://aceee.org/sites/default/files/publications/researchreports/b1601.pdf>

Table 113, below, displays the claimed and evaluated savings (before cross program participation analysis) and the per-household electric savings percentage for each non-IQ wave reporting electric savings. Evaluated savings were lower than implemented reported savings for most waves. The average non-IQ household saved 0.8% of its electric energy usage.

Table 113. 2024 Non Income-Qualified Behavioral Program Claimed and Evaluated Electric Savings

WAVE	CLAIMED (MWh)	EVALUATED (MWh)	90% CI LOWER BOUND	90% CI UPPER BOUND	HOUSEHOLD	90% CI LOWER BOUND	90% CI UPPER BOUND
Wave 1 (eHer) ^a	7,478.79	1,988.59	814.00	3,163.17	1.5%	0.6%	2.4%
Wave 1 (No eHer) ^a		5,084.10	2,833.08	7,335.11	1.9%	1.1%	2.8%
Wave 2	368.60	356.63	30.93	682.32	2.4%	0.2%	4.6%
Wave 3	2,632.01	1,615.91	24.69	3,207.14	1.4%	0.0%	2.8%
Wave 4	980.89	1,251.14	19.43	2,482.86	1.9%	0.0%	3.7%
Wave 5±	1,241.01	631.59	(576.19)	1,839.38	0.7%	-0.7%	2.2%
Wave 7±	915.42	449.49	(554.61)	1,453.58	0.6%	-0.7%	1.8%
Wave 8±	456.75	(113.37)	(1,026.74)	800.00	-0.2%	-1.4%	1.1%
Wave 9±	741.98	674.21	(85.52)	1,433.95	1.5%	-0.2%	3.2%
Wave 11	1,052.89	1,089.95	388.60	1,791.30	1.9%	0.7%	3.1%
Wave 12±	34.05	46.48	(656.99)	749.94	0.1%	-1.3%	1.5%
Wave 13±	209.12	38.13	(397.49)	473.76	0.1%	-0.6%	0.7%
TOTAL UNADJUSTED^b	16,111.51^c	13,112.85	813.19	25,412.51	0.8%^d	-0.1%^d	1.1%^d

^a The eHer and no eHer populations had significantly different baseline consumption numbers such that it was necessary to model them separately to achieve accurate and significant results.

^b Unadjusted savings do not account for channeling analysis.

^c The electric scorecard as of 12/31/2024 reported 16,630 MWh of savings. The savings provided from Oracle in Q1 2025 that were broken out by wave totaled 16,112 MWh.

^{*} Savings for Wave 5, Wave 7, Wave 8, Wave 9, Wave 12, and Wave 13 were not statistically significant.

^d Averages are weighted by participant days in analysis.

Table 114 displays the claimed and evaluated savings (before cross program participation analysis) and the per-household electric savings percentage for each IQ wave reporting electric savings. Evaluated savings were also lower than implementer reported savings for IQ waves. Only the savings of Wave 1 were statistically significant. The range of household percentage savings (-1.2% to 3%) is greater than the range of household percentage savings for the non-IQ waves (-0.2% to 2.4%). The average IQ household saved 0.5% of its electric energy usage.

Table 114. 2024 Income-Qualified Behavioral Program Claimed and Evaluated Electric Savings

WAVE	CLAIMED (MWh)	EVALUATED (MWh)	90% CI LOWER BOUND	90% CI UPPER BOUND	HOUSEHOLD	90% CI LOWER BOUND	90% CI UPPER BOUND
Wave 1 (eHer)a (IQ) ^a	5,252.70	926.30	97.08	1,755.52	1.5%	0.2%	2.8%
Wave 1 (No eHer)a (IQ) ^a		4,285.41	2,573.59	5,997.24	3.0%	1.8%	4.2%
Wave 2 (IQ)±	(10.82)	(134.78)	(410.68)	141.13	-1.2%	-3.7%	1.3%
Wave 3 (IQ) ±	65.03	(212.11)	(1,338.80)	914.57	-0.4%	-2.3%	1.5%
Wave 4 (IQ) ±	600.19	308.07	(555.51)	1,171.64	0.8%	-1.4%	3.0%
Wave 5 (IQ) ±	675.56	744.50	(63.22)	1,552.23	1.8%	-0.2%	3.8%
Wave 7 (IQ) ±	220.22	542.97	(104.94)	1,190.89	1.4%	-0.3%	3.0%
Wave 8 (IQ) ±	278.78	(4.96)	(583.94)	574.03	0.0%	-2.1%	2.1%
Wave 9 (IQ) ±	261.97	194.05	(253.31)	641.42	1.1%	-1.4%	3.6%
Wave 11 (IQ) ±	502.72	352.30	(103.62)	808.22	1.4%	-0.4%	3.2%
Wave 12 (IQ) ±	423.46	325.73	(130.16)	781.62	1.2%	-0.5%	2.8%
Wave 13 (IQ) ±	261.38	68.22	(219.18)	355.62	0.3%	-0.9%	1.5%
TOTAL UNADJUSTED^b	8,531.19^c	7,395.71	(1,092.70)	15,884.12	0.5%^d	-0.1%^d	1.1%^d

^a The eHer and no eHer populations had significantly different baseline consumption numbers such that it was necessary to model them separately to achieve accurate and significant results.

^b Unadjusted savings do not account for channeling analysis.

^c The electric scorecard as of 12/31/2024 reported 8,320 MWh of savings. The savings provided by Oracle in Q1 2025 that were broken out by wave totaled 8,531 MWh.

^d Savings for all waves except Wave 1 are not statistically significant.

^e Averages are weighted by participant days in analysis.

Table 115 displays the claimed and evaluated savings (before cross program participation analysis) and per-household natural gas savings percentage for each non-IQ wave reporting natural gas savings. In 2022, three waves (Wave 4, Wave 5, and Wave 6) plus the larger, no-email portion of Wave 1 exceeded 1% savings. In 2024, four non-IQ waves (Wave 2, Wave 5, Wave 6, and Wave 8) plus the larger, no-email portion of Wave 1, again, exceeded 1% savings. The average non-IQ household saved 0.8% of its natural gas usage.

Table 115. 2024 Non Income-Qualified Behavioral Program Claimed and Evaluated Natural Gas Savings

WAVE	CLAIMED (THERMS)	EVALUATED (THERMS)	90% CI LOWER BOUND	90% CI UPPER BOUND	HOUSEHOLD	90% CI LOWER BOUND	90% CI UPPER BOUND
Wave 1 (eHer) ^{a±}	442,754.18	52,117.24	(15,169.99)	119,404.46	0.5%	-0.1%	1.1%
Wave 1 (No eHer) ^a		349,496.64	203,029.26	495,964.02	1.5%	0.9%	2.1%
Wave 2	34,836.34	33,054.38	10,497.82	55,610.93	2.1%	0.7%	3.5%
Wave 3±	52,447.21	52,733.21	(42,273.69)	147,740.12	0.6%	-0.5%	1.6%
Wave 4±	63,929.93	39,405.47	(38,929.48)	117,740.42	0.7%	-0.7%	2.0%
Wave 5	130,928.18	132,406.27	65,558.98	199,253.56	2.0%	1.0%	3.1%
Wave 6	62,742.06	391,750.39	237,543.67	545,957.11	1.9%	1.2%	2.6%

WAVE	CLAIMED (THERMS)	EVALUATED (THERMS)	90% CI LOWER BOUND	90% CI UPPER BOUND	HOUSEHOLD	90% CI LOWER BOUND	90% CI UPPER BOUND
Wave 8	62,742.06	84,643.70	35,290.19	133,997.21	1.4%	0.6%	2.3%
Wave 9	34,197.96	25,113.85	(16,219.95)	66,447.66	0.7%	-0.4%	1.8%
Wave 11±	12,563.77	29,630.84	(7,442.73)	66,704.40	0.6%	-0.2%	1.4%
Wave 13±	(10,920.34)	6,197.32	(25,851.45)	38,246.10	0.1%	-0.4%	0.7%
TOTAL UNADJUSTED^b	886,221.35^c	1,196,549.31	406,032.63	1,987,065.99	0.8%^d	0.2%^d	1.3%^d

^a The eHer and no eHer populations had significantly different baseline consumption numbers such that it was necessary to model them separately to achieve accurate and significant results.

^b Unadjusted savings do not account for channeling analysis.

^c The gas scorecard as of 12/31/2024 reported 1,122,151 Therms of savings. The savings provided by Oracle in Q1 2025 that were broken out by wave totaled 886,221 Therms.

[†] Savings for Wave 1 (eHer), Wave 3, Wave 4, Wave 11, and Wave 13 are not statistically significant.

^d Averages are weighted by participant days in analysis.

Table 116 displays the claimed and evaluated savings (before cross program participation analysis) and per-household natural gas savings percentage for each IQ wave reporting natural gas savings. In 2024, four waves exceeded 1% savings (Wave 2, Wave 5, Wave 6, and Wave 8), as well as the no-email portion of Wave 1. The average income-qualified household saved 0.4% of its natural gas usage.

Table 116. 2024 Income-Qualified Behavioral Program Claimed and Evaluated Natural Gas Savings

WAVE	CLAIMED (THERMS)	EVALUATED (THERMS)	90% CI LOWER BOUND	90% CI UPPER BOUND	HOUSEHOLD	90% CI LOWER BOUND	90% CI UPPER BOUND
Wave 1 (eHer) (IQ) ^{††}	183,630.75	32,090.17	(20,765.45)	84,945.79	0.6%	-0.4%	1.5%
Wave 1 (No eHer) (IQ) ^a		178,049.55	55,771.97	300,327.13	1.2%	0.4%	2.0%
Wave 2 (IQ) ±	(5,194.51)	1,032.38	(20,713.79)	22,778.54	0.1%	-1.4%	1.6%
Wave 3 (IQ) ±	43,723.33	17,124.31	(56,663.58)	90,912.21	0.3%	-1.0%	1.5%
Wave 4 (IQ) ±	56,980.95	18,727.55	(48,471.58)	85,926.68	0.4%	-1.1%	1.9%
Wave 5 (IQ) ±	58,086.23	46,753.79	(6,929.05)	100,436.63	1.2%	-0.2%	2.7%
Wave 6 (IQ)	915.42	187,314.57	81,993.87	292,635.28	1.4%	0.6%	2.2%
Wave 8 (IQ)	57,800.14	49,974.36	14,569.10	85,379.63	1.8%	0.5%	3.1%
Wave 9 (IQ) ±	22,516.63	11,841.32	(15,612.13)	39,294.78	0.7%	-0.9%	2.2%
Wave 11 (IQ) ±	24,035.52	19,345.06	(10,172.40)	48,862.52	0.8%	-0.4%	1.9%
Wave 13 (IQ) ±	2,854.11	23,552.11	(3,025.77)	50,129.99	1.0%	-0.1%	2.1%
TOTAL UNADJUSTED^b	445,348.55^c	585,805.18	(30,018.83)	1,201,629.19	0.4%^d	-0.1%^d	0.8%^d

WAVE	CLAIMED (THERMS)	EVALUATED (THERMS)	90% CI LOWER BOUND	90% CI UPPER BOUND	HOUSEHOLD	90% CI LOWER BOUND	90% CI UPPER BOUND

^a The eHer and no eHer populations had significantly different baseline consumption numbers such that it was necessary to model them separately to achieve accurate and significant results.

^b Unadjusted savings do not account for channeling analysis.

^c The gas scorecard as of 12/31/2024 reported 606,045 Therms of savings. The savings provided from Oracle in Q1 2025 that were broken out by wave totaled 585,805 Therms MWh.

^{*} Savings for all waves except the non-email portion of Wave 1, Wave 6, and Wave 8 are not statistically significant.

^d Averages are weighted by participant days in analysis.

Cross Program Participation

The team found negative cross-program participation savings for non-IQ customers and positive cross-program participation savings for IQ customers. Table 117 and Table 118, below, show electric and natural gas savings, respectively, for savings that the evaluators attribute to participation in other NIPSCO energy efficiency programs for non-IQ customers. The team found lower savings from other energy efficiency programs among treatment customers than control customers (i.e., negative cross-program participation savings for non-IQ customers). More specifically, the team estimates cross program savings of -44,688 kWh for electric and -14,108 therms for natural gas (shown in Table 119). Wave 1, Wave 2, Wave 3, Wave 4, Wave 5, Wave 8, and Wave 9 had negative cross-program participation savings for both electric and gas. Wave 7 also had negative electric cross program savings.

The tables below show the cross-program participation savings by wave and energy efficiency program for electric and gas home energy report participants. Note that Table 117 and Table 118 calculate a per-home value for comparison to average per-home savings from the Behavioral program, though only a subset of treatment households participated in energy efficiency programs. Some more recent waves (Wave 11 and 13 for electric and gas and Wave 12, an electric-only wave, for electric) had positive cross-program participation savings.

Table 117. 2024 Non Income-Qualified Behavioral Cross Program Participation Electric Savings

	WAVE 1 (EMAIL) SAVINGS		WAVE 1 (NO EMAIL) SAVINGS		WAVE 2 SAVINGS		WAVE 3 SAVINGS		WAVE 4 SAVINGS		WAVE 5 SAVINGS	
	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)
Appliance Recycling	-0.15	-1.98	0.16	4.73	0.00	0.00	-0.06	-0.81	-0.30	-2.47	0.21	1.88
HEA	-0.28	-3.65	-0.05	-1.51	-0.48	-3.02	0.32	4.05	0.15	1.25	-0.39	-3.52
Home Rebates	-0.39	-5.12	-0.46	-13.81	-1.21	-1.60	-0.84	-10.51	-0.63	-5.13	-0.12	-1.06
Marketplace	0.07	0.91	0.00	0.09	-0.64	0.00	-0.12	-1.52	0.03	0.21	0.12	1.09
TOTAL	-0.75	-9.83	-0.35	-10.50	-2.34	-4.63	-0.70	-8.79	-0.76	-6.14	-0.18	-1.60
	WAVE 7 SAVINGS		WAVE 8 SAVINGS		WAVE 9 SAVINGS		WAVE 11 SAVINGS		WAVE 12 SAVINGS		WAVE 13 SAVINGS	
	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)
Appliance Recycling	-0.04	-0.28	0.13	1.07	-0.28	-1.47	0.01	0.05	0.15	1.03	0.03	1.18
HEA	0.12	0.85	0.09	0.72	-0.42	-2.18	0.48	3.27	(0.04)	-0.26	0.09	3.52

	WAVE 1 (EMAIL) SAVINGS		WAVE 1 (NO EMAIL) SAVINGS		WAVE 2 SAVINGS		WAVE 3 SAVINGS		WAVE 4 SAVINGS		WAVE 5 SAVINGS	
	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)
Home Rebates	-0.80	-5.86	-0.99	-8.09	0.77	3.99	-0.01	-0.08	(0.07)	-0.51	(0.03)	-1.21
Marketplace	0.21	1.54	0.10	0.83	-0.08	-0.42	0.17	1.18	0.06	0.41	(0.03)	-1.25
TOTAL	-0.51	-3.76	-0.67	-5.47	-0.02	-0.08	0.65	4.42	0.10	0.67	0.05	2.23

Table 118. 2024 Non Income-Qualified Behavioral Cross Program Participation Natural Gas Savings

	WAVE 1 (EMAIL) SAVINGS		WAVE 1 (NO EMAIL) SAVINGS		WAVE 2 SAVINGS		WAVE 3 SAVINGS		WAVE 4 SAVINGS		WAVE 5 SAVINGS	
	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)
HEA	-0.05	-750.97	-0.01	-159.60	-0.08	-214.97	0.01	262.92	0.02	184.82	-0.07	-687.67
Home Rebates	-0.06	-835.96	-0.18	-5,635.97	-0.32	-811.44	-0.07	-2,168.75	-0.06	-520.59	-0.15	-1,361.07
Marketplace	0.00	-13.85	-0.01	-181.41	-0.01	-26.80	0.00	-57.35	0.00	7.37	0.00	12.33
TOTAL	-0.12	-1,600.78	-0.19	-5,976.98	-0.41	-1,053.21	-0.06	-1,963.18	-0.04	-328.40	-0.22	-2,036.41
	WAVE 6 SAVINGS		WAVE 8 SAVINGS		WAVE 9 SAVINGS		WAVE 11 SAVINGS		WAVE 13 SAVINGS			
	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)		
HEA	0.02	403.70	-0.08	-631.68	-0.03	-186.11	0.06	403.45	0.01	207.15		
Home Rebates	0.03	632.47	-0.15	-1,266.66	-0.19	-996.09	-0.03	-234.79	0.02	540.74		
Marketplace	0.00	8.30	0.00	-10.72	0.00	-9.51	0.00	11.27	0.00	-20.87		
TOTAL	0.06	1,044.48	-0.23	-1,909.06	-0.22	-1,191.71	0.03	179.93	0.02	727.02		

Table 119 shows the total cross-program participation savings and percentage of total behavioral program savings by wave. Cross-program participation savings and percentage of total behavioral program savings were negative for both electric and gas for non-IQ participants.

Table 119. 2024 Non Income-Qualified Behavioral Cross Program Participation Electric and Natural Gas Savings as a Percentage of Total Wave Savings

WAVE	ELECTRICITY SAVINGS		NATURAL GAS SAVINGS	
	CROSS PROGRAM PARTICIPATION SAVINGS (KWH)	PERCENTAGE OF TOTAL BEHAVIORAL PROGRAM SAVINGS	CROSS PROGRAM PARTICIPATION SAVINGS (THERMS)	PERCENTAGE OF TOTAL BEHAVIORAL PROGRAM SAVINGS
Wave 1 (eHer)	(9,833.91)	-0.49%	(1,600.78)	-3.07%
Wave 1 (No eHer)	(10,501.18)	-0.21%	(5,976.98)	-18.63%
Wave 2	(5,833.01)	-1.64%	(1,053.21)	-0.30%
Wave 3	(8,792.77)	-0.54%	(1,963.18)	-1.10%
Wave 4	(6,140.20)	-0.49%	(328.40)	-0.99%
Wave 5	(1,603.14)	-0.25%	(2,036.41)	-197.25%
Wave 6	-	-	1,044.48	1.98%

WAVE	ELECTRICITY SAVINGS		NATURAL GAS SAVINGS	
	CROSS PROGRAM PARTICIPATION SAVINGS (KWH)	PERCENTAGE OF TOTAL BEHAVIORAL PROGRAM SAVINGS	CROSS PROGRAM PARTICIPATION SAVINGS (THERMS)	PERCENTAGE OF TOTAL BEHAVIORAL PROGRAM SAVINGS
Wave 7	(3,757.71)	-0.84%	-	-
Wave 8	(5,467.09)	4.82%	(1,909.06)	-11.15%
Wave 9	(79.74)	-0.01%	(1,191.71)	-3.02%
Wave 11	4,417.61	0.41%	179.93	0.96%
Wave 12	670.00	1.44%	-	-
Wave 13	2,233.14	5.86%	727.02	0.55%
TOTAL UNADJUSTED	(44,688.01)	-0.34%^a	(14,108.31)	-2.14%^a

^a Average percentage of total behavioral program savings was calculated by dividing the total cross program participation savings by the total Behavioral program savings (13,112,850 kWh for electricity savings and 1,196,549 Therms for gas savings).

Table 120 and Table 121 show electric and natural gas savings, respectively, for savings that can be attributed to participation in other NIPSCO energy efficiency programs for IQ customers. The team found higher savings from other energy efficiency programs among treatment customers than control customers—i.e., positive cross-program participation savings for IQ customers. More specifically, the team estimates cross-program savings of 11,890 kWh for electric and 6,609 therms for natural gas (shown in Table 122). Wave 2, Wave 3, and Wave 8 had negative cross-program participation savings for both electric and gas. Wave 4 had negative cross-program participation electric savings, and Wave 9 had negative cross-program participation gas savings.

The tables below show the cross-program participation savings by wave and energy efficiency program for electric and gas home energy report participants. Note that Table 120 and Table 121 calculate a per-home value for comparison to average per-home savings from the Behavioral program, though only a subset of treatment households participated in energy efficiency programs.

Table 120. 2024 Income-Qualified Behavioral Cross Program Participation Electric Savings

	WAVE 1 (EMAIL) SAVINGS		WAVE 1 (NO EMAIL) SAVINGS		WAVE 2 SAVINGS		WAVE 3 SAVINGS		WAVE 4 SAVINGS		WAVE 5 SAVINGS	
	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)
Appliance Recycling	0.21	1.48	0.00	-0.06	0.06	0.14	0.32	2.50	-0.48	-2.87	0.20	1.04
HEA	0.12	0.87	-0.30	-5.57	0.05	-2.12	-0.75	-5.84	-0.15	-0.92	0.52	2.67
Home Rebates	0.16	1.11	0.35	6.40	-0.95	-0.79	0.20	1.52	0.02	0.10	-0.22	-1.15
Marketplace	0.40	2.86	0.04	0.75	-0.35	0.00	-0.03	-0.25	0.29	1.76	-0.17	-0.86
TOTAL	0.89	6.32	0.08	1.51	-1.19	-2.78	-0.27	-2.07	-0.32	-1.92	0.33	1.70
	WAVE 7 SAVINGS		WAVE 8 SAVINGS		WAVE 9 SAVINGS		WAVE 11 SAVINGS		WAVE 12 SAVINGS		WAVE 13 SAVINGS	
	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)	PER HOME (KWH)	TOTAL (MWH)
Appliance Recycling	0.00	0.00	-0.20	-0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18
HEA	-0.01	-0.05	-0.91	-3.27	0.71	1.74	0.39	1.36	0.51	2.52	0.01	0.10
Home Rebates	0.32	1.46	0.25	0.89	0.71	1.74	0.16	0.57	(0.25)	-1.25	0.00	0.03
Marketplace	0.75	3.38	-0.27	-0.99	0.00	0.00	0.21	0.75	0.06	0.30	0.01	0.25
TOTAL	1.06	4.78	-1.13	-4.06	1.41	3.48	0.77	2.68	0.32	1.57	0.03	0.57

Table 121. 2024 Income-Qualified Behavioral Cross Program Participation Natural Gas Savings

	WAVE 1 (EMAIL) SAVINGS		WAVE 1 (NO EMAIL) SAVINGS		WAVE 2 SAVINGS		WAVE 3 SAVINGS		WAVE 4 SAVINGS		WAVE 5 SAVINGS	
	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)
HEA	0.02	192.41	-0.04	-809.75	0.08	179.89	-0.10	-842.37	0.02	143.72	0.11	623.72
Home Rebates	-0.06	-472.03	0.05	1,047.62	-0.43	-1,010.79	0.01	89.14	0.04	263.71	-0.04	-199.15
Market place	0.00	-3.71	0.00	104.36	0.00	10.56	-0.01	-86.69	0.01	52.82	0.00	-13.21
TOTAL	-0.04	-283.33	0.02	342.23	-0.35	-820.34	-0.10	-839.92	0.07	460.25	0.07	411.37
	WAVE 6 SAVINGS		WAVE 8 SAVINGS		WAVE 9 SAVINGS		WAVE 11 SAVINGS		WAVE 13 SAVINGS			
	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)	PER HOME (THERMS)	TOTAL (THERMS)		
HEA	0.11	1,508.20	0.29	1,132.84	0.48	1,290.04	0.46	1,760.19	0.03	476.95		
Home Rebates	0.12	1,688.28	0.06	250.35	-0.44	-1,198.04	-0.09	-339.80	0.01	83.63		
Market place	0.01	200.49	0.08	309.80	-0.27	-720.46	0.24	910.94	0.00	-14.99		
TOTAL	0.25	3,396.97	0.43	1,692.98	-0.23	-628.45	0.60	2,331.32	0.04	545.58		

Table 122 shows the total cross program participation savings and percentage of total behavioral program savings by wave. Cross-program participation savings and percentage of total behavioral program savings were positive for both electric and gas for IQ participants.

Table 122. 2024 Income-Qualified Behavioral Cross Program Participation Electric and Natural Gas Savings as a Percentage of Total Wave Savings

WAVE	ELECTRICITY SAVINGS		NATURAL GAS SAVINGS	
	CROSS PROGRAM PARTICIPATION SAVINGS (KWH)	PERCENTAGE OF TOTAL BEHAVIORAL PROGRAM SAVINGS	CROSS PROGRAM PARTICIPATION SAVINGS (THERMS)	PERCENTAGE OF TOTAL BEHAVIORAL PROGRAM SAVINGS
Wave 1 (eHer) (IQ)	6,317.01	0.09%	(283.33)	-0.88%
Wave 1 (No eHer) (IQ)	1,513.40	0.01%	342.23	0.19%
Wave 2 (IQ)	(2,668.34)	-0.12%	(820.34)	-79.46%
Wave 3 (IQ)	(2,066.49)	-0.03%	(839.92)	-4.90%
Wave 4 (IQ)	(1,924.88)	-0.03%	460.25	2.46%
Wave 5 (IQ)	1,699.83	0.03%	411.37	0.88%
Wave 6 (IQ)	-	-	3,396.97	1.81%
Wave 7 (IQ)	4,784.70	0.11%	-	-
Wave 8 (IQ)	(4,064.88)	-0.11%	1,692.98	3.39%
Wave 9 (IQ)	3,478.12	0.14%	(628.45)	-5.31%
Wave 10 (IQ)	2,680.30	0.08%	2,331.32	12.05%
Wave 11 (IQ)	1,574.84	0.03%	-	-

WAVE	ELECTRICITY SAVINGS		NATURAL GAS SAVINGS	
	CROSS PROGRAM PARTICIPATION SAVINGS (KWH)	PERCENTAGE OF TOTAL BEHAVIORAL PROGRAM SAVINGS	CROSS PROGRAM PARTICIPATION SAVINGS (THERMS)	PERCENTAGE OF TOTAL BEHAVIORAL PROGRAM SAVINGS
Wave 12 (IQ)	566.64	0.00%	545.58	2.32%
TOTAL UNADJUSTED	11,890.23	0.16%^a	6,608.66	1.13%^a

^a Average percentage of total behavioral program savings was calculated by dividing the total cross program participation savings by the total Behavioral program savings (7,395,710 kWh for electricity savings and 585,805 Therms for gas savings).

Upstream Lighting Cross Program Participation

The cross-program participation savings analysis does not include NIPSCO's upstream lighting program. In upstream lighting programs, utilities work directly with manufacturers, distributors, and retailers or a combination of these groups to offer built-in discounts on energy efficient products, rather than paying incentives directly to program participants. Because of this design, these programs do not track detailed participation data such as respondent names and billing account numbers, which are typically available for utility rebate programs. Consequently, the evaluation team could not identify HER treatment and control group respondents who participated in an upstream lighting program. Obtaining the data necessary to adjust for upstream programs requires expensive primary data collection that relies on home visits or customer surveys and requires respondents to recall their lighting purchases.

In a secondary literature review presented to the Michigan utilities, an evaluation team found 10 evaluations of HER programs from 2013 to 2018 that addressed the effects of upstream lighting.³⁰ Five of these evaluations relied on surveys (three phone, one online, one in person), one relied on an onsite home inventory, three on secondary literature, and one used a deemed savings factor. The on-site inventory found the highest rate of cross-program participation savings at 2.6%. Three reported no difference in purchases between treatment and control customers. Others ranged from -0.9 kWh/household/year to 11.1 kWh/household/year. The evaluators presenting to Michigan utilities concluded that most efforts to calculate the cross-program participation rate of upstream programs result in 0% or negative results or that the differences are statistically insignificant.

Given these data limitations, the evaluation team did not estimate cross-program participation savings from upstream programs. Because adjustments to electric savings due to other programs are small, this omission should not affect the total claimed savings significantly.

Demand Reduction

The evaluation team used the conservative estimate of equally distributing savings across all 8,760 annual hours (except for Wave 13, which used 2,920 because the wave started in September 2024) to estimate demand reduction.³¹ As such, the demand reduction estimates are directly proportional to the electric

³⁰ *Avoiding the Double-Counting of Savings in Michigan's Behavioral EWR Programs: Current Practice & Future Options*. April 16, 2019. https://www.michigan.gov/documents/mpsc/Avoiding_Double_Counting_-_20190416_652854_7.pdf

³¹ Demand reduction estimates from AMI data are as high as 2.3 times the 8,760 model estimate, because electric savings are usually weighted to the summer and likely correspond to changes in peak air conditioner usage. See also: Stewart, James, and Pete Cleff. November 2013. "Are You Leaving Peak Demand Savings on the Table? Estimates of Peak-Coincident Demand Savings from PPL Electric's Residential Behavior-Based Program." Oracle Utilities Opower Whitepaper.

savings estimates calculated above. Table 123 displays the demand reduction estimates for all non-IQ waves in 2024 at both the individual level and the program level. The 90% confidence intervals are also shown. The total demand reduction is calculated at 1,506 kW and does not net out the cross-program savings.

Table 123. 2024 Non Income-Qualified Behavioral Demand Reduction Estimates for All Waves

WAVE	ESTIMATED PEAK DEMAND REDUCTION (KW)		90% CONFIDENCE INTERVAL	
	PER HOME	TOTAL	LOWER BOUND	UPPER BOUND
Wave 1 (eHer)	0.017	227.008	92.923	361.093
Wave 1 (No eHer)	0.019	580.376	323.411	837.341
Wave 2	0.016	40.711	3.531	77.891
Wave 3	0.015	184.465	2.818	366.112
Wave 4	0.018	142.825	2.218	283.432
Wave 5 ^a	0.008	72.100	(65.776)	209.975
Wave 7 ^a	0.007	51.311	(63.311)	165.934
Wave 8 ^a	-0.002	(12.942)	(117.208)	91.324
Wave 9 ^a	0.015	76.965	(9.763)	163.693
Wave 11	0.018	124.424	44.361	204.487
Wave 12 ^a	0.001	5.305	(74.999)	85.609
Wave 13 ^a	0.000	13.060	(136.128)	162.247
TOTAL UNADJUSTED	0.133	1,505.607	2.077	3,009.136

^a Savings for Wave 5, Wave 7, Wave 8, Wave 9, Wave 12, and Wave 13 were not statistically significant.

Table 124 displays the demand reduction estimates for all non-IQ waves in 2024 at both the individual level and the program level. The table also shows the 90% confidence intervals. The total demand reduction is calculated at 860 kW and does not net out the cross-program savings.

Table 124. 2024 Income-Qualified Behavioral Demand Reduction Estimates for All Waves

	ESTIMATED PEAK DEMAND REDUCTION (KW)		90% CONFIDENCE INTERVAL	
	PER HOME	TOTAL	LOWER BOUND	UPPER BOUND
Wave 1 (eHer) (IQ)	0.015	105.742	11.082	200.402
Wave 1 (No eHer) (IQ)	0.026	489.202	293.788	684.616
Wave 2 (IQ) ^a	-0.007	(15.386)	(46.882)	16.111
Wave 3 (IQ) ^a	-0.003	(24.214)	(152.831)	104.403
Wave 4 (IQ) ^a	0.006	35.167	(63.414)	133.749
Wave 5 (IQ) ^a	0.016	84.989	(7.217)	177.195
Wave 7 (IQ) ^a	0.014	61.983	(11.979)	135.946
Wave 8 (IQ) ^a	0.000	(0.566)	(66.660)	65.528
Wave 9 (IQ) ^a	0.009	22.152	(28.917)	73.221
Wave 11 (IQ) ^a	0.011	40.217	(11.829)	92.263

	ESTIMATED PEAK DEMAND REDUCTION (KW)		90% CONFIDENCE INTERVAL	
	PER HOME	TOTAL	LOWER BOUND	UPPER BOUND
Wave 12 (IQ) ^a	0.008	37.183	(14.859)	89.226
Wave 13 (IQ) ^a	0.001	23.362	(75.063)	121.787
TOTAL UNADJUSTED	0.097	859.833	(174.780)	1,894.447

^a Savings for all waves except Wave 1 were not statistically significant.

Process Evaluation

The evaluation team sought to answer the following research questions as part of the process evaluation:

- What are opt-out rates? Have they changed over time?
- How are treatment and control group sizes changing over time?
- To what extent are treatment customers reading the emailed HER? Has that changed from the last evaluated program year?
- Are customers using the online portal? Has portal use changed from the last evaluated program year?
- Do the tips, and marketing messaging align with NIPSCO's channeling goals and with changing consumer habits?
- How have the savings changed over time, and what might that indicate for future savings?

The evaluation team reviewed the following metrics and materials Oracle provided:

- Monthly energy savings by wave and fuel type
- Monthly customer counts and opt-out rates by wave and fuel type
- Email engagement (e.g., open rates)
- Web portal engagement (e.g., number of logins)
- Sample printed and electronic HERs

The following sections describe results related to trends in savings over time and between waves, customer counts during 2024, email engagement, and web portal engagement.

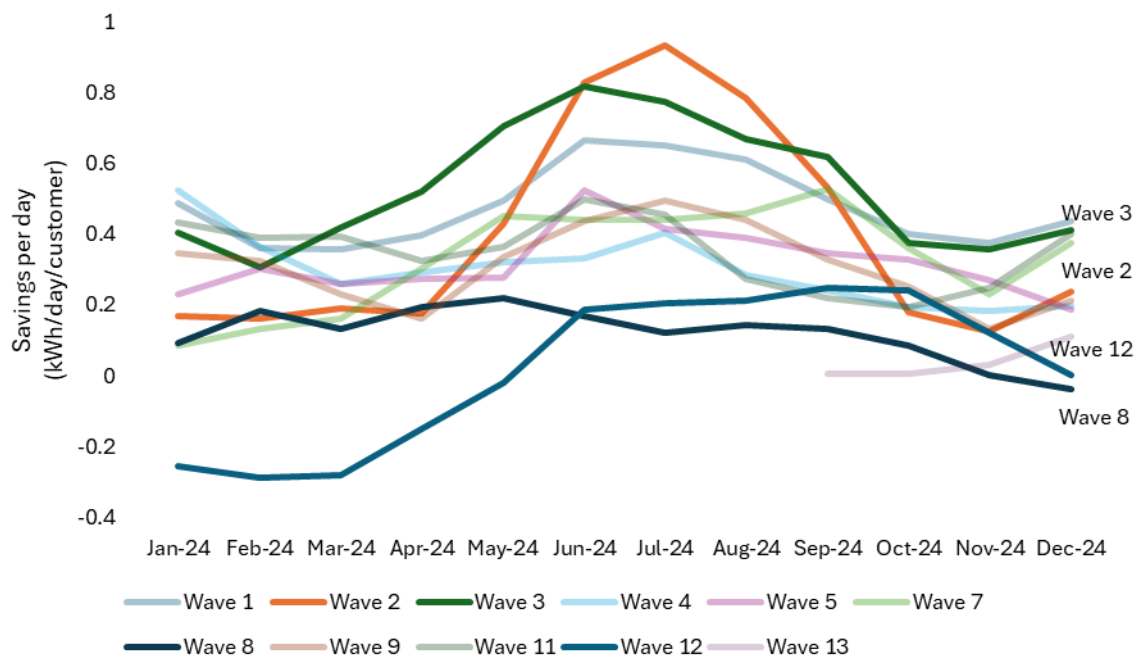
Savings Trends

The evaluation team reviewed monthly savings for each wave to identify any trends over time and between waves. In summary, the program savings in 2024 were steady and clearly identifiable. For its three months of data, Wave 13 had low savings for both electric and gas and both IQ and non-IQ waves, likely due to the typical delayed effect of HER in new waves where savings start to build overtime. As such, we recommend watching the electric and gas savings for Wave 13 in 2025.

As shown in Figure 5, electric savings among non-IQ waves were relatively consistent throughout 2024, although they were highest in the summer across most waves. Wave 3 had the highest average household savings, and Waves 8 and 12 showed low savings in 2024. Wave 12 is a newer wave and savings started

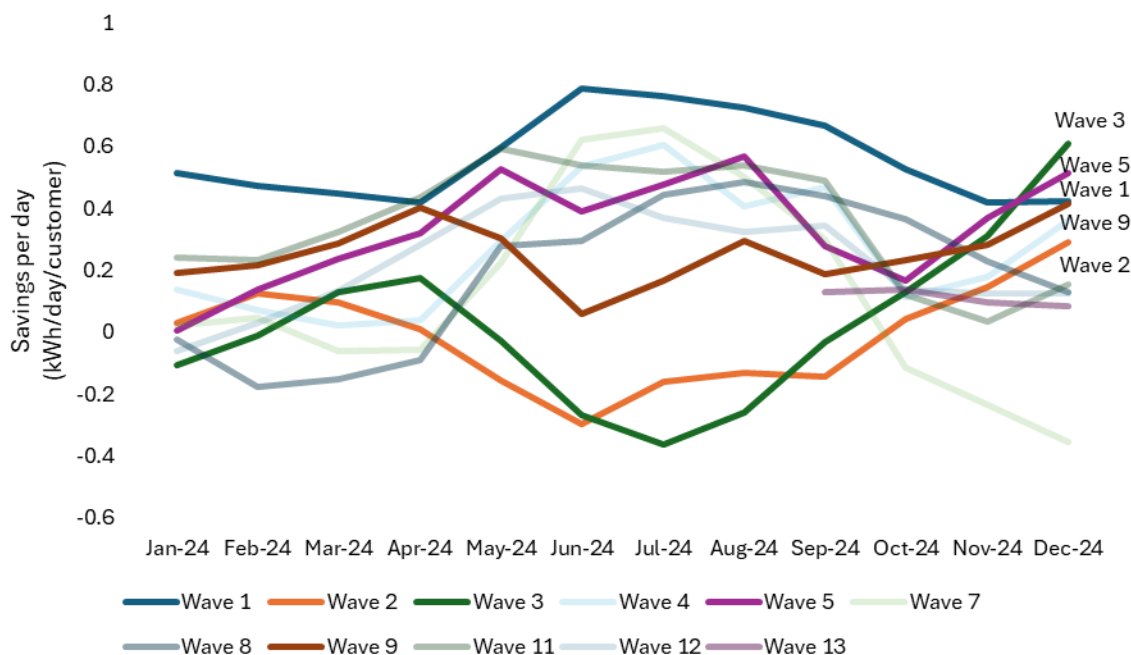
negatively, increasing during the second half of the year. Savings dipped again toward zero at the end of the year. We recommend monitoring in 2025 if Wave 12 savings remain positive or decrease again.

Figure 61. Non Income-Qualified: Average Daily Electric Savings by Wave and Month



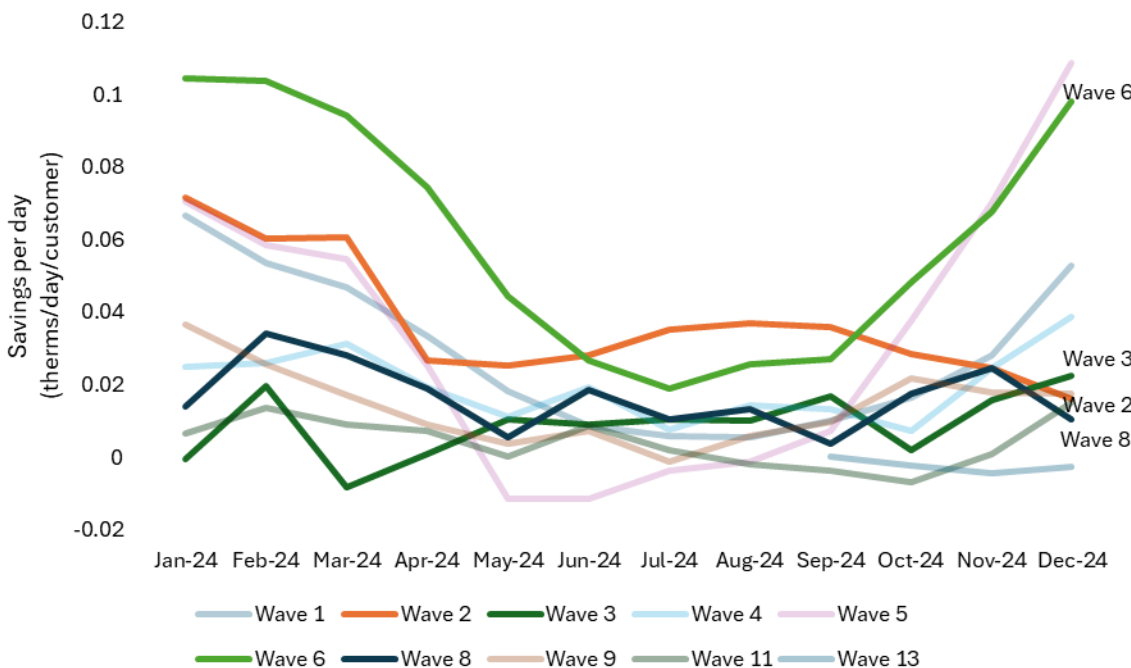
As shown in Figure 62, electric savings among IQ waves were also relatively consistent throughout 2024. Most waves had the highest savings in the summer, but Waves 2 and 3 experienced dips in the summer months. Several waves also dipped in savings in June (Waves 2, 3, 5, and 9). Wave 1 of the IQ participants had the highest savings. The IQ Waves 2 and 3 had the lowest savings, which is in notable contrast to their high-savings non-IQ counterparts. Income may have a larger impact on seasonal savings behavior for participants in these waves. We suggest looking into why in a future study.

Figure 62. Income-Qualified: Average Daily Electric Savings by Wave and Month



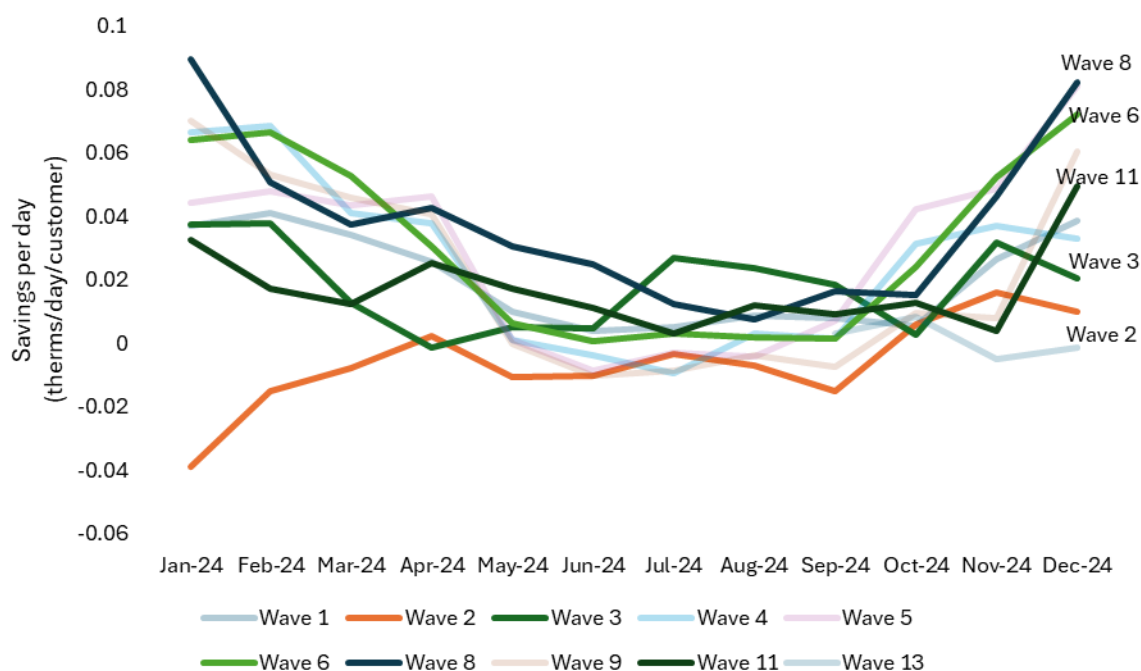
As shown in Figure 63, natural gas savings for non-IQ waves generally followed the typical heating load shape with higher savings in the winter and lower savings in the summer. Wave 6 (a gas-only wave) had the highest savings, and there were notably higher savings in summer months compared to other waves except for Wave 2. Waves 3 and 11 showed relatively low savings.

Figure 63. Non Income-Qualified: Average Daily Gas Savings by Wave and Month



As shown in Figure 64, natural gas savings for IQ waves more closely followed the typical heating load shape with higher savings in the winter and lower savings in the summer. Waves 2 and 3 are exceptions as Wave 2 savings increased in the first three months of 2024 and Wave 3 savings increased during the summer months. Waves 8 and 6 (a gas-only wave) had the highest savings with notably higher savings in summer months compared to other waves, except for Wave 2. IQ Waves 2 and 3 had the lowest savings. Both non-IQ and IQ Wave 3 savings were low compared to other waves, but the non-IQ Wave 2 had higher savings. IQ Wave 2 customers may have other factors impacting their gas usage throughout the year, which is something NIPSCO could study in the future. Wave 2 is also an older wave with a smaller number of participants, so differences could more easily skew overall savings.

Figure 64. Income-Qualified: Average Daily Gas Savings by Wave and Month



Customer Count Trends

In 2024, NIPSCO's Behavioral program lost 6% (electric) and 5% (gas) of non-IQ treatment participants on average. In 2023, the program lost 8% of all treatment participants. Available data suggests these participants left the program due to moving during 2024, rather than by opting out. Based on Oracle's data, only 14 total participants (0.00%) left the program voluntarily by opting out this year. The evaluation team did not receive this data separately by IQ/non-IQ participants.

As shown in Table 125, customers in more recent waves are moving at a higher rate than older waves, thus leaving the program because of it. Wave 12, the 2022 electric-only wave, had the highest attrition of 2024 (14%). Newer waves have consistently had higher attrition rates throughout program history. Older waves see fewer participants move out in the present, likely because the remaining participants are mostly homeowners or long-term tenants.

The most recent wave, Wave 13, is an exception to this with an electric attrition rate of 4% and gas attrition rate of 3%. Wave 13 has fewer months of data since it launched in the fall of 2024 and may or may not continue to be dissimilar from other waves.

Table 125. 2024 Non Income-Qualified Behavioral January and December 2024 Customers by Wave and Fuel Type

WAVE	FIRST REPORT	NUMBER OF PARTICIPANTS JANUARY 2024	ELECTRIC		NUMBER OF PARTICIPANTS JANUARY 2024	GAS	
			NUMBER OF PARTICIPANTS DECEMBER 2024	DECLINE RATE (%)		NUMBER OF PARTICIPANTS DECEMBER 2024	DECLINE RATE (%)
Wave 1	March 2011	43,446	41,936	3%	42,200	41,245	2%
Wave 2	June 2012	2,600	2,482	5%	2,621	2,443	7%
Wave 3	July 2014	13,688	13,243	3%	13,728	13,115	4%
Wave 4	March 2015	9,046	8,698	4%	9,069	8,580	5%
Wave 5	June 2017	10,896	10,440	4%	10,925	10,356	5%
Wave 6	Sept. 2017	-	-	-	18,245	17,825	2%
Wave 7	May 2018	7,786	7,356	6%	-	-	-
Wave 8	April 2019	10,660	10,023	6%	10,714	10,005	7%
Wave 9	April 2020	6,793	6,323	7%	6,813	6,308	7%
Wave 11	April 2022	8,591	7,787	9%	8,517	7,769	9%
Wave 12	April 2022	8,115	6,960	14%	-	-	-
Wave 13	September 2024 [^]	46,291	44,477	4%	39,503	38,168	3%
AVERAGE		-	-	6%	-	-	5%

Source: ILLUME analysis of data provided by Oracle and NIPSCO

[^]Beginning participant counts for Wave 13 are provided for September 2024, the month the wave launched.

For IQ-treatment participants in 2024, the program lost 7% (electric) and 7% (gas) on average. In 2023, the program lost 8% of all treatment participants. As shown in Table 126, below, electric customers in more recent waves are moving—and thus leaving the program—at a higher rate than they were in older waves. Wave 12, the 2022 electric-only wave, had the highest attrition rate of 2024 (13%). Like with the non-IQ Wave 13, Wave 13 had a smaller decline rate, but this will need more months of data to be conclusive. For gas, the attrition rate fluctuates over time, as Wave 6 (a gas only wave) had lower decline rates compared to all the other waves except Wave 1.

Table 126. 2024 Income-Qualified Behavioral January and December 2024 Customers by Wave and Fuel Type

WAVE	FIRST REPORT	NUMBER OF PARTICIPANTS JANUARY 2024	ELECTRIC NUMBER OF PARTICIPANTS DECEMBER 2024	DECLINE RATE (%)	NUMBER OF PARTICIPANTS JANUARY 2024	GAS NUMBER OF PARTICIPANTS DECEMBER 2024	DECLINE RATE (%)
Wave 1 (IQ)	March 2011	25,885	24,849	4%	24,404	24,254	1%
Wave 2 (IQ)	June 2012	2,309	2,157	7%	2,330	2,103	10%
Wave 3 (IQ)	July 2014	8,028	7,646	5%	8,080	7,503	7%
Wave 4 (IQ)	March 2015	6,261	5,908	6%	6,302	5,733	9%
Wave 5 (IQ)	June 2017	5,687	5,364	6%	5,727	5,258	8%
Wave 6 (IQ)	Sept. 2017	-	-	-	12,066	11,886	1%
Wave 7 (IQ)	May 2018	4,740	4,390	7%	-	-	-
Wave 8 (IQ)	April 2019	4,270	3,974	7%	4,319	3,936	9%
Wave 9 (IQ)	April 2020	2,925	2,685	8%	2,947	2,641	10%
Wave 11 (IQ)	April 2022	4,035	3,631	10%	3,808	3,597	6%
Wave 12 (IQ)	April 2022	5,443	4,741	13%	-	-	-
Wave 13 (IQ)	September 2024 [^]	19,775	18,432	7%	15,951	14,911	7%
AVERAGE		-	-	7%	-	-	7%

Source: ILLUME analysis of data provided by Oracle and NIPSCO

[^]Beginning participant counts for Wave 13 are provided for September 2024, the month the wave launched.

Cross Program Participation Analysis

Table 127 indicates the percentage difference in program participation of non-IQ treatment recipients relative to their respective control groups for four applicable programs in the 2024 program year. While most waves exhibit positive cross-program participation in evaluated programs (though note that most percentage differences are less than one), Wave 1 (email) and Wave 2 had negative cross-program participation in multiple programs, contributing to the overall negative cross-program participation savings for non-IQ customers. Notably, the Home Rebates program has the highest cross-program participation of the programs across all waves (except the email group of Wave 1).

Table 127. 2024 Non Income-Qualified Behavioral Cross Program Participation Due to Home Energy Reports

	WAVE 1 (EMAIL)	WAVE 1 (NO EMAIL)	WAVE 2	WAVE 3	WAVE 4	WAVE 5	WAVE 6
Appliance Recycling	0.13%	0.62%	0.00%	0.18%	0.29%	0.50%	0.00%
HEA	-0.84%	0.41%	-0.01%	1.08%	0.77%	0.50%	0.38%
Home Rebates	-3.17%	4.12%	0.55%	5.39%	3.75%	3.74%	3.29%
Marketplace	-0.82%	0.59%	-0.06%	1.41%	1.36%	0.89%	0.12%
	WAVE 7	WAVE 8	WAVE 9	WAVE 11	WAVE 12	WAVE 13	
Appliance Recycling	0.06%	0.14%	0.01%	0.05%	0.03%	0.12%	
HEA	0.08%	0.27%	0.15%	0.51%	0.27%	0.33%	
Home Rebates	0.96%	1.19%	1.46%	1.16%	0.42%	0.75%	
Marketplace	0.41%	0.72%	0.63%	0.43%	0.15%	0.36%	

Table 128 indicates the percentage difference in program participation of IQ-treatment recipients relative to their respective control groups for four applicable programs in the 2024 program year. All waves exhibit positive cross-program participation in evaluated programs, which is in line with the overall positive cross-program participation savings for IQ customers.

Table 128. 2024 Income-Qualified Behavioral Cross Program Participation Due to Home Energy Reports

	WAVE 1 (EMAIL)	WAVE 1 (NO EMAIL)	WAVE 2	WAVE 3	WAVE 4	WAVE 5	WAVE 6
Appliance Recycling	0.18%	0.47%	0.05%	0.56%	0.25%	0.33%	0.00%
HEA	0.53%	0.67%	0.18%	0.67%	0.63%	0.66%	0.14%
Home Rebates	0.65%	3.53%	0.72%	2.85%	2.12%	1.36%	2.03%
Marketplace	0.48%	0.79%	0.08%	0.76%	0.86%	0.42%	0.10%
	WAVE 7	WAVE 8	WAVE 9	WAVE 11	WAVE 12	WAVE 13	
Appliance Recycling	0.00%	0.11%	0.00%	0.00%	0.00%	0.09%	
HEA	0.00%	0.29%	0.58%	0.49%	0.28%	0.28%	
Home Rebates	0.80%	0.79%	1.02%	0.43%	0.11%	0.28%	
Marketplace	0.38%	0.47%	0.00%	0.36%	0.18%	0.22%	

These results corroborate the impact analysis, where cross program participation savings show that HERs can sometimes encourage participation in other programs but to a relatively small degree compared to the total program size and total program savings. This is typical compared to past findings and the nature of HER cross-messaging, which is typically not very exact in terms of target audiences or timing. One way to be more specific in messaging could be to leverage the online portal, which has the potential to provide more targeted cross-promotion with more detailed customer information.

IQ customers had positive cross-program participation and savings overall in 2024, which could be related to the higher IQ behavioral program savings. HER messaging, including usage comparisons and other program messaging, may be more impactful on behavior for IQ customers as they likely have a greater need to save money through energy improvements. As NIPSCO develops specific IQ messaging, savings and cross-program participation may increase even further for these customers.

Email HER (eHER) Engagement

Behavioral programs drive savings by influencing customer behavior through paper and electronic messaging. As such, metrics around email engagement (e.g., open rates) may correlate with savings and provide an indication of program engagement. Table 129 shows email engagement by month in 2024 and historical annual averages. While those who received emails had high open rates, Oracle sends emails to a relatively low percentage of HER recipients (27% on average across waves in 2024). This includes months Oracle does not send participant emails to particular customers, such as to gas only customers during warmer seasons (March through August). To calculate the percentage of emails sent per month, the evaluation team divided the total number of emails sent by the total number of treatments. As seen below, Behavioral program participants who received emails opened, on average, 50% of program emails over the year, higher than 42% in 2023. Participants opened between 45% and 54% of program emails each month in 2024 with slightly

higher open rates in the winter months than in the summer months. While participants opened emails at a relatively consistent rate throughout the year, the highest open rates were in September and December.

The email engagement metrics for NIPSCO’s Behavioral program show that the program is successfully engaging participants who receive emails consistently throughout the year. Participants may have opened more program emails in the fall and winter months than other months because of high winter gas bills.

Table 129. 2024 Behavioral Email Engagement by Month and Year

MONTH	% OF CUSTOMERS SENT EMAILS ^a	EMAILS SUCCESSFULLY RECEIVED (% OF SENT)	EMAILS OPENED (% OF RECEIVED)	EMAILS CLICKED THROUGH (% OF OPENED)
Jan. 2024	0%	99%	53%	0%
Feb. 2024	32%	99%	52%	1%
Mar. 2024	27%	99%	50%	1%
Apr. 2024	26%	99%	47%	1%
May 2024	26%	99%	47%	1%
Jun. 2024	17%	93%	49%	1%
Jul. 2024	10%	99%	45%	1%
Aug. 2024	32%	99%	49%	1%
Sep. 2024	31%	97%	54%	1%
Oct. 2024	36%	99%	52%	1%
Nov. 2024	44%	99%	53%	1%
Dec. 2024	38%	96%	54%	2%
2024 AVERAGE	27%	98%	50%	1%
2023 AVERAGE	28%	98%	42%	2%
2022 AVERAGE	27% ^b	99%	44% ^c	2%
2021 AVERAGE	24%	99%	41%	3%

Source: ILLUME analysis of email analytics data provided by Oracle

^a Customers sent emails is defined as the total number of emails sent divided by the total number of gas and electric treatment customers across waves in each month.

^b The 2022 average excludes September and October, when customers received fewer emails due to a data issue.

^c In prior years emails clicked through were presented as a percentage of total customers. Since 2022 it has been presented as a percentage of opened emails.

Web Portal Engagement

Like the evaluation findings in recent years, very few of NIPSCO’s Behavioral program participants are engaging with the online portal. Around 20 customers (0.00% of NIPSCO’s Behavioral program participants) log into the web portal each month, as shown in Table 130, below. This rate was lower than last year’s average of 60 unique customers logging into the web portal each month. Customers continue to spend less time on the portal on average (five minutes in 2024, which is similar to 2023’s six minutes and down from nine minutes in 2022).

Table 130. 2024 Behavioral Web Portal Analytics by Month

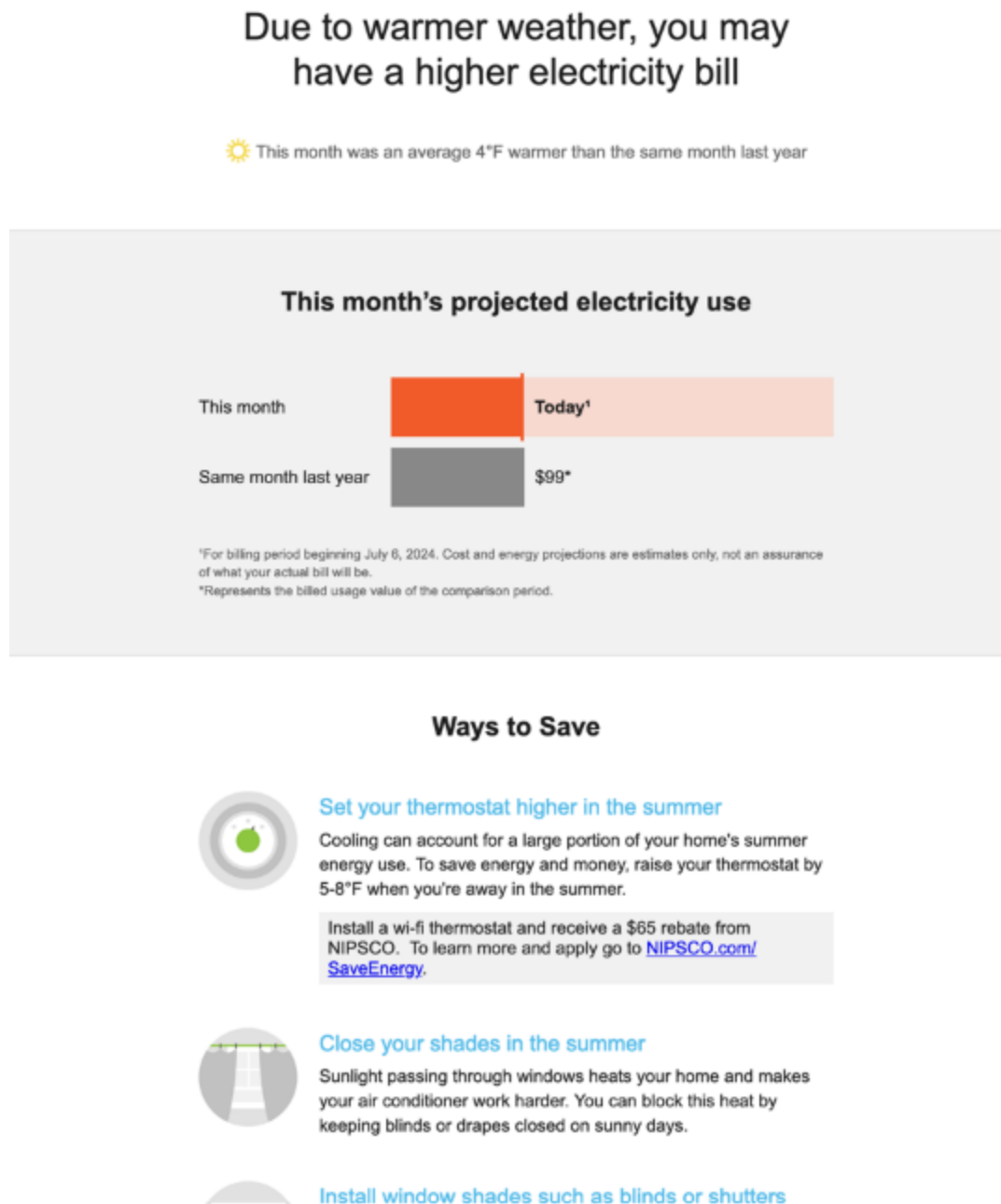
MONTH	UNIQUE PARTICIPANT LOGINS (n= 4,990,423)	AVERAGE TIME ON PORTAL (MINUTES)
Jan. 2024	21	5
Feb. 2024	39	6
Mar. 2024	20	5
Apr. 2024	10	5
May 2024	6	5
Jun. 2024	3	3
Jul. 2024	24	6
Aug. 2024	11	5
Sep. 2024	15	5
Oct. 2024	20	5
Nov. 2024	35	5
Dec. 2024	32	5
AVERAGE	20	5

Source: ILLUME analysis of web portal analytics data provided by Oracle

High Bill Alerts

In 2024, NIPSCO launched high bill alerts to eligible customers, which they refer to as non-Advanced Metering Infrastructure (AMI) high bill alerts due to high monthly usage triggering them (as opposed to more granular usage like hourly data from AMI). Eligible customers received alerts for when the program forecasted their usage to be at least 30% higher than their usage in the same month of the previous year. Oracle uses historical data and weather information to help customers predict when their electric or gas usage may be higher than normal and provides tips for saving during these times (Figure 65). In the future, the team will use targeted messaging in high bill alerts to all customers.

Figure 65. HER Messaging Sample: High Bill Alerts



Channeling

NIPSCO's Behavioral program updates its tip library once per year to ensure the energy savings tips it provides on the reports correctly channel to other energy efficiency programs. Of the 55 tips in the tip library, 11 mention specific NIPSCO programs, measures, and/or rebates and five generally point customers to the NIPSCO energy efficiency website.

Channel messaging was like previous years. Figure 66, below, is a sample print HER that promotes NIPSCO's HEA program. Figure 67 is the section of a sample eHER promoting the air conditioning rebate program with a link to learn more on the NIPSCO website. There were similar messages in print and email HERs for NIPSCO's appliance recycling program and air conditioner rebates. Based on the small uplift effect in 2024 and similar channeling messaging, it is likely that the efficacy of NIPSCO's Behavioral program's channeling efforts is like past years.

While the program sends eHERs every month, only about 27% of customers on average are receiving eHERs each month. Therefore, it is difficult to understand which types of messages are more likely to drive engagement with customers. In previous years, the evaluation team has recommended conducting a survey in a subsequent program year to understand customer recall of the reports and if repeating channeling to the same programs is more helpful than switching program channeling, as well as more specific engagement preferences generally. A survey of customer motivations and preferences for energy savings may also help inform any channel messaging developed for IQ waves specifically.

In previous years, the evaluation team also recommended testing different formats to help NIPSCO understand if more prominent placement could boost channeling. In 2023, program channeling for an air conditioner rebate, for example, was the second-lowest placement in an email report. As seen in Figure 67, in 2024, NIPSCO featured the air conditioner rebate more prominently in the email report, directly under home energy use. It will be useful to see if continuing these features leads to higher participation in NIPSCO programs in the future.

Figure 66. HER Messaging Sample: General Channeling (Print Version)

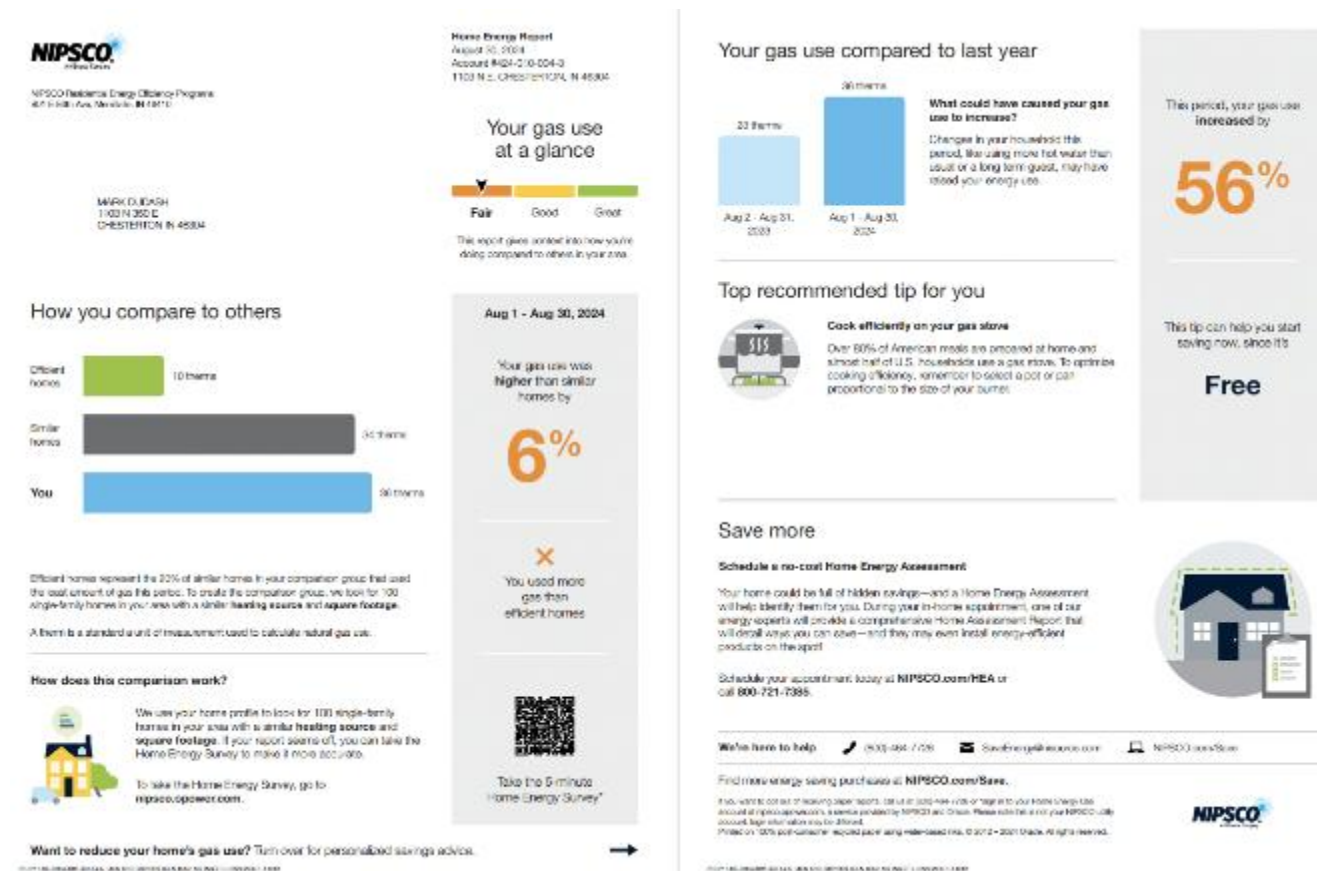
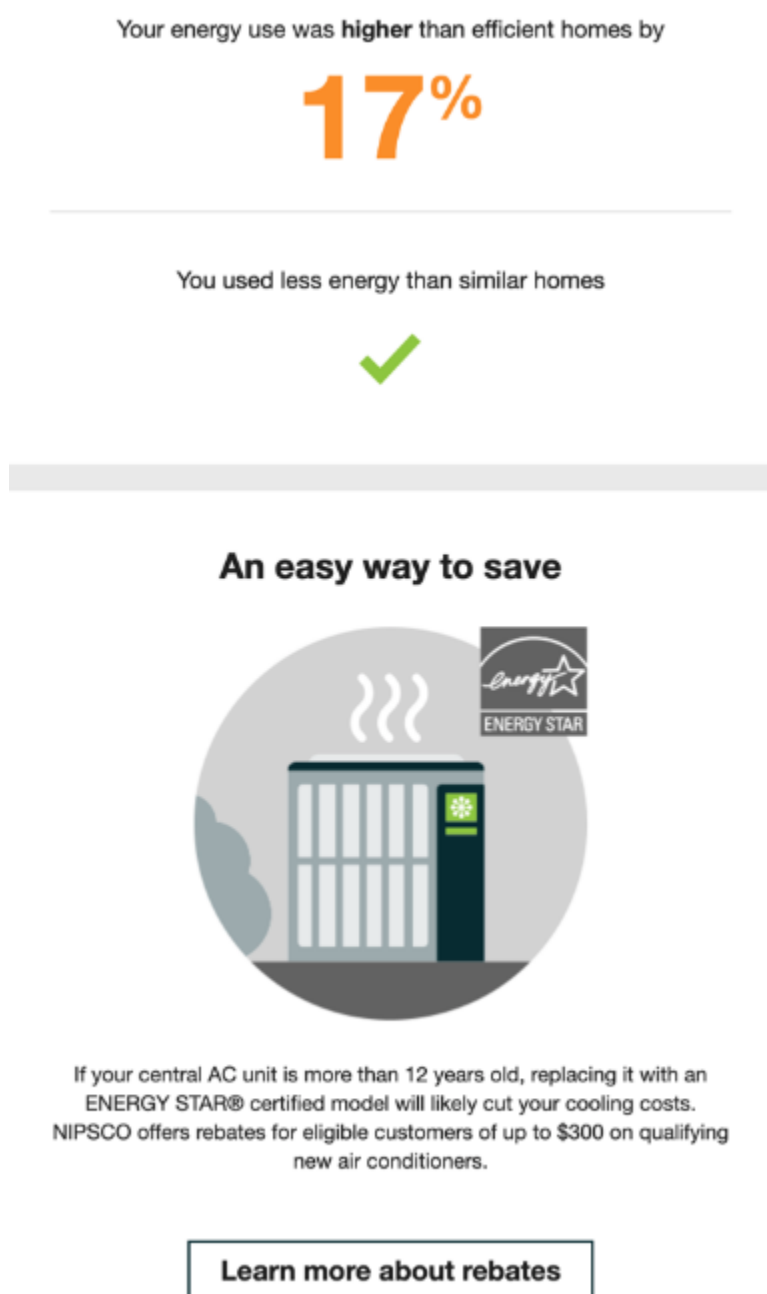


Figure 67. HER Messaging Sample: General Channeling (Email Version)



Conclusions and Recommendations

CONCLUSION 1: THE NEW IQ BEHAVIORAL WAVES MET PROGRAM SAVINGS GOALS FOR ELECTRIC AND GAS, AND THE NON-IQ ELECTRIC WAVES MISSED THE PROGRAM SAVINGS GOAL FOR ELECTRIC.

For the first time in six years, the program did not meet its savings goals for electric and gas. This year, the program had separate goals for the IQ and non-IQ waves. The electric savings goal combined across the two types of waves was 12% higher this year than the goal in 2023, and combined savings were 15% lower than in 2022 and 2023. The IQ and non-IQ gas waves, as well as the IQ electric waves, achieved more than 100% of their savings goals. However, the non-IQ electric waves achieved 67% of the savings goal. The last time the program added new waves in 2022, the savings goal increased 1% from the goal in 2021.

Recommendations:

- Continue to monitor the new 2024 waves as more data is available that spans the cooling season. Consider adjusting goals while the program establishes its separate IQ and non-IQ cohorts. Monitor all waves as savings can take a few years to build up for new waves, but savings can also decrease in household and overall savings for older waves. If savings for older waves present a steady decline (starting with using 2024 as a comparison), consider retiring the waves or moving those control customers into other waves as treatment customers.
- Consider a customer behavior study to understand why behavioral savings increase or decrease over time. The study can examine savings data from the lifespan of the program, as well as demographic and educational messaging data to find drivers of long-term savings. The study can attempt to understand how much customer knowledge about energy savings comes from this program, while helping understand the persistence of savings for the program going forward.

CONCLUSION 2: FEWER WAVES HAD STATISTICALLY SIGNIFICANT SAVINGS THAN IN PRIOR YEARS, POSSIBLY DUE TO SMALLER WAVE SIZES.

Modeled savings were statistically significant ($p > 0.10$) for eight electric waves, and eight natural gas waves.^{32,33} The remaining 14 electric waves and 14 natural gas waves did not have statistically significant savings. The new 2024 wave, which has the largest number of participants of any wave but had only three months of data to evaluate, had positive but not statistically significant savings. Smaller base sizes can make it less likely for savings to be significant in the billing analysis, and all wave sizes decreased this year after splitting the waves by IQ and non-IQ customers. Fifteen electric waves have fewer than 10,000 customers, and 11 gas waves have fewer than 10,000 customers. Customer attrition rates, which impact statistical significance, remain consistent.

³² The statistically significant electric waves included Wave 1 (email, non email, IQ, and non IQ), and non IQ waves for Wave 2, Wave 3, Wave 4, and Wave 11.

³³ The statistically significant natural gas waves included Wave 1 (non email IQ and non IQ); non IQ waves for Waves 2 and 5; and both IQ and non IQ waves for Waves 7 and 8.

Recommendations:

- Monitor statistical significance as well as savings, particularly when the program makes changes that could increase savings, such as instituting AMI high bill alerts.
- Consider conducting a study to determine how the NIPSCO team can maximize savings while maintaining the ability to calculate statistical significance for savings differences with smaller wave sizes. This could help inform the strategy for adding participants to the program to drive savings in future years.
- Using move-out, zip code, and/or renter data at the customer level from NIPSCO, Oracle, or from the census for the whole NIPSCO service territory, investigate any fundamental differences between the waves and the service territory to take into consideration when rebalancing customers in future waves.

CONCLUSION 3: NEW IQ WAVES HAVE A GREATER RANGE OF HOUSEHOLD SAVINGS AND GREATER VARIATION IN SEASONAL SAVINGS PATTERNS COMPARED TO THEIR NON-IQ COHORTS.

NIPSCO separated all waves into IQ and non-IQ customer groups. The range of percentage of household savings for the electric IQ waves was more variable than the typical range of savings in prior evaluations. The percentage of household savings for natural gas was more consistent across the IQ and non-IQ groups. The IQ waves also had more variable savings patterns over the year than their non-IQ counterparts with some waves experiencing lower or negative savings in summer. The average non-IQ household saved 0.8% of its electric energy usage, and the average IQ household saved 0.5%. For natural gas, the average non-IQ household saved 0.8% of its energy usage, and the average IQ household saved 0.4%.

Recommendations:

- Conduct research to better understand the underlying reasons for variable savings to inform decisions about whether to reassign wave participants. The aim of this research would be to better understand who is in each wave and the savings potential of IQ homes. It could include investigating baseline usage for IQ and non-IQ waves and attempting to collect different home data from Oracle or NIPSCO, such as square footage, home vintage, equipment in homes, or cooling system types, to understand the differences between waves with positive and negative savings and the differences in seasonal savings.

CONCLUSION 4: ONLINE PORTAL USAGE AND TIME ON THE PORTAL REMAINS LOW.

On average, about 20 customers (0.00% of NIPSCO's Behavioral program participants) logged into the web portal each month, which was lower than last year's average of 60 unique customers logging into the web portal each month. When customers do log in, they stay on the site for an average of five minutes, which is equal to the 2023 average but down from nine minutes in 2022.

Recommendations:

- Develop new strategies, such as targeting messaging to new waves to update their home profile information, to increase engagement with the online portal. With increased portal engagement, NIPSCO can better market other program offerings to program participants.
- Conduct a customer survey to better understand customer interest in portal usage. A brief survey could gather information as to why customers are interested in the portal, if it meets their expectations, and preferences about what tips they would like to receive through the portal. This survey could also include research to better understand customer interest in energy savings tips and communication preferences. A brief survey could gather 1) participant preferences for mail, email, or both types of communication and 2) relative interest in energy savings tips, the customer portal, or information in other NIPSCO programs. Alternatively, consider conducting an in-depth customer survey, which the evaluation team conducted last in 2018. A more extensive survey could also ask customers about their preferences for email frequency, messaging, and other resources needed to inform Oracle's tip library and potentially drive program cross-participation.
 - When considering these options, it will be especially important to understand the differences between the non-IQ and IQ programs regarding program satisfaction and opportunities for engagement. Additional research questions could include how to use key words and language for the IQ program that align with its participants' current saving habits and motivations.

CONCLUSION 5: CROSS-PROGRAM PARTICIPATION SAVINGS WERE NEGATIVE OVERALL FOR NON-IQ WAVES AND POSITIVE FOR IQ WAVES. HOWEVER, CHANNEL MESSAGING IN HER REPORTS WAS SIMILAR TO PREVIOUS YEARS.

The IQ program had positive uplift for electric and natural gas whereas the non-IQ program had negative uplift for electric and natural gas. Despite the non-IQ program having negative uplift overall, the three newest waves for the non-IQ program had positive uplift for electric and natural gas.

As the evaluation team noted last year, HER messaging often includes information about other NIPSCO programs and resources. These messages encourage customers to participate in other programs by including direct links (for eHERs) or website information. Messaging about NIPSCO programs in 2024 HERs was like that in previous years. Information about other programs was not significantly spotlighted in these reports as it can be found near the bottom of eHERs and on the back of print reports.

Recommendations:

- Conduct research on different consumption and usage patterns in IQ homes to provide useful recommendations to customers shown to have lower baseline usage—and possibly lower opportunities for savings—than their non-IQ cohorts. The program can use this information to enhance messaging to these customers, specifically messaging for programs targeting IQ offerings that align with the findings on customer usage. Use 2025 as a comparison year to 2024, which can serve as a control year for messaging to IQ and non-IQ customers.

- Consider different targeted messages to older waves and newer waves. Customers who have remained in the program for more than five years may be homeowners or long-term renters who could make capital improvements to their homes and might have bigger opportunities for new heating systems, for example. Newer waves may be more interested in a wide range of NIPSCO's offerings, targeted messaging about low-capital investment energy efficiency improvements, or using the online portal, as mentioned above.
- Conduct a message testing study with a sample of customers from waves that demonstrate high savings to evaluate the effectiveness of using targeted channeling efforts that highlight other NIPSCO programs. For example, the team could test using more targeted channeling messaging with participants who are in the oldest waves and have the highest behavioral savings. If the test results demonstrate that targeted channeling leads to higher cross participation and additional energy savings, this could be a new model to drive more savings from the highest-savings participants in the largest program in NIPSCO's residential portfolio.

CONCLUSION 6: EMAIL ENGAGEMENT IS LOW EVEN THOUGH CUSTOMERS WHO RECEIVE PROGRAM EMAILS OPEN THEM.

Customers opened emails in 2024 about 50% of the time on average, which was six percentage points higher than in 2023. Participants opened emails they received slightly more in the winter months than in the summer months. However, engaging with emails by clicking through to the portal occurs at a much lower rate. The click-through rate decreased slightly again from 2% on average to 1% from 2023 to 2024. This rate was highest in December.

Recommendations:

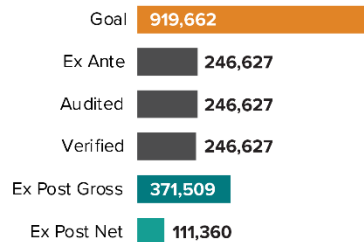
- Conduct brief pre- and post-high bill alert surveys to understand if the attention from high bill alerts is leading to higher customer engagement or possibly higher customer satisfaction. High bill alert emails may have led to increased awareness of and attention to the program communications.
- Consider conducting an experiment creating cohorts of waves that 1) receive the same messaging or timed messages as 2024 or 2) receive messages during different months of the year. NIPSCO can conduct better research to look at savings by month and strategize when to send reports that may attract customer attention.

RESIDENTIAL NEW CONSTRUCTION

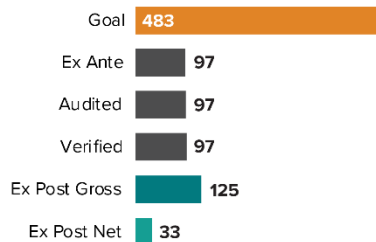


- The program nearly achieved its gas savings goal, and while it fell short of electric savings goals, participation was substantially higher than last year. Electric equipment incremental cost compared to rebate amounts contributed to low electric participation.
- A home's HVAC equipment efficiency appears to have a low correlation with energy savings; however, home size appears to have a significant correlation with savings, and energy recovery ventilation (ERV) Ventilation systems may be correlated with prototype savings.
- Interviewees reported positive experiences with the manufactured homes program, highlighting valuable energy savings and opportunities for increasing participation.

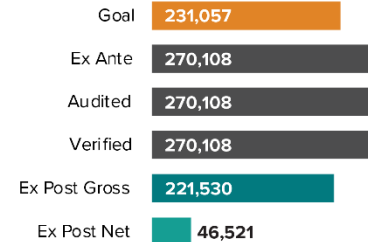
⚡ Electric Savings (kWh)



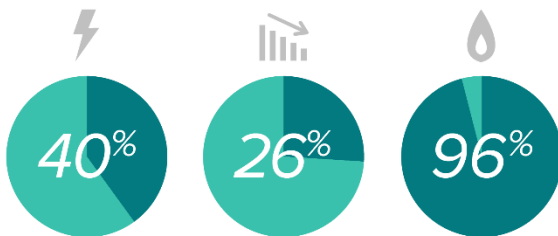
📊 Peak Demand Reduction (kW)



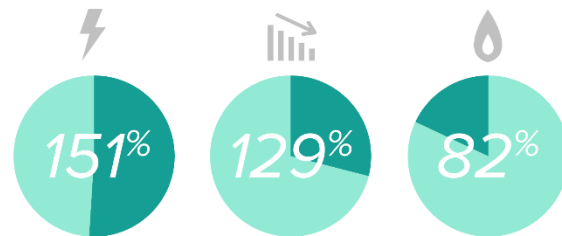
💧 Natural Gas Savings (Therms)



Ex Post Gross Achieved to Gross Goal

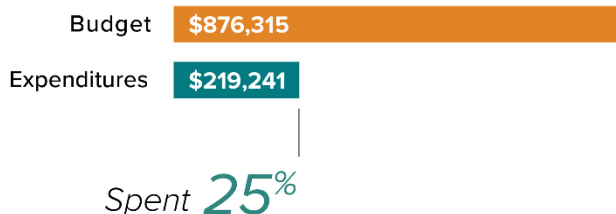


Realization Rate

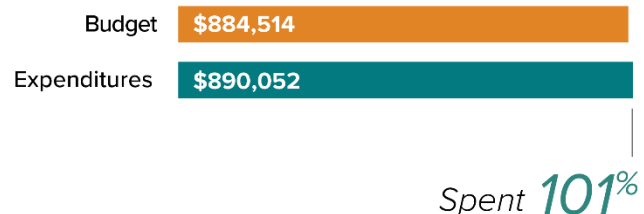


Budget

⚡ 📊 Electric and Peak Demand



💧 Natural Gas



Program Design and Delivery

The Residential New Construction program, implemented by TRC, provides a prescriptive incentive to residential home builders that are building homes to high efficiency standards, as defined by the RESNET Home Energy Rating System (HERS) Index and to homeowners of newly purchased ENERGY STAR Manufactured Homes. NIPSCO introduced the Residential New Construction program in 2019. The ENERGY STAR Manufactured Homes component of the program began in 2023, and NIPSCO expanded the program in 2024 to include additional measures. For HERS measures, NIPSCO pays incentives directly either to home builders that submit incentive applications or to the HERS rater if they provide an instant discount to the builder on their invoice. For ENERGY STAR Manufactured Homes, NIPSCO pays incentives directly to the homeowner. Participating homes must have active NIPSCO residential electric and/or natural gas service.

Incentive Tiers

The program tiered incentives for site-built homes by the HERS Index score range that meet minimum efficiency requirements for heating (95% AFUE), cooling (15.2 SEER2), and heat pump water heaters (2.2 UEF for manufactured homes only). The program also offered several incentives for ENERGY STAR-rated manufactured homes based on their size (single- or double-wide) and ENERGY STAR qualifications for envelope and mechanical equipment (heating, cooling, and DHW).

Homes with lower HERS Index scores receive higher incentives as NIPSCO presumes these homes are more energy efficient. Similarly, more efficient manufactured homes receive higher incentives, and double-wide incentives are greater than single-wide incentives.

Electric-only homes must have an electric cooling system to be eligible for electric fuel incentives. To qualify for the electric incentive, homes with central air conditioning (A/C) or air source heat pump must have a Seasonal Energy Efficiency Ratio 2 (SEER2) rating of 15.2 or higher. Natural gas service-only homes must use natural gas for all space heating to be eligible for natural gas fuel incentives. Homes using ground source heat pumps (geothermal) or dual-fuel systems (a heat pump used in conjunction with a natural gas furnace) are only eligible for an electric rebate.

For the 2024 evaluation, the team grouped the program's incentives into four categories, as described below.

1. HERS Legacy Measures

These measures are carry overs from the 2023 program design and have "Legacy 2023 Measure" in the program data measure name (e.g., New Construction - Gold 58-57 Electric - Legacy 2023 Measure).³⁴ The evaluation applied 2023 per-unit realization rates to these measures, and the evaluation did not include them in the HERS certificate sample general population.

2. HERS Base Measures

These measures are like the HERS Legacy measures but fall under the 2024 program design (e.g., New Construction - Gold 58-57 Electric-Only), and the evaluation included them in the HERS certificate sample general population. The evaluation used prototype modeling to evaluate these measures.

³⁴ The Indiana 2020 Residential Code applies to these measures (the concurrency period ended with the previous code).

3. HERS Plus Measures

These measures include additional deemed savings for high-efficient heating and/or cooling equipment to the corresponding HERS Base measure (e.g., New Construction - Gold 58-57 Electric-Only + Central A/C 15.2 SEER2, New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE, New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE, etc.), and the evaluation included them in the HERS certificate sample general population for the evaluation. The evaluation used prototype modeling to evaluate these measures.

4. ENERGY STAR Manufactured Home Measures

These measures award savings to various categories of newly constructed manufactured homes that receive ENERGY STAR certification. The team evaluated these using baseline and design energy models and did not include them in the HERS certificate sample general population.

Table 131 and Table 132 outline the program tiers and incentives for HERS-based and manufactured home incentives in 2024, respectively.

Table 131. 2024 Residential New Construction Program HERS Incentives

HERS INDEX SCORE	ELECTRIC INCENTIVE	NATURAL GAS INCENTIVE
Silver Star (HERS 59-62) - Legacy 2023 Measure	\$40	\$350
Gold Star (HERS 57-58) - Legacy 2023 Measure	\$50	\$400
Platinum Star (HERS $\leq$ 56) - Legacy 2023 Measure	\$60	\$450
Silver Star - HERS 61-59	\$200	\$300
Gold Star - HERS 58-57	\$250	\$400
Platinum Star - HERS $\leq$ 56	\$350	\$500
Silver Star – HERS 61-59 Electric-only + Air Source Heat Pump 15.2 SEER2	\$350	N/A
Gold Star – HERS 58-57 Electric-only + Air Source Heat Pump 15.2 SEER2	\$400	N/A
Platinum Star – HERS $\leq$ 56 Electric-only + Air Source Heat Pump 15.2 SEER2	\$500	N/A
Silver Star – HERS 61-59 Electric-only + Central Air Conditioner 15.2 SEER2 or greater	\$1,300	N/A
Gold Star - HERS 58-57 Electric-only + Central Air Conditioner 15.2 SEER2 or greater	\$1,350	N/A
Platinum Star – HERS $\leq$ 56 Electric-only + Central Air Conditioner 15.2 SEER2 or greater	\$1,400	N/A

HERS INDEX SCORE	ELECTRIC INCENTIVE	NATURAL GAS INCENTIVE
Silver Star – HERS 61-59 Gas-only + High Efficiency Gas Furnace 95% AFUE or greater	N/A	\$800
Gold Star – HERS 58-57 Gas-only + High Efficiency Gas Furnace 95% AFUE or greater	N/A	\$900
Platinum Star – HERS ≤ 56 Gas-only + High Efficiency Gas Furnace 95% AFUE or greater	N/A	\$1,000
Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	\$126.86	\$1,973.14
Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	\$132.20	\$2,117.80
Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	\$137.07	\$2,262.93

Table 132. 2024 Residential New Construction Program Manufactured Home Incentives

MANUFACTURED HOME TYPE	ELECTRIC INCENTIVE	NATURAL GAS INCENTIVE
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3 ^a	\$800	N/A
ENERGY STAR Manufactured Home V3 – Envelope + Heat Pump package – Single section – Electric Savings	1000	N/A
ENERGY STAR Manufactured Home V3 – Envelope + Heat Pump package – Double section - Electric Savings	2000	N/A
ENERGY STAR Manufactured Home V3 – Envelope + HPWH – Single section (with Gas Heating)- Electric savings	2000	N/A
ENERGY STAR Manufactured Home V3 - Envelope + HPWH- Double section (with Gas Heating)- Electric savings	3000	N/A
ENERGY STAR Manufactured Home V3 - Heat Pump – Single section - Electric Savings	400	N/A
ENERGY STAR Manufactured Home V3 - Heat Pump)- Double section - Electric Savings	800	N/A
ENERGY STAR Manufactured Home V3 – Envelope + High Efficiency Furnace Single section- Gas savings	N/A	\$800
ENERGY STAR Manufactured Home V3- Envelope – + High Efficiency Furnace Double section – Gas savings	N/A	1000
ENERGY STAR Manufactured Home V3 –+ High Efficiency Furnace + Single section – Gas savings	N/A	150
ENERGY STAR Manufactured Home V3 –+ High Efficiency Furnace + Double section – Gas savings	N/A	300
ENERGY STAR Manufactured Home V3 –+ High Efficiency Furnace + Heat Pump Water Heater – Single section – Gas savings	N/A	800

MANUFACTURED HOME TYPE	ELECTRIC INCENTIVE	NATURAL GAS INCENTIVE
ENERGY STAR Manufactured Home V3 →+ High Efficiency Furnace + Heat Pump Water Heater – Double section -Gas savings	N/A	800

^aCarryover from 2023 program design.

Marketing

NIPSCO develops marketing collateral to promote the program and markets the program to builders, HERS raters, and ENERGY STAR manufacturers and retailers directly and through industry organizations, such as builder associations. In 2024, NIPSCO also promoted the Manufactured New Home program as part of the April Earth Day campaign via email and social media postings. NIPSCO does not currently market the program directly to prospective home buyers.

Changes from the 2023 Design

In 2024, the program expanded incentive offerings to include additional ENERGY STAR-certified manufactured new home configurations and offered bonus measures for new construction homes with more efficient equipment. ENERGY STAR-manufactured new homes must be produced in a plant certified by an Environmental Protection Agency (EPA)-recognized Quality Assurance Provider. The home design package must meet the mandatory requirements for all certified manufactured homes. Manufactured new homes must receive a valid ENERGY STAR rating Version 3.

Homes participating in the Residential New Construction program will not be eligible to receive additional NIPSCO rebates for a period of three years after the HERS Index rating date.

Program Performance

As seen in Table 133, throughout 2024, the program processed 1,097 incentives including 286 carry-over incentives under the 2023 program design and 14 ENERGY STAR Manufactured Home projects that received an incentive.

Table 133. 2024 Residential New Construction Program Incentive Quantity

INCENTIVE TYPE	GAS QUANTITY	ELECTRIC QUANTITY	COMBO QUANTITY	TOTAL
HERS Legacy	264	22	0	286
HERS Base	148	278	0	426
HERS Plus	357	3	11	371
Manufactured Home	0	14	0	14
TOTAL	769	317	11	1,097

The program paid incentives to a total of 806 homes with 291 homes receiving both the electric and natural gas incentives (582 total incentives), 26 homes receiving the electric incentive only, 478 homes receiving the natural gas incentive only, and 11 homes receiving the combo fuel incentive (Table 134).

Table 134. 2024 Residential New Construction Program Home Participation

PARTICIPATION TYPE	RESIDENTIAL HOMES	MANUFACTURED HOMES	TOTAL
Natural Gas-Only	478	0	478
Electric-Only	12	14	26
Electric and Gas	291	0	291
Combo	11	0	11
TOTAL	792	14	806

Table 135, below, summarizes savings for the full year of program performance, including program savings goals. The program reported *ex ante* electric energy savings of 246,626.56 kWh, peak demand reduction of 97.274 kW, and natural gas savings of 270,108.15 therms. For *ex post* gross savings, the program achieved 40% of the electric energy savings goal, 26% of the peak demand reduction goal, and 96% of the natural gas savings goal. Electric demand achievement was lower than electric energy due to overestimated planned savings for HERS Plus measures.

The 2024 electric energy savings goal of 919,661.97 kWh was based on planned 731 electric and combo customer new construction incentives and 90 manufactured home incentives. Actual participation was much lower than planned with the program achieving 314 electric new construction incentives and 14 electric manufactured home electric incentives. Although participation was lower than planned, 2024 electric participation increased significantly over the 2023 program year, which only had 38 electric new home incentives and one electric manufactured home incentive. This represents an increase of 726% in electric new home incentives and a 1,300% increase in electric manufactured home incentives year-over-year.

Gas energy savings achieved 96% of planned savings due to higher-than-planned participation in gas projects (780 achieved vs. 731 planned), offset by overestimated planned gas savings for HERS Plus measures. Gas participation in 2024 also increased year-over-year by approximately 13% (691 gas incentives in 2023).

The equipment cost to participate in electric rebates contributed to lower electric achievement compared to gas achievement. For instance, many combination service customers only received a gas rebate and did not receive an electric rebate because the incremental cost of installing a program-compliant air conditioner was too high compared to the electric rebate amount, according to the program implementer.

Table 135. 2024 Residential New Construction Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	919,661.97	246,626.56	246,626.56	246,626.56	371,509.24	111,359.76	40%
Peak Demand Reduction (kW)	483.285	97.274	97.274	97.274	125.398	33.330	26%
Natural Gas Energy Savings (therms/yr.)	231,057.34	270,108.15	270,108.15	270,108.15	221,529.83	46,521.26	96%

Table 136 outlines the *ex post* and net-to-gross (NTG) adjustment factors. Realization rates were 151% for electric energy and 129% for peak demand. The natural gas savings realization rate was 82%.

The evaluation team applied results from the 2022 Residential New Construction program NTG analysis to the 2024 Residential New Construction program evaluation. The data gathered from builder interviews in 2022 suggested high freeridership due primarily to low engagement with the program implementation team and incentives that were too low to affect decision-making. . In conversations with the implementation team, they noted that engagement with both builders and raters has been significant since 2022. The team plans to attempt additional builder interviews in 2025.

Table 136. 2024 Residential New Construction Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	151%	70%	0%	30%
Peak Demand Reduction (kW)	129%	73%	0%	27%
Natural Gas Energy Savings (therms/yr.)	82%	79%	0%	21%

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

Table 137 lists the 2024 program budget and expenditures by fuel type. The lower electric expenditure reflects the low electric measure participation and, therefore, fewer incentives delivered. Gas expenditure, however, reflects the program’s participation exceeding initial estimates.

Table 137. 2024 Residential New Construction Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$876,315.27	\$219,240.70	25%
Natural Gas	\$884,513.59	\$890,052.07	101%

Evaluation Methodology

To inform the 2024 NIPSCO Residential New Construction program impact and process evaluation, the evaluation team completed the following research activities:

- **Program staff discussions** to understand the program process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program participation data.
- **Engineering analysis** to review program savings assumptions and algorithms for reasonableness and accuracy.
- **Manufactured new home participant and property manager interviews (n=2)** to better understand the participants' experiences and satisfaction with the program, as well as to gather information about the program's influence on the homeowner and property manager's decision-making to inform the NTG calculation.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop savings estimates? Are there any updates that should be made?
- What are the *ex post* program savings? Do these suggest any needed updates to the program's design, delivery, or savings assumptions?
- Did the program meet its participation and savings goals overall?
- To what extent did the manufactured homes program influence participant decision-making? What are the manufactured homes program's spillover and freeridership estimates (net savings)?

For all 2024 HERS Base, HERS Plus, and Manufactured Home measure types, the evaluation team compared its engineering calculations to NIPSCO's *ex ante* savings. The team based its savings methodologies and inputs for each measure on standard engineering practices, the 2020 Indiana Residential Code, the 2023 Federal minimum efficiency update, and NIPSCO's program tracking database. The evaluation team applied 2023 realization rates to HERS Legacy measures carried over from the 2023 program design.

Additionally, the evaluation team reviewed program documents, HUD code, Clayton Home literature, and ENERGY STAR literature pertaining to the manufactured homes certification process to develop REM/Rate simulation models for baseline and design manufactured homes.

Audited and Verified Savings

To audit energy savings and demand reduction, the evaluation team conducted a careful review of the program's tracking data, creating multiple data summaries and checking measure identifiers for errors, omissions, or duplicates. Initially, the evaluation team reviewed program tracking data through November 2024 to develop a random sample and to check the tracking data for data quality issues. The team sampled 62 projects from this dataset and confirmed the accuracy by verifying that the rebate amount and program

tier matched the HERS documentation. The evaluation team identified one duplicate project within a preliminary dataset, which the implementer had corrected in the final tracking data provided for the full year.

The evaluation team found no inconsistencies in the final tracking data and applied an in-service rate (ISR) of 100% to all projects as is standard practice in new construction programs, as seen in Table 138, which lists the ISRs for all program-installed measures.

Table 138. 2024 Residential New Construction Program ISRs Ratios by Measure

MEASURE	ISR
New Construction - Silver 62-59 Electric - Legacy 2023 Measure	100%
New Construction - Silver 62-59 Gas - Legacy 2023 Measure	100%
New Construction - Silver 61-59 Electric-Only	100%
New Construction - Silver 61-59 Gas-Only	100%
New Construction - Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	100%
New Construction - Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	100%
New Construction - Gold 58-57 Electric - Legacy 2023 Measure	100%
New Construction - Gold 58-57 Gas - Legacy 2023 Measure	100%
New Construction - Gold 58-57 Electric-Only	100%
New Construction - Gold 58-57 Gas-Only	100%
New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	100%
New Construction - Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	100%
New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	100%
New Construction - Platinum ≤ 56 Electric - Legacy 2023 Measure	100%
New Construction - Platinum ≤ 56 Gas - Legacy 2023 Measure	100%
New Construction - Platinum ≤ 56 Electric-Only	100%
New Construction - Platinum ≤ 56 Gas-Only	100%
New Construction - Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	100%
New Construction - Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	100%
New Construction - Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	100%
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3	100%
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double-Wide (w/Gas Heating)	100%
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single-Wide (w/Gas Heating)	100%

Table 139 summarizes the tracking data quantity, audited quantity, applied ISRs, and resulting verified quantity per measure. To calculate the verified measure quantity, the evaluation team multiplied the audited measure quantity by the ISR. Because the ISR is 100% for all measures, audited and verified quantities are the same.

Table 139. 2024 Residential New Construction Program Audited and Verified Quantities

MEASURE	UNIT OF MEASURE	AUDITED QUANTITY	ISR	VERIFIED QUANTITY
New Construction - Silver 62-59 Electric - Legacy 2023 Measure	Home	8	100%	8
New Construction - Silver 62-59 Gas - Legacy 2023 Measure	Home	180	100%	180
New Construction - Silver 61-59 Electric-Only	Home	137	100%	137
New Construction - Silver 61-59 Gas-Only	Home	74	100%	74
New Construction - Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	Home	206	100%	206
New Construction - Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	Home	2	100%	2
New Construction - Gold 58-57 Electric - Legacy 2023 Measure	Home	6	100%	6
New Construction - Gold 58-57 Gas - Legacy 2023 Measure	Home	49	100%	49
New Construction - Gold 58-57 Electric-Only	Home	74	100%	74
New Construction - Gold 58-57 Gas-Only	Home	40	100%	40
New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	Home	66	100%	66
New Construction - Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	Home	1	100%	1
New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	Home	2	100%	2
New Construction - Platinum ≤ 56 Electric - Legacy 2023 Measure	Home	8	100%	8
New Construction - Platinum ≤ 56 Gas - Legacy 2023 Measure	Home	35	100%	35
New Construction - Platinum ≤ 56 Electric-Only	Home	67	100%	67
New Construction - Platinum ≤ 56 Gas-Only	Home	34	100%	34
New Construction - Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	Home	85	100%	85
New Construction - Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	Home	2	100%	2
New Construction - Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	Home	7	100%	7
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3	Home	1	100%	1
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double-Wide (w/Gas Heating)	Home	4	100%	4
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single-Wide (w/Gas Heating)	Home	9	100%	9
Total		1,097	100%	1,097

Ex Post Gross Savings

The evaluation team reviewed the program's *ex ante* assumptions, sources, and algorithms for reasonableness and updates. Below are detailed *ex post* gross analysis results.

Through an engineering review, the evaluation team identified notable differences between *ex ante* and *ex post* savings for natural gas and electric homes. The following overarching factors caused these differences:

- *Ex ante* savings were based on the 2022 evaluated results, which is consistent with how NIPSCO estimated *ex ante* savings for Residential New Construction program in past program years.
- Due to changes in home characteristics—such as conditioned floor area, duct tightness, home tightness, and envelope thermal performance—the 2024 sampled homes had greater natural gas savings compared to the 2022 sampled homes.
- *Ex ante* savings added TRM-based savings for high-efficient equipment to the *ex ante* HERS Base savings amount for the various HERS Plus measures, which resulted in higher *ex ante* electric demand and gas savings than evaluated savings, respectively.
- NIPSCO based *ex ante* savings for manufactured homes primarily on ENERGY STAR literature. The evaluation team used REM/Rate models for the baseline and design home to calculate savings. The differences in approach resulted in lower *ex post gross* savings and, therefore, low realization rates for these measures.

Engineering Reviews

The evaluation team created 26 prototypes (17 natural gas and 9 electric) from the 2024 sampled homes to model savings using REM/Rate (version 2023) software. The evaluated savings compared the prototype home energy use and peak demand relative to the requirements of the 2020 Indiana statewide residential energy code and 2023 federal minimum efficiency updates.

The evaluation team used prototype home characteristics based on a random sample of 71 HERS certificates from 2024 program homes combined with incentive types (fuel types and tiers) from program data. These HERS certificates provided key prototype model inputs including home square footage, insulation levels, home tightness, duct tightness, and mechanical equipment capacity and efficiency. The team developed prototypes according to the nearest weather station, foundation type, ventilation type, water heater type, and water heater fuel.

Silver-, Gold-, and Platinum-rated homes can have a myriad of different home characteristics within each tier and, therefore, defining prototypes by common home features is preferable to grouping by HERS tier. The team modeled prototypes that reflected the construction of the sampled homes, given the available information, to generate an overall analysis of the population of homes.

The overall weighted realization rate, based on the random sample, ensures correct overall adjustments. *Appendix 8. Residential New Construction Program* provides a full description of the methods used to calculate gross energy and peak demand savings.

Ex Post Gross Savings Summary

The evaluation approach differed for each measure type, described below.

HERS Legacy Measures. The evaluation team applied per-unit realization rates from the 2023 evaluation to the deemed savings values to calculate evaluated savings for HERS Legacy measures (110% kWh, 104% kW, 65% gas). The *ex ante* and *ex post* savings values for HERS Legacy measures remain unchanged from the 2023 evaluation.

HERS Base and HERS Plus Measures. The evaluation team used prototype simulation models to calculate evaluated savings for HERS Base and HERS Plus measures. The significant differences between estimates of *ex ante* and *ex post* electric energy and natural gas savings are likely to be the result of the different home characteristics of the 2024 sampled homes compared to the 2022 sampled homes.³⁵ These differences include the following overarching factors:

1. Home size increased by 14% compared to 2022, due in part to the fact that most 2024 homes had conditioned basements. Larger homes have correspondingly more energy savings potential.
2. Envelope air tightness increased 13% (ACH50).
3. Duct air leakage increased 20% (CFM25/100 CFA).
4. Air conditioner SEER increased 6%.
5. Electric water heater efficiency increased 3%.
6. Gas water heater efficiency increased 11%.

However, differences between *ex ante* and *ex post* electric demand savings are the result of an overestimation of the incremental increase in savings from 15.2 SEER2 air conditioners. *Ex ante* estimated demand savings for HERS Plus measures by adding the planned savings (TRM based) from NIPSCO's Home Rebates program for 15.2 SEER2 air conditioner to the deemed demand savings of each corresponding HERS Base tier, which exceeded prototype model savings used in *ex post*.

Manufactured Home Measures. The evaluated electric savings for ENERGY STAR Manufactured Homes were less than *ex ante* estimates. The evaluation team used REM/Rate modeling to determine savings while the planned savings used ENERGY STAR literature from 2023 to forecast savings. However, the referenced electric savings from ENERGY STAR literature used in the *ex ante* estimates assumed electric heating, whereas the program measure names reference gas heating. Additional savings for heat pump water heaters added planned savings (TRM based) from NIPSCO's Home Rebates program for heat pump water heaters (as applicable) to the original deemed value. These discrepancies led to differences between *ex ante* and *ex post* savings for manufactured homes.

Table 140, below, shows the *ex ante* deemed savings and *ex post* gross per-measure savings for all 2024 Residential New Construction program measures.

³⁵ NIPSCO 2024 Residential New Construction *ex ante* savings were based on the evaluated results from the 2022 program year.

Table 140. 2024 Residential New Construction Program *Ex Ante* and *Ex Post* Gross Per-Measure Savings Values

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
New Construction - Silver 62-59 Electric - Legacy 2023 Measure	Home	460.63	0.240	0.00	506.50	0.250	0.00
New Construction - Silver 62-59 Gas - Legacy 2023 Measure	Home	0.00	0.000	300.26	0.00	0.000	196.40
New Construction - Silver 61-59 Electric-Only	Home	563.60	0.280	0.00	1,092.59	0.380	0.00
New Construction - Silver 61-59 Gas-Only	Home	0.00	0.000	235.00	0.00	0.000	354.68
New Construction - Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	Home	0.00	0.000	406.81	0.00	0.000	308.20
New Construction - Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	Home	766.36	1.011	406.81	1,030.01	0.391	308.20
New Construction - Gold 58-57 Electric - Legacy 2023 Measure	Home	460.63	0.240	0.00	506.50	0.250	0.00
New Construction - Gold 58-57 Gas - Legacy 2023 Measure	Home	0.00	0.000	315.86	0.00	0.000	206.60
New Construction - Gold 58-57 Electric-Only	Home	563.60	0.280	0.00	1,092.59	0.380	0.00
New Construction - Gold 58-57 Gas-Only	Home	0.00	0.000	247.21	0.00	0.000	373.10
New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	Home	0.00	0.000	419.02	0.00	0.000	317.45
New Construction - Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	Home	766.36	1.011	0.00	1,030.01	0.391	0.00
New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	Home	766.36	1.011	419.02	1,030.01	0.391	317.45
New Construction - Platinum ≤ 56 Electric - Legacy 2023 Measure	Home	460.63	0.240	0.00	506.50	0.250	0.00
New Construction - Platinum ≤ 56 Gas - Legacy 2023 Measure	Home	0.00	0.000	332.27	0.00	0.000	217.34
New Construction - Platinum ≤ 56 Electric-Only	Home	563.60	0.280	0.00	1,092.59	0.380	0.00
New Construction - Platinum ≤ 56 Gas-Only	Home	0.00	0.000	260.00	0.00	0.000	392.41
New Construction - Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	Home	0.00	0.000	431.81	0.00	0.000	306.99
New Construction - Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	Home	766.36	1.011	0.00	1,030.01	0.391	0.00

MEASURE	UNIT OF MEASURE	EX ANTE DEEMED SAVINGS			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
New Construction - Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	Home	766.36	1.011	431.81	1,030.01	0.391	306.99
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3	Home	4,480.00	0.000	0.00	854.34	0.633	0.00
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double-Wide (w/Gas Heating)	Home	6,520.22	0.000	0.00	3,115.91	0.633	0.00
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single-Wide (w/Gas Heating)	Home	4,280.22	0.000	0.00	3,209.79	0.633	0.00

Table 141 highlights reasons for notable differences between *ex ante* and *ex post* gross estimates.

Table 141. 2024 Residential New Construction Notable Differences Between *Ex Ante* and *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
HERS Base and HERS Plus Electric	HERS Base measures used <i>ex post</i> values from the 2022 evaluation. HERS Plus measures added IL TRM v12 based savings for 15.2 SEER2 air conditioners to the base measure value.	Program data and HERS certificate data from a random sample used to generate prototypes. Savings based on REM/Rate prototype model analysis with a code-minimum baseline home.	kWh and kW savings differ due to different prototype home characteristics and savings compared to <i>ex ante</i> value.
HERS Base and HERS Plus Natural Gas	HERS Base measures used <i>ex post</i> values from the 2022 evaluation. HERS Plus measures added IL TRM v12 based savings for a 95% AFUE natural gas furnace to the base measure value.	Program data and HERS certificate data from a random sample used to generate prototypes. Savings based on REM/Rate prototype model analysis with a code-minimum baseline home.	Natural gas savings differ due to different prototype home characteristics and savings compared to <i>ex ante</i> value.
ENERGY STAR Manufactured Home Electric	ENERGY STAR literature correlated to Chicago, IL modeled savings result.	REM/Rate models for baseline and efficient home, the difference in energy usage equates to savings. HUD guidelines and code requirements to establish baseline model characteristics. Clayton Home and ENERGY STAR literature to establish efficient model characteristics and geometric values (area, height, perimeter, etc.).	kWh and kW savings differ due to the different approaches to calculate savings.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
ENERGY STAR Manufactured Home Natural Gas	ENERGY STAR literature correlated to Chicago, IL modeled savings result.	REM/Rate models for baseline and efficient home, the difference in energy usage equates to savings. HUD guidelines and code requirements to establish baseline model characteristics. Clayton Home and ENERGY STAR literature to establish efficient model characteristics and geometric values (area, height, perimeter, etc.).	Natural gas savings differ due to the different approaches to calculate savings.

Realization Rates

The next three tables (Table 142 through Table 144) show the program’s *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms.

HERS Legacy measures. The evaluation team applied realization rates from the 2023 evaluation to HERS Legacy measures in the 2024 evaluation.

HERS Base and HERS Plus measures. Although the evaluation updated the reference home to reflect the 2023 federal minimum efficiency updates for cooling systems (13.4 SEER2 for ACs/14.3 SEER2 for heat pumps in the northern climate), evaluated electric energy and natural gas savings for all HERS Base measures on a per-unit basis significantly exceeded 100%, mainly due to differences in home characteristics in 2024 compared to 2022.³⁶ All HERS Plus realization rates were lower than their corresponding HERS Base realization rates due to an overestimation of the incremental savings for adding efficient equipment in planned savings. (The 15.2 SEER2 air conditioner additional savings equaled 202.76 kWh and 0.731 kW, and the 95% AFUE furnace equaled 171.81 therms from TRM based calculations.)

On a per-unit basis, electric realization rates for HERS Base measures equaled 194% for kWh, 136% for kW, and 151% for natural gas. Meanwhile, the realization rates for all HERS Plus measures equaled 134% for kWh, 39% for kW, and varied between 76% (for Silver Star and Gold Star) and 71% (for Platinum Star) for natural gas.

The evaluation revealed that the electric energy savings of HERS Base and HERS Plus measures were approximately equal (1,092.6 kWh HERS Base vs. 1030.0 kWh HERS Plus), and the gas savings for HERS Base measures were greater than the corresponding HERS Plus measures on average (368 therms HERS Base vs. 310 therms HERS Plus). This suggests other characteristics besides HVAC equipment efficiency have a greater influence on a home’s energy savings.

A summary of 2024 home characteristic changes from 2022 that influenced realization rates includes the following:

³⁶ Equivalent to 14.0 SEER for air conditioners and 15.0 SEER for heat pumps.

- The average home size was 2,841 square feet in 2022 and increased to 3,225 square feet in 2024.
- The average home air leakage declined (i.e., tighter enclosure) from 3.2 ACH50 in 2022 to 2.84 ACH50 in 2024.
- The average home duct air leakage declined (i.e., tighter ducts) from 1.84 CFM25/100 CFA in 2022 to 1.54 CFM25/100 CFA in 2024.
- The average air conditioner efficiency increased from 13.9 SEER in 2022 to 14.7 SEER (14.0 SEER2) in 2024.³⁷
 - The average SEER2 for electric rebate homes was 13.8 SEER2, which is below the program requirement of 15.2 SEER2.
- Electric water heater efficiency increased from 0.923 EF in 2022 to 0.940 EF in 2024.³⁸
- The average furnace efficiency in 2022 was 95.0% AFUE, which is slightly less than the 2024 gas rebate home average of 95.3% AFUE.

The percentages of HERS Base and HERS Plus measures varied by fuel type, which also affected program level realization rates due to their different values. The split between HERS Base and HERS Plus electric measures was 95% HERS Base and 5% HERS Plus. Meanwhile, the split between HERS Base and HERS Plus gas measures was 29% HERS Base and 71% HERS Plus.

Manufactured Home Measures. Realization rates for ENERGY STAR Manufactured Homes varied between 19% and 75% for kWh. The evaluation team did not calculate realization rates for electric demand since planned savings did not include any, and we did not calculate realization rates for natural gas since there were no manufactured home measures that received a gas rebate. The difference in methodology in estimating savings (values from ENERGY STAR literature used in planned savings vs. modeled savings used in the evaluation) drove electric realization rates lower for manufactured homes.

Table 142. 2024 Residential New Construction Program *Ex Ante* and *Ex Post* Gross Electric Energy Savings

MEASURE	<i>EX ANTE</i> ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	<i>EX POST</i> GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
New Construction - Silver 62-59 Electric - Legacy 2023 Measure	3,685.04	3,685.04	3,685.04	4,052.00
New Construction - Silver 62-59 Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
New Construction - Silver 61-59 Electric-Only	77,213.20	77,213.20	77,213.20	149,684.79
New Construction - Silver 61-59 Gas-Only	0.00	0.00	0.00	0.00
New Construction - Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	0.00	0.00	0.00	0.00
New Construction - Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	1,532.72	1,532.72	1,532.72	2,060.03

³⁷ SEER2 converted to SEER by dividing by 0.95 factor per IL TRM v12 (SEER = SEER2 / 0.95).

³⁸ REM/Rate calculation to convert UEF to EF uses this formula for residential electric water heaters: EF = 2.4029 * UEF - 1.2844.

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
New Construction - Gold 58-57 Electric - Legacy 2023 Measure	2,763.78	2,763.78	2,763.78	3,039.00
New Construction - Gold 58-57 Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
New Construction - Gold 58-57 Electric-Only	41,706.40	41,706.40	41,706.40	80,851.64
New Construction - Gold 58-57 Gas-Only	0.00	0.00	0.00	0.00
New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	0.00	0.00	0.00	0.00
New Construction - Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	766.36	766.36	766.36	1,030.01
New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	1,532.72	1,532.72	1,532.72	2,060.03
New Construction - Platinum ≤ 56 Electric - Legacy 2023 Measure	3,685.04	3,685.04	3,685.04	4,052.00
New Construction - Platinum ≤ 56 Gas - Legacy 2023 Measure	0.00	0.00	0.00	0.00
New Construction - Platinum ≤ 56 Electric-Only	37,761.20	37,761.20	37,761.20	73,203.51
New Construction - Platinum ≤ 56 Gas-Only	0.00	0.00	0.00	0.00
New Construction - Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	0.00	0.00	0.00	0.00
New Construction - Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	1,532.72	1,532.72	1,532.72	2,060.03
New Construction - Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	5,364.52	5,364.52	5,364.52	7,210.10
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3	4,480.00	4,480.00	4,480.00	854.34
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double-Wide (w/Gas Heating)	26,080.88	26,080.88	26,080.88	12,463.62
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single-Wide (w/Gas Heating)	38,521.98	38,521.98	38,521.98	28,888.13
Total Savings	246,626.56	246,626.56	246,626.56	371,509.24
Total Program Realization Rate				151%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 143. 2024 Residential New Construction Program *Ex Ante* and *Ex Post* Gross Peak Demand Reduction

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
New Construction - Silver 62-59 Electric - Legacy 2023 Measure	1.920	1.920	1.920	2.00
New Construction - Silver 62-59 Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
New Construction - Silver 61-59 Electric-Only	38.360	38.360	38.360	52.027
New Construction - Silver 61-59 Gas-Only	0.000	0.000	0.000	0.000
New Construction - Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	0.000	0.000	0.000	0.000
New Construction - Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	2.022	2.022	2.022	0.781
New Construction - Gold 58-57 Electric - Legacy 2023 Measure	1.440	1.440	1.440	1.500
New Construction - Gold 58-57 Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
New Construction - Gold 58-57 Electric-Only	20.720	20.720	20.720	28.102
New Construction - Gold 58-57 Gas-Only	0.000	0.000	0.000	0.000
New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	0.000	0.000	0.000	0.000
New Construction - Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	1.011	1.011	1.011	0.391
New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	2.022	2.022	2.022	0.781
New Construction - Platinum ≤ 56 Electric - Legacy 2023 Measure	1.920	1.920	1.920	2.000
New Construction - Platinum ≤ 56 Gas - Legacy 2023 Measure	0.000	0.000	0.000	0.000
New Construction - Platinum ≤ 56 Electric-Only	18.760	18.760	18.760	25.444
New Construction - Platinum ≤ 56 Gas-Only	0.000	0.000	0.000	0.000
New Construction - Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	0.000	0.000	0.000	0.000
New Construction - Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	2.022	2.022	2.022	0.781
New Construction - Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	7.077	7.077	7.077	2.734
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3	0.000	0.000	0.000	0.633
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double-Wide (w/Gas Heating)	0.000	0.000	0.000	2.530
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single-Wide (w/Gas Heating)	0.000	0.000	0.000	5.693
Total Savings	97.274	97.274	97.274	125.398
Total Program Realization Rate				129%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 144. 2024 Residential New Construction Program *Ex Ante* and *Ex Post* Gross Natural Gas Savings

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
New Construction - Silver 62-59 Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
New Construction - Silver 62-59 Gas - Legacy 2023 Measure	54,046.80	54,046.80	54,046.80	35,351.73
New Construction - Silver 61-59 Electric-Only	0.00	0.00	0.00	0.00
New Construction - Silver 61-59 Gas-Only	17,390.00	17,390.00	17,390.00	26,245.98
New Construction - Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	83,802.86	83,802.86	83,802.86	63,489.52
New Construction - Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	813.62	813.62	813.62	616.40
New Construction - Gold 58-57 Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
New Construction - Gold 58-57 Gas - Legacy 2023 Measure	15,477.14	15,477.14	15,477.14	10,123.52
New Construction - Gold 58-57 Electric-Only	0.00	0.00	0.00	0.00
New Construction - Gold 58-57 Gas-Only	9,888.40	9,888.40	9,888.40	14,924.14
New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	27,655.32	27,655.32	27,655.32	20,951.83
New Construction - Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	0.00	0.00	0.00	0.00
New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	838.04	838.04	838.04	634.90
New Construction - Platinum ≤ 56 Electric - Legacy 2023 Measure	0.00	0.00	0.00	0.00
New Construction - Platinum ≤ 56 Gas - Legacy 2023 Measure	11,629.45	11,629.45	11,629.45	7,606.76
New Construction - Platinum ≤ 56 Electric-Only	0.00	0.00	0.00	0.00
New Construction - Platinum ≤ 56 Gas-Only	8,840.00	8,840.00	8,840.00	13,341.83
New Construction - Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	36,703.85	36,703.85	36,703.85	26,094.29
New Construction - Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	0.00	0.00	0.00	0.00
New Construction - Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	3,022.67	3,022.67	3,022.67	2,148.94
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3	0.00	0.00	0.00	0.00
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double-Wide (w/Gas Heating)	0.00	0.00	0.00	0.00
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single-Wide (w/Gas Heating)	0.00	0.00	0.00	0.00
Total Savings	270,108.15	270,108.15	270,108.15	221,529.83
Total Program Realization Rate				82%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Ex Post Net Savings

The evaluation team used the NTG analysis results from the 2022 Residential New Construction program evaluation and applied them to the 2024 Residential New Construction program evaluation, including the new measures in 2024. For manufactured homes, the evaluation team assumed a 100% NTG for 2024. The evaluation team interviewed one homeowner participant in the Manufactured New Home program. The homeowner indicated that the rebate was not the primary motivator in their home purchase decision-making but acknowledged the significant energy savings and ease of program participation facilitated by the manufactured home community. Additional evidence from speaking with the manufactured home community owner suggests the rebate program has an influence on the community's purchasing of homes from the manufacturer and the selection of energy efficient equipment. However, quantifying NTG savings attributable to program influence is not feasible without additional program participation data and further research.

Table 145 shows the NTG ratios by measure.

Table 145. 2024 Residential New Construction Program NTG Ratios by Measure

MEASURE	NTG
New Construction - Silver 62-59 Electric - Legacy 2023 Measure	21%
New Construction - Silver 62-59 Gas - Legacy 2023 Measure	21%
New Construction - Silver 61-59 Electric-Only	21%
New Construction - Silver 61-59 Gas-Only	21%
New Construction - Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	21%
New Construction - Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	21%
New Construction - Gold 58-57 Electric - Legacy 2023 Measure	21%
New Construction - Gold 58-57 Gas - Legacy 2023 Measure	21%
New Construction - Gold 58-57 Electric-Only	21%
New Construction - Gold 58-57 Gas-Only	21%
New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	21%
New Construction - Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	21%
New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	21%
New Construction - Platinum ≤ 56 Electric - Legacy 2023 Measure	21%
New Construction - Platinum ≤ 56 Gas - Legacy 2023 Measure	21%
New Construction - Platinum ≤ 56 Electric-Only	21%
New Construction - Platinum ≤ 56 Gas-Only	21%
New Construction - Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	21%
New Construction - Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	21%
New Construction - Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	21%
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3	100%
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double-Wide (w/Gas Heating)	100%
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single-Wide (w/Gas Heating)	100%

Table 146 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 146. 2024 Residential New Construction Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
New Construction - Silver 62-59 Electric - Legacy 2023 Measure	4,052.00	2.000	0.00	21%	850.92	0.420	0.00
New Construction - Silver 62-59 Gas - Legacy 2023 Measure	0.00	0.000	35,351.73	21%	0.00	0.000	7,423.86
New Construction - Silver 61-59 Electric-Only	149,684.79	52.027	0.00	21%	31,433.81	10.926	0.00
New Construction - Silver 61-59 Gas-Only	0.00	0.000	26,245.98	21%	0.00	0.000	5,511.66
New Construction - Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	0.00	0.000	63,489.52	21%	0.00	0.000	13,332.80
New Construction - Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	2,060.03	0.781	616.40	21%	432.61	0.164	129.44
New Construction - Gold 58-57 Electric - Legacy 2023 Measure	3,039.00	1.500	0.00	21%	638.19	0.315	0.00
New Construction - Gold 58-57 Gas - Legacy 2023 Measure	0.00	0.000	10,123.52	21%	0.00	0.000	2,125.94
New Construction - Gold 58-57 Electric-Only	80,851.64	28.102	0.00	21%	16,978.84	5.902	0.00
New Construction - Gold 58-57 Gas-Only	0.00	0.000	14,924.14	21%	0.00	0.000	3,134.07
New Construction - Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	0.00	0.000	20,951.83	21%	0.00	0.000	4,399.88
New Construction - Gold 58-57 Electric-Only + Central A/C15.2 SEER2	1,030.01	0.391	0.00	21%	216.30	0.082	0.00
New Construction - Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	2,060.03	0.781	634.90	21%	432.61	0.164	133.33
New Construction - Platinum ≤ 56 Electric - Legacy 2023 Measure	4,052.00	2.000	0.00	21%	850.92	0.420	0.00
New Construction - Platinum ≤ 56 Gas - Legacy 2023 Measure	0.00	0.000	7,606.76	21%	0.00	0.000	1,597.42
New Construction - Platinum ≤ 56 Electric-Only	73,203.51	25.444	0.00	21%	15,372.74	5.343	0.00
New Construction - Platinum ≤ 56 Gas-Only	0.00	0.000	13,341.83	21%	0.00	0.000	2,801.78
New Construction - Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	0.00	0.000	26,094.29	21%	0.00	0.000	5,479.80
New Construction - Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	2,060.03	0.781	0.00	21%	432.61	0.164	0.00
New Construction - Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	7,210.10	2.734	2,148.94	21%	1,514.12	0.574	451.28

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
ENERGY STAR Manufactured Home - Envelope Only – Double-Wide - Electric Savings - V3	854.34	0.633	0.00	100%	854.34	0.633	0.00
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double-Wide (w/Gas Heating)	12,463.62	2.530	0.00	100%	12,463.62	2.530	0.00
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single-Wide (w/Gas Heating)	28,888.13	5.693	0.00	100%	28,888.13	5.693	0.00
Total Savings	371,509.24	125.398	221,529.83	22%	111,359.76	33.330	46,521.26

Table 147 shows the NTG results for each fuel.

Table 147. 2024 Residential New Construction Program NTG Results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr)	246,626.56	371,509.24	30%	111,359.76
Peak Demand Reduction (kW)	97.274	125.398	27%	33.330
Natural Gas Energy Savings (therms/yr)	270,108.15	221,529.83	21%	46,521.26

Process Evaluation

The evaluation team completed a limited process evaluation, focusing on recipients of ENERGY STAR Manufactured Home measures, to answer the following research questions:

- How do manufactured home buyers become aware of the Manufactured Homes program?
- What drives participation in the Manufactured Homes program? How do incentives influence participant decision-making?
- How satisfied are Manufactured Homes program owner participants with the program overall, the process, and the incentives they received?
- What was the participant's experience with the Manufactured Homes program process? How, if at all, could it be improved?
- How satisfied are Manufactured Homes program participants with NIPSCO?
- How do Manufactured Homes participant's motivations and participation compare to those reported by builders and HERS raters in 2022?

Based on the participant data available at the time of recruitment, the team attempted to contact all six homeowner participants represented in the tracking data. After multiple recruitment attempts, we completed an interview with the one participant homeowner who responded to our outreach. The team held an

additional interview with the owner of the manufactured home community in which all six of the selected Manufactured New Home program participants live.

Interview Findings

The following sections provide feedback from the interviews with the Manufactured New Home participant and the manufactured home community owner.

Program Motivation and Experience

The interviewed participant expressed a highly positive experience with the program, highlighting ease of participation, minimal challenges, and satisfaction with the energy efficiency benefits. The homeowner noted that they purchased the energy efficient manufactured home primarily due to its availability and convenience rather than the ENERGY STAR certification or prior knowledge of the rebate program. While they did not describe home energy efficiency as a driver of their decision-making, they noted benefiting significantly more from lower energy bills than expected.

Influence of the Manufactured Home Community

The manufactured home community facilitated the homeowner's participation in the program. The manufactured home community handled all aspects of the rebate application from coordinating directly with the implementer and simplifying the homeowner's involvement to signing documents. The homeowner expressed appreciation for the detailed information from the home manufacturer provided at purchase, regarding aspects such as an energy efficiency packet and clear labeling of the energy efficient equipment.

Community Owner Perspective

As the primary touchpoint between the homeowners and the program, we expanded our interview strategy to speak with the owner of the manufactured home community. Six of the 14 2024 participants in the manufactured new home program own homes within a single community, highlighting the relationship between program participation and the community's engagement with their members, as described by the homeowner interviewee. The community owner explained that they handle all aspects of the rebate application process to minimize any burden on the homeowner.

The manufactured home community owner expressed great satisfaction with the program, particularly working with the program implementer staff to facilitate participation with their residents. The interviewee emphasized the importance of the program as a valuable incentive driving the choice of HVAC equipment installed in the homes in their community. The interviewee described working directly with the home manufacturer to select equipment to maximize rebate potential with the goal of contributing to long-term energy savings for residents. The owner actively promotes the rebate program to potential buyers, seeing it as an important selling point that saves residents significantly over time. From their perspective, the program directly contributes to solving home affordability challenges for the community.

Suggestions for Improvement

Both interviewees suggested more could be done to promote the program, noting social media and radio advertising as potential marketing channels. In addition to general program promotion, the community

owner noted that direct engagement with other manufactured home community owners and managers would go a long way to program promoting awareness and participation.

From the perspective of the community owner, the program's 90-day application timeline is a barrier to broad program participation. They observed that the 90-day window to submit the program application begins when NIPSCO turns on the home's utilities, which, in many cases, takes place before the resident purchases the home. The community owner shared that NIPSCO turns on utilities before the final sale so that the home is move-in ready. Depending on how long it takes to find a buyer for the home, it may be more than 90 days before the program-eligible homeowner purchases and is able to apply. If the 90-day window began at the time of sale or when the utility account is in the name of the new owner, rather than the activation of the utilities to the home, the application process could be more manageable.

Conclusions and Recommendations

CONCLUSION 1: PRIMARY AND SECONDARY RESEARCH IS NECESSARY TO DETERMINE NTG AND TO UPDATE ENERGY MODELS FOR ENERGY STAR MANUFACTURED HOMES.

The evaluation team assumed an NTG ratio of 100% for ENERGY STAR Manufactured Homes for the 2024 evaluation based on the 2023 program evaluation. Interview findings suggest there is a connection between the program and the decision-making of manufactured homeowners and community owners who work directly with the manufacturers of ENERGY STAR manufactured new homes. Additional research is necessary to understand this relationship and develop more accurate NTG values.

Manufactured home models relied on third-party literature from online research, general details from Clayton Home publications, and engineering assumptions.

Recommendations:

- Conduct ENERGY STAR manufactured new homes manufacturer interviews as part of the 2025 evaluation to better understand energy efficiency decision-making.
- Conduct manufactured home community owner interviews as part of the 2025 evaluation to better understand the relationship and decision-making responsibility between community owners, homeowners, and program participation.
- Conduct benchmarking research on other utility programs that incentivize ENERGY STAR-manufactured new homes to inform program design and NTG analysis.
- Update manufactured home baseline and design energy models with information from new homes manufacturer interviews to increase estimated savings accuracy.

CONCLUSION 2: INTERVIEWEES REPORTED POSITIVE EXPERIENCES WITH THE MANUFACTURED HOMES PROGRAM, HIGHLIGHTING VALUABLE ENERGY SAVINGS AND OPPORTUNITIES FOR INCREASING PARTICIPATION.

Both the homeowner participant and owner interviewed suggested that other homeowners and manufactured home communities would benefit from participating in the program. Interviewees suggested increasing marketing for the program to increase awareness, such as through social media and radio, as well as by direct engagement with manufactured home community owners, so that others can benefit from the energy savings. In addition, the community owner identified the program's 90-day application timeline as a barrier for increased participation because it does not always allow enough time for the owner to apply for the rebate. Instead of the 90-day window starting when NIPSCO activates the utilities, they suggested that it start at the time of sale or when the utility account is in the name of the new owner.

Recommendations:

- Consider marketing the manufactured home rebates through additional channels, such as social media and radio, as well as through direct engagement with manufactured home community owners, to increase program awareness and participation.

- Shift the 90-day application window to start at the time of sale or when the utility account is in the name of the new owner so that new homeowners have adequate time to apply.

CONCLUSION 3: THE PROGRAM NEARLY ACHIEVED ITS GAS SAVINGS GOAL, AND WHILE IT FELL SHORT OF ELECTRIC SAVINGS GOALS, PARTICIPATION WAS SUBSTANTIALLY HIGHER THAN LAST YEAR. ELECTRIC EQUIPMENT INCREMENTAL COST COMPARED TO REBATE AMOUNTS CONTRIBUTED TO LOW ELECTRIC PARTICIPATION.

The program achieved 40% of its electric energy savings goals and 26% of its peak demand, while natural gas savings achieved 96% of the planned estimates. The 2024 electric energy savings goal was based on planned 731 electric and combo customer new construction incentives and 90 manufactured home incentives. Actual participation was much lower than planned, having achieved 314 new construction incentives and 14 manufactured home electric incentives. High electric realization rates offset the lower-than-planned participation (151% kWh and 129% kW).

Gas energy savings achieved 96% of planned savings due to higher-than-planned participation (780 achieved vs. 731 planned gas projects). The low gas realization rate (82%) offset the higher-than-planned participation.

Electric participation increased significantly over the 2023 program year, which only had 38 electric new home incentives and one electric manufactured home incentive. Also, gas participation in 2024 increased year-over-year by approximately 13% (691 gas incentives in 2023).

Electric incentives comprise most of the HERS Base projects (278 out of 426) and gas incentives comprise the bulk of HERS Plus projects (357 gas-only and 11 combo measures vs. 3 electric-only measures). The equipment cost to participate in electric rebates contributed to lower electric achievement because the incremental cost of installing a program-compliant air conditioner was too high compared to the electric rebate amount, according to the program implementer. The average SEER2 for electric rebate homes was 13.8 SEER2, which is below the 2024 program requirement of 15.2 SEER2 (the federal minimum efficiency requirement for central air conditioners is 13.4 SEER2).

Recommendations:

- Consider increasing the electric rebate amount for HERS Base and HERS Plus incentives to offset the incremental equipment cost and to increase electric participation.
- Consider lowering the cooling efficiency requirements for participating in electric rebates to lower the equipment cost and to increase participation.
- Consider using more conservative numbers for planned participants in future program designs for new home and manufactured home electric measures to lower the risk of overestimating the program's planned savings.

CONCLUSION 4: A HOME'S HVAC EQUIPMENT EFFICIENCY APPEARS TO HAVE A LOW CORRELATION WITH ENERGY SAVINGS; HOWEVER, HOME SIZE APPEARS TO HAVE A SIGNIFICANT CORRELATION WITH SAVINGS, AND ENERGY RECOVERY VENTILATION (ERV) VENTILATION SYSTEMS MAY BE CORRELATED WITH PROTOTYPE SAVINGS.

The evaluation team found that electric and gas energy savings for HERS Base measures exceeded HERS Plus measures. HERS Base measures saved 368.32 therms and 1,092.59 kWh while HERS Plus measures saved

314.65 therms and 1,030.01 kWh per home on average, which could indicate that a home's HVAC system efficiency is not highly correlated with energy savings. Further, the homes with HERS Base measures tended to be smaller than homes with HERS Plus measures, indicating that home size may be correlated with the energy savings.

Additionally, prototype models with ERVs saved 24% more electric heating and cooling energy and 13% more gas heating energy per square foot than prototypes with exhaust-only ventilation, but the actual correlation to savings remains unknown.

The gas and electric savings per square foot in 2024 increased compared to the values stated in the 2023 annual report.

Recommendations:

- Consider conducting a multivariant regression analysis to better understand which home characteristics correlate well to savings. Consider including the following:
 - Ventilation system type (ERV, air cyclers, exhaust-only) to determine how it correlates to savings compared to other home characteristics.
 - Normalizing the savings in the analysis to home area in order to identify which other characteristics (if any) correlate highly to savings.
- Consider normalizing the deemed *ex ante* savings for all measures on a per-area basis and track home area for all new home and manufactured home measures in the program database to improve *ex ante* savings estimates and reduce the impact of home size variability.
- Consider comparing future *ex ante* savings estimates to the following evaluated value ranges to ensure values align with previous evaluations:
 - kWh: 0.250/sf to 0.329/sf
 - kW: 0.000100/sf to 0.000114/sf
 - Therms: 0.081/sf to 0.109/sf

CONCLUSION 5: HERS MEASURE REALIZATION RATES VARIED SIGNIFICANTLY BY MEASURE AND FUEL TYPE.

While HERS Base electric and gas measures achieved high realization rates due to changes in home characteristics, the HERS Plus measure had much lower realization rates than the respective HERS Base measure. The evaluation team found electric energy realization rates for HERS Base and HERS Plus measures exceeded 100%, but HERS Plus measures achieved a lower realization rate than Base HERS measures (194% HERS Base and 134% HERS Plus). Electric demand savings varied greatly between HERS Base measures (136%) and HERS plus measures (39%). Gas savings realization rates were much greater for HERS Base measures (151%) than HERS Plus measures (between 71% and 76%).

Planned HERS Plus savings estimates added prescriptive measure savings from the Home Rebates program for the Central A/C 15.2 SEER2 measure (202.8 kWh/0.731 kW per unit) and the Natural Gas Furnace – 95% AFUE measure (171.8 therms per unit) to the deemed HERS Base measure savings, which overestimated the incremental savings attributed to the equipment.

Recommendation:

- Consider updating the Natural Gas Furnace – 95% AFUE prescriptive savings calculation for new homes by revising parameters to reflect the average participating home values for HERS Base participants instead of TRM defaults in baseline parameters (e.g., 80% AFUE TRM default vs. 92.1% AFUE average of HERS Base participants, and 13.4 SEER2 (14.0 SEER) TRM default vs. 13.7 SEER2 (14.4 SEER) average of HERS Base participants) to reduce overestimation of the incremental savings in planned savings.

CONCLUSION 6: THE MANUFACTURED HOME MEASURES ACHIEVED LOW REALIZATION RATES DUE TO INCORRECTLY APPLIED ENERGY STAR SAVINGS.

Incorrect application of savings provided in ENERGY STAR literature to planned *ex ante* measure savings resulted in low realization rates for manufactured home measures. The referenced ENERGY STAR literature assumed electric heating in its model assumptions, and the program’s manufactured home measure names refer to gas heating for the electric rebates. The evaluation team used REM/Rate models to calculate ENERGY STAR Manufactured Home measure savings, which resulted in varying electric energy realization rates (between 19% and 75%).

Recommendation:

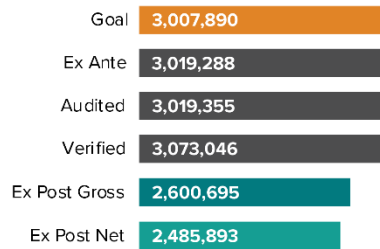
- Work with the evaluation team to develop new manufactured home models (and review what’s existing) to revise future planned savings estimates for all variations of manufactured home measures to improve planned savings estimates.

SCHOOL EDUCATION

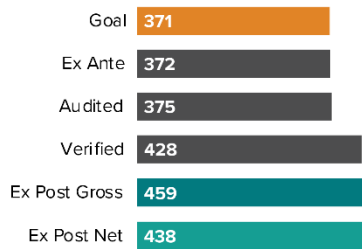


- The use of assumptions from outside of the Illinois TRM in Ex Ante savings led to discrepancies between Ex Ante and Ex Post savings for all program measures.
- Although teachers were very satisfied with the School Education program, calling it useful, beneficial, and valuable to their students, they also provided some suggestions for improvement.
- Many teachers showed a lack of awareness of the available resources and best practices for the program, some of which may have cleared up areas of confusion for students, parents, and teachers.

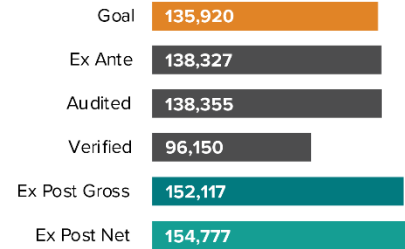
⚡ Electric Savings (kWh)



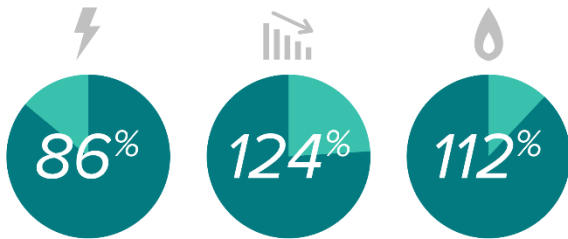
📊 Peak Demand Reduction (kW)



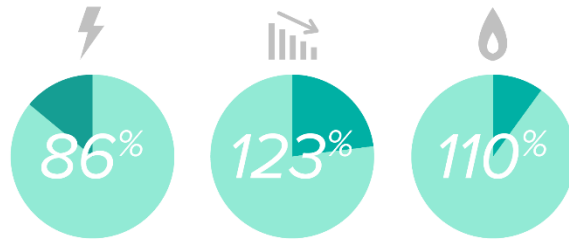
💧 Natural Gas Savings (Therms)



Ex Post Gross Achieved to Gross Goal



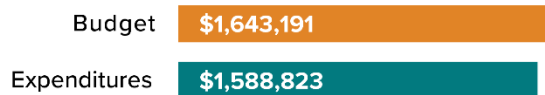
Realization Rate



Budget



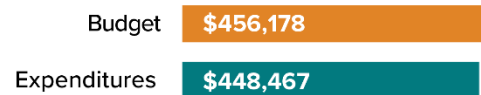
Electric and Peak Demand



Spent **97%**



Natural Gas



Spent **98%**

Program Design and Delivery

NIPSCO designed the School Education program to produce cost-effective electric and gas savings by influencing fifth-grade (Energy Efficiency Education program) and high school (Energy Efficiency Innovation program) students and their families to focus on efficiently using electricity and gas. Through a comprehensive approach, the program provides classroom instruction, posters, and activities aligned with national and state learning standards. The program also distributes energy education kits filled with energy-saving products and advice, empowering students and their families to take steps toward energy efficiency. Both fifth-grade and high school students participate in an energy education presentation at school learning about basic energy concepts through class lessons and hands-on activities. Then, students receive an energy education kit of quality, high-efficiency products and are instructed to install the energy efficient products at home with their families. By participating in classroom activities, completing Home Energy Worksheets (HEWs), and involving their families in the process, students learn about energy efficiency and share energy efficiency habits with others.

TRC served as the program implementer, overseeing the comprehensive management of the program and serving as the liaison between NIPSCO and program subcontractor. TRC contracted with the National Energy Foundation (NEF) to actualize the program's objectives. NEF's responsibility spanned a spectrum of key components to foster the program's success, including:

- Maintaining a program website
- Marketing and outreach efforts
- Creating educational collateral and kit materials
- Engaging teachers and explaining how to use the program's educational materials
- Distributing kits to students
- Reporting on the number of kits shipped
- Collecting student responses to the HEW
- Dispersing teacher mini-grants when students returned the target percentage of HEWs

NEF distributed the kits and curriculum materials to fifth-grade and high school teachers who enrolled in the program. They distributed two types of kits, tailored to NIPSCO customers:

1. Combo kits for schools in NIPSCO's natural gas and electric territory
2. Gas-only kits for schools in NIPSCO's natural gas territory, but not in NIPSCO's electric territory

The kits contained the following energy-saving measures along with the following other educational materials:

Combo Kit Measures

- Two connected LEDs
- One bathroom faucet aerator (1.0 gpm)
- One kitchen faucet aerator (1.5 gpm)
- One low-flow showerhead (1.5 gpm)
- One LED night-light (0.5 watt)
- One advanced power strip (Tier 1)
- Eight light switch gaskets
- Eighteen power outlet gaskets
- One plumbers' tape

Gas-Only Kit Measures

- Two bathroom faucet aerators (1.0 gpm)
- One kitchen faucet aerator (1.5 gpm)
- Two low-flow showerheads (1.5 gpm)
- Eight light switch gaskets
- Eighteen power outlet gaskets
- One plumbers' tape

The kit information card includes a QR code to connect participants with energy-related resources available on the thinkenergy.org website, providing families with a convenient array of materials designed to enhance program engagement. The website's resources include the HEW, parent letter, program presentations, introductory video, kit installation guides and videos, and engaging games designed to reinforce key concepts.

Program participation is primarily driven by targeted outreach efforts with a focus on schools that have previously engaged in the program. Leveraging established relationships and past successes, the implementation team prioritizes direct engagement with these schools to encourage ongoing participation and enthusiasm. Additionally, community outreach initiatives, direct mail campaigns, and social media platforms serve as effective channels for promoting the program to a wider audience.

Changes from the 2023 Design

In 2024, NEF added a high school program called the Energy Efficiency Innovation program to expand the NIPSCO offering to high school students and teachers in addition to fifth-grade students and teachers. The fifth-grade Energy Efficiency Education program remained the same.

Program Performance

In 2024, the program distributed 14,707 kits, comprising 14,304 combo kits and 403 gas-only kits. While *ex ante* savings for the program exceeded all savings goals, the program's *ex post* gross savings fell short of goal for electric energy savings but exceeded goals for demand and natural gas savings, as shown in Table 148, below.

The discrepancies in savings are mainly attributable to the difference between the *ex ante* and *ex post* savings calculation assumptions for in-service rates (ISRs) and fuel type saturations. For nightlights, the *ex post* ISR factored in an incandescent replacement factor so that the program only achieved savings when it replaced an existing inefficient nightlight. *Ex ante* calculations did not include water or space heating or cooling saturation factors, but *ex post* calculations incorporated these saturations to account for the distribution of fuel types and the presence of central air conditioning (A/C).

Both *ex ante* and *ex post* savings were calculated using the Illinois TRM v12.0; however, for water measures, *ex ante* used the actual flow rate of the efficient fixture rather than the TRM-prescribed in-situ value used to

calculate *ex post* savings. Evaluated savings also uses input from the HEW, such as people per household, where *ex ante* uses the TRM default.

Table 148. 2024 School Education Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr)	3,007,890.00	3,019,288.32	3,019,354.64	3,073,045.64	2,600,694.91	2,485,892.99	86%
Peak Demand Reduction (kW)	370.500	371.904	375.383	428.203	458.528	437.624	124%
Natural Gas Energy Savings (therms/yr)	135,920.00	138,326.60	138,355.12	96,150.13	152,117.21	154,776.68	112%

Differences between the *ex ante* and *ex post* gross assumptions for the light switch and power outlet gaskets also affected realization rates, as shown in Table 149. The *ex ante* methodology was updated to use the Illinois TRM v12.0 for outlet gaskets but not for switch gaskets. Further, *ex ante* calculations only claimed electric cooling savings(no heating season savings), and claimed zero demand savings. The evaluation team applied NTG values from the 2023 survey results for the 2024 program year.

Table 149 outlines the *ex post* gross and NTG adjustment factors.

Table 149. 2024 School Education Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILLOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr)	86%	18%	14%	96%
Peak Demand Reduction (kW)	123%	19%	14%	95%
Natural Gas Energy Savings (therms/yr)	110%	12%	14%	102%

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

The School Education program came in slightly under budget in 2024. As shown in Table 150, the program spent 97% of the allocated electric budget and 98% of the natural gas budget.

Table 150. 2024 School Education Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$1,643,190.90	\$1,588,822.11	97%
Natural Gas	\$456,177.83	\$448,467.30	98%

Evaluation Methodology

To inform the 2024 NIPSCO School Education program impact and process evaluations, the evaluation team completed the following research activities:

- **Program staff discussions** to understand the program process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of program participation data.
- **Engineering analysis** to review the program’s savings assumptions and algorithms for reasonableness and accuracy.
- **Teacher interviews (n=8)** to understand both fifth-grade and high school teachers’ experiences in the program and to gather information to improve the program.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions did the program use to develop deemed savings estimates? Are there any updates the program should make?
- What are *ex post* program savings? Do these suggest any needed updates to the program’s design, delivery, or savings assumptions?

For all measure types, the evaluation team compared its engineering calculations to NIPSCO’s *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: standard engineering practices, the Illinois TRM v12.0, and NIPSCO’s program tracking database.³⁹

Audited and Verified Savings

To audit the program’s savings, the evaluation team performed the following reviews to verify alignment with the program’s scorecard:

1. **Audited Kits Quantity.** Reviewed program tracking data provided by the implementer and audited the number of kits distributed, checking for duplicates and eligibility.
2. **Confirmed Measure-Level Savings Calculations.** Reviewed per-measure and per-kit savings in the documentation provided by NIPSCO.
3. **Reviewed Savings Estimate.** Confirmed the program-level total savings.

¹ Illinois Energy Efficiency Stakeholder Advisory Group. 2023 *Illinois Statewide Technical Reference Manual for Energy Efficiency Version 11.0. Volume 3: Residential Measures*. September 22, 2022.

NIPSCO reported a total of 14,304 combo kits and 403 gas-only kits distributed through the School Education program, with these figures and the scorecard values confirmed in the program tracking data audit. The evaluation team made no adjustments to the quantities.

To confirm savings, the evaluation team reviewed savings documentation, which included both measure- and kit-level savings.

Upon review of the documentation, the evaluation team found that the measure-level savings values in the tracking data were consistent with NIPSCO’s kit savings documentation. However, program tracking data savings were reported at the kit level with rounded total kit values, and NIPSCO’s measure calculation file savings were reported at the measure level with unrounded per-measure values. This difference in the unit of analysis led to rounding errors, resulting in a slight deviation between the total of measure savings and the tracking data savings. The remainder of this report will note these rounding errors where applicable.

ISRs

The evaluation team used the ISRs calculated in 2023 by leveraging self-reported data from HEWs completed in 2023 and ISR values calculated from the 2023 parent survey to calculate the 2024 verified savings values. Table 151 lists the ISRs for all program-installed measures. For full detail on the methodology used to calculate these ISRS, see the *2023 DSM Portfolio Evaluation* report.

Table 151. 2024 School Education Program ISRs by Measure

MEASURE	ISR
Connected LEDs	88%
Bathroom Aerator	38%
Kitchen Aerator	40%
Low-flow Showerhead	31%
Nightlight	84%
Advanced Power Strip	86%
Light Switch Gaskets	22%
Power Outlet Gaskets	14%

Water Heater Saturation

The evaluation team adjusted the *ex ante* electric and natural gas saturation rates for water-saving measures by analyzing data from the 2023 HEW results from the School Education program, which provided a large sample of customers who reported their water heater fuel. The results, shown in Table 152, indicate a slight discrepancy between *ex ante* and verified electric and natural gas domestic water heating saturation rates.

Table 152. 2024 School Education Program Water Heater Fuel Saturation

WATER HEATING FUEL	REPORTED <i>EX ANTE</i>	VERIFIED COMBO/ELECTRIC KITS ^a	VERIFIED GAS-ONLY KITS ^b
Electric	100%	23%	20%
Natural Gas	100%	64%	70%

^a Note: 13% responded, “Other – propane gas, LP gas.”

^b Note: 10% responded, “Other – propane gas, LP gas.”

Verified Savings Summary

To calculate the verified savings, the evaluation team replaced the *ex ante* ISR and water heater saturation values with verified information obtained from the 2023 parent survey and HEW. This updated data provides a more accurate representation of the actual ISRs and water heater fuel saturation levels among the current program year participants. Table 153 summarizes *ex ante* and verified savings per unit.

Table 153. 2024 School Education Program *Ex Ante* and Verified Per-Unit Savings

MEASURE	<i>EX ANTE</i> ISR	<i>EX ANTE</i> SAVINGS ^a			VERIFIED ISR	VERIFIED SAVINGS		
		KWH	KW	THERMS		KWH	KW	THERMS
Connected LEDs - Combo Kit	84%	2.70	0.0004	0.00	88%	2.83	0.000	0.00
Advanced Power Strip - Combo Kit	81%	83.43	0.0094	0.00	38%	88.58	0.010	0.00
Nightlight - Combo Kit	84%	26.13	0.0000	0.00	84%	26.13	0.000	0.00
Low-Flow Showerhead - Combo Kit	30%	67.71	0.0066	2.90	31%	69.97	0.007	3.00
Low-Flow Showerhead – Gas-Only Kit	30%	0.00	0.0000	2.90	31%	0.00	0.000	3.00
Kitchen Aerator - Combo Kit	35%	12.73	0.0025	0.55	40%	14.55	0.003	0.62
Kitchen Aerator – Gas-Only Kit	35%	0.00	0.0000	0.55	40%	0.00	0.000	0.62
Bathroom Aerator - Combo Kit	28%	5.03	0.0070	0.22	38%	6.83	0.009	0.29
Bathroom Aerator – Gas-Only Kit	28%	0.00	0.0000	0.22	38%	0.00	0.000	0.29
Light Switch Gaskets - Combo Kit	25%	0.10	0.0000	0.23	22%	0.09	0.000	0.20
Light Switch Gaskets – Gas-Only Kit	25%	0.00	0.0000	0.23	22%	0.00	0.000	0.20
Power Outlet Gaskets - Combo Kit	57%	0.55	0.0000	0.21	14%	0.13	0.000	0.05
Power Outlet Gaskets – Gas-Only Kit	57%	0.00	0.0000	0.21	14%	0.00	0.000	0.05

Ex Post Gross Savings

The evaluation team reviewed the program’s *ex ante* assumptions, sources, and algorithms for reasonableness and updates. Below are detailed *ex post* gross analysis results.

Engineering Reviews

The evaluation team referred to the Illinois TRM v12.0 to calculate *ex post* gross electric energy savings, demand reduction, and natural gas savings. *Appendix 9. School Education Program*

contains details on the specific algorithms, variable assumptions, and references for all program measure *ex post* gross calculations.

Through the engineering review, the evaluation team found differences between *ex ante* and *ex post* gross savings. The following overarching factors primarily drove the differences:

- The evaluation team used Illinois TRM v12.0 assumptions for the flow rate of efficient water fixtures to calculate *ex post* savings while *ex ante* savings were calculated using the actual, rated flow rate.
- The evaluation team used updated ISRs, water heater fuel saturation, space heating fuel saturation, and other algorithm inputs based on the 2023 HEW and the 2023 NIPSCO School Education program parent survey, which adjusted savings across measures. *Ex ante* savings were calculated using IL TRM v12.0 default assumptions and omits fuel saturations.

The following sections summarize the team's findings based on the engineering review.

Ex Post Gross Savings Summary

Ex post savings reflect the engineering adjustments made to the verified measure savings. The evaluation team calculated *ex post* electric energy, peak demand, and natural gas energy savings for each kit measure using algorithms from the Illinois TRM v12.0. The evaluation team estimated people per household and water and space heating fuel type saturation from the 2023 HEW and updated ISRs using the results of the 2023 parent survey then used this information to inform *ex post* gross savings calculations.

Table 154 below, shows the *ex ante* deemed savings and *ex post* gross per-measure savings for the 2023 School Education program measures. *Ex post* savings calculations differed from the *ex ante* analysis for the following overarching reasons:

- **Connected LED:** Updated ISR and standby power draw. Both the 2023 *ex ante* and *ex post* analyses use the Illinois TRM v12.0; however, the program calculated *ex ante* savings with the TRM default standby power assumption instead of the actual rating of the lamp contained in the kit.
- **Advanced Power Strip:** *Ex post* ISR of 86% from the 2023 parent survey is slightly higher than the *ex ante* assumption of 81%.
- **LED Nightlight:** Updated ISR from the 2023 parent survey to include the incandescent replacement factor from the 2023 HEW (8%). This factor was not included in *ex ante*.
- **Low-Flow Faucet Aerators and Showerheads:** Updated water heating fuel saturation percentages and household demographics based on 2023 HEW results, and updated ISRs based on the 2023 parent survey. Updated baseline and efficient flow rate assumptions to match the Illinois TRM v12.0. As reported in *Appendix 9. School Education Program*
- , the average number of people per home reported in the 2023 HEW was significantly higher compared to *ex ante* which was taken from the Illinois TRM v12.0. *Ex ante* savings omits water heating fuel saturation percentages.

- **Outlet and Switch Gaskets:** Updated to Illinois TRM v12.0 and incorporated space heating fuel type saturations and assigned demand savings based on the presence of central air conditioning from the 2023 HEW results. Updated ISRs based on the 2023 parent survey. The program did not update *ex ante* savings for light switch gaskets to use the Illinois TRM v12.0. It did update outlet gaskets to the new methodology; however, the program only claimed cooling season savings. The program claimed no *ex ante* demand savings.

Table 154. 2024 School Education Program *Ex Ante* and *Ex Post* Gross Per-Measure Savings Values

MEASURE	QTY PER KIT	EX ANTE DEEMED SAVINGS ^a			EX POST GROSS PER-MEASURE SAVINGS		
		KWH	KW**	THERMS	KWH	KW**	THERMS
Connected LEDs - Combo Kit	2	2.70	0.0004	0.00	2.30	0.0004	0.00
Advanced Power Strip - Combo Kit	1	83.43	0.0094	0.00	88.58	0.0099	0.00
Nightlight - Combo Kit	1	26.13	0.0000	0.00	2.08	0.0000	0.00
Low Flow Showerhead - Combo Kit	1	67.71	0.0066	2.90	32.35	0.0055	3.86
Low Flow Showerhead – Gas-Only Kit	2	0.00	0.0000	2.90	0.00	0.0000	4.22
Kitchen Aerator - Combo Kit	1	12.73	0.0025	0.55	40.16	0.0039	4.79
Kitchen Aerator – Gas-Only Kit	1	0.00	0.0000	0.55	0.00	0.0000	5.24
Bathroom Aerator - Combo Kit	1	5.03	0.0070	0.22	4.39	0.0033	0.52
Bathroom Aerator – Gas-Only Kit	2	0.00	0.0000	0.22	0.00	0.0000	0.57
Light Switch Gaskets - Combo Kit	8	0.10	0.0000	0.23	0.50	0.0004	0.05
Light Switch Gaskets – Gas-Only Kit	8	0.00	0.0000	0.23	0.00	0.0000	0.06
Power Outlet Gaskets - Combo Kit	18	0.55	0.0000	0.21	0.32	0.0003	0.03
Power Outlet Gaskets – Gas-Only Kit	18	0.00	0.0000	0.21	0.00	0.0000	0.04

^a *Ex ante* values in this table are audited savings. *Ex ante* savings in the tracking data are per-kit values, not measure specific.

** Due to low demand reduction for some measures, four decimals are displayed for per-measure savings.

Table 155 highlights notable differences between *ex ante* and *ex post* gross estimates.

Table 155. 2024 School Education Program Notable Differences Between *Ex Ante* and *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Connected LED	<i>Ex ante</i> savings use IL TRM v12.0 assumptions, including standby power consumption. ISR = 84%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, but uses actual standby power from the manufacturer spec sheet and 2023 parent survey to determine the ISR. ISR = 88%	<i>Ex post</i> uses actual standby power consumption. Updated ISR.
Bathroom Aerator	<i>Ex ante</i> savings use IL TRM v12.0 assumptions excluding flow rate of the efficient fixture. ISR = 28%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, 2023 HEW for fuel saturation percentages and demographics; and 2023 parent survey for ISR. ISR = 38%	<i>Ex post</i> uses TRM value for flow rate of efficient fixture. Updated ISR and HEW info.
Kitchen Aerator	<i>Ex ante</i> savings use IL TRM v12.0 assumptions excluding flow rate of the efficient fixture. ISR = 35%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, 2023 HEW for fuel saturation percentages and demographics and 2023 parent survey for ISR. ISR = 40%	<i>Ex post</i> uses TRM value for flow rate of efficient fixture. Updated ISR and HEW info.
Low-Flow Showerhead	<i>Ex ante</i> savings use IL TRM v12.0. ISR = 30%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, 2023 HEW for fuel saturation percentages and demographics, and 2023 parent survey for ISR. ISR = 31%	Updated ISR and HEW info.
LED Nightlights	<i>Ex ante</i> savings use IL TRM v12.0. ISR = 84%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, 2023 HEW for incandescent replacement factor, and 2023 parent survey for ISR. ISR = 84%	<i>Ex post</i> includes an incandescent replacement factor of 8% from HEW data.
Advanced Power Strips	<i>Ex ante</i> savings use IL TRM v12.0 assumptions. ISR = 81%	<i>Ex post</i> savings use IL TRM v12.0 assumptions and 2023 parent survey for ISR. ISR = 86%	<i>Ex post</i> ISR is higher than <i>ex ante</i> .
Light Switch Gaskets	<i>Ex ante</i> savings uses online calculator at EnergyEarth.com. ISR = 25%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, 2023 HEW for fuel saturation percentages, and 2023 parent survey for ISR. ISR = 22%	Methodology differences. <i>Ex ante</i> does not include an adjustment for space heating fuel type or saturation assign demand savings based on the presence of central air conditioning. Updated ISR.
Power Outlet Gaskets	<i>Ex ante</i> savings use IL TRM v12.0 assumptions excluding heating season savings. ISR = 57%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, 2023 HEW for fuel saturation percentages, and 2023 parent survey for ISR. ISR = 14%	<i>Ex ante</i> does not include heating season savings. Updated ISR.

Therm Penalties

The evaluation team excluded therm penalties from the evaluated savings, consistent with previous evaluations. However, it is important to note that cost-effectiveness results for gas and electric programs will still incorporate these penalties.

The evaluation team believes this approach is appropriate as it accounts for the penalty on the electric side (where it is generated) and allows the evaluation team to show the gas program performance and measure performance more clearly. The total therm penalty, as shown in Table 156, was -2,113.19 therms. *Ex ante* program data did not include a therm penalty.

Table 156. 2024 School Education Program Waste Heat Factor Therm Penalty

MEASURE	WASTE HEAT FACTOR THERM PENALTY
Connected LEDs - Combo Kit	-1,442.48
Nightlight - Combo Kit	-670.71
Total Therm Penalty	-2,113.19

Realization Rates

The next three tables (Table 157 through Table 159) show the program's *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms. Across all measures, the sources referenced to calculate savings and updated ISRs primarily drove the differences between *ex ante* and *ex post* savings..

Table 157. 2024 School Education Program *Ex Ante* to *Ex Post* Gross Electric Energy Savings

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Connected LEDs - Combo Kit		77,233.59	80,911.38	65,872.81
Advanced Power Strip - Combo Kit		1,193,382.72	1,267,048.32	1,267,048.32
Nightlight - Combo Kit		373,758.92	373,758.92	29,766.83
Low Flow Showerhead - Combo Kit		968,538.94	1,000,823.57	462,671.99
Low Flow Showerhead - Gas-Only Kit		0.00	0.00	0.00
Kitchen Aerator - Combo Kit		182,151.51	208,173.15	574,430.71
Kitchen Aerator - Gas-Only Kit		0.00	0.00	0.00
Bathroom Aerator - Combo Kit		71,957.09	97,656.05	62,764.91

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Bathroom Aerator – Gas-Only Kit		0.00	0.00	0.00
Light Switch Gaskets - Combo Kit		11,443.20	10,070.02	56,804.96
Light Switch Gaskets – Gas-Only Kit		0.00	0.00	0.00
Power Outlet Gaskets - Combo Kit		140,888.68	34,604.24	81,334.37
Power Outlet Gaskets – Gas-Only Kit		0.00	0.00	0.00
Total Savings	3,019,288.32	3,019,354.64	3,073,045.64	2,600,694.91
Total Program Realization Rate				86%

Note: Totals may not sum properly due to rounding.

^a Ex ante savings in the tracking data do not report savings at the individual measure level, therefore only the summary of savings is included.

Table 158. 2024 School Education Program *Ex Ante* to *Ex Post* Gross Peak Demand Reduction

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Connected LEDs - Combo Kit		11.370	11.911	11.911
Advanced Power Strip - Combo Kit		133.919	142.185	142.185
Nightlight - Combo Kit		0.000	0.000	0.000
Low Flow Showerhead - Combo Kit		94.129	97.266	78.819
Low Flow Showerhead – Gas- Only Kit		0.000	0.000	0.000
Kitchen Aerator - Combo Kit		35.861	40.984	55.222
Kitchen Aerator – Gas-Only Kit		0.000	0.000	0.000
Bathroom Aerator - Combo Kit		100.105	135.857	47.790
Bathroom Aerator – Gas-Only Kit		0.000	0.000	0.000
Light Switch Gaskets - Combo Kit		0.000	0.000	50.415
Light Switch Gaskets – Gas- Only Kit		0.000	0.000	0.000

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Power Outlet Gaskets - Combo Kit		0.000	0.000	72.186
Power Outlet Gaskets – Gas- Only Kit		0.000	0.000	0.000
Total Savings	371.904	375.383	428.203	458.528
Total Program Realization Rate				123%

Note: Totals may not sum properly due to rounding.

^a *Ex ante* savings in the tracking data do not report savings at the individual measure level, therefore only the summary of savings is included.

Table 159. 2024 School Education Program *Ex Ante* to *Ex Post* Gross Natural Gas Savings

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Connected LEDs - Combo Kit		0.00	0.00	0.00
Advanced Power Strip - Combo Kit		0.00	0.00	0.00
Nightlight - Combo Kit		0.00	0.00	0.00
Low Flow Showerhead - Combo Kit		41,520.02	42,904.02	55,190.69
Low Flow Showerhead – Gas- Only Kit		2,339.57	2,417.55	3,401.43
Kitchen Aerator - Combo Kit		7,808.60	8,924.12	68,522.04
Kitchen Aerator – Gas-Only Kit		219.85	251.26	2,111.52
Bathroom Aerator - Combo Kit		3,084.71	4,186.39	7,487.03
Bathroom Aerator – Gas-Only Kit		173.70	235.73	461.43
Light Switch Gaskets - Combo Kit		25,747.20	22,657.54	5,963.46
Light Switch Gaskets – Gas-Only Kit		725.40	638.35	181.35
Power Outlet Gaskets - Combo Kit		55,181.40	13,553.33	8,538.60
Power Outlet Gaskets – Gas-Only Kit		1,554.68	381.85	259.66
Total Savings	138,326.60	138,355.12	96,150.13	152,117.21
Total Program Realization Rate				110%

Note: Totals may not sum properly due to rounding.

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)

^a *Ex ante* savings in the tracking data do not report savings at the individual measure level, therefore only the summary of savings is included.

Table 160 summarizes savings at the kit level by fuel type.

Table 160. 2024 School Education Program *Ex Ante* to *Ex Post* Gross Kit Savings

MEASURE	EX ANTE ^a	AUDITED GROSS	VERIFIED GROSS	EX POST GROSS	REALIZATION RATE
Electric Energy Savings (kWh/yr.)					
Combo Kit	3,019,288.32	3,019,354.64	3,073,045.64	2,600,694.91	86%
Gas-Only Kit	0.00	0.00	0.00	0.00	N/A
Peak Demand Reduction (kW/yr.)					
Combo Kit	371.904	375.383	428.203	458.528	123%
Gas-Only Kit	0.000	0.000	0.000	0.000	N/A
Natural Gas Energy Savings (therms/yr.)					
Combo Kit	133,313.28	133,341.93	92,225.39	145,701.82	109%
Gas-Only Kit	5,013.32	5,013.19	3,924.74	6,415.39	128%

^a *Ex ante* savings are based on a rounded savings value that is applied to each kit. The audited values are calculated at the full savings value, per-measure, and per-kit.

Ex Post Net Savings

Since we did not conduct a parent survey in 2024, the evaluation team used freeridership and participant spillover values, calculated from the 2023 survey, to calculate 2024 *ex post* net savings. For additional details, see the *2023 DSM Portfolio Evaluation Report*.

Table 161 shows the NTG ratios by measure.

Table 161. 2024 School Education Program NTG Ratios by Measure

MEASURE	FREERIDERSHIP	SPILLOVER	NTG
Connected LEDs	23%	14%	91%
Bathroom Aerator	9%	14%	105%
Kitchen Aerator	12%	14%	102%
Low-Flow Showerhead	10%	14%	104%
Nightlight	19%	14%	95%
Advanced Power Strip	24%	14%	90%
Light Switch Gaskets	24%	14%	90%

MEASURE	FREERIDERSHIP	SPILLOVER	NTG
Power Outlet Gaskets	24%	14%	90%

Table 162 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 162. 2024 School Education Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Connected LEDs - Combo Kit	65,872.81	11.911	0.00	91%	59,944.26	10.839	0.00
Advanced Power Strip - Combo Kit	1,267,048.32	142.195	0.00	90%	1,140,343.49	127.967	0.00
Nightlight - Combo Kit	29,766.83	0.000	0.00	95%	28,278.49	0.000	0.00
Low Flow Showerhead - Combo Kit	462,671.99	78.819	55,190.69	104%	481,178.87	81.971	57,398.32
Low Flow Showerhead – Gas-Only Kit	0.00	0.000	3,401.43	104%	0.00	0.000	3,537.49
Kitchen Aerator - Combo Kit	574,430.71	55.222	68,522.04	102%	585,919.33	56.327	69,892.48
Kitchen Aerator – Gas-Only Kit	0.00	0.000	2,111.52	102%	0.00	0.000	2,153.75
Bathroom Aerator - Combo Kit	62,764.91	47.790	7,487.03	105%	65,903.15	50.179	7,861.38
Bathroom Aerator – Gas-Only Kit	0.00	0.000	461.43	105%	0.00	0.000	484.50
Light Switch Gaskets - Combo Kit	56,804.96	50.415	5,963.46	90%	51,124.46	45.374	5,367.12
Light Switch Gaskets – Gas-Only Kit	0.00	0.000	181.35	90%	0.00	0.000	163.21
Power Outlet Gaskets - Combo Kit	81,334.37	72.186	8,538.60	90%	73,200.94	64.967	7,684.74
Power Outlet Gaskets – Gas-Only Kit	0.00	0.000	259.66	90%	0.00	0.000	233.69
Total Savings	2,600,694.91	458.528	152,117.21		2,485,892.99	437.624	154,776.68

Table 163 shows the NTG results for each fuel type.

Table 163. 2024 School Education Program NTG Results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	3,019,288.32	2,600,694.91	96%	2,485,892.99
Peak Demand Reduction (kW/yr.)	371.904	458.528	95%	437.624
Natural Gas Energy Savings (therms/yr.)	138,326.60	152,117.21	102%	154,776.68

Process Evaluation

The evaluation team reviewed materials and completed interviews with teachers who participated in the NIPSCO School Energy Efficiency Education (fifth-grade) and Energy Efficiency Innovation (high school) program to answer the following research questions:

- How has the program changed since 2023?
- What are the experiences of teachers (fifth grade and high school) who participated in the NIPSCO School Education program?
- How useful did teachers find the program in teaching students about energy-related topics? What challenges do they experience in getting students to engage with the program at school? And at home?
- Are families completing the HEW? What are the challenges with getting families to complete the worksheet?
- To what extent did teachers use resources provided by NIPSCO? Do teachers experience any difficulties in using those resources?
- What are the benefits of participating in the program? Did teachers find the program valuable for their students?
- What types of feedback on the program did teachers receive from students and/or parents?
- What is teachers' satisfaction with the program and NIPSCO overall?
- Are teachers participating in the program each year? Why or why not?

The evaluation team conducted teacher interviews with both fifth-grade and high school teachers who participated in the 2024 NIPSCO School Education Program. In total, 289 fifth-grade teachers and 28 high school teachers participated in the program in 2024.

With the goal of completing interviews with six fifth-grade teachers and six high school teachers, we worked with the NEF program coordinator who sent multiple waves of outreach emails to participating teachers to recruit teachers for interviews. We were able to recruit six high school teachers for an interview; however, fifth-grade teacher recruitment was more challenging. Ultimately, we interviewed a total of two fifth-grade teachers and six high school teachers in January and February of 2025.

Teacher Participant Feedback

The following sections describe interview findings related to teachers' awareness of and decision to participate in program, reasons for participation, feedback about program curriculum and teacher materials,

energy efficiency kits, high school teachers' program experience, participation in other NIPSCO programs and energy efficiency behaviors, and satisfaction with the program.

Teacher and School Characteristics

The high school teachers we interviewed ranged from having one to 25 years of teaching experience and taught mostly freshmen and sophomore students science courses—primarily biology, earth science, and environmental science subjects. In addition, some high school teachers taught honors-level or upper-level science courses.

The interviewed fifth-grade teachers ranged from having four and 18 years of experience and each only had one class of students along with one fifth-grade teacher co-teaching with another teacher on different subjects to the same group of students.

More detailed teacher and school characteristics are included in *Teacher and School Characteristics*.

Program Awareness

High School Program

High school teachers heard about the program through a variety of ways including an email from the NEF program coordinator (n=3), another fellow teacher (n=2), or both a NEF email and another teacher (n=1). Two high school teachers were also aware of the program from their students, and another two heard about it from other teachers' children participating in the fifth-grade program. The high school program piqued their interest as teachers thought the program was relevant and fit well to the topics they were teaching in their courses. In 2024, the high school program was brand new, so high school teachers could not reflect on their experience with the program prior to this year.

Fifth-Grade Program

Both of the fifth-grade teachers interviewed mentioned that the School Education program was already established at their schools for many years. Each fifth-grade teacher could opt-in to do the program every year by responding to an email received from the NEF program coordinator asking if they would like to participate again; if the teacher said yes, the program would ask about the number of kits needed for their class. One fifth-grade teacher who has participated for the past eight years mentioned the School Education program gets better each year. The fifth-grade teacher said:

"I've seen the resources change just a little bit, and things are updated obviously from year to year. Some of the products have changed a little bit for the better. Every time changes are made, I think, 'That was a good switch,' or, 'I like that.'"

One fifth-grade teacher, who has participated in the program for the past four years recalled that they participated in the program themselves as a fifth-grade student. They were very excited to find the School Education program still in place so they could provide the program to their own students. The fifth-grade teacher said:

"I remember doing [the NIPSCO program] when I was in the fifth grade, and that's a long time ago, back in 2008/2009. So, [the program] has been around for a long time. I remember looking forward to it when I was little, seeing all the older kids getting all these little bags and all this stuff. I remember getting all excited when it was my turn in fifth grade. So, [the program] has been around for a long time. It's cool to see that something that I did when I was in elementary school is still being done."

Decision to Participate

High School Program

High school teachers typically decided to participate individually or with the team of teachers teaching the same course, and only one teacher noted needing to inform school administration that they were participating. One high school teacher mentioned all course teachers signed up to participate at their school, but other teachers said only a few high school teachers signed up. Most teachers said the decision was left to each individual teacher or course teachers' group. One teacher said they had to get permission from their principal to participate in the NIPSCO program.

Almost all high school teachers decided to use the NIPSCO program for all of their classes, and one teacher decided to pilot the program this year with only his environmental science students.

One teacher mentioned the support they got from administrators about the program and said:

"I think all three [high school biology and environmental science teachers] got the email, and we just talked about [participating]. Our administrators are great [about] letting us try to be creative in our classroom. They didn't question us at all."

Fifth-Grade Program

The two interviewed fifth-grade teachers were also able to decide for themselves whether to participate and noted that all or most other fifth-grade teachers at their school also participated. One teacher mentioned all teachers opted to participate, and the other teacher said all but two or three out of 16 fifth-grade teachers participated in the program. As the program has already been in place for multiple years, the interviewed teachers did not need school administration approval.

Participation Process

Overall, teachers understood the steps to take to participate in the program and found it easy to participate; however, a couple of teachers described challenges with the kit delivery. Two teachers mentioned that the pallets of kits delivered to their school did not have any contact information, so the school loading dock staff had no idea who they were for. The teachers were eventually able to track down their kits and claim them for their classroom; however, they suggested that in the future, including the teacher's name on the pallet and providing a shipment notification to the teacher could help alleviate this challenge.

Program Curriculum and Materials

In this section, we describe teacher experiences with the program curriculum, including teacher guide activities and energy efficiency kits.

Program Curriculum

High School Program

High school teachers mentioned incorporating the energy efficiency curriculum into a variety of topics including the environment, ecology, water use, the water cycle, energy conservation, heat transfer, nutrient and carbon cycle, global warming, greenhouse gases, recycling, carbon dioxide, cells and water properties, and wind. One high school teacher highlighted how well the program integrated with their lessons, saying:

"I thought it was an interesting program I could apply to my environmental science class since we focus in one of our main units, [on] energy sources, renewable, non-renewable, and ways of conservation [topics]. I thought the [Energy Efficiency Innovation Education program] tied in very well."

High school teachers did not make any significant changes to the curriculum to fit their needs, and most (four out of six) used some of the Teacher Guide activities. Teachers mentioned they (a) moved the program content into their learning management system to be more student friendly and accessible and (b) used the energy efficiency curriculum as an integrated content into their regular curriculum.

Teachers had varying approaches to homework for the program. Some teachers assigned taking the kit home, completing the survey, and completing HEWs as homework, and others treated everything as voluntary with no assignments. Some teachers also did other activities related to the Energy Efficiency Education program such as watching the introductory video in class with students being featured, which introduced students to the NIPSCO program and what energy and energy efficiency is; taking photos of using or installing kit items at home; or taking the kit home and explaining to parents what it was.

One teacher, who was also a parent of a high school student, discussed the homework they assigned and how effective it was to get parents and students to work together. They stated:

"I told them that I needed to see [they took the kits home]. Because they're high school kids, they love taking selfies or pictures. I [made a homework assignment], I need you to take a picture of this kit getting to your house... A lot of my kids took it home and took a picture [with the kit] in front of their house with their mom or dad. I thought that was cool because I am a parent myself of high school kids, and they don't always tell you anything about what they're doing in school. It was a way for [students] to show their parents [the kit]... and they worked on setting [the kit] up in their house together."

Teachers mentioned the following components as being most engaging to students: specific kit items (i.e., smart LED and advanced power strip), introductory video featuring the student, the "How much energy used in a year" activity, the "What do you use energy on" activity, and other videos.

One high school teacher mentioned how excited their students were when they opened their kits. They said:

"I can tell you the excitement that those [high school] kids had when they got those light bulbs out, and the fact that they knew they could change colors. And all this other stuff [in the kit], they were beyond themselves. They were really excited about it."

The evaluation team also asked teachers if there was any content that was confusing to students. High school teachers remarked that some kit items (i.e., aerators and showerheads) sounded intimidating to students to install, some students did not want to take kits home, some students thought the program was tracking them and their families in some way, and some students were unclear on what each item in the kit was.

One high school teacher mentioned students' concerns regarding what the program was about:

"A couple of students didn't want to take [the kits] because they were afraid it was like a tracking thing. I didn't make them do anything they didn't want to do. I felt bad for them because this is really cool stuff, and they're like, 'No'... I think it had more to do [their family's legal status]... Even though I knew [this program] didn't have anything to do with [legal status and tracking], [the students] didn't understand that."

Fifth-Grade Program

The two interviewed fifth-grade teachers used the program curriculum in different ways. One teacher integrated the energy efficiency curriculum into their daily schedule with topics on earth studies, the environment, water and energy conservation, the elements (e.g., water and energy), fossil fuels (e.g., natural gas and coal), and the use of natural resources. The other fifth-grade teacher mentioned they used the curriculum as a standalone lesson since science is taught at the end of the year, and the fifth-grade teachers at his school needed to focus on subjects fifth-grade students are tested on in standardized tests (i.e., social studies, reading, math).

The two fifth-grade teachers also approached the Teacher Guide activities and homework differently. One teacher did a few of the activities, and one teacher did not do any activities as they did not have time. One of the teachers had her students take the kit home and complete the survey and HEW as homework, and the other fifth-grade teacher made everything voluntary with no assignments.

When asked about student engagement with the program, the fifth-grade teachers mentioned that the scented highlighter for completing the HEW and specific kit items (i.e., smart LED and power strip) were components of the program that fifth-grade students were most engaged with.

Fifth-grade teachers were also asked if there was any confusing content for students. One teacher mentioned that their students thought the HEW questions were too difficult to answer as they were unclear about the vocabulary or did not know specific information about their home. As that teacher remarked:

"I think the [HEW] is more geared toward adults. I feel the [HEW] is not super user-friendly to kids. Some of the vocabulary is a little over their heads. Some of the options, some of the kids get confused by: 'Do you never do this,' or 'Do you sometimes or often,' or they get confused [about the HEW] and what [it's] asking them to do[.] Some of the questions are things the kids wouldn't know. They don't really know what they have at home and the kind of utilities and appliances they have. I feel like I like this [HEW] could be improved to be a little more, a little more kid friendly."

The Energy Efficiency Education program’s teacher materials (i.e., welcome flyer and rewarding results flier) for the fifth-grade program states students will be rewarded with a scented highlighter when they complete their HEW online or on paper. No mention of parents filling out the HEW for their fifth-grade student is found on the paper HEW form or the webpage to submit digital HEWs.

Energy Efficiency Kits

This section discusses how teachers used the kits and supporting materials.

Classroom Activities: High school and fifth-grade teachers used a variety of different activities to introduce the kits, though one high school teacher noted that they did not discuss the kits with their students. Both fifth-grade teachers took time during class to discuss with their students what was in the kits and the purpose of each individual item. High school teachers had informal discussions at the beginning of class on each kit item. As a part of the discussion, teachers asked how students installed items at home, which items were the most popular, and why. Some teachers also assigned homework by having students upload photos to their learning management system of taking the kit home.

As a post-homework activity, one teacher shared with their class the various photos taken at home of the kit and the items installed. That teacher integrated the homework assignment they created on taking the kits home into a classroom discussion and said this:

“[If high school students installed kit measures], they got bonus points... they had to take a selfie of them putting that in. They took all these selfies... We just spent five minutes a day discussing: ‘How do you like it? Do you think it’s cool? Who installed it? What did you think was the coolest [item] out of the kit?’ I just made a collage on my smart board of their pictures to give them something to look at while we were talking. It was fun.”

A fifth-grade teacher remarked how easy the program was for students and their families to make energy efficiency changes at home, and they stated:

“[The program kit] is not something that [families] have to totally revamp their whole lifestyle [for]. These are just easy little fixes that they can go home and implement right away. That is the beauty of those kits because people probably wouldn’t take the effort initially to go out and buy those things, but because [NIPSCO is] giving them [out], and you’re explaining how they can be used in little ways to make a big difference, [the students use them.] I think that’s the best part.”

Kit Experiments: The kits included two experiments (i.e., thermometer and flow test bag) that students could use in class and/or at home. Some high school teachers specifically mentioned using the thermometer and one mentioned the flow test bag provided to students. High school teachers mentioned that they tried the thermometer experiment in class, and some students tried the experiment at home. Of the flow test bag, one teacher mentioned that they showed their students how it worked, but one teacher also remarked that their students thought the flow test bag was too much effort. The fifth-grade teachers demonstrated the experiments at school but were unsure if the students tried the experiments at home.

Kit Items: Teachers mentioned most of their students installed something from the kit—primarily, the LED bulb and power strip. Other kit items were more sporadic in installation due to the more complicated nature of installation (e.g., outlet insulators, showerheads, and aerators). Specific challenges to kit items included: aerators did not fit, students were intimidated by the idea of installing the items, showerheads were difficult to install, or students were hesitant to install kit items. Some of the feedback teachers received from students was that showerheads and outlet insulators needed parent permission to install, and student-specific issues were that some students were adamant that they did not want to take an energy efficient kit home or they lost their kit during the school day (but the teacher was able to give out extras).

Incentives to Complete and Turn In Materials

To encourage students and teachers to complete HEWs and parent/guardian comment cards and return them to NEF, teachers could receive a mini-grant based on the percentage of HEWs returned and of students who returned the HEW received a prize. Fifth grade teachers who returned at least 80% of the HEWs (either via mail or online) received a \$50 mini-grant from NIPSCO (distributed by the subcontractor).

High school teachers who returned 50% or more of the HEWs received a \$100 gift card, those who returned 31% to 49% received a \$50 gift card, and those who returned 5% to 30% received a \$25 gift card—all from NIPSCO and distributed by subcontractor. Fifth-grade students who returned the HEW received a scented highlighter, and the program entered high school students who returned the HEW into a drawing for Beats headphones.

Teachers mentioned that, for high school students, the drawing for Beats headphones was very popular, and students were very excited about it. For teachers themselves, some of them mentioned the mini-grant was a great incentive for them, and they were able to buy items for their classrooms.

“I think the [high school students] were pretty excited they were able to participate in something, and there was a contest involved... I guess our school had a lot of surveys come back, so we got two sets of [Beats headphones.] The [students] were so excited. The kids who won were so thankful and excited. That was heartwarming to me... it was kids who actually appreciated that they won something.”

High School Program Experience

Because this is the first year of evaluation for the high school program we specifically asked high school teachers about their experiences with the new program. Overall, all interviewed high school teachers remarked that it was a worthwhile program. However, they had varying opinions on whether the program curriculum was at an appropriate level for high school students with two saying yes, two saying it was appropriate for their regular class but not challenging enough for their advanced students. Two said that it was not appropriate as their regular biology students were not excited about or motivated to participate in it and, for their advanced placement students, the curriculum was not challenging enough. Additionally, two high school teachers mentioned they wanted to find better ways to integrate the energy efficiency program into their regular curriculum and lesson plans, but they did not have enough classroom time to include it. As one high school teacher who said the program was “easy” to implement noted:

"I thought [the high school program] was spot on. It was very easy to follow. It was easy to use. It was easy to implement [the program materials]."

Other NIPSCO Program Participation and Behavior

The NIPSCO School Education program is intended to educate students about energy efficiency and behaviors, which could lead to future participation in other NIPSCO programs by teachers and students' families due to their participation in the School Education program.

Although several interviewed teachers participated in other NIPSCO programs or took energy-saving actions at home, these actions were prior to participating in the School Education program. Almost all teachers took one of the school kits and installed items at home or at their school. Additionally, one teacher mentioned the NIPSCO School Education program made them more mindful about looking for and purchasing energy efficient products for the future. They said:

"I [installed] one of the showerheads [from the kit], and we were finishing up renovations in one of our bathrooms... We've been in our home 10 years now, and there are some things [in my home] that have seen the end of their lifetime. So, as we look at replacing those, looking for those energy efficient ratings that are mentioned in the NIPSCO [kit] is something we're being probably a little bit more mindful of. Sometimes, if you spend maybe a little bit more at the initial cost, you know you'll save over the years."

Only one interviewed teacher had heard anything from students about additional further energy efficient actions their families were taking. This teacher mentioned hearing their students were involved in the NIPSCO Home Energy Assessment (HEA) program and an Earth Day program. Two different teachers shared that they heard from students that their families have started practicing other energy efficient behaviors, which were usually turning off lights, unplugging things in the home, or adjusting the thermostat.

Program Satisfaction

All interviewed teachers, both high school and fifth grade, were very satisfied with the NIPSCO program. Teachers mentioned the program was a good, easy to implement, educational, and well-thought-out program that they found beneficial to their students. Some also mentioned that the program was fun and helpful at their students' grade level. All interviewed teachers intend to participate in the program in the future. Teachers who received feedback from colleagues heard that others enjoyed the program, and one mentioned that even nonparticipating teachers noticed students were excited about it. Teachers found the program curriculum to be very effective in teaching students and families about energy efficiency. Some teachers said they liked the hands-on learning and the chance for students to work with their families; they also liked that energy efficiency was an engaging topic. Additionally, one teacher appreciated the tangible, physical items offered to students. As one high school teacher mentioned:

"Everything was great. I thought it was amazing [NIPSCO] did this for the students. And I think it's something [the high school students] really enjoyed."

Additionally, all teachers only had positive things to say about NEF, the program coordinator stating that it was great to work with, communicated well, was very accessible to answer questions, and regularly checked in.

Suggestions For Improvement

Although all interviewed teachers were very satisfied with the NIPSCO School Education program, they did offer some suggestions for ways to improve it that NIPSCO could apply to both the fifth-grade and high school programs:

- Provide teachers with a way to demonstrate how to install items from kits in class and have the students practice.
- Create a video that provides an overview of each item in the kit and its purpose in energy efficiency as students are often unfamiliar with the items provided.
- Include a printed card in the kit to explain each item and its purpose.
- Provide videos in Spanish and a vocabulary sheet to help students who have language barriers engage with the materials.

Specific suggestions teachers provided to improve the high school Energy Efficiency Innovation program included the following:

- Create program materials for each year of high school with more advanced curriculum and activities for honors and AP classes.
- Create a curriculum different from the fifth-grade model that is more challenging and/or in-depth.
- Provide a science version vs. A nonscience version of the curriculum so students can learn other things about energy efficiency beyond science (e.g., history of lighting).
- Provide additional items in kits that are different from the fifth-grade kits.
- Have a guest speaker come talk to students about the program (either in person or virtually). Educate students on what NIPSCO is (e.g., what a utility does, potential careers in utility and energy efficiency).
- Include additional information in the parent/guardian letter to describe the specific purpose of the program, explain why data is collected, and reassure families this program is purely educational in nature.

Specific suggestions teachers provided to improve the fifth-grade program included the following:

- Provide interactive, digital activities or simulations (e.g., Kahoot).
- Make the HEW more student-friendly and accessible at their grade level.

Conclusions and Recommendations

CONCLUSION 1: ALTHOUGH TEACHERS WERE VERY SATISFIED WITH THE NIPSCO SCHOOL EDUCATION PROGRAM, CALLING IT USEFUL, BENEFICIAL, AND VALUABLE TO THEIR STUDENTS, THEY ALSO PROVIDED SOME SUGGESTIONS FOR IMPROVEMENT.

Fifth-grade and high school teachers were very satisfied with the NIPSCO School Education program and found it worthwhile. Not only did the teachers find the program to be educational as their students learned about energy efficiency and energy use, but the program was also easy to sign up for and free to participate in. They also mentioned that the program provided a unique opportunity for students to work with their parents/guardians. Teachers were easily able to incorporate the energy efficiency curriculum into a variety of topics they were already teaching in their classrooms. Teachers also said that their students really enjoyed the program curriculum and kits. All eight interviewed teachers mentioned they would like to participate in the program in the future.

That said, the fifth-grade and high school teachers interviewed provided suggestions to make the NIPSCO School Education program even better. Many teachers suggested curriculum improvements and wanted additional resources for different abilities and language learners. Also, as the high school program is new, high school teachers mentioned NIPSCO could better align the curriculum with high school students' aptitudes and grade levels, as some students are of higher ability and more advanced and need supplementary activities.

Recommendations:

- Consider providing additional curriculum and resources to teachers such as (a) a summary video providing an overview of each item in the kit is and its purpose, which teachers could use in class to show how items work; (b) videos in Spanish and along with a vocabulary sheet to help students with language barriers better engage with materials; (c) more interactive, digital activities or simulations; and (d) suggestions for activities or assignments teachers could use with students to confirm that they took their kit home and installed items. For example, some teachers had students take photos or videos that were then shared in class.
- Provide different versions of the curriculum for the high school program. As noted, teachers recommended varying levels of difficulty to accommodate different grade and ability levels, as well as including curriculum that is not science focused and could be incorporated into other subjects. Possible topics could include the history of lighting and career opportunities in energy efficiency.
- Consider ways to further differentiate the fifth-grade and high school programs through the curriculum and the items provided in the kits.
- Consider offering the in-person presentation option for the NEF programs in NIPSCO's service area as some teachers suggested that having a guest speaker talk to students about the program could be beneficial.

CONCLUSION 2: MANY TEACHERS SHOWED A LACK OF AWARENESS OF THE AVAILABLE RESOURCES AND BEST PRACTICES FOR THE PROGRAM, SOME OF WHICH MAY HAVE CLEARED UP AREAS OF CONFUSION FOR STUDENTS, PARENTS, AND TEACHERS.

Many teachers seemed unaware of all the resources that NIPSCO provides for the School Education program even though there are dedicated webpages for both the fifth-grade and high school programs. Also, we found that both high school and fifth-grade teachers had their students fill out the HEWs during class, as program materials described doing, even though the questions likely cannot be readily answered by most students. Teachers noted that students did not know how to answer the questions. Additionally, program materials may not have explained the purpose of the program and information gathered as one teacher mentioned that their students did not want to take part in the program due to concerns about the program tracking their legal status.

Recommendations:

- Provide additional information in the parent/guardian letter and the kit insert clearly explaining the intention of the program to reassure families who have concerns about the kit and how the program will use information supplied in the HEW.
- Update program materials to clearly indicate that students will need assistance from their parents to complete the HEWs. Having assistance from parents/guardians will provide more accurate home characteristic information.
- Consider including a teacher survey as part of the evaluation for both the fifth-grade and high school programs in the future to solicit feedback from more teachers. More feedback will allow NIPSCO to better understand teacher perceptions of and satisfaction with the program and to better identify any additional pain points. The survey could gather awareness of, use of, and satisfaction with the curriculum, program materials, supplemental materials, and resources the program provides. It could also ask about areas of improvement.

CONCLUSION 3: OPPORTUNITIES MAY EXIST TO BETTER PROMOTE NIPSCO'S OTHER ENERGY EFFICIENCY PROGRAMS TO SCHOOL EDUCATION PARTICIPANTS.

The kit inserts include information about NIPSCO's other programs (Home Online Marketplace, Appliance Recycling, Home Rebate program, HEA, and Income-Qualified Weatherization). However, teachers indicated when asking their students if their parents or guardians participated in additional NIPSCO programs after receiving the energy efficiency kit that students did not mention further NIPSCO participation. Only one teacher mentioned their students participated in the HEA program and Earth Day activities. Further, teachers did not make any energy efficiency changes due to participating in the School Education programs although some made energy saving improvements prior to participating in the program.

Recommendations

- Send follow-up fliers or emails to parents and teachers of School Education program participants reminding them of NIPSCO's other programs. Explore opportunities and channels to educate participants about other NIPSCO programs through the School Education program, such as the program website and other program materials including the kit insert.

- Consider educating high school students participating in the program about NIPSCO's other energy efficiency programs and encourage them to share this information with their parents.
- Continue to monitor awareness and participation in other NIPSCO programs and energy efficiency practices at home via the parent survey.
- Improve the visibility of NIPSCO's programs on the kit insert, and identify ways to highlight savings opportunities by participating in other NIPSCO programs.

CONCLUSION 5: THE USE OF ASSUMPTIONS FROM OUTSIDE OF THE ILLINOIS TRM IN *EX ANTE* SAVINGS LED TO DISCREPANCIES BETWEEN *EX ANTE* AND *EX POST* SAVINGS FOR ALL PROGRAM MEASURES.

The evaluation team identified notable measure-level differences between *ex ante* and *ex post* savings across all measures through the engineering review. The driver of these measure-level differences was that the *ex ante* savings used inputs from different sources, including the 2022 EM&V report, when deemed values existed in the Illinois TRM. Notable differences between *ex ante* and *ex post* savings for low-flow showerheads and faucet aerators are due to using different values for water supply temperature and flow rate. Differences in savings values for nightlights occurred due to *ex post* savings applying an incandescent replacement factor. Power outlet gasket savings discrepancies were due to *ex ante* calculations omitting heating season savings, and switch gaskets did not use the Illinois TRM methodology. Other savings discrepancies were due to differences in ISR values and household characteristics from the HEW.

Recommendations:

Implement the following updates to *ex ante* savings to improve the accuracy of *ex ante* savings estimates:

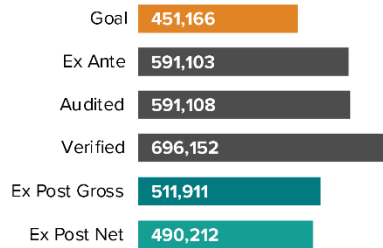
- Update all inputs with deemed values in the Illinois TRM to use the Illinois TRM instead of using older values from previous evaluations.
- Use the as-used value provided in the TRM as the Illinois TRM algorithm is not set up to use the actual, rated flow rate for faucet aerators.
- Include an incandescent replacement factor for nightlights to account for units that do not replace an existing nightlight.
- Update the power outlet gasket savings calculation to include heating season savings.
- Update the switch gaskets savings calculation to use the Illinois TRM.
- Update ISRs to the values found in the most recent participant survey.
- Update household characteristics to the values found in the most recent HEWs.

HOMELIFE CALCULATOR

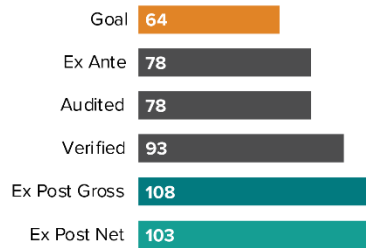


- The HomeLife Calculator Program exceeded all of its 2024 savings goals for electric energy savings, natural gas savings, and peak demand savings.
- The use of assumptions from outside of the Illinois TRM in ex ante savings led to discrepancies between ex ante and ex post savings for all program measures.

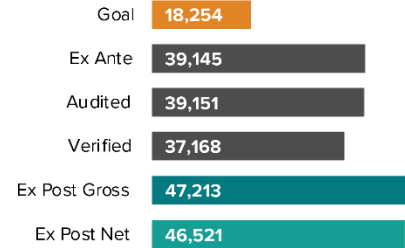
⚡ Electric Savings (kWh)



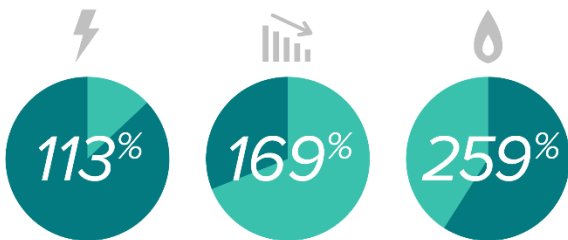
📊 Peak Demand Reduction (kW)



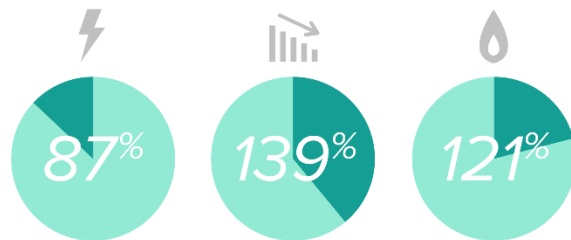
💧 Natural Gas Savings (Therms)



Ex Post Gross Achieved to Gross Goal



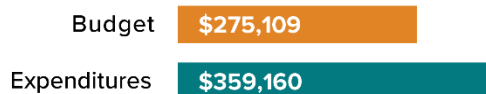
Realization Rate



Budget



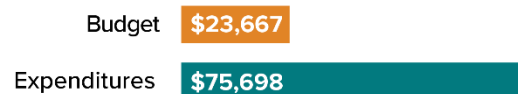
Electric and Peak Demand



Spent **131%**



Natural Gas



Spent **320%**

Program Design and Delivery

The HomeLife Energy Efficiency Calculator (HomeLife Calculator) program provides residential customers with the opportunity to assess their home's energy usage through a user-friendly online platform. By offering a do-it-yourself home audit and complimentary energy savings kit, the program aims to achieve several key goals: 1) identify low-cost/no-cost measures that NIPSCO residential customers can easily implement to manage their gas and electric consumption; 2) allow eligible customers to request a free home energy kit; 3) educate customers on the diverse range of energy efficiency programs available through NIPSCO's residential energy efficiency portfolio. TRC is the implementer of this program.

Access to the calculator is available through NIPSCO's website and is exclusive to residential customers with a valid account number. Eligibility for receiving a kit is contingent upon active electric and/or gas customer status, along with other eligibility criteria described below. The calculator is a comprehensive resource, providing practical tips on low- to no-cost improvements designed to save customers energy and money. Additionally, the calculator provides an analysis of each customer's energy consumption along with tailored recommendations to improve the efficiency of their home.

The HomeLife Calculator program energy efficiency kit eligibility extends to all categories of NIPSCO's residential customers, including combo, electric-only, and gas-only, who have not had an assessment through the Home Energy Assessment (HEA) or Income-Qualified Weatherization (IQW) programs and have not received an energy efficiency kit in the last three years. Electric-only customers receive the combo kit, but NIPSCO does not claim savings for the gas measures. Gas-only customers receive a kit with additional water-saving devices.

Combo and Electric-Only Kit Measures

- 2 connected LEDs
- 1 bathroom faucet aerator (1.0 gpm)
- 1 kitchen faucet aerator (1.5 gpm)
- 1 low-flow showerhead (1.5 gpm)
- 1 LED night-light (0.5 watt)
- 1 advanced power strip (Tier 1)
- 8 light switch gaskets
- 18 power outlet gaskets
- 1 plumbers' tape

Gas-Only Kit Measures

- 2 bathroom faucet aerators (1.0 gpm)
- 1 kitchen faucet aerator (1.5 gpm)
- 2 low-flow showerheads (1.5 gpm)
- 8 light switch gaskets
- 18 power outlet gaskets
- 1 plumbers' tape

Changes from the 2023 Design

In 2024, NIPSCO made no changes to the design of the program.

Program Performance

In 2024, the program exceeded all of its savings goals, distributing a total of 3,672 kits comprised of 2,759 combo kits (798 legacy), 196 combo kits to electric-only customers (56 legacy), and 717 gas-only kits (641 legacy). This was a 63% increase from the number of kits distributed in 2023 (n=2,246). Program goals also increased from 2023 with a 296% increase in electric energy savings goals, 574% increase in demand reduction savings goals, and 49% increase in natural gas savings goals. Table 164 summarizes results for the full year of program performance.

Table 164. 2024 HomeLife Calculator Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	451,166.40	591,102.56	591,108.06	696,151.73	511,911.09	490,211.76	113%
Peak Demand Reduction (kW)	64.020	77.873	78.049	92.621	108.171	103.228	169%
Natural Gas Energy Savings (therms/yr.)	18,254.20	39,144.67	39,151.45	37,167.65	47,212.56	46,521.18	259%

Table 165 provides an overview of the *ex post* gross and net-to-gross (NTG) adjustment factors. Since we did not conduct a 2024 participant survey for this program, we used the same values from 2023 to indicate freeridership, spillover, and NTG.

Table 165. 2024 HomeLife Calculator Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	87%	14%	10%	96%
Peak Demand Reduction (kW)	139%	15%	10%	95%
Natural Gas Energy Savings (therms/yr.)	121%	11%	10%	99%

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

The discrepancies in savings are mainly attributable to the difference between the *ex ante* and *ex post* savings calculation assumptions for in-service rates (ISRs) and fuel type saturations. For nightlights, the *ex post* ISR accounts for the incandescent replacement factor so that the program only achieves savings when the customer replaces an existing inefficient nightlight. *Ex ante* calculations do not include water, space heating or cooling saturation factors, but *ex post* calculations incorporate these saturations to account for the distribution of fuel types and the presence of central air conditioning. The evaluation team used the Illinois TRM v12.0 to calculate *ex ante* and *ex post* savings; however, for water-saving measures, *ex ante* calculations use the actual, rated flow rate of the efficient fixture rather than the TRM-prescribed in-situ value used to

calculate *ex post* savings. The *ex post* gross savings also use input from the 2023 participant survey, such as fixtures per household, whereas the *ex ante* savings use the TRM default.

Differences between the *ex ante* and *ex post* gross assumptions for the light switch and power outlet gaskets also affected realization rates (Table 149). The program used the Illinois TRM v12.0 to calculate *ex ante* for outlet gaskets but not for switch gaskets. Further, *ex ante* savings only included electric cooling savings (no heating season savings) and claimed zero demand savings.

Table 166 lists the 2024 HomeLife Calculator program budget and expenditures by fuel type. Given the increased participation in and popularity of the HomeLife Calculator program in 2024, the expenditures for each fuel type exceeded the budgeted values, as detailed in Table 3.

Table 166. 2024 HomeLife Calculator Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$275,108.66	\$359,159.89	131%
Natural Gas	\$23,667.23	\$75,698.07	320%

Evaluation Methodology

To inform the 2024 NIPSCO evaluations, the evaluation team completed the following research activities:

- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program participation data.
- **Engineering analysis** to review program savings assumptions and algorithms for reasonableness and accuracy.
- **Uplift analysis** to understand the level of participation in other programs after a customer participated in the HomeLife Calculator program.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop deemed savings estimates? Are there any updates that the program should make?
- What are the *ex post* program savings? Do these suggest any needed updates to program’s design, delivery, or savings assumptions?

The evaluation team compared the engineering calculations and NIPSCO’s *ex ante* savings across all measure types. We derived these savings methodologies and inputs for each measure from several sources including standard engineering practices, the Illinois TRM v12.0, and NIPSCO’s program tracking database.⁴⁰

Audited and Verified Savings

To audit program savings, the evaluation team performed the following reviews to verify alignment with the program’s scorecard:

- 4. **Audited Kits Quantity.** Reviewed the program tracking data provided by the implementer and audited the number of kits distributed.
- 5. **Confirm Measure-Level Savings Calculations.** Reviewed the per-measure and per-kit savings in the documentation provided by NIPSCO.
- 6. **Savings Estimate Review.** Confirmed the program-level total savings.

NIPSCO reported the distribution of 2,759 combo kits, 717 gas-only kits, and 196 electric-only kits through the HomeLife Calculator program. The evaluation team cross-checked these reported values from the scorecard against the program tracking data, and no adjustments were necessary in the audited phase.

To confirm savings, the evaluation team reviewed the kit savings documentation, which included both measure-level and kit-level savings.

Upon review of the documentation, the evaluation team found that measure-level savings values in the tracking data were consistent with NIPSCO’s kit savings documentation. However, the program tracking data reported savings at the kit level with rounded total kit values, while NIPSCO’s measure calculation file savings reported savings at the measure level with unrounded per-measure values. Further, the program updated kit saving values in April 2024. NIPSCO reported its measure calculation file savings at the measure level with unrounded per-measure values and matched the updated savings values. This difference in the unit of analysis led to rounding errors, resulting in a slight deviation between the total of measure savings and the tracking data savings. We note these rounding errors, where applicable, in the remainder of this report.

ISRs

The evaluation team referred to HomeLife Calculator participant survey results to calculate ISRs. Table 167 lists the ISRs for all program-installed measures. As we used the 2023 ISR values in 2024, additional detail on these ISRs is located in the 2023 DSM Portfolio Evaluation Report.

Table 167. 2024 HomeLife Calculator Program Survey ISRs by Measure

MEASURE	ISR
Connected LEDs	83%
Bathroom Aerators	52%
Kitchen Aerators	60%
Low-Flow Showerheads	48%
Nightlights	88%
Advanced Power Strips	89%
Light Switch Gaskets	36%
Power Outlet Gaskets	35%

Verified Savings Summary

To calculate the verified savings, the evaluation team replaced the *ex ante* ISR with the verified ISR from the 2023 participant survey. This updated data provides a more accurate representation of actual ISRs among program participants. Table 168 summarizes the audited and verified savings per unit.

Table 168. 2024 HomeLife Calculator Program Audited & Verified Per Unit Savings

MEASURE	EX ANTE ISR	EX ANTE PER-UNIT SAVINGS ^a			VERIFIED ISR	VERIFIED PER UNIT SAVINGS		
		KWH	KW	THERMS		KWH	KW	THERMS
Connected LEDs - Combo Kit	93%	2.99	0.000	0.00	83%	2.67	0.000	0.00
Connected LEDs – Electric-Only Kit	93%	2.99	0.000	0.00	83%	2.67	0.000	0.00
Advanced Power Strip - Combo Kit	81%	83.43	0.009	0.00	89%	91.67	0.010	0.00
Advanced Power Strip – Electric-Only Kit	81%	83.43	0.009	0.00	89%	91.67	0.010	0.00
Nightlight - Combo Kit	84%	26.13	0.000	0.00	88%	27.37	0.000	0.00
Nightlight – Electric-Only Kit	84%	26.13	0.000	0.00	88%	27.37	0.000	0.00
Low-Flow Showerhead - Combo Kit	38%	85.77	0.008	3.68	48%	108.34	0.011	4.64
Low-Flow Showerhead – Electric-Only Kit	38%	85.77	0.008	0.00	48%	108.34	0.011	0.00
Low-Flow Showerhead – Gas-Only Kit	38%	0.00	0.000	3.68	48%	0.00	0.000	4.65
Kitchen Aerator - Combo Kit	42%	15.28	0.003	0.66	60%	21.83	0.004	0.94
Kitchen Aerator – Electric-Only Kit	42%	15.28	0.003	0.00	60%	21.83	0.004	0.00
Kitchen Aerator – Gas-Only Kit	42%	0.00	0.000	0.66	60%	0.00	0.000	0.94
Bathroom Aerator - Combo Kit	46%	8.26	0.011	0.35	52%	9.34	0.013	0.40
Bathroom Aerator – Electric-Only Kit	46%	8.26	0.011	0.00	52%	9.34	0.013	0.00
Bathroom Aerator – Gas-Only Kit	46%	0.00	0.000	0.35	52%	0.00	0.000	0.40
Light Switch Gaskets - Combo Kit	25%	0.10	0.000	0.23	36%	0.14	0.000	0.32
Light Switch Gaskets – Electric-Only Kit	25%	0.10	0.000	0.00	36%	0.14	0.000	0.00
Light Switch Gaskets – Gas-Only Kit	25%	0.00	0.000	0.23	36%	0.00	0.000	0.32
Power Outlet Gaskets - Combo Kit	40%	0.38	0.000	0.15	35%	0.34	0.000	0.13
Power Outlet Gaskets – Electric-Only Kit	40%	0.38	0.000	0.00	35%	0.34	0.000	0.00
Power Outlet Gaskets – Gas-Only Kit	40%	0.00	0.000	0.15	35%	0	0.000	0.13
Total HomeLife Combo Kit - Legacy 2023 Measure	n/a	120.00	0.010	12.15	n/a	148.22	0.013	10.42
Total HomeLife Electric-Only Kit - Legacy 2023 Measure	n/a	120.25	0.010	0.00	n/a	148.43	0.013	0.00
Total HomeLife Gas-Only Kit - Legacy 2023 Measure	n/a	0.00	0.000	16.26	n/a	0	0	9.66

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Ex Post Gross Savings

The evaluation team reviewed the program's *ex ante* assumptions, sources, and algorithms for reasonableness and updates. Below are detailed *ex post* gross analysis results.

Engineering Reviews

The evaluation team referred to the Illinois TRM v12.0 to calculate *ex post* gross electric energy savings, demand reduction, and natural gas savings. *Appendix 10. HomeLife Calculator Program* contains details on the specific algorithms, variable assumptions, and references for all program measure *ex post* gross calculations.

Through the engineering review, the evaluation team found differences between *ex ante* and *ex post* gross savings. The following overarching factors primarily drove the differences:

- The evaluation team used Illinois TRM v12.0 assumptions for the flow rate of efficient water fixtures to calculate *ex post* savings while the program calculated *ex ante* savings using the rated flow rate from the packaging.
- The evaluation team used updated IRS, water heater fuel saturation, space heating fuel saturation, and other algorithm inputs based on the 2023 participant survey, which adjusted savings across measures.

The following sections summarize the team's findings based on the engineering review.

Ex Post Gross Savings Summary

Ex post savings reflect the engineering adjustments made to verified measure savings. The evaluation team calculated *ex post* electric energy, peak demand, and natural gas energy savings for each kit measure using algorithms and inputs from the Illinois TRM v12.0 as well as customer location to account for weather effects. The evaluation team leveraged the HomeLife Calculator program participant survey information to calculate the number of faucets and showerheads per home and heating system and water heater fuel type saturation values, then used this information to inform *ex post* gross savings calculations.

Table 169 below, shows the *ex ante* deemed savings and *ex post* gross per-measure savings for 2024 HomeLife Calculator program measures. The *ex post* savings calculations differed from *ex ante* analysis as follows:

- **Connected LED:** The evaluation team updated the ISR and standby power draw in the *ex post* savings calculation. Both the 2024 *ex ante* and *ex post* analyses use the Illinois TRM v12.0; however, the program calculated *ex ante* savings with the TRM default standby power assumption instead of the actual rating of the lamp contained in the kit.
- **Advanced Power Strip:** The *ex post* ISR of 86% from the 2023 participant survey is slightly higher than the *ex ante* assumption of 81%.
- **LED Nightlight:** The evaluation team updated the ISR (88% compared to 84%) and incorporated the incandescent replacement factor (26% compared to 100%) from the 2023 participant survey.
- **Low-Flow Faucet Aerators and Showerheads:** The evaluation team updated water heating fuel saturation percentages, household demographics, and ISRs based on the 2023 participant survey. We also updated baseline and efficient flow rate assumptions to match the Illinois TRM v12.0. *Ex ante* savings omit water heating fuel saturation percentages.

- Outlet and Switch Gaskets:** The evaluation team used the updated Illinois TRM v12.0 algorithm and incorporated ISRs and space heating fuel type saturations and assigned demand savings based on the presence of central air conditioning from the 2023 participant survey results. *Ex ante* savings for light switch gaskets were not updated to use the Illinois TRM v12.0. *Ex ante* savings for outlet gaskets were updated to the Illinois TRM v12.0 methodology; however, only cooling season savings were claimed instead of both heating and cooling season savings. There were no *ex ante* demand savings claimed.

Table 169. 2024 HomeLife Calculator Program *Ex Ante*^a & *Ex Post* Gross Per Unit Savings Values

MEASURE	QUANTITY PER KIT	EX ANTE PER-UNIT DEEMED SAVINGS			EX POST GROSS PER-UNIT SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Connected LEDs - Combo Kit	2	2.99	0.000	0.00	2.17	0.000	0.00
Connected LEDs – Electric-Only Kit	2	2.99	0.000	0.00	2.17	0.000	0.00
Advanced Power Strip - Combo Kit	1	83.43	0.009	0.00	91.67	0.010	0.00
Advanced Power Strip – Electric-Only Kit	1	83.43	0.009	0.00	91.67	0.010	0.00
Nightlight - Combo Kit	1	26.13	0.000	0.00	7.09	0.000	0.00
Nightlight – Electric-Only Kit	1	26.13	0.000	0.00	7.09	0.000	0.00
Low-Flow Showerhead - Combo Kit	1	85.77	0.008	3.68	20.57	0.006	4.46
Low-Flow Showerhead – Electric-Only Kit	1	85.77	0.008	0.00	20.57	0.006	0.00
Low-Flow Showerhead – Gas-Only Kit	2	0.00	0.000	3.68	0.00	0.000	4.02
Kitchen Aerator - Combo Kit	1	15.28	0.003	0.66	22.03	0.004	4.78
Kitchen Aerator – Electric-Only Kit	1	15.28	0.003	0.00	22.03	0.004	0.00
Kitchen Aerator – Gas-Only Kit	1	0.00	0.000	0.66	0.00	0.000	4.31
Bathroom Aerator - Combo Kit	1	8.26	0.011	0.35	2.54	0.003	0.55
Bathroom Aerator – Electric-Only Kit	1	8.26	0.011	0.00	2.54	0.003	0.00
Bathroom Aerator – Gas-Only Kit	2	0.00	0.000	0.35	0.00	0.000	0.50
Light Switch Gaskets - Combo Kit	8	0.10	0.000	0.23	0.58	0.001	0.24
Light Switch Gaskets – Electric-Only Kit	8	0.10	0.000	0.00	0.58	0.001	0.00
Light Switch Gaskets – Gas-Only Kit	8	0.00	0.000	0.23	0.00	0.000	0.26
Power Outlet Gaskets - Combo Kit	18	0.38	0.000	0.15	0.56	0.001	0.11
Power Outlet Gaskets – Electric-Only Kit	18	0.38	0.000	0.00	0.56	0.001	0.00
Power Outlet Gaskets – Gas-Only Kit	18	0.00	0.000	0.15	0.00	0.000	0.12
Total HomeLife Combo Kit - Legacy 2023 Measure	n/a	120.00	0.010	12.15	198.51	0.025	11.66
Total HomeLife Electric-Only Kit - Legacy 2023 Measure	n/a	120.25	0.010	0.00	199.78	0.025	0.00

MEASURE	QUANTITY PER KIT	EX ANTE PER-UNIT DEEMED SAVINGS			EX POST GROSS PER-UNIT SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Total HomeLife Gas-Only Kit - Legacy 2023 Measure	n/a	0.00	0.000	16.26	0.00	0.000	15.10

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Table 170 highlights notable differences between *ex ante* and *ex post* gross estimates.

Table 170. 2024 HomeLife Calculator Program Notable Differences Between *Ex Ante* and *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Connected LED	<i>Ex ante</i> savings use IL TRM v12.0 assumptions, including standby power consumption. ISR = 93%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, and incorporate actual standby power from the manufacturer spec sheet and 2023 participant survey to determine the ISR. ISR = 83%	<i>Ex post</i> uses actual standby power consumption. Updated ISR.
Bathroom Aerator	<i>Ex ante</i> savings use IL TRM v12.0 assumptions excluding flow rate of the efficient fixture. ISR = 46%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, and 2023 participant survey results for fuel saturation percentages, demographics, and ISR. ISR = 52%	<i>Ex post</i> uses TRM value for flow rate of efficient fixture. Updated ISR and survey info.
Kitchen Aerator	<i>Ex ante</i> savings use IL TRM v12.0 assumptions excluding flow rate of the efficient fixture. ISR = 42%	<i>Ex post</i> savings use IL TRM v12.0 assumptions and 2023 participant survey results for fuel saturation percentages, demographics, and ISR. ISR = 60%	<i>Ex post</i> uses TRM value for flow rate of efficient fixture. Updated ISR and survey info.
Low-Flow Showerhead	<i>Ex ante</i> savings use IL TRM v12.0. ISR = 38%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, and 2023 participant survey results for fuel saturation percentages, demographics, and ISR. ISR = 48%	Updated ISR and survey info.
LED Nightlights	<i>Ex ante</i> savings use IL TRM v12.0. ISR = 84%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, and 2023 participant survey results for incandescent replacement factor and ISR. ISR = 88%	<i>Ex post</i> includes an incandescent replacement factor of 26% from survey data.
Advanced Power Strips	<i>Ex ante</i> savings use IL TRM v12.0 assumptions. ISR = 81%	<i>Ex post</i> savings use IL TRM v12.0 assumptions and 2023 participant survey ISR. ISR = 89%	<i>Ex post</i> ISR is higher than <i>ex ante</i> .
Light Switch Gaskets	<i>Ex ante</i> savings uses online calculator at EnergyEarth.com	<i>Ex post</i> savings use IL TRM v12.0 assumptions, and 2023 participant survey	Methodology differences. <i>Ex ante</i> does not include an adjustment for space heating fuel type or

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
	ISR = 25%	results for fuel saturation percentages and ISR. ISR = 36%	saturation assign demand savings based on the presence of central air conditioning. Updated ISR.
Power Outlet Gaskets	<i>Ex ante</i> savings use IL TRM v12.0 assumptions excluding heating season savings. ISR = 40%	<i>Ex post</i> savings use IL TRM v12.0 assumptions, and 2023 participant survey results for fuel saturation percentages and ISR. ISR = 35%	<i>Ex ante</i> does not include heating season savings. Updated ISR.

Therm Penalties

The evaluation team excluded therm penalties from the evaluated savings, which is consistent with previous evaluations. However, it is important to note that cost-effectiveness results for gas and electric programs will still incorporate these penalties. The evaluation team believes this approach is appropriate as it accounts for the penalty on the electric side (where it is generated) and allows the evaluation team to show the gas program performance and measure performance more clearly. The total therm penalty, as shown in Table 171, was -710.89 therms. *Ex ante* program data did not include a therm penalty.

Table 171. 2024 HomeLife Calculator Program Waste Heat Factor Therm Penalty

MEASURE	WASTE HEAT FACTOR THERM PENALTY
Connected LEDs - Combo Kit	-262.42
Nightlight - Combo Kit	-440.47
Total Therm Penalty	-702.89

Realization Rates

The next three tables (Table 172 through Table 174) show the program's *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms. Across all measures, the sources referenced to calculate savings and updated ISRs primarily drove the differences between *ex ante* and *ex post* savings.

We provide additional discussion about the *ex ante* and *ex post* savings calculation assumptions above in Table 171.

Table 172. 2024 HomeLife Calculator Program *Ex Ante* to *Ex Post* Gross Electric Energy Savings

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Connected LEDs - Combo Kit		11,722.76	10,471.74	8,517.69
Connected LEDs – Electric-Only Kit		836.91	747.60	608.10

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)
Advanced Power Strip - Combo Kit		163,606.23	179,764.87	179,764.87
Advanced Power Strip – Electric-Only Kit		11,680.20	12,833.80	12,833.80
Nightlight - Combo Kit		51,240.30	53,672.57	13,894.39
Nightlight – Electric-Only Kit		3,658.15	3,831.80	991.95
Low-Flow Showerhead - Combo Kit		168,189.75	212,454.74	40,342.46
Low-Flow Showerhead – Electric-Only Kit		12,007.43	15,167.60	2,880.14
Low-Flow Showerhead – Gas-Only Kit		0.00	0.00	0.00
Kitchen Aerator - Combo Kit		29,966.37	42,808.63	43,196.86
Kitchen Aerator – Electric-Only Kit		2,139.36	3,056.20	3,083.92
Kitchen Aerator – Gas-Only Kit		0.00	0.00	0.00
Bathroom Aerator - Combo Kit		16,206.66	18,315.74	4,977.31
Bathroom Aerator – Electric-Only Kit		1,157.03	1,307.60	355.34
Bathroom Aerator – Gas-Only Kit		0.00	0.00	0.00
Light Switch Gaskets - Combo Kit		1,568.80	2,255.15	9,038.55
Light Switch Gaskets – Electric-Only Kit		112.00	161.00	645.28
Light Switch Gaskets – Gas-Only Kit		0.00	0.00	0.00
Power Outlet Gaskets - Combo Kit		13,554.43	11,864.05	19,771.82
Power Outlet Gaskets – Electric-Only Kit		967.68	847.00	1,411.55
Power Outlet Gaskets – Gas-Only Kit		0.00	0.00	0.00
Total HomeLife Combo Kit - Legacy 2023 Measure		95,760.00	118,279.56	158,409.43
Total HomeLife Electric-Only Kit - Legacy 2023 Measure		6,734.00	8,312.08	11,187.63
Total HomeLife Gas-Only Kit - Legacy 2023 Measure		0.00	0.00	0.00
Total Savings	591,102.56	591,108.06	696,151.73	511,911.09
Total Program Realization Rate				87%

Note: Totals may not sum properly due to rounding.

^a Ex ante savings in the tracking data do not report savings at the individual measure level, therefore only the summary of savings is included.

Table 173. 2024 HomeLife Calculator Program *Ex Ante* to *Ex Post* Gross Peak Demand Reduction

MEASURE	<i>EX ANTE</i> ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	<i>EX POST</i> GROSS PEAK DEMAND REDUCTION (KW/YR.)
Connected LEDs - Combo Kit		1.726	1.569	1.540
Connected LEDs – Electric-Only Kit		0.123	0.112	0.110
Advanced Power Strip - Combo Kit		18.360	19.610	20.173
Advanced Power Strip – Electric-Only Kit		1.311	1.400	1.440
Nightlight - Combo Kit		0.000	0.000	0.000
Nightlight – Electric-Only Kit		0.000	0.000	0.000
Low-Flow Showerhead - Combo Kit		16.346	21.571	11.639
Low-Flow Showerhead – Electric-Only Kit		1.167	1.540	0.831
Low-Flow Showerhead – Gas-Only Kit		0.000	0.000	0.000
Kitchen Aerator - Combo Kit		5.900	7.844	7.900
Kitchen Aerator – Electric-Only Kit		0.421	0.560	0.564
Kitchen Aerator – Gas-Only Kit		0.000	0.000	0.000
Bathroom Aerator - Combo Kit		22.546	25.493	6.237
Bathroom Aerator – Electric-Only Kit		1.610	1.820	0.445
Bathroom Aerator – Gas-Only Kit		0.000	0.000	0.000
Light Switch Gaskets - Combo Kit		0.000	0.000	10.530
Light Switch Gaskets – Electric-Only Kit		0.000	0.000	0.752
Light Switch Gaskets – Gas-Only Kit		0.000	0.000	0.000
Power Outlet Gaskets - Combo Kit		0.000	0.000	23.034
Power Outlet Gaskets – Electric-Only Kit		0.000	0.000	1.644
Power Outlet Gaskets – Gas-Only Kit		0.000	0.000	0.000
Total HomeLife Combo Kit - Legacy 2023 Measure		7.980	10.374	19.925
Total HomeLife Electric-Only Kit - Legacy 2023 Measure		0.560	0.728	1.406
Total HomeLife Gas-Only Kit - Legacy 2023 Measure		0.000	0.000	0.000
Total Savings	77.873	78.049	92.621	108.171
Total Program Realization Rate				139%

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)

Note: Totals may not sum properly due to rounding.

^a Ex ante savings in the tracking data do not report savings at the individual measure level, therefore only the summary of savings is included.

Table 174. 2024 HomeLife Calculator Program Ex Ante to Ex Post Gross Natural Gas Savings

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Connected LEDs - Combo Kit		0.00	0.00	0.00
Connected LEDs – Electric-Only Kit		0.00	0.00	0.00
Advanced Power Strip - Combo Kit		0.00	0.00	0.00
Advanced Power Strip – Electric-Only Kit		0.00	0.00	0.00
Nightlight - Combo Kit		0.00	0.00	0.00
Nightlight – Electric-Only Kit		0.00	0.00	0.00
Low-Flow Showerhead - Combo Kit		7,210.08	9,099.04	8,755.24
Low-Flow Showerhead – Electric-Only Kit		0.00	0.00	0.00
Low-Flow Showerhead – Gas-Only Kit		558.86	706.04	611.61
Kitchen Aerator - Combo Kit		1,284.62	1,835.50	9,374.71
Kitchen Aerator – Electric-Only Kit		0.00	0.00	0.00
Kitchen Aerator – Gas-Only Kit		49.79	71.14	327.44
Bathroom Aerator - Combo Kit		694.76	784.40	1,080.19
Bathroom Aerator – Electric-Only Kit		0.00	0.00	0.00
Bathroom Aerator – Gas-Only Kit		53.81	60.80	75.46
Light Switch Gaskets - Combo Kit		3,529.80	5,078.99	3,732.89
Light Switch Gaskets – Electric-Only Kit		0.00	0.00	0.00
Light Switch Gaskets – Gas-Only Kit		136.80	196.84	158.29
Power Outlet Gaskets - Combo Kit		5,308.82	4,647.57	3,948.43
Power Outlet Gaskets – Electric-Only Kit		0.00	0.00	0.00
Power Outlet Gaskets – Gas-Only Kit		205.75	180.12	167.43
Total HomeLife Combo Kit - Legacy 2023 Measure		9,695.70	8,315.16	9,303.16
Total HomeLife Electric-Only Kit - Legacy 2023 Measure		0.00	0.00	0.00

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)
Total HomeLife Gas-Only Kit - Legacy 2023 Measure		10,422.66	6,192.06	9,677.72
Total Savings	39,144.67	39,151.45	37,167.65	47,212.56
Total Program Realization Rate				121%

Note: Totals may not sum properly due to rounding.

^a *Ex ante* savings in the tracking data do not report savings at the individual measure level, therefore only the summary of savings is included.

The following table (Table 175) summarizes the savings at the kit level.

Table 175. 2024 HomeLife Calculator Program *Ex Ante* to *Ex Post* Gross Kit Savings

MEASURE	EX ANTE ^a	AUDITED GROSS	VERIFIED GROSS	EX POST GROSS	REALIZATION RATE
Electric Energy Savings (kWh/yr.)					
Combo Kit	551,810.16	551,815.30	649,887.05	477,913.38	87%
Electric-Only Kit	39,292.40	39,292.77	46,264.68	33,997.71	87%
Gas-Only Kit	0.00	0.00	0.00	0.00	N/A
Peak Demand Reduction (kW/yr.)					
Combo Kit	72.693	72.857	86.461	100.978	139%
Electric-Only Kit	5.180	5.192	6.160	7.192	139%
Gas-Only Kit	0.000	0.000	0.000	0.000	N/A
Natural Gas Energy Savings (therms/yr.)					
Combo Kit	27,717.29	27,723.78	29,760.66	36,194.62	131%
Electric-Only Kit	0.00	0.00	0.00	0.00	N/A
Gas-Only Kit	11,427.38	11,427.67	7,407.00	11,017.94	96%

^a *Ex ante* savings are based on a rounded savings value that is applied to each kit. The audited values are calculated at the full savings value, per-measure, and per-kit.

Ex Post Net Savings

Since the evaluation team did not conduct a participant survey in 2023, we used freeridership and participant spillover values from the 2023 survey to calculate 2024 *ex post* net savings. For additional details, see the 2023 DSM Portfolio Evaluation Report. Table 176 provides the NTG ratios by measure.

Table 176. 2024 HomeLife Calculator Program NTG Ratios

MEASURE	FREERIDERSHIP	SPIlLOVER	NTG
Connected LEDs	11%	10%	99%

MEASURE	FREERIDERSHIP	SPILLOVER	NTG
Bathroom Aerator	8%	10%	102%
Kitchen Aerator	8%	10%	102%
Low-Flow Showerhead	7%	10%	103%
Nightlight	16%	10%	94%
Advanced Power Strip	17%	10%	93%
Light Switch Gaskets	19%	10%	91%
Power Outlet Gaskets	19%	10%	91%
Total HomeLife Combo Kit - Legacy 2023 Measure	14%	10%	96%
Total HomeLife Electric-Only Kit - Legacy 2023 Measure	14%	10%	96%
Total HomeLife Gas-Only Kit - Legacy 2023 Measure	11%	10%	99%

Table 177 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 177. 2024 HomeLife Calculator Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Connected LEDs - Combo Kit	8,517.69	1.540	0.00	99%	8,432.51	1.525	0.00
Connected LEDs – Electric-Only Kit	608.10	0.110	0.00	99%	602.02	0.109	0.00
Advanced Power Strip - Combo Kit	179,764.87	20.173	0.00	93%	167,181.33	18.761	0.00
Advanced Power Strip – Electric- Only Kit	12,833.80	1.440	0.00	93%	11,935.43	1.339	0.00
Nightlight - Combo Kit	13,894.39	0.000	0.00	94%	13,060.72	0.000	0.00
Nightlight – Electric-Only Kit	991.95	0.000	0.00	94%	932.43	0.000	0.00
Low-Flow Showerhead - Combo Kit	40,342.46	11.639	8,755.24	103%	41,552.74	11.988	9,017.90
Low-Flow Showerhead – Electric- Only Kit	2,880.14	0.831	0.00	103%	2,966.54	0.856	0.00
Low-Flow Showerhead – Gas-Only Kit	0.00	0.000	611.61	103%	0.00	0.000	629.95
Kitchen Aerator - Combo Kit	43,196.86	7.900	9,374.71	102%	44,060.79	8.058	9,562.20
Kitchen Aerator – Electric-Only Kit	3,083.92	0.564	0.00	102%	3,145.59	0.575	0.00
Kitchen Aerator – Gas-Only Kit	0.00	0.000	327.44	102%	0.00	0.000	333.99
Bathroom Aerator - Combo Kit	4,977.31	6.237	1,080.19	102%	5,076.86	6.362	1,101.79

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Bathroom Aerator – Electric-Only Kit	355.34	0.445	0.00	102%	362.45	0.454	0.00
Bathroom Aerator – Gas-Only Kit	0.00	0.000	75.46	102%	0.00	0.000	76.97
Light Switch Gaskets - Combo Kit	9,038.55	10.530	3,732.89	91%	8,225.08	9.582	3,396.93
Light Switch Gaskets – Electric-Only Kit	645.28	0.752	0.00	91%	587.21	0.684	0.00
Light Switch Gaskets – Gas-Only Kit	0.00	0.000	158.29	91%	0.00	0.000	144.04
Power Outlet Gaskets - Combo Kit	19,771.82	23.034	3,948.43	91%	17,992.36	20.961	3,593.08
Power Outlet Gaskets – Electric-Only Kit	1,411.55	1.644	0.00	91%	1,284.51	1.496	0.00
Power Outlet Gaskets – Gas-Only Kit	0.00	0.000	167.43	91%	0.00	0.000	152.36
Total HomeLife Combo Kit - Legacy 2023 Measure	158,409.43	19.925	9,303.16	96%	152,073.06	19.128	8,931.04
Total HomeLife Electric-Only Kit - Legacy 2023 Measure	11,187.63	1.406	0.00	96%	10,740.13	1.350	0.00
Total HomeLife Gas-Only Kit - Legacy 2023 Measure	0.00	0.000	9,677.72	99%	0.00	0.000	9,580.94
Total Savings	511,911.09	108.171	47,212.56		490,211.76	103.228	46,521.18

Table 178. 2024 HomeLife Calculator Program NTG Results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	591,102.56	511,911.09	96%	490,211.76
Peak Demand Reduction (kW)	77.873	108.171	95%	103.228
Natural Gas Energy Savings (therms/yr.)	39,144.67	47,212.56	99%	46,521.18

Process Evaluation

The evaluation team conducted an uplift analysis to answer the following research question:

- What proportion of customers go on to participate in other NIPSCO programs after the HomeLife program?

Uplift Analysis

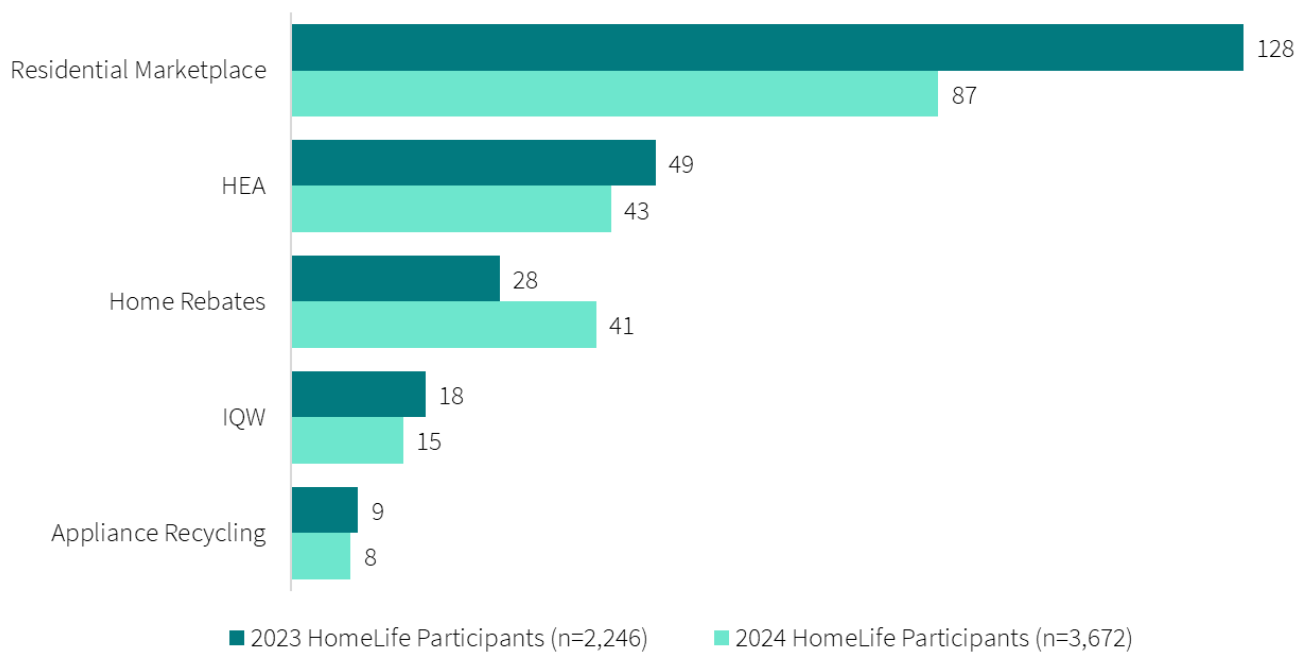
The evaluation team conducted an uplift analysis to determine the number of HomeLife Calculator program participants who participated in other NIPSCO programs after the HomeLife Calculator program. The team analyzed residential participant tracking data from 2023 and 2024 for the Appliance Recycling, Home Rebates, Residential Online Marketplace, HEA, and IQW programs.

For 2023 participants, the team cross-referenced tracking data from both 2023 and 2024 to determine participation in other programs in either year *after* participating in the HomeLife Calculator program in 2023. For 2024 participants, the team cross-referenced 2024 tracking data to determine participation in other programs in 2024 *after* participating in the HomeLife Calculator program in 2024.

Out of the 2023 participants (n=2,246), 232 participated in additional NIPSCO programs in 2023 or 2024 after participating in the HomeLife Calculator program (10%). Of the 2024 participants (n=3,672), 194 participated in additional NIPSCO programs in 2024 after participating in HomeLife Calculator program (5%).

HomeLife Calculator program participants most often also participated in the Residential Online Marketplace after participating in HomeLife Calculator program, followed by the HEA program and the Home Rebates program. Figure 68, below, contains the counts of 2023 and 2024 HomeLife Calculator program participants who went on to participate in other NIPSCO programs.

Figure 68. 2023-2024 HomeLife Calculator Program Uplift



Conclusions and Recommendations

CONCLUSION 1: THE HOMELIFE CALCULATOR PROGRAM EXCEEDED ALL OF ITS 2024 SAVINGS GOALS FOR ELECTRIC ENERGY SAVINGS, NATURAL GAS SAVINGS, AND PEAK DEMAND SAVINGS.

Despite seeing an increase in program savings goals from 2023, the program exceeded all its savings goals in 2024. In 2024, the program distributed a total of 3,672 kits, comprised of 2,759 combo kits, 196 combo kits to electric-only customers, and 717 gas-only kits. This was a 63% increase from the number of kits distributed in 2023 (n=2,246).

CONCLUSION 2: THE USE OF ASSUMPTIONS FROM OUTSIDE OF THE ILLINOIS TRM IN *EX ANTE* SAVINGS LED TO DISCREPANCIES BETWEEN *EX ANTE* AND *EX POST* SAVINGS FOR ALL PROGRAM MEASURES.

The evaluation team identified notable measure-level differences between *ex ante* and *ex post* savings across all measures through an engineering review. The primary driver of these measure level-differences was that the *ex ante* savings used inputs from different sources, including the 2022 EM&V report, when more updated values existed in the Illinois TRM. Notable differences between *ex ante* and *ex post* savings for low-flow showerheads and faucet aerators were due to the use of different values for the water supply temperature and flow rate. Differences in savings values for nightlights occurred due to *ex post* savings applying an incandescent replacement factor. Power outlet gasket savings discrepancies were due to *ex ante* savings calculations omitting heating season savings, and *ex ante* savings calculations for switch gaskets did not use the Illinois TRM methodology. Other savings discrepancies were due to differences in ISR values.

Recommendations:

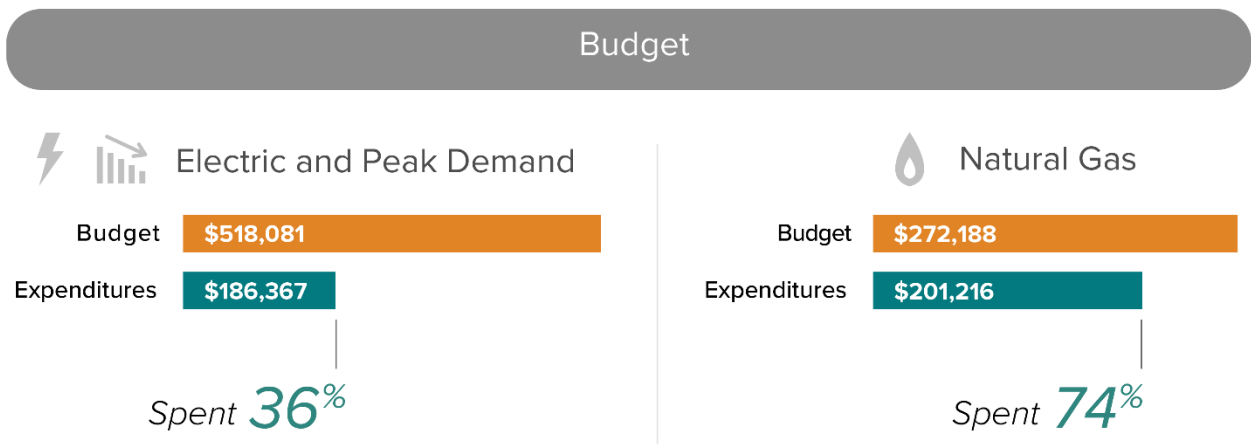
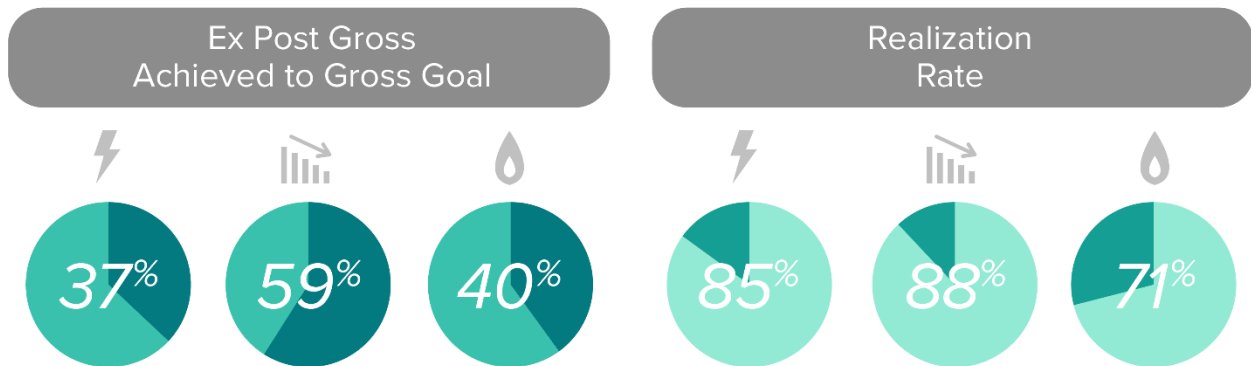
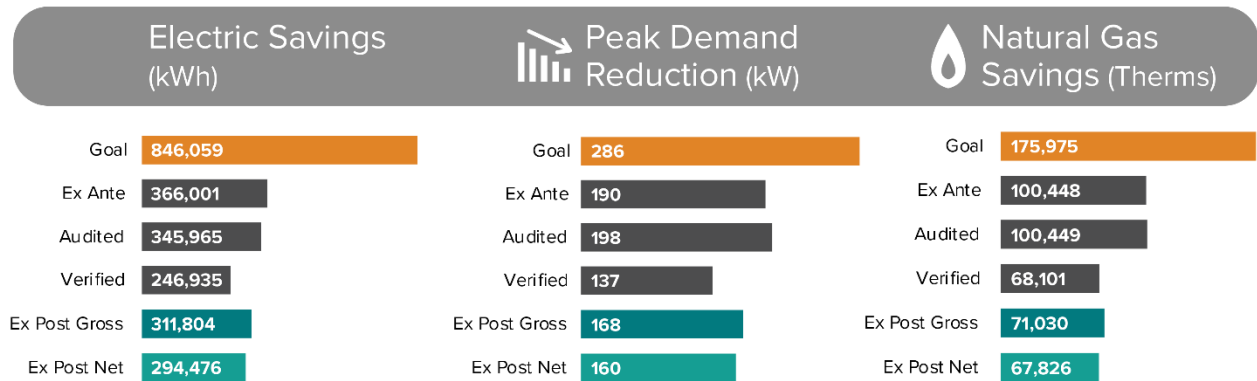
Implement the following updates to *ex ante* savings to improve the accuracy of *ex ante* savings estimates:

- Update all inputs that have deemed values in the Illinois TRM to use those values instead of using older values from previous evaluations.
- Use the “as-used” flow rate value for faucet aerators provided in the Illinois TRM as the TRM is not set up to use the rated flow rate for faucet aerators.
- Include an incandescent replacement factor for nightlights to account for units that do not replace an existing nightlight.
- Update the power outlet gasket savings calculation to include heating season savings.
- Update the switch gaskets savings calculation to use the Illinois TRM.
- Update ISRs to the values found in the most recent participant survey.

RESIDENTIAL MARKETPLACE



- The program fell short of its electric energy savings, peak demand savings, and natural gas energy savings goals in part due to its late start in 2024 after a change in vendor partners.
- Errors with the ex ante savings applied to the energy saver kits and wi-fi thermostats resulted in discrepancies between the ex ante scorecard savings and the audited program savings.
- Overall, free thermostat recipients expressed relatively high levels of satisfaction with the smart thermostat they received and the NIPSCO OLM overall.



Program Design and Delivery

The Online Marketplace (OLM) program, launched in late 2020, provides instant discounts on energy-saving products and energy-saving kits that are shipped directly to the customer's home. Each measure has a prescriptive incentive amount paid per unit, instantly reimbursing the customer for a portion of their cost. Incentives are based on equipment efficiency and the marketplace provides them instantaneously to the customer. The program's intent is to help remove the financial barrier associated with the initial cost of these energy efficient alternatives.

The OLM program is available to all NIPSCO residential customers. Upon accessing the OLM, customers can browse for energy-saving products that meet their needs. Product limits are in place to prevent customers from taking advantage of the program as well as to meet evaluation requirements. Customers add their selected product(s) to their shopping cart and proceed to the checkout page when shopping is complete. During checkout, customers must verify their NIPSCO residential account number to confirm program eligibility and complete the checkout process; there is no application or documentation required to participate in the program. After checkout, customers immediately receive an email confirmation with their order details.

TRC, who partnered with Enervee in 2024 to implement the OLM, implements the program. Enervee was responsible for building, hosting, and maintaining the OLM website; verifying customer accounts; handling customer orders; shipping products to customers; and answering customer questions and concerns.

Enervee fulfills orders within two to three days of placing the order, and shipping typically takes about three to five days (unless impacted by inventory issues). Returns and warranty are subject to the retailer that distributes the item purchased. Completed and shipped order information is sent to TRC monthly for invoicing.

The OLM program provides instant discounts for smart Wi-Fi thermostats, clothes washers and dryers, air purifiers and refrigerators and limited time offer (LTO) deals for kits. Additional manufacturer discounts (like Earth Day or Holiday Sales) may further reduce the end cost to customers. The measures offered through the OLM program are listed below. For certain measures, there are limits on the number of items a customer can buy in a calendar year:

- ENERGY STAR Air Purifier/Cleaner (*limit of two air purifiers per residential account per calendar year*)
- ENERGY STAR Refrigerator-Freezer (*limit of one refrigerator per residential account per calendar year*)
- Advanced Refrigerator and Advanced Refrigerator-Freezer (*limit of one refrigerator per residential account per calendar year*)
- ENERGY STAR Clothes Dryer (Electric) (*limit of one dryer per residential account per calendar year*)
- Advanced Clothes Dryer (Electric) (*limit of one dryer per residential account per calendar year*)
- ENERGY STAR Clothes Dryer (Electric Heat Pump) (*limit of one dryer per residential account per calendar year*)
- ENERGY STAR Clothes Washer (*limit of one washer per residential account per calendar year*)
- Advanced Clothes Washer (*limit of one washer per residential account per calendar year*)
- LTO Energy Saver Kit (*limit of one kit per residential account per calendar year*)

- Two Smart LEDs
- One Low-Flow Showerhead
- One Low-Flow Showerhead with ShowerStart
- One Nightlight
- One Wi-Fi Thermostat
- Wi-Fi Thermostat, Including LTO Specials (*limit of two smart thermostats per residential account per calendar year*)

In 2024, the OLM program promoted Energy Saver Kits (also known as Energy Saver Starter Packs) and Wi-Fi thermostats through LTOs. The program offered kit products only in November and December of 2024; it offered Wi-Fi thermostats at an additional discount from manufacturers from the end of July through the end of the year, including a free thermostat giveaway in August and September of 2024.

TRC's strategy to promote the Residential OLM program relies on mass marketing methods such as social media campaigns, community outreach, and cross promotions. The marketing approach builds awareness by informing customers in the NIPSCO territory about details of the program, available educational materials, and the benefits of energy-saving measures. TRC deploys a mix of marketing tactics to meet program goals based on the available budget. Tactics may include, but are not limited to:

- **Promotional Sales:** TRC and the supplier coordinate with smart thermostat manufacturers to promote products during promotional periods for the OLM. NIPSCO designed these offers to drive sales and progress toward annual goals as well as to increase site visibility through digital marketing campaigns. TRC also offered an additional \$50 incentive for air purifiers in September of 2024.
- **Community Outreach and Events:** TCR promotes the OLM program at various community outreach events in conjunction with other NIPSCO residential energy efficiency programs.
- **E-Mail Campaigns:** TRC sends e-mail campaigns to NIPSCO residential customers to increase program awareness and provide a direct link to the OLM.
- **Social media:** TRC provides catchy, concise messages to NIPSCO to raise awareness and inform customers on accessing the OLM, popular incentives, and links to find more information.
- **Cross-Selling:** TRC utilizes opportunities with customers participating in other programs to market and encourages participation in the OLM program.
- **Website:** The NIPSCO website has a webpage where customers can learn about and access the OLM program.
- **LTOs:** TRC promotes the OLM program throughout the year and runs it in conjunction with manufacturer discounts.

Changes from the 2023 Design

The measures included in the energy-saver kits differed slightly last year from 2023: In 2024 the kits included two smart LEDs rather than one and one nightlight rather than two. In addition, the program added two low-flow showerheads; added a thermostatic shower start; added one smart Wi-Fi thermostat; and did not include an advanced power strip (APS), desk lamps, or the optional recessed downlight retrofit kit. There was also a

free thermostat promotion that took place in August and September of 2024 that provided customers with a free smart thermostat at no cost aside from taxes and shipping (\$16.92 total cost to the customer).

The program's implementer TRC used a new partner (Enervee) in 2024 and ended its partnership with Techniart. The change of partners delayed the program, and the new marketplace did not launch to customers until July of 2024. The new partner helped the program begin transitioning to offer larger appliances and coincided with the removal of several small stand-alone measures.

The program stopped offering the following stand-alone measures on the OLM:

- APS
- Bathroom Aerator 1.0 gpm
- Kitchen Aerator 1.5 gpm
- LED Indoor and Outdoor String Lighting
- LED Light Bulbs
- Low-flow Showerhead and Handheld Showerhead
- Low-flow Showerhead and Handheld Showerhead with ShowerStart
- Pipe Wrap
- ShowerStart
- Smart Plug

The program began offering the following stand-alone measures on the OLM in 2024:

- ENERGY STAR Refrigerator-Freezer
- Advanced Refrigerator and Advanced Refrigerator-Freezer
- ENERGY STAR Clothes Dryer (Electric)
- Advanced Clothes Dryer (Electric)
- ENERGY STAR Clothes Dryer (Electric Heat Pump)
- ENERGY STAR Clothes Washer
- Advanced Clothes Washer

Program Performance

In 2024, the program fell short of its electric energy savings, peak demand savings, and natural gas energy savings goals in part due to its late start in 2024 after a change in vendor partners.⁴¹ The program achieved 37% of its electric energy savings goal, 59% of its peak demand reduction goal, and 40% of its natural gas energy savings goal. Kits and Wi-Fi thermostats drove all electric, demand, and natural gas savings. Kits accounted for 63% of gross electric energy savings, 55% of gross demand savings, and 58% of gross natural gas savings.

The 2024 electric energy savings (*ex post* gross) were 40% lower than 2023 savings, and 2024 peak demand savings (*ex post* gross) were 26% lower than 2023 savings; the program did not claim natural gas savings in

⁴¹ Program goals were not adjusted to account for delayed program start and were higher relative to 2023 in terms of both electric energy savings (92%) and peak demand reduction (117%); the program did not have natural gas energy savings goals in 2023.

2023. Table 179 summarizes savings for the full year of program performance, including program savings goals.

Table 179. 2024 Residential OLM Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVED
Electric Energy Savings (kWh/yr.)	846,059.06	366,001.19	345,965.29	246,934.74	311,804.23	294,475.82	37%
Peak Demand Reduction (kW)	285.712	190.107	197.579	136.506	167.773	159.550	59%
Natural Gas Energy Savings (therms/yr.)	175,974.60	100,447.55	100,449.25	68,101.07	71,029.79	67,826.34	40%

Table 180 outlines the *ex post* and net-to-gross (NTG) adjustment factors. Realization rates reflect differences in how savings were calculated. Though both the *ex post gross* and *ex ante* savings calculations utilized the Illinois TRM v12.0, the evaluation team applied a more rigorous methodology with updated values to the algorithm inputs to calculate the *ex post gross* savings values. *Ex ante* savings relied more heavily on deemed values and included errors within several measure savings calculations. The 2024 NTG ratios of 94% for energy and 95% for peak demand were consistent with 2023 values of 95% and 96%, respectively. (The program did not claim natural gas savings in 2023.)

Table 180. 2024 Residential OLM Program Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	85%	9%	4%	94%
Peak Demand Reduction (kW)	88%	8%	4%	95%
Natural Gas Energy Savings (therms/yr.)	71%	8%	4%	95%

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

Due to its delayed start in July 2024, the program did not spend its allotted budget in 2024, spending 36% of the electric budget and 74% of the natural gas budget (Table 181). Compared to 2023, program expenditures for electric measures decreased by 49%, which aligns with a 51% reduction in the number of kits provided by the program year over year.

Table 181. 2024 Residential OLM Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$518,080.92	\$186,367.18	36%
Natural Gas	\$272,187.74	\$201,215.99	74%

Evaluation Methodology

To inform the 2024 OLM program's impact and process evaluation, the evaluation team completed the following research activities:

- **Program staff interviews and discussions** to understand the program process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program participation data.
- **Engineering analysis** to review the program's savings assumptions and algorithms for reasonableness and accuracy.
- **Free thermostat participant surveys (n=70)** to understand the participant experience in the program and to gather information to calculate in-service, freeridership, and spillover rates for customers who took part in the free thermostat promotion.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop deemed savings estimates? Are there any updates that should be made?
- What are the *ex post* program savings? Do these suggest any needed updates to the program design, delivery, or savings assumptions?
- What are installation rates for free thermostats and kit measures? Are there certain measures that are installed most often? Least often?
- To what extent did the program influence participants' decision-making? What are the program's spillover and freeridership estimates (net savings)?

For all measure types, the evaluation team compared its engineering calculations to NIPSCO's *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: standard engineering practices, the Indiana TRM Workbook v1.0, the Illinois TRM v12, and NIPSCO's program tracking database.

Per the Indiana TRM Workbook v1.0, The Indiana TRM "is intended to be used as an accompaniment to [the Illinois TRM], automatically incorporating the most recent and effective version of the [Illinois] TRM, including measures newly added to the [Illinois] TRM." For each measure, the evaluation team first prioritized the Indiana TRM, which directly references the Illinois TRM for most measures. The team prioritized the VEIC Proposed Indiana Assumptions on the "Code Baseline Measures" tab of the Indiana TRM as a source for baseline assumptions where provided for specific measures. Additionally, the team used the "Weather Zone Mapping" tab to map cities in NIPSCO's territory to the appropriate Illinois city to estimate weather impacts. Where provided, we used coincidence factors from the "Loadshapes" tab of the Indiana TRM.

Audited and Verified Savings

Audited Savings

According to the 2024 tracking data, the program rebated a total of 7,148 units and distributed to 1,815 customers.⁴² The evaluation team audited measure quantities by looking for duplicate records, ensuring measures followed program guidelines and ensuring the correct deemed savings values were applied.

The audit process identified that the program had categorized one smart thermostat measure incorrectly as an air purifier (ENERGY STAR Air Purifier/Cleaner (Smoke CADR $\geq$ 200)). The implementation team made revisions to the tracking data prior to calculation of the scorecard, which correctly added the smart thermostat measure but did not remove the air purifier; as such, we removed one air purifier from the tracking data in the audit stage.

In 2024 the OLM program provided three distinct categories of (non-legacy) Wi-Fi Thermostats: “FREE Wi-Fi Thermostats” (free), “Wi-Fi Thermostats” (purchased), and “Energy Saver Kit – Wi-Fi Thermostats” (Kit). The *ex ante* per-unit deemed savings for the free and purchased wi-fi thermostats do not vary by *delivery method* (free or purchased), only by the types of heating and cooling systems they control (kit thermostats utilize different *ex ante* per-unit deemed savings values altogether). However, different ISRs are applied to the free thermostats than are applied to purchased thermostats, resulting in different per-unit *verified* savings values. Program tracking data does not explicitly differentiate between “free” and “purchased” thermostats: as such, per direction from TRC the evaluation team defined free thermostats as those with installation dates between 8/1/2024 and 9/30/2024 included on invoices #RES-INC-124102 and #RES-INC-124125, and all other (non-kit, non-legacy) thermostats were treated as “purchased” thermostats.

The evaluation team reviewed the *ex ante* savings documentation (“NIPSCO Residential 24-26 program Design v4.4”), which documents measure-level savings for standalone measures and measures included in kits sold through the OLM. This review identified one error in the deemed savings value of the 2024 Energy Saver Kit: The total kwh savings attributed to each kit included the deemed savings for **two** nightlights, while the 2024 kit only included **one** nightlight. This resulted in the audited savings of each kit to be 30.28 kWh lower than the *ex ante* kit savings reported in the tracking data. Overall, this discrepancy is responsible for most of the difference (19,465.90 kWh) in the program’s *ex ante* scorecard savings (366,001.19 kWh) and the audited program savings (345,965.29 kWh); the remaining difference was due to the removal of the air purifier.

Aside from those discrepancies, measure-level and kit-level savings values in the tracking data aligned with NIPSCO’s savings documentation. However, the tracking data reported kit savings at the kit level and used a rounded value, while the design file reported savings both at the kit- and measure-level and used un-rounded values. Throughout the report, the evaluation team split kit items into individual measures to reflect in-service rates (ISRs) and *ex post* gross adjustments, which we applied at the measure level.

Splitting kit items into multiple rows and applying unrounded measure-level savings resulted in a rounding discrepancy, meaning that the sum of total measure savings was slightly off from the tracking data savings. We note these rounding discrepancies where applicable in the rest of this report.

⁴² Individual kit components were counted as individual units, so that one kit accounted for 6 total units.

Verified Savings

The evaluation team prioritized updating ISRs for kit measures and free thermostats in 2024; however, the full participant tracking data for the kits was not available in time to conduct a comprehensive survey effort prior to this report. As such, we only surveyed recipients of the free thermostat promotion and only updated the ISR and NTG values for those measures; we will survey recipients of kit measures in spring of 2025. The evaluation team thus applied the 2023 ISR values to smart thermostats (not provided through the free promotion), air purifiers, smart bulbs, nightlights (kits), and other standalone measures. We updated the ISR for the showerheads provided in the kits and for pipe wrap according to the results of the 2024 Home Energy Analysis program (HEA) participant survey.

Table 182 lists the ISRs for all program-installed measures.

Table 182. 2024 Residential OLM Program ISR Ratios by Measure

MEASURE	EX ANTE ISR	VERIFIED ISR	VERIFIED SOURCE	N ^a
Advanced Refrigerator- Freezer with mounted Freezer Solid Door	100%	100%	IL TRM v12	n/a
ENERGY STAR Air Purifier/Cleaner (Smoke C ADR 100-149)	100%	100%	IL TRM v12	n/a
ENERGY STAR Air Purifier/Cleaner (Smoke C ADR 150-200)	100%	100%	IL TRM v12	n/a
ENERGY STAR Air Purifier/Cleaner (Smoke C ADR >=200)	100%	100%	IL TRM v12	n/a
FREE Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	90% cooling/ 100% heating	58%	2024 Residential OLM participant survey	70
FREE Wi-Fi Thermostat - Electric Cooling & Heating Savings	90%	58%	2024 Residential OLM participant survey	70
FREE Wi-Fi Thermostat - Electric Cooling Only Savings	90%	58%	2024 Residential OLM participant survey	70
FREE Wi-Fi Thermostat - Gas Heating Only Savings	100%	58%	2024 Residential OLM participant survey	70
FREE Wi-Fi Thermostat - Heat Pump Savings	90%	58%	2024 Residential OLM participant survey	70
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	90% cooling/ 100% heating	77%	2023 Residential OLM participant survey	70
Wi-Fi Thermostat - Electric Cooling Only Savings	90%	77%	2023 Residential OLM participant survey	70
Wi-Fi Thermostat - Gas Heating Only Savings	100%	77%	2023 Residential OLM participant survey	70
Energy Saver Kit – Smart LED Bulbs (2)	98%	67%	2023 Residential OLM participant survey	136

MEASURE	EX ANTE ISR	VERIFIED ISR	VERIFIED SOURCE	N ^a
Energy Saver Kit – Nightlight	98%	77%	2023 Residential OLM participant survey	138
Energy Saver Kit – Low-Flow Showerhead – Electric Water Heating	86%	48%	2023 Home Life participant survey	58
Energy Saver Kit – Low-Flow Showerhead – Gas Water Heating	86%	48%	2023 Home Life participant survey	58
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Electric Water Heating	86%	48%	2023 Home Life participant survey	58
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Gas Water Heating	86%	48%	2023 Home Life participant survey	58
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Gas Heating Savings	90% cooling/ 100% heating	77%	2023 Residential OLM participant survey	70
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Heating Savings	90%	77%	2023 Residential OLM participant survey	70
Energy Saver Kit – Wi-Fi Thermostat – Heat Pump Savings	90%	77%	2023 Residential OLM participant survey	70
Energy Saver Kit – Wi-Fi Thermostat – Gas Heating Only Savings	100%	77%	2023 Residential OLM participant survey	70
Advanced Power Strips - Tier 1 - Legacy 2023 Measure	87%	71%	IL TRM v11	n/a
Air Purifier - Legacy 2023 Measure	100%	100%	IL TRM v11	n/a
Bathroom Aerator 1.0 GPM - Legacy 2023 Measure	44%	92%	2022 HEA participant survey	51
Kitchen Aerator 1.5 GPM - Legacy 2023 Measure	44%	93%	2022 HEA participant survey	27
Low-Flow Showerhead with ShowerStart 1.5 GPM - Legacy 2023 Measure	88%	86%	2022 HEA participant survey	58
Smart LED (Jul-Dec 2023) - Legacy 2023 Measure	98%	86%	2022 Residential Lighting program evaluation	n/a
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings - Legacy 2023 Measure	79%	77%	2023 Residential OLM participant survey	70
Wi-Fi Thermostat - Electric Cooling & Heating Savings - Legacy 2023 Measure	79%	77%	2023 Residential OLM participant survey	70
Wi-Fi Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	79%	77%	2023 Residential OLM participant survey	70
Wi-Fi Thermostat - Electric Heating Only Savings - Legacy 2023 Measure	79%	77%	2023 Residential OLM participant survey	70
EE Week Savings Kit - Smart LED Bulb (Jul-Dec 2023) - Legacy 2023 Measure	98%	67%	2023 Residential OLM participant survey	136

MEASURE	EX ANTE ISR	VERIFIED ISR	VERIFIED SOURCE	N ^a
EE Week Savings Kit - Desk Lamp - Legacy 2023 Measure	100%	83%	2023 Residential OLM participant survey	140
EE Week Savings Kit - Nightlights (2) - Legacy 2023 Measure	85%	77%	2023 Residential OLM participant survey	138
EE Week Savings Kit - Tier 2 APS - Legacy 2023 Measure	83%	59%	2023 Residential OLM participant survey	135
EE Week Savings Kit - (2) Add-on - 6" recessed downlight fixture (Jul-Dec 2023) - Legacy 2023 Measure	100%	43%	2023 Residential OLM participant survey	61
Pipe Wrap - Legacy 2023 Measure	88%	93%	2024 HEA/IQW Survey	30

n^a: Sample size for survey ISRs, where applicable

Respondents to the 2024 Residential OLM program participant survey (n=70) received 71 free thermostats (69 respondents received one free thermostat, and one respondent received two). Each survey respondent confirmed that they had received the number of thermostats reported in the tracking data, while only 57% of respondents indicated that they had installed the thermostats, resulting in an ISR of 58%. It is worth noting that the ISRs do not include customers who reported that they plan to install the thermostat in the future: Future research should include follow-up surveys with these customers to confirm whether they installed the measure. These follow-up surveys can be used to inform a “partial ISR,” which NIPSCO can apply to these measures in the future. This will account for the fact that even if a customer does not immediately install a measure, it may still produce meaningful energy savings if installed in the future. The *Process Evaluation* section provides information on why some customers chose not to install the free thermostats that they received.

The evaluation team applied different ISRs to the legacy 2023 standalone APSs and kit APSs based on the belief that time-of-sale ISRs from the Illinois TRM v11 are a better proxy for the standalone APSs than ISRs calculated from kit survey data. Customers buying standalone power strips specifically seek out this measure, while kit purchasers could be motivated by a variety of different measures included in the kit. This methodology aligns with that in 2023 but is a departure in the methodology the evaluation team applied in 2021 and 2022 when survey ISRs for APSs from the kit were applied to all delivery methods.

Kit measures, including the smart LEDs, APSs (those specific to the legacy kits), and desk lamps (legacy kits) also had lower ISRs than *ex ante* calculations, which may be due to respondents being interested in some but not all measures included in the kit. For a few measures, the evaluation team assigned higher verified ISRs compared to *ex ante* calculations: These measures included bathroom and kitchen aerators and pipe wrap.

To calculate the verified savings, the evaluation team replaced the *ex ante* ISR with the verified values. Table 183 summarizes the tracking *ex ante* ISR and associated deemed savings values and compares them to the verified ISR and associated verified per-unit savings values.

Table 183. 2024 Residential OLM Program *Ex Ante* and Verified Gross Per-Unit Savings

MEASURE	UNIT OF MEASURE	EX ANTE ISR	EX ANTE PER-UNIT DEEMED SAVINGS			VERIFIED ISR	VERIFIED GROSS PER-UNIT SAVINGS		
			KWH	KW	THERMS		KWH	KW	THERMS
Advanced Refrigerator (Freezer with mounted Freezer Solid Door)	Fridge	100%	73.90	0.011	-	100%	73.90	0.011	-
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	Purifier	100%	229.00	0.026	-	100%	229.00	0.026	-
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-200)	Purifier	100%	303.00	0.035	-	100%	303.00	0.035	-
ENERGY STAR Air Purifier/Cleaner (Smoke CADR >=200)	Purifier	100%	570.00	0.065	-	100%	570.00	0.065	-
FREE Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	Thermostat	90% cooling /100% heating	97.94	0.173	68.86	58%	63.12	0.111	39.94
FREE Wi-Fi Thermostat - Electric Cooling & Heating Savings	Thermostat	90%	1,436.14	0.088	-	58%	925.51	0.057	-
FREE Wi-Fi Thermostat - Electric Cooling Only Savings	Thermostat	90%	97.94	0.173	-	58%	63.12	0.111	-
FREE Wi-Fi Thermostat - Gas Heating Only Savings	Thermostat	100%	-	-	68.86	58%	-	-	39.94
FREE Wi-Fi Thermostat - Heat Pump Savings	Thermostat	90%	1,469.11	-	-	58%	946.76	-	-
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	Thermostat	90% cooling /100% heating	97.94	0.173	68.86	77%	83.90	0.148	53.09
Wi-Fi Thermostat - Electric Cooling Only Savings	Thermostat	90%	97.94	0.173	-	77%	83.90	0.148	-
Wi-Fi Thermostat - Gas Heating Only Savings	Thermostat	100%	-	-	68.86	77%	-	-	53.09
Energy Saver Kit – Smart LED Bulbs (2)	Smart LED Bulb	98%	3.15	0.000	-	67%	2.15	0.000	-
Energy Saver Kit – Nightlight	Nightlight	98%	60.56	-	-	77%	23.82	-	-
Energy Saver Kit – Low-Flow Showerhead – Electric Water Heating	Showerhead	86%	198.65	0.019	-	48%	110.88	0.011	-
Energy Saver Kit – Low-Flow Showerhead – Gas Water Heating	Showerhead	86%	-	-	8.52	48%	-	-	4.75

MEASURE	UNIT OF MEASURE	EX ANTE ISR	EX ANTE PER-UNIT DEEMED SAVINGS			VERIFIED ISR	VERIFIED GROSS PER-UNIT SAVINGS		
			KWH	KW	THERMS		KWH	KW	THERMS
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Electric Water Heating	Showerhead and ShowerStart	86%	258.39	0.023	-	48%	231.99	0.021	-
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Gas Water Heating	Showerhead and ShowerStart	86%	-	-	11.08	48%	-	-	9.95
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Gas Heating Savings	Thermostat	90% cooling /100% heating	199.90	0.141	60.30	77%	153.92	0.109	46.43
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Heating Savings	Thermostat	90%	1,502.00	0.141	-	77%	1,156.54	0.109	-
Energy Saver Kit – Wi-Fi Thermostat – Heat Pump Savings	Thermostat	90%	788.80	-	-	77%	607.37	-	-
Energy Saver Kit – Wi-Fi Thermostat – Gas Heating Only Savings	Thermostat	100%	-	-	60.30	77%	-	-	46.43
Advanced Power Strips - Tier 1 - Legacy 2023 Measure	Power Strip	71%	89.61	0.010	-	71%	73.13	0.008	-
Air Purifier - Legacy 2023 Measure	Purifier	100%	303.00	0.035	-	100%	303.00	0.035	-
Bathroom Aerator 1.0 GPM - Legacy 2023 Measure	Aerator	44%	14.98	0.001	-	92%	31.31	0.003	-
Kitchen Aerator 1.5 GPM - Legacy 2023 Measure	Aerator	44%	79.24	0.004	-	93%	167.49	0.008	-
Low-Flow Showerhead with ShowerStart 1.5 GPM - Legacy 2023 Measure	Showerhead and ShowerStart	88%	325.34	0.040	-	86%	317.95	0.040	-
Smart LED (Jul-Dec 2023) - Legacy 2023 Measure	Smart LED Bulb	98%	1.88	-	-	86%	1.60	-	-
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings - Legacy 2023 Measure	Thermostat	79%	85.91	0.098	-	77%	83.74	0.095	-
Wi-Fi Thermostat - Electric Cooling & Heating Savings - Legacy 2023 Measure	Thermostat	79%	925.19	0.098	-	77%	904.52	0.095	-

MEASURE	UNIT OF MEASURE	EX ANTE ISR	EX ANTE PER-UNIT DEEMED SAVINGS			VERIFIED ISR	VERIFIED GROSS PER-UNIT SAVINGS		
			KWH	KW	THERMS		KWH	KW	THERMS
Wi-Fi Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	Thermostat	79%	85.91	0.098	-	77%	83.74	0.031	-
Wi-Fi Thermostat - Electric Heating Only Savings - Legacy 2023 Measure	Thermostat	79%	816.44	-	-	77%	795.77	-	-
EE Week Savings Kit - Smart LED Bulb (Jul-Dec 2023) - Legacy 2023 Measure	Smart LED Bulb	98%	1.88	-	-	67%	1.28	-	-
EE Week Savings Kit - Desk Lamp - Legacy 2023 Measure	LED Lamp	100%	10.20	-	-	83%	8.47	-	-
EE Week Savings Kit - Nightlights (2) - Legacy 2023 Measure	Nightlight	85%	2.09	-	-	77%	1.89	-	-
EE Week Savings Kit - Tier 2 APS - Legacy 2023 Measure	Power Strip	83%	96.70	0.018	-	59%	68.74	0.013	-
EE Week Savings Kit - (2) Add-on - 6" recessed downlight fixture (Jul-Dec 2023) - Legacy 2023 Measure	One Fixture	100%	103.07	0.014	-	43%	44.32	0.006	-
Pipe Wrap - Legacy 2023 Measure	Wrap (15ft)	88%	293.71	0.030	-	93%	310.40	0.033	-

Ex Post Gross Savings

The evaluation team reviewed the program's *ex ante* assumptions, sources, and algorithms for reasonableness and updates. Below are detailed *ex post* gross analysis results.

Engineering Reviews

The evaluation team referred to the Illinois TRM v12.0 and the Indiana TRM Workbook (v1.0) to calculate *ex post* gross electric energy savings, demand reduction, and natural gas savings. *Appendix A. Residential OLM Program* contains details on the specific algorithms, variable assumptions, and references for all program measure *ex post* gross calculations.

Through the engineering review, the evaluation team found differences between the *ex ante* and *ex post* gross savings. The following overarching factors primarily drove these differences:

- The evaluation team used Illinois TRM v12.0 algorithms and non-climate-related assumptions to calculate *ex post* savings while *ex ante* savings were calculated using a mixture of the Illinois TRM

v11.0, Illinois TRM v12.0, Illinois TRM v13.0, Indiana TRM v2.2 algorithms and assumptions, and historical EM&V results.

- The evaluation team used the installation zip code to match each customer to the closest city from the Indiana TRM v2.2—for example, South Bend, and Fort Wayne—to more precisely account for variations in climate for parameters in the thermostat measure calculations.
- The evaluation team used updated ISRs for free Wi-Fi thermostats based on the 2024 NIPSCO Residential OLM program participant survey, which adjusted savings across measures.
- For all Wi-Fi thermostats (free, purchased, and kit), the evaluation team used the Illinois TRM v12.0 algorithms and capacity value inputs from the 2024 Home Rebates program evaluation.⁴³

The following sections summarize the team’s findings and recommendations based on the engineering review.

Ex Post Gross Savings Summary

Ex post savings reflect the engineering adjustments made to audited measure savings. The evaluation team calculated *ex post* electric energy, peak demand, and natural gas energy savings for each measure using algorithms and inputs from the Illinois TRM v12.0, the Indiana TRM Workbook v1.0, customer location to account for weather effects, inputs from other NIPSCO programs, and inputs from past evaluation results, as well as survey data when appropriate.

The differences with the largest effect on realization rates between *ex post* and *ex ante* savings are as follows:

- **Advanced Refrigerator:** *Ex ante* energy savings were determined using the Illinois TRM v12.0 savings algorithms and the TRM lookup tables for Product Category #4: *Fridge-Freezer, auto defrost w/ side-mounted freezer without through-the door ice service* row in the TRM lookup table. Based on the model number of the refrigerator sold through the marketplace, this categorization was incorrect and should be Product Category #3. *Ex post* energy savings uses the Illinois TRM v12.0 savings algorithms and the ENERGY STAR Qualified Product List (QPL) to reference the equipment’s model numbers. This QPL lookup determined a different baseline and efficient unit energy consumption, which is the reason for the difference in savings.

Air Purifier: Both *ex ante* and *ex post* energy savings were determined using the Illinois TRM v12.0 and referenced the base Smoke CADR value from the equipment model number in the ENERGY STAR QPL. These differed in energy savings by *ex ante* using this base Smoke CADR value to look up deemed savings values within the TRM tables. We determined *ex post* energy savings from the TRM algorithm, which used the base Smoke CADR value to look up several variables.

Wi-Fi Thermostat: Several factors contribute to the difference in *ex ante* and *ex post* gross savings. Major differences in savings were due to the difference in ISR values, while the evaluation team attributes more minor differences in savings to the use of outdated and incorrect variables, as well as misrepresented electric heating energy savings. We explain these below:

⁴³ To more accurately calculate *ex post* gross savings for all non-legacy Wi-Fi Thermostats, the evaluation team used capacity values from the NIPSCO 2024 Home Rebates program. These capacity values referenced were specific to central air conditioners and air source heat pump HVAC measures within the program’s impact workbook and were given a weighted average based on participation. These values were used as the OLM program did not provide capacity data, and the IL TRM v12 provides one single-family value to use.

- The 2024 (non-legacy) Wi-Fi thermostats were broken into three categories: “FREE Wi-Fi Thermostats” (free), “Wi-Fi Thermostats” (purchased), and “Energy Saver Kit – Wi-Fi Thermostats” (Kit). The evaluation team assigned the free thermostats an ISR of 58%, calculated from the 2024 OLM program participant survey, while we assigned the purchased and kit thermostats an ISR of 77%, calculated from the 2023 OLM participant survey. *Ex ante* savings calculations used ISR values between 90% and 100% from Illinois TRM v12.0.
 - The evaluation team calculated *ex post gross* savings for each measure using the customers’ respective zip code locations, which we then mapped from Indiana to Illinois cities using the Indiana TRM Workbook v1.0. The team did this for several location-based variables such as Elec_Heat_Consumption, Gas_Heat_Consumption, and Full Load Cooling Hours (FLH). *Ex ante* savings mapped weather-based inputs only to the city of Chicago.
 - *Ex ante* energy savings report zero electric energy heating savings for any gas heating households. However, according to the Illinois TRM v12.0, gas heating households carry therms savings through the electric energy heating savings equation in the form of energy savings. Therefore, *ex post* savings include electric energy savings for all gas heating households.
 - *Ex ante* peak demand reduction savings used the wrong variable for all Thermostat categories (free, purchased, and kit) with the measure categorization: **Smart Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings**. For all free and purchased thermostats with this categorization, *ex ante* demand savings used a Cooling_Reduction value of 0.084 from the Illinois TRM v12.0 instead of the correct Cooling_DemandReduction value of 0.164. For all kit thermostats with this categorization, *ex ante* demand savings used a Cooling_Reduction value of 0.096 from the Illinois TRM v13.0 instead of the correct Cooling_DemandReduction value of 0.164. *Ex post* demand savings were determined using the correct Cooling_DemandReduction value from the Illinois TRM v12.0.
 - *Ex ante* energy savings use an EFLHc value of 429 from the 2022 EM&V report for free and purchased thermostats and use an EFLHc value of 709 from the Illinois TRM v13.0 for kit thermostats. These values are different from the Illinois TRM v12.0 FLH values and are used in the following free, purchased, and kit thermostat categorizations:
 - Wi-Fi Programmable Thermostat - Electric Cooling and Gas Heating Savings
 - Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings
 - Wi-Fi Programmable Thermostat - Electric Cooling Only Savings
 - Wi-Fi Programmable Thermostat - Heat Pump Savings
- **Energy Saver Kit - Smart LEDs:** *Ex ante* energy savings were determined using the Illinois TRM v13.0 savings algorithms, while the evaluation team determined *ex post* energy savings using the Illinois TRM v12.0. The main difference in savings came from *ex post* savings incorporating the Heating Penalty equation when the home used electric heating. *Ex ante* savings does not incorporate the Heating Penalty equation from the Illinois TRM v13.0.
- **Energy Saver Kit - Nightlight LEDs:** *Ex ante* energy savings were determined using the Illinois TRM v13.0 savings algorithms and mistakenly used a quantity of two nightlights per kit, thus doubling savings. The evaluation team determined *ex post* energy savings using the Illinois TRM v12.0 and

accounted for only one nightlight per kit. *Ex post* savings also incorporated the Heating Penalty equation, as referenced above.

The difference in savings came from *ex post* savings incorporating this corrected quantity as well as the Heating Penalty equation.

- **Pipe Wrap – 2023 Legacy Measure:** *Ex ante* energy savings were determined using the outdated Residential Program Design v2.4 file, which uses algorithms and inputs from the IN TRM v2.2 and EM&V 2021 Report. The evaluation team determined *ex post* gross savings using the Illinois TRM v12.0 and product specification sheets. Differences in savings values occurred due to *ex ante* using a deemed existing R-value from the IN TRM v2.2, instead of the actual R-value of the pipe insulation according to the manufacturer spec sheet. *Ex ante* savings also incorporated an ISR value of 88% compared to the *ex post* value of 93%.

Table 184 shows the *ex ante* deemed savings and *ex post* gross per-unit savings for 2024 Residential OLM program measures. *Ex ante* assumptions sometimes include deemed savings values from the TRM, whereas *ex post* gross per-unit savings calculations use the TRM algorithms or ENERGY STAR QPL. This report explains these differences in greater detail in Table 184, below.

Table 184. 2024 Residential OLM Program *Ex Ante* and *Ex Post* Gross Per-Unit Savings Values

MEASURE	UNIT OF MEASURE	EX ANTE PER-UNIT SAVINGS			EX POST GROSS PER-UNIT SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Advanced Refrigerator-							
Freezer with mounted Freezer Solid Door	Fridge	73.90	0.011	0.00	45.33	0.007	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	Purifier	229.00	0.026	0.00	307.27	0.035	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-200)	Purifier	303.00	0.035	0.00	386.93	0.044	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR >=200)	Purifier	570.00	0.065	0.00	736.33	0.084	0.00
FREE Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	Thermostat	97.94	0.173	68.86	138.02	0.109	39.91
FREE Wi-Fi Thermostat - Electric Cooling & Heating Savings	Thermostat	1,436.14	0.088	0.00	922.82	0.108	0.00
FREE Wi-Fi Thermostat - Electric Cooling Only Savings	Thermostat	97.94	0.173	0.00	94.06	0.109	0.00
FREE Wi-Fi Thermostat - Gas Heating Only Savings	Thermostat	0.00	0.000	68.86	36.44	0.000	39.61
FREE Wi-Fi Thermostat - Heat Pump Savings	Thermostat	1,469.11	0.000	0.00	552.40	0.071	0.00
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	Thermostat	97.94	0.173	68.86	183.99	0.145	53.03

MEASURE	UNIT OF MEASURE	EX ANTE PER-UNIT SAVINGS			EX POST GROSS PER-UNIT SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Wi-Fi Thermostat - Electric Cooling Only Savings	Thermostat	97.94	0.173	0.00	135.41	0.145	0.00
Wi-Fi Thermostat - Gas Heating Only Savings	Thermostat	0.00	0.000	68.86	48.87	0.000	53.12
Energy Saver Kit - Smart LED Bulb	Smart LED Bulb	3.15	0.000	0.00	2.02	0.000	0.00
Energy Saver Kit - Nightlight	Nightlight	60.56	0.000	0.00	23.87	0.000	0.00
Energy Saver Kit - Low-Flow Showerhead - Electric Water Heating	Showerhead	198.65	0.019	0.00	128.96	0.013	0.00
Energy Saver Kit - Low-Flow Showerhead - Gas Water Heating	Showerhead	0.00	0.00	8.52	0.00	0.000	5.53
Energy Saver Kit - Low-Flow Showerhead with ShowerStart - Electric Water Heating	Showerhead and ShowerStart	258.39	0.023	0.00	169.64	0.042	0.00
Energy Saver Kit - Low-Flow Showerhead with ShowerStart - Gas Water Heating	Showerhead and ShowerStart	0.00	0.000	11.08	0.00	0.000	7.28
Energy Saver Kit - Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	Thermostat	199.90	0.141	60.30	183.40	0.145	53.05
Energy Saver Kit - Wi-Fi Thermostat - Electric Cooling & Heating Savings	Thermostat	1,502.00	0.141	0.00	1,226.32	0.143	0.00
Energy Saver Kit - Wi-Fi Thermostat - Heat Pump Savings	Thermostat	788.80	0.000	0.00	730.64	0.095	0.00
Energy Saver Kit - Wi-Fi Thermostat - Gas Heating Only Savings	Thermostat	0.00	0.000	60.30	48.31	0.000	52.51
Advanced Power Strips - Tier 1 - Legacy 2023 Measure	Power Strip	89.61	0.010	0.00	73.13	0.005	0.00
Air Purifier - Legacy 2023 Measure	Purifier	303.00	0.035	0.00	243.40	0.028	0.00
Bathroom Aerator 1.0 GPM - Legacy 2023 Measure	Aerator	14.98	0.001	0.00	17.39	0.001	0.00
Kitchen Aerator 1.5 GPM - Legacy 2023 Measure	Aerator	79.24	0.004	0.00	169.77	0.005	0.00
Low-Flow Showerhead with ShowerStart 1.5 GPM - Legacy 2023 Measure	Showerhead and ShowerStart	325.34	0.040	0.00	199.42	0.032	0.00

MEASURE	UNIT OF MEASURE	EX ANTE PER-UNIT SAVINGS			EX POST GROSS PER-UNIT SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Smart LED (Jul-Dec 2023) - Legacy 2023 Measure	Smart LED Bulb	1.88	0.000	0.00	2.12	0.002	0.00
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings - Legacy 2023 Measure	Thermostat	85.91	0.098	0.00	154.44	0.230	0.00
Wi-Fi Thermostat - Electric Cooling & Heating Savings - Legacy 2023 Measure	Thermostat	925.19	0.098	0.00	848.76	0.230	0.00
Wi-Fi Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	Thermostat	85.91	0.098	0.00	111.43	0.230	0.00
Wi-Fi Thermostat - Electric Heating Only Savings - Legacy 2023 Measure	Thermostat	816.44	0.000	0.00	729.24	0.000	0.00
EE Week Savings Kit - Smart LED Bulb (Jul-Dec 2023) - Legacy 2023 Measure	Smart LED Bulb	1.88	0.000	0.00	1.69	0.001	0.00
EE Week Savings Kit - Desk Lamp - Legacy 2023 Measure	LED Lamp	10.20	0.000	0.00	4.86	0.002	0.00
EE Week Savings Kit - Nightlight - Legacy 2023 Measure	Nightlight	2.09	0.000	0.00	23.82	0.000	0.00
EE Week Savings Kit - Tier 2 APS - Legacy 2023 Measure	Power Strip	96.70	0.018	0.00	68.73	0.013	0.00
EE Week Savings Kit - (2) Add-on - 6" recessed downlight fixture (Jul-Dec 2023) - Legacy 2023 Measure	One Fixture	103.07	0.014	0.00	0.00	0.000	0.00
Pipe Wrap - Legacy 2023 Measure	Wrap (15ft)	293.71	0.030	0.00	686.63	0.078	0.00

Table 185 highlights notable differences between *ex ante* and *ex post* gross estimates. The table explains the differences for Wi-Fi thermostats by breaking them out by heating and cooling type but represents assumptions for free, purchased, and kit thermostats, unless otherwise specified.

Table 185. 2024 Residential OLM Program Notable Differences Between *Ex Ante* and *Ex Post* Gross

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Advanced Refrigerator	IL TRM v12.0; assumed category #4, 429.8 UECbase and 418.9 UECee in TRM lookup table	IL TRM v12.0; assumed UECbase & UECee based on ENERGY STAR QPL from unit model number	<i>Ex ante</i> miscategorized variables in TRM lookup table; <i>ex post</i> uses ENERGY STAR QPL values.
Air Purifier	IL TRM v12.0 deemed values	IL TRM v12.0 lookup tables and ENERGY STAR QPL	<i>Ex ante</i> uses deemed savings values; <i>ex post</i> uses the TRM algorithm.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	IL TRM v12.0 and 2022 EM&V; assumed zero electric heating energy savings. Assumed values for EFLHc and Capacity from EM&V 2022 Report.	IL TRM v12.0; incorporated electric heating energy savings, based off the IL TRM v12.0 algorithm which dictated therms savings to be carried through. Assumed IL TRM v12.0 FLH value based on location, and average Single-Family Capacity from the 2024 Home Rebates evaluation.	<i>Ex ante</i> used several outdated variables from the 2022 EM&V in energy savings calculation and did not include electric heating energy savings; <i>ex post</i> used more recent inputs from the IL TRM v12.0 and NIPSCO Home Rebates program evaluation and incorporated electric heating energy savings.
Wi-Fi Thermostat - Electric Cooling & Heating Savings	IL TRM v12.0; energy savings assumed EFLHc from EM&V 2022 Report. Demand savings used Cooling_Reduction instead of Cooling_DemandReduction, which is used in the IL TRM v12.0 algorithm. Assumed Capacity from EM&V 2022 Report.	IL TRM v12.0; energy savings assumed FLH based on location. Capacity used an average of HVAC unit capacities from the 2024 Home Rebates evaluation.	<i>Ex ante</i> used outdated sources and one incorrect cooling reduction input in energy and demand savings calculations; <i>ex post</i> corrected the cooling reduction input. Used an averaged Capacity value from HVAC equipment from the 2024 Home Rebates evaluation.
Wi-Fi Thermostat - Electric Cooling Only Savings	IL TRM v12.0; energy savings assumed EFLHc and Capacity from EM&V 2022 Report.	IL TRM v12.0; energy savings assumed FLH based on location. Assumed average Single-Family Capacity from the 2024 Home Rebates evaluation.	<i>Ex ante</i> used several outdated variables from the 2022 EM&V in energy savings calculation. <i>Ex post</i> used more recent inputs from the IL TRM v12.0 and NIPSCO Home Rebates program evaluation.
Wi-Fi Thermostat - Gas Heating Only Savings	IL TRM v12.0; assumed zero electric heating and cooling energy savings.	IL TRM v12.0; incorporated electric heating energy savings, based off the IL TRM v12.0 algorithm which dictated therms savings to be carried through.	<i>Ex ante</i> energy savings did not include electric heating energy savings, while <i>ex post</i> incorporated these savings.
Wi-Fi Thermostat - Heat Pump Savings	IL TRM v12, IL TRM v13, 2022 EM&V, and 2023 EM&V; assumed %AC=0 which gave zero electric heating energy savings and demand savings. FREE Thermostats used variables from v12.0 and 2022 sources. Assumed fixed value for Electric_Heat_Consumption.	IL TRM v12.0; assumed %AC=1 which incorporated electric heating energy savings and demand savings. Both FREE and Purchased Thermostats used IL TRM v12.0 based variables. Used location based TRM match for Electric_Heat_Consumption.	<i>Ex ante</i> assumed %AC=0, used outdated sources, and applied one incorrect cooling reduction input in energy and demand savings calculations; <i>ex post</i> corrected the cooling reduction input.
Energy Saver Kit – Smart LED Bulbs (2)	IL TRM v13.0; energy savings calculation excluded heat penalty equation, which does not align with IL TRM v12.0 or v13.0.	IL TRM v12.0; energy savings calculation included heat penalty equation, which aligns with IL TRM v12.0.	<i>Ex ante</i> energy savings did not include electric heating energy savings, while <i>ex post</i> did incorporate these savings.

MEASURE	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Energy Saver Kit – Nightlight	IL TRM v13.0; assumed 2-lamps per kit	IL TRM v12.0; assumed 1-lamp per kit	<i>Ex ante</i> savings calculation assumed two lamps per kit when there was only one; <i>ex post</i> was adjusted to account for one lamp per kit.
Energy Saver Kit – Low-Flow Showerhead	IL TRM v13.0; assumed 2.62 ppl/house	IL TRM v12.0; assumed 2.42 ppl/house	Difference in household assumptions between the two TRM versions led to higher <i>ex post</i> savings.
Energy Saver Kit – Low-Flow Showerhead with ShowerStart	IL TRM v13.0; assumed 2.62 ppl/house	IL TRM v12.0; assumed 2.42 ppl/house	Difference in household assumptions between the two TRM versions led to higher <i>ex post</i> savings.
Energy Saver Kit – Wi-Fi Thermostat	IL TRM v13.0 and 2023 EM&V; assumed zero electric savings for all gas heating households, used variables from v13.0 and 2023 sources.	IL TRM v12.0; incorporated electric heating energy savings, based off the IL TRM v12.0 algorithm which dictated therms savings to be carried through.	<i>Ex ante</i> energy savings did not include electric heating energy savings, while <i>ex post</i> did incorporate these savings.
Pipe Wrap	IN TRM v2.2, and 2021 EM&V; assumed R_exist=1.0.	IL TRM v12.0; assumes ISR=93% and R_exist=0.521 from lookup tables and specification documentation, which was found using tracking data model numbers.	<i>Ex post</i> uses specific values from tracking data model numbers while <i>ex ante</i> uses general values from an outdated IN TRM v2.2.

Water Heater Saturation

During the OLM checkout process, the platform asks customers to specify their water heating type, and this determines whether the customer receives savings for the measure. Therefore, *ex ante* saturation rates were assumed to be 100%. The evaluation team was able to use this customer self-report information to assign 100% saturation rates to the *ex post* calculations for electric and gas water-heating measures.

Waste Heat Factor – Therm Penalties

The evaluation team did not include therm penalties when calculating evaluated savings for the 2024 HEA program. However, cost-effective results for both the gas and electric programs will include these penalties. The evaluation team believes this approach is appropriate as it accounts for the penalty on the electric side (where it is generated) and allows the evaluation team to show gas program performance and measure performance more clearly.

These values are not included in the *ex post* analysis, and the evaluation team is reporting these below to be used in the cost-effectiveness analysis. *Ex ante* savings for LED kit add-on packs did not include therm penalties. In total, the *ex post* therm penalty for cost-effectiveness analysis was -213.62 therms (Table 186).

For the lighting measures within the Energy Saver Kit (smart LED and nightlight), there was a heating fuel designation in the tracking data, so the evaluation team assigned therm penalties accordingly.

Table 186. 2024 Residential OLM Program Waste Heat Factor Therm Penalty

MEASURE	EX POST WASTE HEAT FACTOR THERM PENALTY
Energy Saver Kit – Smart LED Bulbs (2)	(198.29)
Energy Saver Kit – Nightlight	(15.33)
Total	(213.62)

Realization Rates

The next three tables (Table 187 through Table 189) show the program's *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms. All 2023 legacy measures have the same realization rates as their respective measures from the last program year. The 2024 measures with the highest realization rates were Wi-Fi thermostats, kit smart LEDs, and kit nightlights. *Ex ante* savings calculations that used incorrect inputs and did not account for electric savings in gas heated households impacted the Wi-Fi thermostats' realization rates. In addition, when calculating *ex post* gross savings, the team used two different ISR values for free and purchased Wi-Fi thermostats. Kit LED's and kit nightlights have low realization rates due to a lower audited quantity and the *ex ante* savings equations not incorporating a heating penalty.

Table 187. 2024 Residential OLM Program *Ex Ante* and *Ex Post* Gross Electric Energy Savings

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)
Advanced Refrigerator-Freezer with mounted Freezer Solid Door	221.70	221.70	221.70	136.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	1,145.00	1,145.00	1,145.00	1,536.33
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-200)	303.00	303.00	303.00	386.93
ENERGY STAR Air Purifier/Cleaner (Smoke CADR >=200)	4,560.00	3,990.00	3,990.00	5,154.34
FREE Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	42,799.78	42,799.78	27,582.12	60,314.61
FREE Wi-Fi Thermostat - Electric Cooling & Heating Savings	8,616.84	8,616.84	5,553.07	5,536.89
FREE Wi-Fi Thermostat - Electric Cooling Only Savings	293.82	293.82	189.35	282.17
FREE Wi-Fi Thermostat - Gas Heating Only Savings	0.00	0.00	0.00	9,183.64
FREE Wi-Fi Thermostat - Heat Pump Savings	1,469.11	1,469.11	946.76	552.40
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	3,036.14	3,036.14	2,600.96	5,703.79
Wi-Fi Thermostat - Electric Cooling Only Savings	97.94	97.94	83.90	135.41
Wi-Fi Thermostat - Gas Heating Only Savings	0.00	0.00	0.00	684.16
Energy Saver Kit – Smart LED Bulbs (2)	4,050.90	4,050.90	2,764.90	2,596.15
Energy Saver Kit – Nightlight	38,941.55	19,470.77	15,314.09	15,345.54
Energy Saver Kit – Low-Flow Showerhead – Electric Water Heating	8,740.79	8,740.79	4,878.58	5,674.12

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)
Energy Saver Kit – Low-Flow Showerhead – Gas Water Heating	0.00	0.00	0.00	0.00
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Electric Water Heating	11,369.09	11,369.09	10,207.75	7,464.07
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Gas Water Heating	0.00	0.00	0.00	0.00
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Gas Heating Savings	114,742.14	114,742.14	88,351.44	105,269.38
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Heating Savings	7,509.98	7,509.98	5,782.69	6,131.61
Energy Saver Kit – Wi-Fi Thermostat – Heat Pump Savings	3,943.99	3,943.99	3,036.87	3,653.20
Energy Saver Kit – Wi-Fi Thermostat – Gas Heating Only Savings	0.00	0.00	0.00	2,850.08
Advanced Power Strips - Tier 1 - Legacy 2023 Measure	268.83	268.83	219.39	219.39
Air Purifier - Legacy 2023 Measure	5,151.00	5,151.00	5,151.00	4,137.78
Bathroom Aerator 1.0 GPM - Legacy 2023 Measure	89.88	89.88	187.86	104.36
Kitchen Aerator 1.5 GPM - Legacy 2023 Measure	158.48	158.48	334.98	339.55
Low-Flow Showerhead with ShowerStart 1.5 GPM - Legacy 2023 Measure	1,301.36	1,301.36	1,271.80	797.69
Smart LED (Jul-Dec 2023) - Legacy 2023 Measure	1.88	1.88	1.60	2.12
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings - Legacy 2023 Measure	7,044.62	7,044.62	6,866.68	12,664.19
Wi-Fi Thermostat - Electric Cooling & Heating Savings - Legacy 2023 Measure	2,775.57	2,775.57	2,713.56	2,546.29
Wi-Fi Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	171.82	171.82	167.48	222.87
Wi-Fi Thermostat - Electric Heating Only Savings - Legacy 2023 Measure	3,265.76	3,265.76	3,183.08	2,916.96
EE Week Savings Kit - Smart LED Bulb (Jul-Dec 2023) - Legacy 2023 Measure	721.92	721.92	491.52	650.11
EE Week Savings Kit - Desk Lamp - Legacy 2023 Measure	3,916.80	3,916.80	3,252.48	1,866.81
EE Week Savings Kit - Nightlights (2) - Legacy 2023 Measure	1,602.33	1,605.12	1,451.52	18,291.17
EE Week Savings Kit - Tier 2 APS - Legacy 2023 Measure	37,130.88	37,132.80	26,396.16	26,394.24
EE Week Savings Kit - (2) Add-on - 6" recessed downlight fixture (Jul-Dec 2023) - Legacy 2023 Measure	49,677.33	49,677.33	21,362.24	0.00
Pipe Wrap - Legacy 2023 Measure	881.13	881.13	931.20	2,059.89

MEASURE	EX ANTE ^a ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)
Total Savings	366,001.19	345,965.29	246,934.74	311,804.23
Total Program Realization Rate				85%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

^a *Ex ante* savings in the tracking data do not report savings at the individual measure level for kits, creating rounding errors, therefore only the summary of savings is included.

Table 188. 2024 Residential OLM Program *Ex Ante* and *Ex Post* Gross Peak Demand Reduction

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Advanced Refrigerator-Freezer with mounted Freezer Solid Door	0.033	0.033	0.033	0.020
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	0.130	0.130	0.130	0.175
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-200)	0.035	0.035	0.035	0.044
ENERGY STAR Air Purifier/Cleaner (Smoke CADR >=200)	0.520	0.455	0.455	0.588
FREE Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	75.601	75.601	48.654	47.487
FREE Wi-Fi Thermostat - Electric Cooling & Heating Savings	0.528	0.528	0.342	0.647
FREE Wi-Fi Thermostat - Electric Cooling Only Savings	0.519	0.519	0.334	0.326
FREE Wi-Fi Thermostat - Gas Heating Only Savings	0.000	0.000	0.000	0.000
FREE Wi-Fi Thermostat - Heat Pump Savings	0.000	0.000	0.000	0.071
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	5.363	5.363	4.588	4.480
Wi-Fi Thermostat - Electric Cooling Only Savings	0.173	0.173	0.148	0.145
Wi-Fi Thermostat - Gas Heating Only Savings	0.000	0.000	0.000	0.000
Energy Saver Kit – Smart LED Bulbs (2)	1.193	1.193	0.408	0.389
Energy Saver Kit – Nightlight	0.000	0.000	0.000	0.000
Energy Saver Kit – Low-Flow Showerhead – Electric Water Heating	0.830	0.830	0.463	0.583
Energy Saver Kit – Low-Flow Showerhead – Gas Water Heating	0.000	0.000	0.000	0.000
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Electric Water Heating	1.012	1.012	0.931	1.860
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Gas Water Heating	0.000	0.000	0.000	0.000

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Gas Heating Savings	81.177	81.177	62.506	82.957
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Heating Savings	0.707	0.707	0.544	0.717
Energy Saver Kit – Wi-Fi Thermostat – Heat Pump Savings	0.000	0.000	0.000	0.474
Energy Saver Kit – Wi-Fi Thermostat – Gas Heating Only Savings	0.000	0.000	0.000	0.000
Advanced Power Strips - Tier 1 - Legacy 2023 Measure	0.030	0.030	0.024	0.015
Air Purifier - Legacy 2023 Measure	0.595	0.595	0.595	0.473
Bathroom Aerator 1.0 GPM - Legacy 2023 Measure	0.006	0.006	0.018	0.006
Kitchen Aerator 1.5 GPM - Legacy 2023 Measure	0.008	0.008	0.016	0.011
Low-Flow Showerhead with ShowerStart 1.5 GPM - Legacy 2023 Measure	0.160	0.160	0.160	0.127
Smart LED (Jul-Dec 2023) - Legacy 2023 Measure	0.000	0.000	0.000	0.002
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings - Legacy 2023 Measure	8.036	8.036	7.790	18.868
Wi-Fi Thermostat - Electric Cooling & Heating Savings - Legacy 2023 Measure	0.294	0.294	0.285	0.690
Wi-Fi Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	0.196	0.196	0.062	0.460
Wi-Fi Thermostat - Electric Heating Only Savings - Legacy 2023 Measure	0.000	0.000	0.000	0.000
EE Week Savings Kit - Smart LED Bulb (Jul-Dec 2023) - Legacy 2023 Measure	0.000	0.000	0.000	0.337
EE Week Savings Kit - Desk Lamp - Legacy 2023 Measure	0.000	0.000	0.000	0.764
EE Week Savings Kit - Nightlights (2) - Legacy 2023 Measure	0.000	0.000	0.000	0.000
EE Week Savings Kit - Tier 2 APS - Legacy 2023 Measure	6.912	6.912	4.992	4.821
EE Week Savings Kit - (2) Add-on - 6" recessed downlight fixture (Jul-Dec 2023) - Legacy 2023 Measure	6.748	13.496	2.892	0.000
Pipe Wrap - Legacy 2023 Measure	0.090	0.090	0.099	0.235
Total Savings	190.896	197.579	136.506	167.773
Total Program Realization Rate				88%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

^a Ex ante savings in the tracking data do not report savings at the individual measure level for kits, creating rounding errors, therefore only the summary of savings is included.

Table 189. 2024 Residential OLM Program *Ex Ante* and *Ex Post* Gross Natural Gas Savings

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/ YR.)	AUDITED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/ YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS /YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS /YR.)
Advanced Refrigerator-Freezer with mounted Freezer Solid Door	0.00	0.00	0.00	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	0.00	0.00	0.00	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-200)	0.00	0.00	0.00	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR >=200)	0.00	0.00	0.00	0.00
FREE Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	30,091.82	30,091.82	17,452.64	17,439.09
FREE Wi-Fi Thermostat - Electric Cooling & Heating Savings	0.00	0.00	0.00	0.00
FREE Wi-Fi Thermostat - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
FREE Wi-Fi Thermostat - Gas Heating Only Savings	17,352.72	17,352.72	10,064.22	9,982.00
FREE Wi-Fi Thermostat - Heat Pump Savings	0.00	0.00	0.00	0.00
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	2,134.66	2,134.66	1,645.76	1,643.98
Wi-Fi Thermostat - Electric Cooling Only Savings	0.00	0.00	0.00	0.00
Wi-Fi Thermostat - Gas Heating Only Savings	964.04	964.04	743.25	743.63
Energy Saver Kit – Smart LED Bulbs (2)	0.00	0.00	0.00	0.00
Energy Saver Kit – Nightlight	0.00	0.00	0.00	0.00
Energy Saver Kit – Low-Flow Showerhead – Electric Water Heating	0.00	0.00	0.00	0.00
Energy Saver Kit – Low-Flow Showerhead – Gas Water Heating	5,101.12	5,101.12	2,847.14	3,311.41
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Electric Water Heating	0.00	0.00	0.00	0.00
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Gas Water Heating	6,634.99	6,634.99	5,957.23	4,361.51
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Gas Heating Savings	34,612.20	34,612.20	26,651.39	30,450.32
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Heating Savings	0.00	0.00	0.00	0.00
Energy Saver Kit – Wi-Fi Thermostat – Heat Pump Savings	0.00	0.00	0.00	0.00
Energy Saver Kit – Wi-Fi Thermostat – Gas Heating Only Savings	3,557.70	3,557.70	2,739.43	3,097.84
Advanced Power Strips - Tier 1 - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Air Purifier - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Bathroom Aerator 1.0 GPM - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Kitchen Aerator 1.5 GPM - Legacy 2023 Measure	0.00	0.00	0.00	0.00

MEASURE	EX ANTE ^a NATURAL GAS ENERGY SAVINGS (THERMS/ YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/ YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS /YR.)	EX POST GROSS NATURAL GAS ENERGY SAVINGS (THERMS /YR.)
Low-Flow Showerhead with ShowerStart 1.5 GPM - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Smart LED (Jul-Dec 2023) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Wi-Fi Thermostat - Electric Cooling & Heating Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Wi-Fi Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Wi-Fi Thermostat - Electric Heating Only Savings - Legacy 2023 Measure	0.00	0.00	0.00	0.00
EE Week Savings Kit - Smart LED Bulb (Jul-Dec 2023) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
EE Week Savings Kit - Desk Lamp - Legacy 2023 Measure	0.00	0.00	0.00	0.00
EE Week Savings Kit - Nightlights (2) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
EE Week Savings Kit - Tier 2 APS - Legacy 2023 Measure	0.00	0.00	0.00	0.00
EE Week Savings Kit - (2) Add-on - 6" recessed downlight fixture (Jul-Dec 2023) - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Pipe Wrap - Legacy 2023 Measure	0.00	0.00	0.00	0.00
Total Savings	100,449.25	100,449.25	68,101.07	71,029.79
Total Program Realization Rate				71%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent Audited values, since the scorecard provides only savings totals.

Ex Post Net Savings

The team estimated freeridership and spillover for free Wi-Fi thermostats distributed in 2024 using survey data collected from participants. Details on the free Wi-Fi thermostats freeridership and spillover analysis are in *Free Thermostat Promotion Freeridership and Spillover Analysis*. Table 190 shows the NTG ratios by measure for surveyed measures only.

Table 190. 2024 Residential OLM Program NTG Ratios by Measure (Surveyed Measures)

MEASURE	RESPONSES (N)	FREERIDERSHIP ^a	PARTICIPANT SPILLOVER	NTG
Free Wi-Fi Thermostats	40	7%	0%	93%

^a Freeridership score is an average weighted by *ex post* gross MMBtu savings.

The 2024 Residential OLM participant survey only surveyed for free Wi-Fi thermostats. For all other measures, if the evaluation team had surveyed those measures in 2021, 2022, or 2023, we used those participant survey results for 2024 NTG values. For advanced refrigerator, air purifier, and shower timer measures, the evaluation team applied NTG values from secondary source literature reviews.⁴⁴ For smart LED bulbs where we have not yet surveyed respondents, the evaluation team applied the overall program-level NTG ratios, developed from measures with 2021-2024 survey respondents, weighted by *ex post* gross population savings. For 2023 legacy measures where we have not yet surveyed respondents, the evaluation team applied the overall 2023 program-level NTG ratios, developed from measures with 2021-2023 survey respondents, weighted by 2023 *ex post* gross population savings. Table 191 shows the NTG ratio applied by measure for all program measures.

Table 191. Residential OLM Program NTG Ratios by Measure

MEASURE	FREERIDERSHIP ^a	SPILLOVER	NTG	SOURCE
Advanced Refrigerator	45%	0%	55%	2024 Lit Review
ENERGY STAR Air Purifier/Cleaner (Smoke CADR >=200)	22%	0%	78%	2024 Lit Review
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	22%	0%	78%	2024 Lit Review
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-200)	22%	0%	78%	2024 Lit Review
FREE Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	7%	0%	93%	2024 Res OLM survey
FREE Wi-Fi Thermostat - Electric Cooling & Heating Savings	7%	0%	93%	2024 Res OLM survey
FREE Wi-Fi Thermostat - Electric Cooling Only Savings	7%	0%	93%	2024 Res OLM survey
FREE Wi-Fi Thermostat - Gas Heating Only Savings	7%	0%	93%	2024 Res OLM survey
FREE Wi-Fi Thermostat - Heat Pump Savings	7%	0%	93%	2024 Res OLM survey
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	9%	5%	96%	2023 Res OLM survey
Wi-Fi Thermostat - Electric Cooling Only Savings	9%	5%	96%	2023 Res OLM survey
Wi-Fi Thermostat - Gas Heating Only Savings	9%	5%	96%	2023 Res OLM survey
Energy Saver Kit – Smart LED Bulbs (2)	10%	4%	94%	OLM overall electric weighted average

⁴⁴ This review covered documents published in the last two years consisting of OLM NTG studies, TRMs, and Cadmus evaluation plans. We calculated NTG values based on an average of the following sources: ComEd (2023), Ameren (2024), PPL (2024), PSE&G (2025), CA e-TRM (2024), and NJ TRM (2023).

MEASURE	FREERIDERSHIP ^a	SPILLOVER	NTG	SOURCE
Energy Saver Kit – Nightlight	14%	5%	91%	2023 Res OLM survey values
Energy Saver Kit – Low-Flow Showerhead – Electric Water Heating	8%	10%	102%	2023 Home Life survey
Energy Saver Kit – Low-Flow Showerhead – Gas Water Heating	8%	10%	102%	2023 Home Life survey
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Electric Water Heating	8%	10%	102%	2023 Home Life survey
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Gas Water Heating	8%	10%	102%	2023 Home Life survey
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Gas Heating Savings	9%	5%	96%	2023 Res OLM survey ⁴⁵
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Heating Savings	9%	5%	96%	2023 Res OLM survey
Energy Saver Kit – Wi-Fi Thermostat – Heat Pump Savings	9%	5%	96%	2023 Res OLM survey
Energy Saver Kit – Wi-Fi Thermostat – Gas Heating Only Savings	9%	5%	96%	2023 Res OLM survey
Advanced Power Strips - Tier 1 - Legacy 2023 Measure	10%	5%	95%	OLM overall electric weighted average
Air Purifier - Legacy 2023 Measure	10%	5%	95%	OLM overall electric weighted average
Bathroom Aerator 1.0 GPM - Legacy 2023 Measure	17%	7%	90%	2021 Res OLM survey values
Kitchen Aerator 1.5 GPM - Legacy 2023 Measure	17%	7%	90%	2021 Res OLM survey values
Low-Flow Showerhead with ShowerStart 1.5 GPM - Legacy 2023 Measure	27%	7%	80%	2021 Res OLM survey values
Smart LED (Jul-Dec 2023) - Legacy 2023 Measure	10%	5%	95%	OLM overall electric weighted average
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings - Legacy 2023 Measure	9%	5%	96%	2023 Res OLM survey values
Wi-Fi Thermostat - Electric Cooling & Heating Savings - Legacy 2023 Measure	9%	5%	96%	2023 Res OLM survey values
Wi-Fi Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	9%	5%	96%	2023 Res OLM survey values

⁴⁵ Program data was not available in time to survey kit recipients for this evaluation. Therefore, the 2024 Res OLM Free Thermostat NTG analysis values were applied (2023 Res OLM survey).

MEASURE	FREERIDERSHIP ^a	SPILLOVER	NTG	SOURCE
Wi-Fi Thermostat - Electric Heating Only Savings - Legacy 2023 Measure	9%	5%	96%	2023 Res OLM survey values
EE Week Savings Kit - Smart LED Bulb (Jul-Dec 2023) - Legacy 2023 Measure	8%	5%	97%	2023 Res OLM survey values
EE Week Savings Kit - Desk Lamp - Legacy 2023 Measure	10%	5%	95%	2023 Res OLM survey values
EE Week Savings Kit - Nightlights (2) - Legacy 2023 Measure	14%	5%	91%	2023 Res OLM survey values
EE Week Savings Kit - Tier 2 APS - Legacy 2023 Measure	9%	5%	96%	2023 Res OLM survey values
EE Week Savings Kit - (2) Add-on - 6" recessed downlight fixture (Jul-Dec 2023) - Legacy 2023 Measure	n/a	n/a	n/a	2023 Res OLM survey values
Pipe Wrap - Legacy 2023 Measure	8%	0%	92%	2024 HEA survey

Resulting Net Savings

Table 192 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 192. 2024 Residential OLM Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Advanced Refrigerator- Freezer with mounted Freezer Solid Door	136.00	0.020	0.00	55%	74.80	0.011	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 100-149)	1,536.33	0.175	0.00	78%	1,198.34	0.137	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR 150-200)	386.93	0.044	0.00	78%	301.80	0.034	0.00
ENERGY STAR Air Purifier/Cleaner (Smoke CADR >=200)	5,154.34	0.588	0.00	78%	4,020.39	0.459	0.00
FREE Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	60,314.61	47.487	17,439.09	93%	56,092.58	44.163	16,218.35
FREE Wi-Fi Thermostat - Electric Cooling & Heating Savings	5,536.89	0.647	0.00	93%	5,149.31	0.602	0.00
FREE Wi-Fi Thermostat - Electric Cooling Only Savings	282.17	0.326	0.00	93%	262.41	0.303	0.00
FREE Wi-Fi Thermostat - Gas Heating Only Savings	9,183.64	0.000	9,982.00	93%	8,540.79	0.000	9,283.26
FREE Wi-Fi Thermostat - Heat Pump Savings	552.40	0.071	0.00	93%	513.73	0.066	0.00

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings	5,703.79	4.480	1,643.98	96%	5,475.64	4.301	1,578.22
Wi-Fi Thermostat - Electric Cooling Only Savings	135.41	0.145	0.00	96%	129.99	0.139	0.00
Wi-Fi Thermostat - Gas Heating Only Savings	684.16	0.000	743.63	96%	656.79	0.000	713.89
Energy Saver Kit – Smart LED Bulbs (2)	2,596.15	0.389	0.00	94% ^b	2,446.20	0.366	0.00
Energy Saver Kit – Nightlight	15,345.54	0.000	0.00	91%	13,964.44	0.000	0.00
Energy Saver Kit – Low-Flow Showerhead – Electric Water Heating	5,674.12	.583	0.00	102%	5,787.60	0.595	0.00
Energy Saver Kit – Low-Flow Showerhead – Gas Water Heating	0.00	0.000	3,311.41	102%	0.00	0.000	3,377.64
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Electric Water Heating	7,464.07	1.860	0.00	102%	7,613.36	1.897	0.00
Energy Saver Kit – Low-Flow Showerhead with ShowerStart – Gas Water Heating	0.00	0.000	4,361.51	102%	0.00	0.000	4,448.75
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Gas Heating Savings	105,269.38	82.957	30,450.32	96%	101,058.61	79.639	29,232.30
Energy Saver Kit – Wi-Fi Thermostat – Electric Cooling & Heating Savings	6,131.61	0.717	0.00	96%	5,886.34	0.688	0.00
Energy Saver Kit – Wi-Fi Thermostat – Heat Pump Savings	3,653.20	0.474	0.00	96%	3,507.07	0.455	0.00
Energy Saver Kit – Wi-Fi Thermostat – Gas Heating Only Savings	2,850.08	0.000	3,097.84	96%	2,736.07	0.000	2,973.93
Advanced Power Strips - Tier 1 - Legacy 2023 Measure	219.39	0.015	0.00	95% ^a	207.50	0.015	0.00
Air Purifier - Legacy 2023 Measure	4,137.78	0.473	0.00	95% ^a	3,913.47	0.447	0.00
Bathroom Aerator 1.0 GPM - Legacy 2023 Measure	104.36	0.006	0.00	90%	93.93	0.006	0.00
Kitchen Aerator 1.5 GPM - Legacy 2023 Measure	339.55	0.011	0.00	90%	305.59	0.010	0.00
Low-Flow Showerhead with ShowerStart 1.5 GPM - Legacy 2023 Measure	797.69	0.127	0.00	80%	638.15	0.102	0.00
Smart LED (Jul-Dec 2023) - Legacy 2023 Measure	2.12	0.002	0.00	95% ^a	2.00	0.002	0.00
Wi-Fi Thermostat - Electric Cooling & Gas Heating Savings - Legacy 2023 Measure	12,664.19	18.868	0.00	96%	12,157.62	18.113	0.00

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Wi-Fi Thermostat - Electric Cooling & Heating Savings - Legacy 2023 Measure	2,546.29	0.690	0.00	96%	2,444.44	0.663	0.00
Wi-Fi Thermostat - Electric Cooling Only Savings - Legacy 2023 Measure	222.87	0.460	0.00	96%	213.95	0.442	0.00
Wi-Fi Thermostat - Electric Heating Only Savings - Legacy 2023 Measure	2,916.96	0.000	0.00	96%	2,800.28	0.000	0.00
EE Week Savings Kit - Smart LED Bulb (Jul-Dec 2023) - Legacy 2023 Measure	650.11	0.337	0.00	97%	630.60	0.327	0.00
EE Week Savings Kit - Desk Lamp - Legacy 2023 Measure	1,866.81	0.764	0.00	95%	1,773.47	0.726	0.00
EE Week Savings Kit - Nightlights (2) - Legacy 2023 Measure	18,291.17	0.000	0.00	91%	16,644.96	0.000	0.00
EE Week Savings Kit - Tier 2 APS - Legacy 2023 Measure	26,394.24	4.821	0.00	96%	25,338.47	4.628	0.00
EE Week Savings Kit - (2) Add-on - 6" recessed downlight fixture (Jul-Dec 2023) - Legacy 2023 Measure	0.00	0.000	0.00	98%	0.00	0.000	0.00
Pipe Wrap - Legacy 2023 Measure	2,059.89	0.253	0.00	92%	1,895.10	0.216	0.00
Total Savings	311,804.23	167.773	71,029.79		294,475.82	159.550	67,826.34

Note: Totals may not sum properly due to rounding.

^aUses 2023 OLM overall electric weighted average of 95%

^bUses 2024 OLM overall electric weighted average of 94%

Table 193 shows the NTG results for each fuel.

Table 193. 2024 Residential OLM Program NTG Results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	366,001.19	311,804.23	94%	294,475.82
Peak Demand Reduction (kW)	190.107	167.773	95%	159.550
Natural Gas Energy Savings (therms/yr.)	100,447.55	71,029.79	95%	67,826.34

Process Evaluation

The evaluation team sought to administer surveys to recipients of free thermostats and kit measures in 2024; however, we did not have access to participant tracking data for the kits in time to conduct a survey prior to this report. As such, we only surveyed customers who participated in the free thermostat promotion; we will survey recipients of kit measures in the spring of 2025.

The evaluation team administered a participant survey to answer the following research questions:

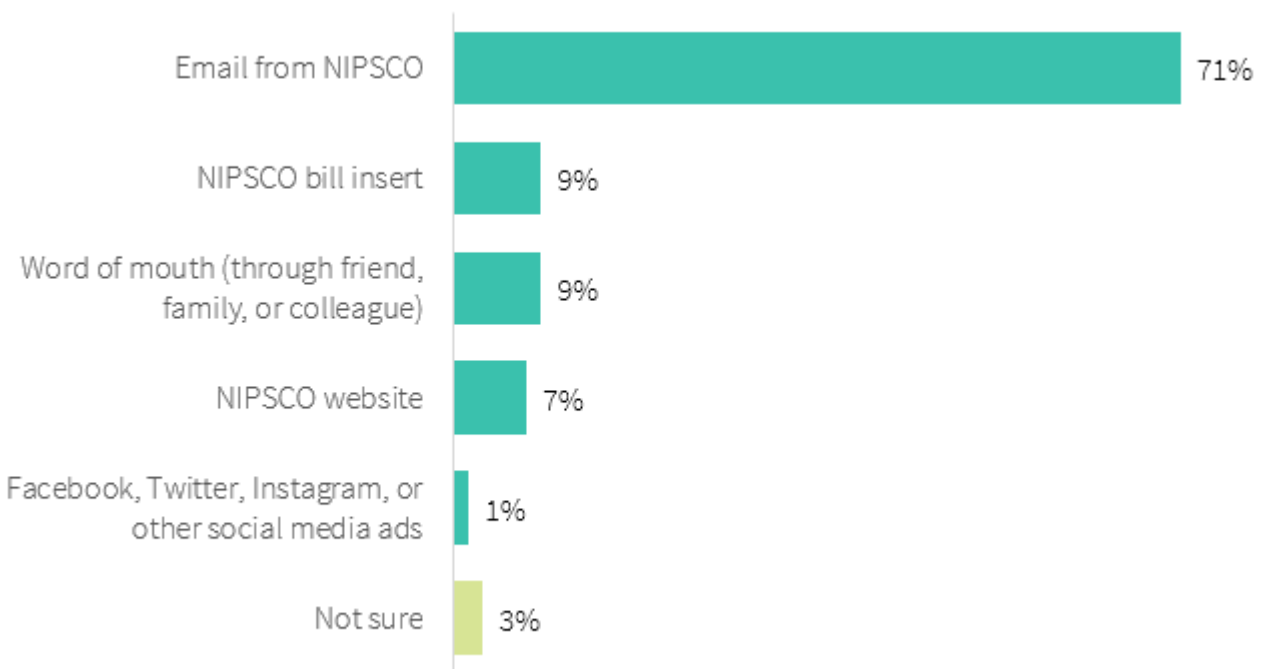
- How did customers learn about the free thermostat and kit promotions?
- For those who did not install the products, why didn't they install them?
- How satisfied are customers with the OLM?

To answer these research questions, the evaluation team completed a survey of participants in the free thermostat promotion (n=70) to understand customers' experiences with the marketplace and thermostats and their satisfaction with the program, as well as to inform impacts inputs. The team administered the survey via phone and online, with 53 respondents (76%) completing the survey over the phone, and 17 completing the survey online.

Energy Efficiency Awareness and Marketing

TRC's strategy to promote the Residential OLM program relies on mass marketing methods such as bill inserts, email campaigns, social media campaigns, community outreach, and cross promotions. The majority of survey respondents (71%) reported that they learned about NIPSCO's OLM via email campaigns from NIPSCO, while respondents also named bill inserts (9%), and the NIPSCO website (7%) as sources of program awareness (Figure 69). Aside from NIPSCO's own promotional efforts, 9% of survey respondents reported they learned about the program via word of mouth.

Figure 69. 2024 Residential OLM Program: Free Thermostat Promotion Sources of Awareness

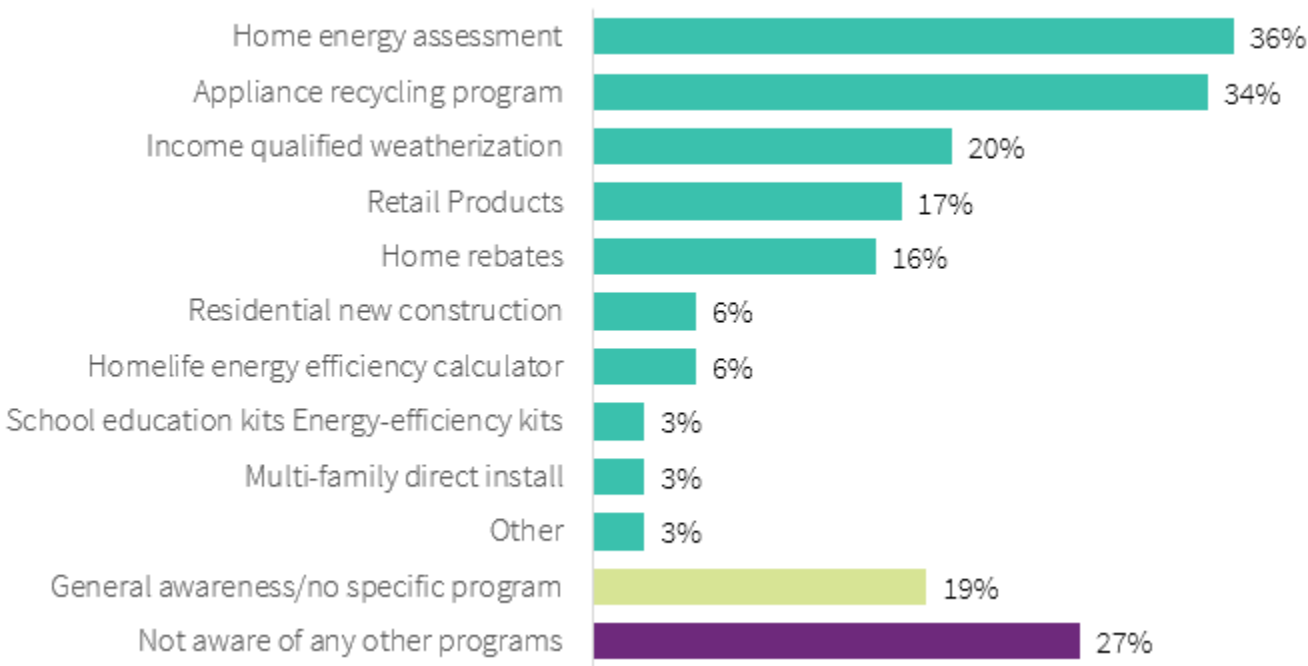


Source: Residential OLM Program Participant Survey Question C1. "How did you learn about NIPSCO's free thermostat promotion?" (n=70).

The majority of survey respondents (73%) indicated that they were aware of at least one other energy efficiency program offered by NIPSCO, while 27% of respondents expressed that they were not aware of any

other NIPSCO programs (Figure 70).⁴⁶ Survey respondents expressed the greatest awareness of the HEA program (36%) and the Appliance Recycling program (34%), with relatively fewer respondents reporting awareness of the Income-Qualified Weatherization (20%), Retail Products (17%), and Home Rebates (16%) programs. Nineteen percent of respondents indicated they were aware that other programs existed but were unable to name them or provide any specific details, while the two respondents who responded “other” mentioned awareness of programs for “bathroom fans” (one respondent) or “lights/lighting” (one respondent).

Figure 70. Awareness of Other NIPSCO Programs



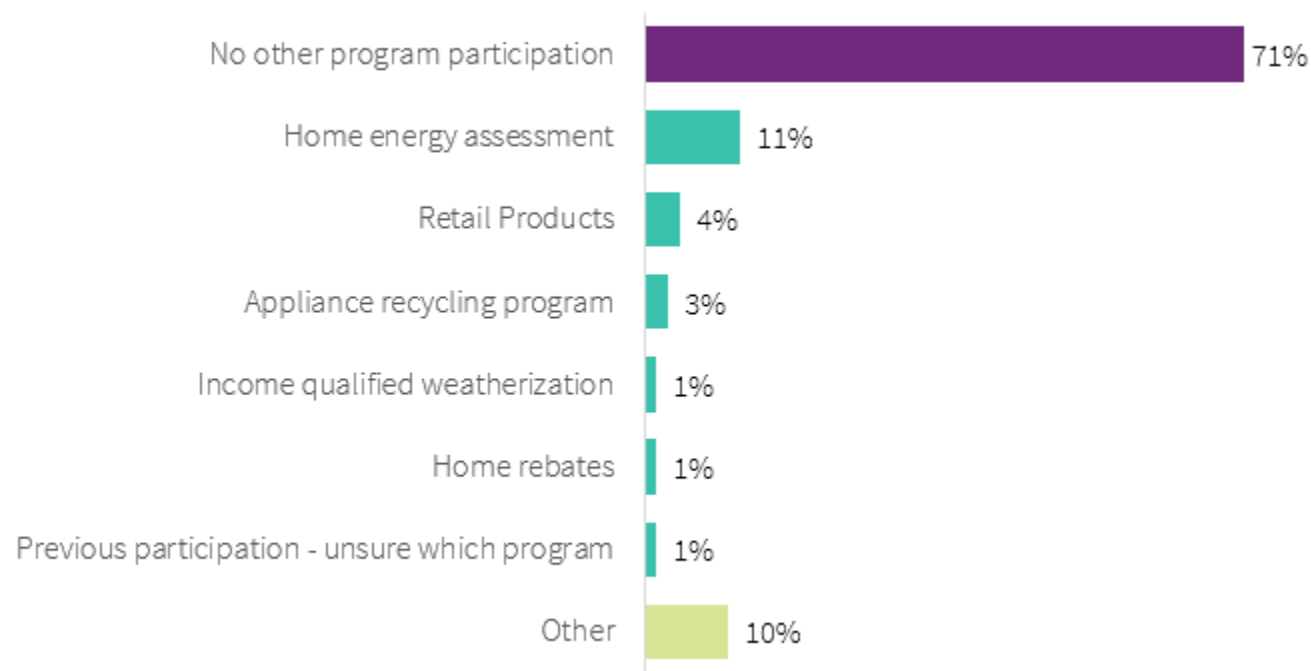
Sources: Residential OLM Program Participant Survey Question C2. “Besides the Free thermostat promotion, are you aware that NIPSCO offers other energy efficiency programs?” (n=70), and Question C3. “What energy efficiency programs are you aware of?” (n=51).

While survey respondents reported high awareness of NIPSCO’s other program offerings, they did not report high participation; most respondents (71%) indicated that they had not participated in any programs besides the free thermostat promotion.⁴⁷ Overall, respondents most frequently reported they had participated in the HEA program (11%), while fewer respondents reported they had participated in either the Retail Products program (4%), Appliance Recycling program (3%), Income-Qualified Weatherization program (1%), or Home Rebates program (1%). Respondents who reported that they participated in “other” programs indicated they received rebates for specific measures, including HVAC (three respondents), light bulbs (three respondents), insulation (two respondents), or power strips (two respondents).

⁴⁶ The 2023 OLM Participant survey found that 74% of respondents were aware of other NIPSCO programs.

⁴⁷ The 2023 OLM Participant survey found that 36% of respondents had participated in another NIPSCO program.

Figure 71: Participation in Other NIPSCO Programs



Sources: Residential OLM program Participant Survey Question C4. “Besides the Free thermostat promotion, have you participated in any other NIPSCO energy efficiency programs?” (n=70), and Question C5. “What energy efficiency programs have you participated in?” (n=20). All percentages are based off the total number of survey respondents (n=70).

Equipment Installation

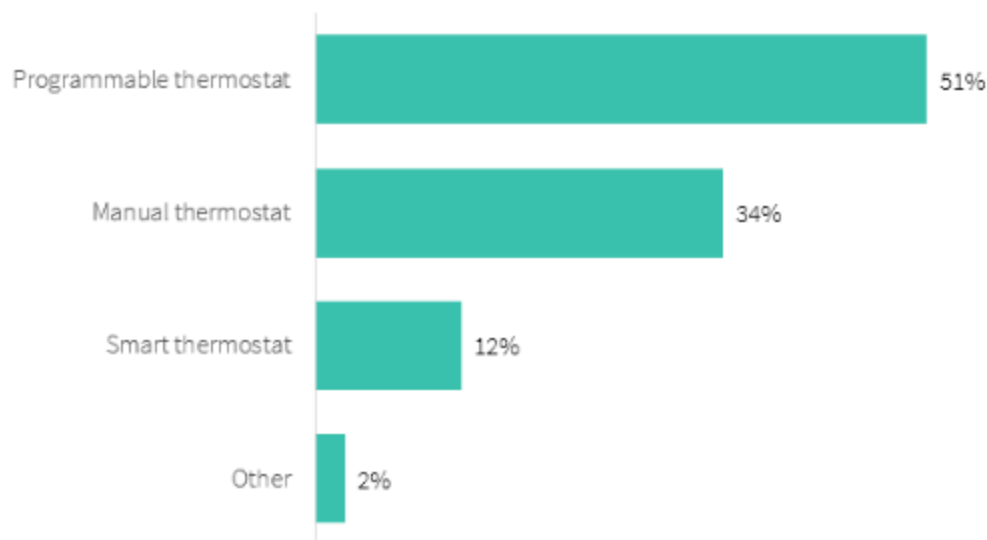
Among the 70 survey respondents, 69 received one free thermostat, while one respondent received two. Each survey respondent confirmed that they had received the number of thermostats reported in the tracking data. Overall, 57% of respondents indicated that they had installed the thermostats, resulting in an ISR of 58% (Table 194).

Table 194. Free Thermostat Promotion ISR

SURVEY RESPONDENTS	THERMOSTATS RECEIVED	THERMOSTATS INSTALLED	ISR
70	71	41	58%

Concerning the existing thermostats that the new thermostats replaced, 51% were programmable thermostats, 34% were manual thermostats, and 12% were smart thermostats (Figure 72); the respondent who reported “other” stated that the new thermostat “replaced a new HBA system.”

Figure 72. Existing Thermostat Types



Source: Residential OLM program Participant Survey Question E6. “Which of the following best describes your old thermostat? This would be the one you replaced with the new smart thermostat you bought from the Online Marketplace” (n=41).

Among the 30 respondents who did not install their thermostats, 73% expressed that they plan to do so in the future. The ISR (58%) does not include these customers who reported that they plan to install the thermostat in the future. Future research should include follow-up surveys with these customers to confirm whether they did install the measure. NIPSCO can use these follow-up surveys to inform a “partial ISR” that it can apply to these measures in the future. This would account for the fact that even if a customer does not immediately install a measure, it can still produce meaningful energy savings in the future.

Survey respondents who did not express an intention to install the smart thermostat in the future (n=8) commonly noted the equipment did not work/was not compatible with their home (n=4), while two respondents expressed concerns over data security/privacy. The full extent of respondents’ reasons for not installing their thermostat are provided below (one respondent for each reason):

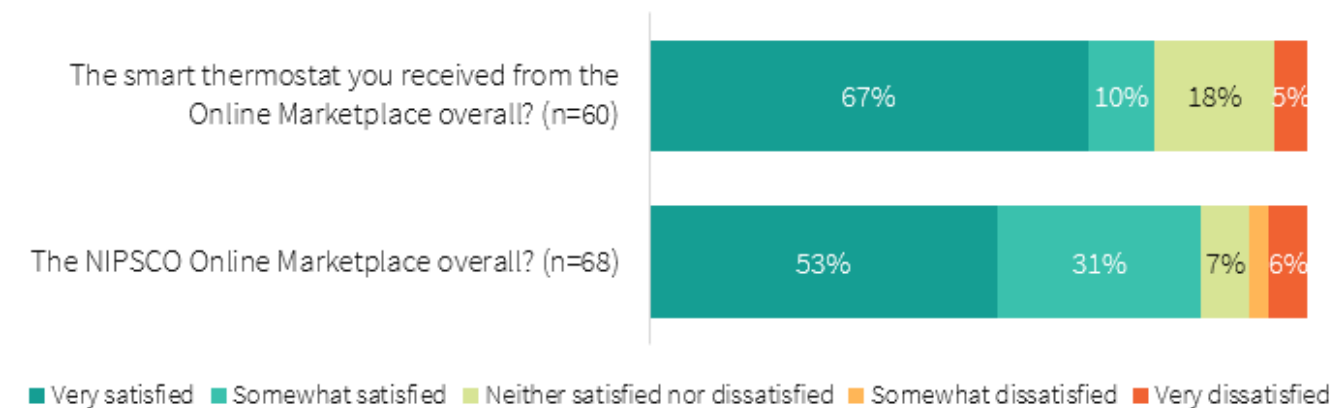
- “Wasn’t compatible with HVAC equipment”
- “Thermostat would not connect to “gas” through Wi-Fi.”
- “It did not work”
- “Not compatible with house”
- “Already had a thermostat of similar or higher efficiency”
- “Didn’t like the appearance”
- “I have heard that energy companies will mess with your thermostat remotely, even with[out] your consent.”
- “Wary of signing up online to initiate service. Too much personal data to surrender.”

Satisfaction with Program and NIPSCO

Overall Program Satisfaction

Overall, survey respondents expressed relatively high levels of satisfaction with the smart thermostat they received, as 77% indicated they were either “very satisfied” or “somewhat satisfied,” and only 5% reported they were either “somewhat dissatisfied” or “very dissatisfied.” Survey respondents also reported high levels of satisfaction with the NIPSCO OLM overall as 84% of respondents indicated they were either “very satisfied” or “somewhat satisfied;” however, some survey respondents also reported lower levels of satisfaction with the OLM overall, as 9% reported they were either “somewhat dissatisfied” or “very dissatisfied.”

Figure 73. 2024 Residential OLM Program: Free Thermostat Promotion Satisfaction



Source: Residential OLM program Participant Survey Questions E10. “How satisfied or dissatisfied are you with the smart thermostat you received from the Online Marketplace overall?” (n=60) ⁴⁸ & H2. “How satisfied are you with the NIPSCO Online Marketplace overall?” (n=68) ⁴⁹; 10 and 2 respondents indicated “Not sure” to E10 and H2 respectively and were removed from the analysis of these questions.

When elaborating on the reasons for their dissatisfaction with the thermostat, survey respondents most often indicated that they have not used it or installed it yet (five respondents), with one of those respondents indicating that they have been unable to find someone to remove their old thermostat. Three respondents reported that the new thermostat does not work, either expressing difficulty connecting to the app or getting the thermostat to connect to their Wi-Fi. One respondent each stated their dissatisfaction was because the thermostat ultimately was not free (when including shipping fees), that they had not seen any energy savings, that they received the wrong color/wrong order, or that they are simply “not big on technology (and) use it like a normal thermostat.”

⁴⁸ 10 Respondents answered “Not sure” to this question and were removed from the analysis.

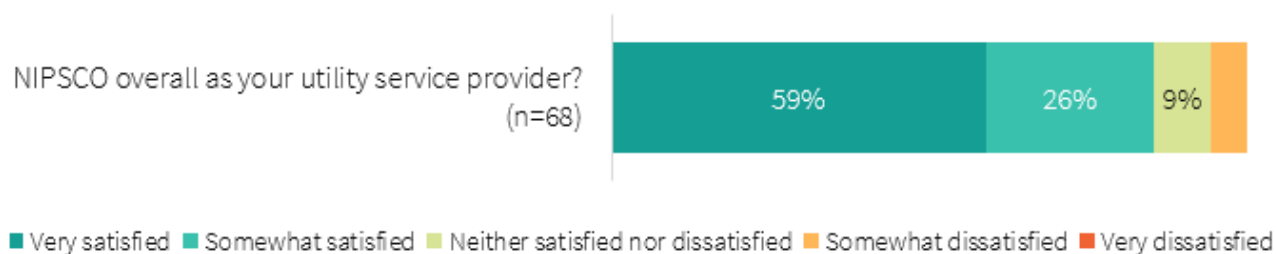
⁴⁹ 2 Respondents answered “Not sure” to this question and were removed from the analysis.

Regarding the marketplace overall, three survey respondents reported that the marketplace would not accept their order, and they had to contact someone for assistance. Three respondents expressed that they have no strong feelings about the marketplace, either good or bad, as they only used it once. One respondent noted that the initial email looked like a phishing attempt as it directed them to the OLM rather than the NIPSCO website, and one respondent indicated that there was no one to contact about receiving the wrong order.

NIPSCO Satisfaction

Overall, 85% of survey respondents reported that they were either “somewhat satisfied” or “very satisfied” with NIPSCO on the whole as their utility service provider. No survey respondents reported they were “very dissatisfied;” however, 6% of respondents reported that they were “somewhat dissatisfied,” and 9% of respondents reported that they were “neither satisfied nor dissatisfied.” Of respondents who did not report satisfaction with NIPSCO (n=10), three cited cost/high bills, two reported a lack of options or competition, one person mentioned power outages, one person expressed they don’t believe NIPSCO is improving their facilities/generation capacity, and one respondent expressed frustration that they cannot get their power lines buried; two respondents did not provide an explanation for their response.

Figure 74: Satisfaction with NIPSCO



Source: Residential OLM program Participant Survey Questions H5. “How satisfied or dissatisfied are you with the smart thermostat you received from the Online Marketplace overall?” (n=68)

Suggestions for Improvement

We asked survey respondents to provide recommendations to help improve NIPSCO’s OLM program. The most common suggestions were related to improvements to the website, with four respondents explicitly mentioning website navigation:

- “When I first logged in...I made an error, and it stated I was not eligible, so I had to fix my error and get my account number to get access. It was not quite as [straightforward.]”
- “I pay my bill online and having to bounce back and forth from other portals is [so] extremely painful that I almost didn't do it. A hyper link that [autofills] information for me is important for me.”
- “It was difficult to navigate the website. Make that easier [and] straightforward.”
- “Navigation, how to get around it.”
- “List available rebates.”
- “The navigation to find out if any of the appliances are covered and not worth the hassle.” (providing context to a low satisfaction rating)
- “Consolidate all programs to one spot.”

Two survey respondents recommended improvements to program marketing, including:

- “Just reminding people it is there since I forgot about it.”
- “If they send out marketing [campaign, it] needs to look like it is coming from NIPSCO.”

One survey respondent expressed dissatisfaction that NIPSCO marketed the thermostat as being free, but they still had to pay shipping fees:

- “If you advertise something as being free, don't charge outrageous shipping and handling fees.”

One respondent provided suggestions for additional measures the marketplace could offer:

- “Keep up with the trends. For example, how many USB charging ‘cubes’ are left plugged in all the time? A simpler, smart device would know when it is being used and throttle back or shut off when detecting nothing connected. Garage EV smart chargers should be part of this program, helping owners transition from inefficient and ineffective 120v charging to much more efficient (and manipulative as electric fraud demand increases) 240v smart charging. Very pleased to see NIPSCO offering this program and hope to see it expand accordingly with new usage and consumer products.”

Finally, one respondent indicated they would like to be able to extend the offer to their tenants:

- “It would be useful to do this for my tenants.”

Participant Survey Demographics

Most respondents (94%) live in a single-family home, and 96% own their home. The household size of survey respondents was mostly two (45%) or three (17%), and the largest proportion of respondents had lived in their homes for more than 10 years (43%). Respondents' homes varied in age, though almost a quarter of homes (24%) were built in 2005 or later.

Most respondents were born between 1960 and 1979 (36%) or born between 1940 and 1959 (33%). Most respondents (82%) identified as white, and almost all respondents (91%) primarily speak English at home. Most respondents reported an annual household income of \$100,000 to under \$150,000 (24%) or \$50,000 to under \$75,000 (24%).

The following table (Table 195) contains details on the demographic characteristics of survey respondents.

Table 195. 2024 Residential OLM Program Participant Survey Demographics

DEMOGRAPHICS	PERCENTAGE
Home Ownership (n=68)	
Own	96%
Rent	3%
Other	1%
Type of Residence (n=67)	
Single-family detached home	94%
Multi-Family apartment or condo building (with 4 or more units)	1%
Attached house (townhouse, row house, or twin)	3%

DEMOGRAPHICS	PERCENTAGE
Mobile or manufactured home	1%
Years Lived in Current Home (n=68)	
One year or less	9%
2-3 years	16%
4-5 years	16%
6-10 years	16%
More than 10 years	43%
Number of People in the Home (n=65)	
One	14%
Two	45%
Three	17%
Four	15%
Five or more	9%
Year Home Built (n=68)	
Before 1900	1%
1900 to 1939	7%
1940 to 1959	12%
1960 to 1979	19%
1980 to 1989	4%
1990 to 1999	15%
2000 to 2004	12%
2005 or later	24%
Not Sure	6%
Birth Year (n=61)	
2000 to 2004	2%
1990 to 1999	11%
1980 to 1989	18%
1940 to 1959	33%
1960 to 1979	36%
Ethnicity (n=61)	
Asian (for example, Chinese, Filipino, Asian Indian, Vietnamese, Korean, or Japanese)	2%
Hispanic, Latino, or Spanish origin (for example, Mexican or Mexican American, Puerto Rican, Cuban, Salvadorian, Dominic	7%

DEMOGRAPHICS	PERCENTAGE
Black or African American (for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, or Somali)	10%
White (for example, German, Irish, English, Italian, Polish, or French)	82%
Primary Language (n=70)	
Other	1%
Spanish	4%
Prefer not to answer	6%
English	91%
Household Income (n=51)	
Not sure	4%
\$25,000 to under \$35,000	4%
\$35,000 to under \$50,000	8%
Under \$25,000	8%
Over \$150,000	12%
\$75,000 to under \$100,000	18%
\$100,000 to under \$150,000	24%
\$50,000 to under \$75,000	24%
\$100,000 to under \$150,000	24%
\$50,000 to under \$75,000	24%

Source: Participant survey. Questions: "What type of residence do you live in?" "Do you own or rent your residence?" "How many years have you lived in your current home?" "Including yourself, how many people live in your home?" "When was your home built?"

Conclusions and Recommendations

CONCLUSION 1: THE PROGRAM FELL SHORT OF ITS ELECTRIC ENERGY SAVINGS, PEAK DEMAND SAVINGS, AND NATURAL GAS ENERGY SAVINGS GOALS IN PART DUE TO ITS LATE START IN 2024 AFTER A CHANGE IN VENDOR PARTNERS.

The program implementer TRC used a new partner (Enervee) in 2024 and ended the partnership with the previous program partner (Techniart). This change in partnership caused program delays, and the new marketplace did not launch to customers until July of 2024. NIPSCO did not adjust program goals to account for the delayed program start and were in fact higher relative to 2023 in terms of both electric energy savings (92% higher) and peak demand reduction (117% higher). The program did not have natural gas energy savings goals in 2023. Relative to 2023, the program achieved 40% less electric energy savings and 26% lower peak demand savings in 2024. The combination of increased savings goals and lower achieved savings contributed to the program falling short of the 2024 goals, as the program achieved 37% of its electric energy goal, 59% of its peak demand reduction goal, and 40% of its natural gas energy savings goal.

Kits and Wi-Fi thermostats predominantly drove the program's electric, demand reduction, and natural gas savings. Kits accounted for 63% of gross electric energy savings, 55% of gross demand savings, and 58% of gross natural gas savings. Wi-Fi thermostats accounted for 32% of gross electric energy savings, 44% of gross demand savings, and 42% of gross natural gas savings. The 2024 electric energy savings (*ex post* gross) were 40% lower than 2023 savings, and 2024 peak demand savings (*ex post* gross) were 26% lower than 2023 savings. The program did not claim natural gas savings in 2023.

CONCLUSION 2: OVERALL, FREE THERMOSTAT RECIPIENTS EXPRESSED RELATIVELY HIGH LEVELS OF SATISFACTION WITH THE SMART THERMOSTAT THEY RECEIVED AND THE NIPSCO OLM OVERALL.

The majority of survey respondents were satisfied with the smart thermostat they received, as 77% indicated they were either "very satisfied" or "somewhat satisfied," and only 5% reported they were either "somewhat dissatisfied" or "very dissatisfied." Survey respondents who were dissatisfied with the free thermostat most commonly indicated that they have not used it or had not installed it yet (five respondents), with one of those respondents indicating that they have been unable to find someone to remove their old thermostat. Three respondents reported that the new thermostat does not work, expressing difficulty either connecting to the app or getting the thermostat to connect to their Wi-Fi.

Survey respondents also reported high levels of satisfaction with the NIPSCO OLM overall, as 84% of respondents indicated they were either "very satisfied" or "somewhat satisfied;" however, 9% reported they were either "somewhat dissatisfied" or "very dissatisfied" with the OLM overall. Survey respondents who were dissatisfied with the marketplace overall most commonly reported that the marketplace would not accept their order and they had to contact someone for assistance (three respondents). One respondent noted that the initial email looked like a phishing attempt as it directed them to the OLM rather than the NIPSCO website, and one respondent indicated that there was no one to contact about receiving the wrong order.

CONCLUSION 3: ERRORS WITH THE *EX ANTE* SAVINGS APPLIED TO THE ENERGY SAVER KITS AND STANDALONE WI-FI THERMOSTATS RESULTED IN DISCREPANCIES BETWEEN THE *EX ANTE* SCORECARD SAVINGS AND THE AUDITED PROGRAM SAVINGS.

The evaluation team reviewed the *ex ante* savings documentation (“NIPSCO Residential 24-26 program Design v4.4”), which had measure-level savings for standalone measures and measures included in kits sold through the OLM. For the 2024 Energy Saver Kit, the total *ex ante* kWh savings attributed to each kit included the deemed savings for two nightlights, even though the kit only included one nightlight. This resulted in the audited savings of each kit being approximately 30 kWh lower than the *ex ante* kit savings reported in the tracking data. Overall, this discrepancy is largely responsible for the difference in the program’s *ex ante* scorecard savings (366,001.19 kWh) and the audited program savings (345,965.29 kWh); the remaining difference was due to the removal of one air purifier, which had been incorrectly categorized in the program tracking data.

Recommendations:

- Ensure the program design file and associated tracking data use savings values that account for the correct quantity of nightlight(s) within each energy saver kit.

CONCLUSION 4: ERRORS WITH THE *EX ANTE* SAVINGS APPLIED TO WI-FI THERMOSTATS RESULTED IN DISCREPANCIES BETWEEN THE *EX ANTE* SCORECARD SAVINGS AND THE *EX POST* GROSS PROGRAM SAVINGS.

The total *ex ante* kWh and kW savings for several Wi-Fi thermostat measures contained either outdated FLH values or used the wrong variable in their calculation. The evaluation team calculated *ex ante* kWh savings for some thermostat measures using an EFLHc value from the 2022 EM&V report, while the evaluation team used a lookup table for FLH values based on zip code.

Additionally, *ex ante* energy savings reported zero electric heating savings for all gas heating household measures. According to the Illinois TRM v12.0, gas heating households should receive therms savings through the electric energy heating savings equation in the form of energy savings. Therefore, *ex post* savings included electric energy savings for all gas heating households.

Ex ante peak demand reduction savings used an incorrect input for all free, purchased, and kit thermostat measures with the categorization *Wi-Fi Programmable Thermostat - Electric Cooling and Heating Savings*. For all free and purchased thermostats with this categorization, *ex ante* demand savings used a Cooling_Reduction value of 0.084 from the Illinois TRM v12.0 instead of the correct Cooling_DemandReduction value of 0.164. For these kit thermostats, *ex ante* demand savings used a Cooling_Reduction value of 0.096 from the Illinois TRM v13.0 instead of the correct Cooling_DemandReduction value of 0.164.

These three findings resulted in a significant impact on both the energy and demand reduction realization rates for free, purchased, and kit Wi-Fi thermostats.

Recommendations:

- Ensure the program design file and associated tracking data use savings values calculated with the correct and most up-to-date variables, such as FLH and cooling demand reduction.

CONCLUSION 5: WHILE ONLY 58% OF RESPONDENTS HAD INSTALLED THE FREE THERMOSTATS AT THE TIME OF THE SURVEY, A LARGE PORTION OF RESPONDENTS WHO HAD NOT EXPRESSED AN INTENTION TO INSTALL THEM IN THE FUTURE.

Among the 30 respondents who had not yet installed their thermostat, 73% (n=22) expressed that they plan to do so in the future. The calculated ISR does not include customers who reported that they plan to install the thermostat in the future, but the evaluation team could calculate a partial ISR based on customer reported installation of these measures in the future.

Recommendations:

- Distribute messaging to free thermostat recipients encouraging them to install the equipment and providing installation resources to those who need assistance.
- Include follow-up surveys in future research on these customers to confirm whether they ultimately did install the measure. The evaluation team can use these follow-up surveys to inform a partial ISR that NIPSCO can apply to these measures in the future. This will help account for the fact that even if a customer does not immediately install a measure, it can still produce meaningful energy savings in the future.
- Over-sample recipients of free thermostats in future evaluations to ensure that a sufficient population of participants who have not yet installed their thermostat are available for future research.

CONCLUSION 6: ADDITIONAL CROSS-PROGRAM PROMOTION COULD BOLSTER AWARENESS OF AND PARTICIPATION IN OTHER NIPSCO PROGRAMS.

Among survey respondents who received free thermostats, 73% reported awareness of other NIPSCO program offerings, and 29% indicated they had participated in another program at some point; these results were similar to last year where 73% of survey respondents reported awareness of other NIPSCO program offerings and 29% had participated in another program. Survey respondents expressed the greatest awareness of the HEA program (36%) and the Appliance Recycling Program (34%), while respondents most commonly reported they had participated in the HEA program (11%).

Recommendations:

- Include links to additional program offerings in the customer check-out process.
- Include literature and information on other program offerings with the thermostats that the program sends to customers.
- Send follow-up marketing emails directly to OLM program participants to inform them of additional program and energy-saving opportunities.

CONCLUSION 7: THE *EX ANTE* SAVINGS FOR KIT MEASURES USED DIFFERENT SAVINGS CALCULATION SOURCES THAN THE REST OF THE PROGRAM'S NON-KIT MEASURES, WHICH

RESULTED IN DISCREPANCIES BETWEEN *EX ANTE* SCORECARD SAVINGS AND THE *EX POST* GROSS PROGRAM SAVINGS.

The program calculated *ex ante* savings for all non-kit measures using inputs from the Illinois TRM v12.0 and 2022 EM&V Report sources, while it used calculations using inputs from Illinois TRM v13.0 and the 2023 EM&V Report for the 2024 Energy Saver Kit measures

The evaluation team found that using the Illinois TRM v13.0 was not appropriate as this version of the TRM did not become effective until January 1, 2025, and the 2024 program year *ex ante* savings should be evaluated based on the TRM version with an effective date *prior* to the program start (Illinois TRM v12.0 effective January 1, 2024). Moreover, applying newer sources introduced inconsistencies in measure inputs, making it more difficult to compare *ex ante* and *ex post* gross savings results.

Recommendations:

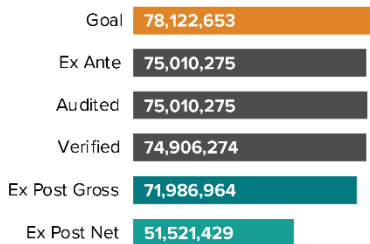
- Use the most recent and relevant TRM with the correct effective date to evaluate the current program year.
- Refrain from using more than one version of the same TRM for *ex ante* measure calculations.

C&I PROGRAMS

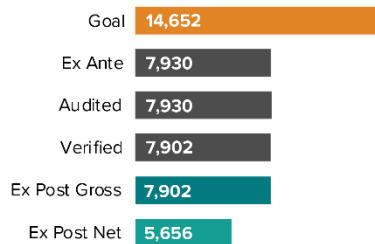


- While program level realization rates for the C&I Programs were close to 100%, realization rates for some measure categories were low due to outdated resources used in ex ante savings calculations.
- Goal achievement varied substantially across programs and energy savings types.
- SBDI program freeridership survey results indicate high intention freeridership and possible inconsistencies in program implementation.
- The SEM program is likely running at or near capacity given the current conditions and resources available.

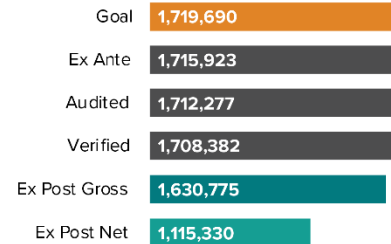
⚡ Electric Savings (kWh)



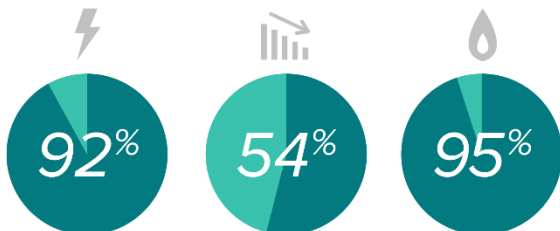
📊 Peak Demand Reduction (kW)



💧 Natural Gas Savings (Therms)



Ex Post Gross Achieved to Gross Goal

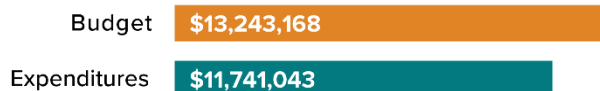


Realization Rate



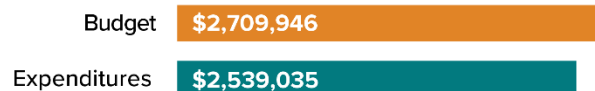
Budget

⚡ 📊 Electric and Peak Demand



Spent **89%**

💧 Natural Gas



Spent **94%**

Program Design and Delivery

Through the Commercial and Industrial (C&I) programs, NIPSCO offers incentives for nonresidential customers who install energy efficiency measures in new and existing facilities. The program implementer, TRC, oversees program management, delivery, and marketing efforts to customers and contractors. Contractors are instrumental in identifying energy saving opportunities and promoting the programs to customers. NIPSCO's major account managers also assist with implementation efforts through direct support and program assistance to customers within the service territory. NIPSCO offers the following programs to nonresidential customers.

Custom program. The Custom program offers incentives for nonprescriptive measures that involve more complex technologies or equipment changes than are covered in the Prescriptive program. The Custom program incentives are based on a measure's estimated electric or natural gas energy savings.

Strategic Energy Management (SEM) program. NIPSCO initially introduced this program as the School SEM program in 2022, and in 2024, NIPSCO renamed it as the SEM program and expanded its scope to include grocery stores and healthcare facilities. SEM is a method to operate buildings efficiently and effectively by integrating energy management into everyday business and operations practices. This results in persistent energy savings and long-term cost reduction for participants. Staff at all levels participate in daily operational habits to ensure the buildings and equipment are operating as efficiently and cost-effectively as possible. The program also encourages participants to utilize a performance tracking tool, such as ENERGY STAR® Portfolio Manager®, to benchmark and track their progress toward their energy conservation goals.

New Construction program. The New Construction program provides financial incentives to C&I new construction facilities that exceed the energy efficiency requirements of statewide building codes. The program determines energy savings using the ASHRAE 90.1 2007 standard or IECC 2018 (baseline standard dependent on project start date) as a baseline energy usage. The following types of projects are eligible for the program:

- New buildings
- Additions or expansions to existing buildings
- Gut rehabs for a change of purpose requiring the replacement of all mechanical systems and equipment.

Prescriptive program. The Prescriptive program offers incentives to commercial, industrial, non-profit, governmental, and institutional customers that are making energy efficiency improvements in existing buildings. The program incentives are paid on a per-unit basis to reimburse customers for a portion of the energy efficient measure's cost. The midstream channel is supported under the Prescriptive program and promotes the adoption of high-efficiency equipment among end users by incentivizing approved distributors to increase the market share and availability of qualifying equipment.

Small Business Direct Install (SBDI) program. NIPSCO designed the SBDI program to encourage small business customers with a peak electric demand of 200 kW or less over the past 12 months to service or replace standard equipment with higher-efficiency equipment. Incentives available through the SBDI program are typically higher than those offered through the Prescriptive and Custom programs. Participating customers can also apply for the Prescriptive and Custom programs’ incentives for equipment that falls outside the scope of the SBDI program. The SBDI program provides energy saving measures and pays up to 100% of the total cost of the measure, including material and labor.

Approved SBDI contractors walk through customer sites, identify potential measures that could benefit the customer, and present findings to the customer in the form of a proposal. Upon approval from the customer, the contractor will install the measures and submit an application and invoice to the program.

Commercial Online Marketplace. We discuss this program in a separate chapter of this report.

As in previous years, at various points in the year, the Prescriptive, Custom and SBDI programs offered incentive bonuses to spur activity. From June 1 to August 31 and from October 1 to December 31, the three programs offered a \$2 bonus for LED tube re-lamp measures, a 20% bonus incentive for electric, lighting and compressed air leak repair measures, and a 40% bonus on refrigeration measures. The Prescriptive and SBDI programs offered a 20% bonus from October to year end on gas space heating boiler tune-ups.

Changes from the 2023 Design

The C&I program designs were largely unchanged from 2023 apart from the SEM program, which expanded its focus to include grocery stores and health care facilities.

Program Performance

In 2024, 869 unique participants (i.e., Parent Sites), completed 1,277 unique projects (i.e., Parent Projects) through NIPSCO’s C&I programs.⁵⁰ Many sites had multiple projects across multiple programs. Participant counts using both measurements are listed by program in Table 196. The Parent Projects and Parent Sites offered in Table 196 sum to greater than 1,277 and 869, respectively, because many Parent Sites (n=126) participated in more than one C&I program and some Parent Projects spanned multiple programs, as well. Those customers and projects are counted in each program they participated in to accurately reflect the activity of each program, but they are only counted as unique participants once in the cumulative C&I portfolio customer count.

Table 196. Participation Counts by Program

PROGRAM	SCORECARD ELECTRIC	SCORECARD GAS	PARENT PROJECTS ^a	PARENT SITES
Custom	388	63	484	342
SEM	6	0	6	2
New Construction	69	70	118	107
Prescriptive	437	70	506	370
SBDI	192	50	246	191
Totals	1,092	253	1,360	1,012

^a Participant count by program was determined by the count of unique Parent Projects listed for each program. In many cases, Parent Projects are listed as participating in multiple programs so the total count of Parent Projects summed from individual program counts will be larger than the overall list of unique Parent Projects. Bonus measures were excluded.

⁵⁰ There were 719 unique participants in 2023, 711 in 2022, 810 in 2021, and 847 in 2020.

Comparing the *ex post* gross savings with savings goals, the C&I portfolio fell just short of its goals at the portfolio level, achieving 92% of electric energy savings, 54% of peak demand savings, and 95% of natural gas savings. The gross goal achievement varied by program and fuel type:

- The **Custom program** fell short of its electric energy, demand savings, and natural gas therms goals (90%, 37%, and 86%, respectively). The electric energy and demand savings goal levels for this program were largely unchanged from 2023; however, the program increased the natural gas savings goal by nearly 50% from 2023. The program experienced a 43% increase in *ex ante* electric savings and a 30% increase in *ex ante* gas savings in 2024, as compared to 2023, building on the growth from 2022 to 2023.
- The **SEM** program was new in 2022 and is gradually increasing its participation. The focus in 2023 was exclusively lighting, and the focus in 2024 was exclusively refrigeration measures. The program fell far short of all goals (6% of electric energy, 2% of demand savings, and 0% of gas savings). As in 2023, the program did not achieve any gas savings, despite its goal of 8,620 therms. The implementation staff is limited for this program, potentially contributing to it not achieving the goals it set forth. Additional information on program activity levels and options for expanding it are discussed in the *SEM Program* section.
- The **New Construction program** overachieved on its electric energy savings and demand savings goals (117% and 115%, respectively) but fell short of the natural gas savings goal (74%). The electric goals in 2024 nearly doubled from 2023 levels, presumably due to the overachievement of meeting these goals in 2023. The program achieved fewer *ex ante* savings in 2024 as compared to 2023 in all energy metrics; however, 2023 *ex ante* achievement stood out from prior years potentially as an anomaly, influenced by several individual projects with very high savings.
- The **Prescriptive program** fell short of its electric energy and demand savings goals (75% and 46% respectively) but achieved over double the gas savings goal. The electric energy and natural gas goals for this program were significantly reduced from 2023, however the program nearly matched the 2023 *ex ante* electric energy savings and demand savings reduction values (both within 5%) and nearly doubled natural gas *ex ante* savings.
- The **SBDI program** exceeded all of its goals (252% of electric energy, 162% of peak demand savings, and 1,007% of gas savings). The program experienced a notable increase in *ex ante* electric savings from 2023 (a nearly 1.5 million kWh increase, resulting in 157% of 2023 *ex ante* electric savings), likely due to nearly double the participant count from the year prior. Half of the participant increase was in refrigeration measures, which contributed significant kWh savings to the program. In 2024, the SBDI program achieved virtually all of its gas savings through space heating boiler tune-ups during its Q4 enhanced bonus promotion, incentivizing 142 gas space heating boiler tune-ups during that period.

Table 197, below, summarizes savings for 2024 program performance, including savings goals. The total *ex ante* savings of 75,010,275 kWh in 2024 was almost the same as the *ex ante* savings achieved in 2023 (74,929,257 kWh in 2023) but continued to build on the growth trend over the last few years (60 million kWh in 2022 and 52 million kWh in 2021).

The total *ex ante* demand reduction of 7,930 kW was lower than the 2023 *ex ante* demand reduction of 9,368 kW. There was moderate growth in *ex ante* therms savings year over year, growing from 1,445,286 therms in 2022 to 1,527,816 therms in 2023 and 1,715,923 therms in 2024.

Table 197. 2024 C&I Programs Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Custom Program							
Electric Energy Savings (kWh/yr.)	36,123,997.29	34,785,345.02	34,785,345.34	34,681,344.18	32,599,258.57	24,775,436.51	90%
Demand Reduction (kW)	3,735.008	1,467.177	1,467.177	1,439.647	1,380.544	1,049.213	37%
Natural Gas Energy Savings (therm/yr.)	887,668.55	720,445.80	716,801.07	712,899.27	766,150.32	582,274.24	86%
SEM Program							
Electric Energy Savings (kWh/yr.)	787,130.00	45,162.74	45,162.74	45,162.74	45,162.75	45,162.75	6%
Demand Reduction (kW)	216.668	4.840	4.840	4.840	4.796	4.796	2%
Natural Gas Energy Savings (therm/yr.)	8,620.00	-	-	-	-	-	0%
New Construction Program							
Electric Energy Savings (kWh/yr.)	13,661,975.21	16,534,476.92	16,534,476.64	16,534,476.92	15,927,647.82	8,282,376.87	117%
Demand Reduction (kW)	1,725.273	1,968.284	1,968.284	1,968.284	1,979.625	1,029.405	115%
Natural Gas Energy Savings (therm/yr.)	732,891.45	608,472.89	608,471.79	608,478.20	542,684.10	282,195.73	74%
Prescriptive Program							
Electric Energy Savings (kWh/yr.)	25,975,290.00	19,679,613.53	19,679,613.53	19,679,613.53	19,449,217.63	15,364,881.93	75%
Demand Reduction (kW)	8,608.356	3,903.901	3,903.901	3,903.901	3,943.739	3,115.554	46%
Natural Gas Energy Savings (therm/yr.)	73,270.00	212,141.05	212,141.05	212,141.05	148,289.94	117,149.06	202%
SBDI Program							
Electric Energy Savings (kWh/yr.)	1,574,260.00	3,965,677.10	3,965,677.10	3,965,677.10	3,965,677.10	3,053,571.37	252%

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Demand Reduction (kW)	366.665	585.483	585.483	585.483	593.708	457.155	162%
Natural Gas Energy Savings (therm/yr.)	17,240.00	174,863.32	174,863.32	174,863.32	173,650.99	133,711.26	1,007%
Total C&I Portfolio^a							
Electric Energy Savings (kWh/yr.)	78,122,652.50	75,010,275.31	75,010,275.35	74,906,274.47	71,986,963.87	51,521,429.42	92%
Demand Reduction (kW)	14,651.969	7,929.685	7,929.685	7,902.155	7,902.413	5,656.124	54%
Natural Gas Energy Savings (therm/yr.)	1,719,690.00	1,715,923.06	1,712,277.23	1,708,381.84	1,630,775.34	1,115,330.29	95%
^a C&I Online Marketplace summary values have been excluded from this table of results and from the Total C&I Portfolio summary values shown. C&I Online Marketplace summary values are outlined in a separate chapter.							

Table 198. 2024 C&I Programs Adjustment Factors outlines the *ex post* gross and net-to-gross (NTG) adjustment factors. The evaluation team developed NTG ratios for the SBDI program through survey data collected from the 2024 C&I participant survey, as described in the *Ex Post Net Savings* section. We developed all other C&I program NTG ratios through survey data collected from the 2023 C&I participant survey. Realization rates were relatively high throughout all programs except for the Prescriptive program natural gas realization rate of 70%. Of the programs surveyed, the NTG values range from 52% to 79%. Due to limited participation, we have not been able to survey SEM participants and have deemed NTG for that program at 100%.

Table 198. 2024 C&I Programs Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILLOVER	NTG (%) ^b
Custom Program				
Electric Energy Savings (kWh/yr.)	94%	24%	0%	76%
Peak Demand Reduction (kW)	94%			
Natural Gas Energy Savings (therms/yr.)	106%			
SEM Program				
Electric Energy Savings (kWh/yr.)	100%	0%	0%	100%
Peak Demand Reduction (kW)	99%			
Natural Gas Energy Savings (therms/yr.)	N/A			

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILLOVER	NTG (%) ^b
New Construction Program				
Electric Energy Savings (kWh/yr.)	96%	48%	0%	52%
Peak Demand Reduction (kW)	101%			
Natural Gas Energy Savings (therms/yr.)	89%			
Prescriptive Program				
Electric Energy Savings (kWh/yr.)	99%	21%	0%	79%
Peak Demand Reduction (kW)	101%			
Natural Gas Energy Savings (therms/yr.)	70%			
SBDI Program				
Electric Energy Savings (kWh/yr.)	100%	24%	1%	77%
Peak Demand Reduction (kW)	101%			
Natural Gas Energy Savings (therms/yr.)	99%			
Total C&I Programs				
Electric Energy Savings (kWh/yr.)	96%	28%	0%	72%
Peak Demand Reduction (kW)	100%			
Natural Gas Energy Savings (therms/yr.)	95%			

^a Realization Rate is defined as *ex post* Gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

At the C&I portfolio level, in 2024 NIPSCO spent 89% of its electric budget and 94% of its natural gas budget. The proportion of spending aligned with performance toward savings goals at the portfolio level (92% and 95%, respectively). Most programs were under or at budget, while some (New Construction and SBDI) exceeded their budgets significantly. Table 199. 2024 C&I Programs Expenditures lists the 2024 program budgets and program trackable expenditures by fuel type.

Table 199. 2024 C&I Programs Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Custom Program			
Electric	\$6,195,452.50	\$5,867,538.37	95%
Natural Gas	\$1,375,853.22	\$1,034,912.53	75%
SEM Program			
Electric	\$137,909.99	\$12,551.09	9%
Natural Gas	\$13,360.69	\$547.29	4%

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
New Construction Program			
Electric	\$2,243,019.11	\$2,405,796.11	107%
Natural Gas	\$1,135,954.47	\$828,072.92	73%
Prescriptive Program			
Electric	\$4,336,709.50	\$2,731,180.48	63%
Natural Gas	\$147,001.49	\$294,455.54	200%
SBDI Program			
Electric	\$330,076.45	\$723,977.32	219%
Natural Gas	\$37,776.27	\$381,046.64	1009%
Total C&I Programs			
Electric	\$13,243,167.55	\$11,741,043.37	89%
Natural Gas	\$2,709,946.14	\$2,539,034.91	94%

Evaluation Methodology

To inform the 2024 NIPSCO impact and process evaluation, the evaluation team completed the following research activities:

- **Program staff discussions** to understand the program process, delivery, and design.
- **Documentation and materials review** to provide context on program implementation.
- **Tracking data analysis** to audit and verify the accuracy of the program participation data.
- **Engineering analysis** to review program savings assumptions and algorithms for reasonableness and accuracy.
- **SBDI Participant surveys (n=29)** to understand the participant experience in the program and to gather information to calculate freeridership and spillover rates.
- **An SEM field engineer interview (n=1)** to better understand their perspective and gain insight into the program's performance.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop savings estimates? Are there any updates that should be made?
- What are the *ex post* program savings? Do these suggest any needed updates to the program's design, delivery, or savings assumptions?
- How effective was the program in influencing participant decision-making? What are the program's spillover and freeridership estimates (net savings)?
- Are tracking database savings sourced with proper documentation?

The evaluation team sampled at the measure level, which we defined as 2024 measure entries with attributed energy savings in the tracking database. A completed project could consist of one or multiple measures, potentially from different measure categories and from different C&I programs. We defined measure categories as overarching measure classifications, such as HVAC, lighting, compressed air, and motors. We defined measure subcategories as all potential incentive measures within the measure category and available in the C&I programs in 2024. Each measure subcategory aligns with a numeric measure code in the 2024 NIPSCO Program Design.

For all measures, the evaluation team compared its engineering calculations to NIPSCO's *ex ante* savings, basing its savings methodologies and inputs for each measure on several sources: standard engineering practices and relevant building codes, the Indiana TRM Workbook v1.0, the Illinois TRM v12.0, NIPSCO's program tracking database, and other secondary sources as needed.

Per the Indiana TRM Workbook v1.0, the Indiana TRM "is intended to be used as an accompaniment to [the Illinois TRM], automatically incorporating the most recent and effective version of the [Illinois] TRM, including measures newly added to the [Illinois] TRM." For each measure, the evaluation team first prioritized the Indiana TRM Workbook v1.0, which directly references the Illinois TRM for most measures. The team prioritized the VEIC Proposed Indiana Assumptions on the "Code Baseline Measures" tab of the Indiana TRM as a source for baseline assumptions where provided for specific measures. Additionally, we used the "Weather Zone Mapping" tab to map cities in NIPSCO's territory to the appropriate Illinois city to estimate weather impacts. Where provided and applicable to the measure category we were evaluating, the team utilized coincidence factors (CF) from the "Loadshapes" tab of the Indiana TRM.

Audited and Verified Savings

To develop an audited measure quantity and savings, the evaluation team checked the program tracking data for data quality issues. In the verified savings step, the team made minor modifications to the quantities and the resulting energy savings values for sampled measures when we found discrepancies between the measure documentation and the reported values. Examples include wattages, quantities, square footage, and other metrics that might have differed between *ex ante* calculations and the application data. To determine audited and verified savings, the team used the same method of savings calculation used for the reported *ex ante* savings.

Ex Post Gross Savings

The evaluation team adjusted 2024 measure savings in the *ex post* gross analysis to address discrepancies in quantity, equipment capacity, equipment efficiency, or lighting wattage discovered during a review of project documents or at virtual site inspections. The team used the following data sources to adjust:

- Annual operating hours from customer interviews, online schedules, posted store schedules, logged data, Illinois TRM v12.0, and IN TRM Workbook v1.0 values for the building type or equipment type.
- CFs consistent with the Illinois TRM v12.0 for some measure categories and the Indiana TRM Workbook v1.0 for other measure categories, as described below.
- Methodologies or simple calculation methods from the Illinois TRM v12.0 or Indiana TRM Workbook v1.0.

Impact Sampling Strategy

The evaluation team selected a representative sample of measures for desk reviews and virtual audits, targeting a minimum of a 90% confidence interval with $\pm 10\%$ precision for each program across the two-year cycle.⁵¹ While we have presented results at the C&I portfolio and individual program levels, this report is primarily organized by measure category to better illustrate measure category trends across all commercial programs.

The evaluation team classified measures into measure categories and stratified the sample into: (1) lighting measures and (2) non-lighting measures. The team further defined the measures by category within those groups but estimated and extrapolated savings within the two broader groups. This report chapter breaks out the evaluation analysis into measure categories to provide transparency on results and guidance on how to best improve program savings estimates and activities; however, the team did not design the sample to estimate realization rates by measure categories beyond the lighting and non-lighting categories by program.

Out of the 3,049 unique measures in the population, the evaluation sample conducted an engineering review of 129 total unique measures, 17 through purposive (handpicked) sampling and 112 through proportional (random) sampling. We completed desk reviews for all 129 measures and completed virtual audits to confirm and support the desk review findings for 45 measures.

- For each program, the team purposively sampled measures that comprised at least 5% of the cumulative program savings and measures that comprised at least 20% of the measure category savings. We did not extrapolate the results to the rest of the population. We refer to these measures as **handpicked measures**. Because we sampled these measures with certainty (100% of the highest saving measures were sampled), we assigned them a measures realization rate specific to the individual measure and did not extrapolate to the rest of the population. We added the *ex post* gross savings from handpicked measures to the *ex post* savings from the rest of the population to determine the cumulative *ex post* savings for the program.
- The team proportionally sampled from the remaining measures by program, ensuring we sampled at least one measure from each measure category. We extrapolated findings to the population of savings for the relevant measure categories. We refer to these measures as **randomly sampled measures**. The evaluation team determined realization rates from randomly sampled measures by program and by two measure categories: lighting and non-lighting. Non-lighting is an aggregate of all measure categories excluding the lighting measure category. We applied the realization rates determined by the randomly sampled measures to all non-sampled measures to determine cumulative *ex post* gross savings.

An outline of this methodology is shown in Figure 75, below, using the lighting measure category within the 2024 New Construction program to illustrate the example.

⁵¹ Measures are defined as a unique line item in the implementer's tracking data, representing an incentivized measure installed by a customer account. A project could be composed of one or multiple measures. Bonus measures have been excluded from the measure count.

Figure 75. Example of 2024 C&I Programs Sampling Methodology (New Construction Program)

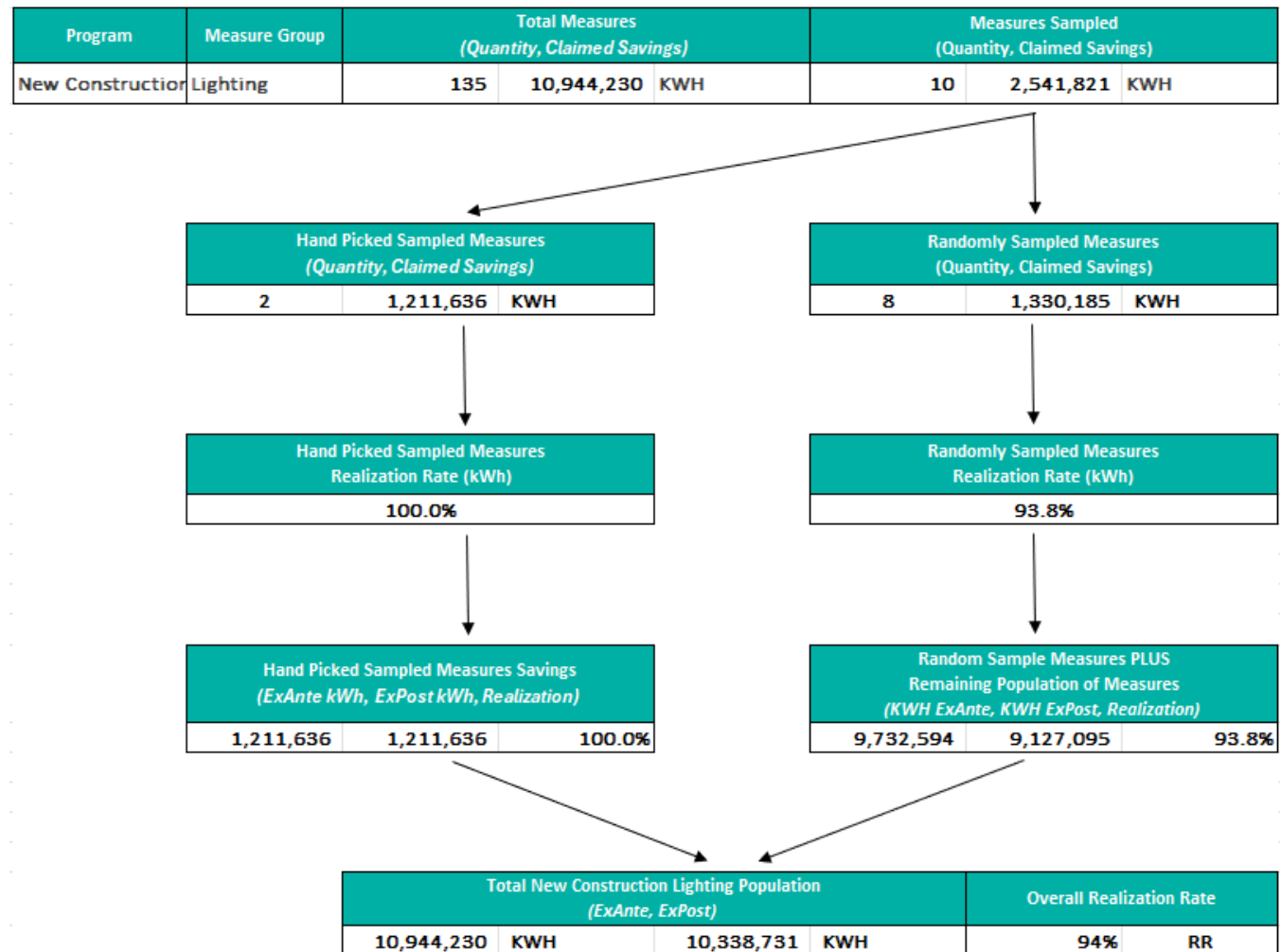


Table 200 summarizes the number of evaluated measures and the proportion of *ex ante* program savings the evaluated measures represent by program. The 2024 C&I programs sample included 16% of cumulative portfolio electricity savings, 29% of gas savings, and 20% of the kW demand savings.

Table 200. 2024 C&I Combined Programs Sampled Measures by Program

PROGRAM	POPULATION MEASURES ^a	NUMBER OF SAMPLED MEASURES	SAMPLED HANDPICKED	SAMPLED RANDOM	NUMBER OF VIRTUAL SITE VISIT MEASURES	PERCENT EX ANTE ELECTRIC SAVINGS SAMPLED	PERCENT EX ANTE DEMAND SAVINGS SAMPLED	PERCENT EX ANTE GAS SAVINGS SAMPLED
Custom	778	34	5	29	7	15%	38%	36%
SEM	18	10	-	10	-	62%	63%	N/A
NC	320	31	4	27	6	24%	24%	33%
Prescriptive	1,329	33	2	31	2	13%	12%	15%

PROGRAM	POPULATION MEASURES ^a	NUMBER OF SAMPLED MEASURES	SAMPLED HANDPICKED	SAMPLED RANDOM	NUMBER OF VIRTUAL SITE VISIT MEASURES	PERCENT <i>EX ANTE</i> ELECTRIC SAVINGS SAMPLED	PERCENT <i>EX ANTE</i> DEMAND SAVINGS SAMPLED	PERCENT <i>EX ANTE</i> GAS SAVINGS SAMPLED
SBDI	604	21	6	15	-	16%	16%	6%
Total	3,049	129	17	112	15	16%	20%	29%

^aExcludes Bonus Measures. The total measure count is 3,994 including bonus measures. Measures are defined as a unique line item in the implementer's tracking data, representing an incentivized measure installed by a customer account. A project could be composed of one or multiple measures.

Table 201 summarizes the proportion of *ex ante* program savings that the sampled measures represent. The lighting measure category was the largest measure category in 2024, and the sample captured 19% of total lighting electric savings. The non-lighting measure category shows all other measures combined and the cumulative non-lighting sample captured 14% of electric savings and 29% of gas savings. The evaluation team sampled 20% of C&I programs' lighting and 21% of C&I programs' non-lighting kW demand savings.

Table 201. 2024 C&I Combined Programs *Ex ante* Sampled Measures

MEASURE CATEGORY	MEASURE COUNTS				TOTAL <i>EX ANTE</i> SAVINGS			SAMPLED <i>EX ANTE</i> SAVINGS & PROPORTION OF SAVINGS SAMPLED					
	TOTAL ^A	SAMPLE TOTAL	HAND PICKED	RANDOM	KWH	KW	THERMS	KWH	KWH %	KW	KW %	THERMS	THERMS %
Lighting	1,752	32	9	23	38,239,548.64	7,211.472	-	7,193,162.66	19%	1,454.916	20%	-	
Non-Lighting	1,297	97	8	89	36,770,726.67	718.213	1,715,923.06	5,166,934.64	14%	152.622	21%	501,936.10	29%
Study	28	-	-	-	-	-	-	-	-	-	-	-	-
Compressed Air	265	10	1	9	20,605,427.34	34.280	-	2,041,366.00	10%	12.000	35%	-	-
Controls	19	2	-	2	837,160.00	-	68,241.89	57,572.00	7%	-	-	3,111.00	5%
HVAC	609	49	4	45	4,354,850.95	243.298	1,441,509.88	859,236.04	20%	24.303	10%	375,410.10	26%
Kitchen	6	1	-	1	12,267.54	0.724	10,601.00	-	0%	-	0%	9,644.00	91%
Motors	41	3	-	3	4,202,657.22	2.761	-	294,164.00	7%	-	0%	-	-
Process	23	3	1	2	2,327,439.00	-	157,982.60	820,966.00	35%	-	-	110,000.00	70%
Refrigeration	269	24	2	22	4,333,578.39	420.422	9,584.20	1,028,045.46	24%	106.467	25%	1,952.00	20%
Variable Frequency Drive (VFD)	7	1	-	1	94,882.23	16.728	-	63,121.14	67%	9.852	59%	-	-
Water Heat	30	4	-	4	2,464.00	-	28,003.49	2,464.00	100%	-	-	1,819.00	6%
Total	3,049	129	17	112	75,010,275.31	7,929.685	1,715,923.06	12,360,097.30	16%	1,607.538	20%	501,936.10	29%

* Excludes Bonus Measures. Total measure count is 3,994 including bonus measures.

Engineering Reviews, Realization Rates, and *Ex Post* Gross Savings

The evaluation team completed engineering desk reviews for 129 measures and sampled 97 unique customer sites (as defined by NIPSCO tracking data site codes) as a subset of the 129 evaluated measures. The evaluation team sampled measures in waves three to four times per year for all C&I programs evaluated, providing an opportunity for the implementer to make real-time adjustments. The following sections summarize the results of the engineering review by lighting and non-lighting measures.

Lighting Measures

Four of the C&I programs contained lighting measures. (SEM did not have any lighting measures this year.) Table 202 documents the number of measures, sample sizes, and proportion of savings by each program. The team evaluated 32 lighting measures across the C&I programs.

Table 202. 2024 C&I Combined Programs Sampled Lighting Measures

PROGRAM	NUMBER OF MEASURES				PROPORTION OF PROGRAM SAVINGS EVALUATED		
	TOTAL	SAMPLED TOTAL	HAND PICKED	RANDOM	KWH	KW	THERMS
Custom	336	5	1	4	30%	39%	N/A
SEM	-	-	-	-	N/A	N/A	N/A
New Construction	135	10	2	8	23%	24%	N/A
Prescriptive	986	10	2	8	11%	10%	N/A
SBDI	295	7	4	3	16%	18%	N/A
Total	1,752	32	9	23	19%	20%	N/A

The reasons for *ex post* savings adjustments are detailed below, organized by interior and exterior lighting measures.

Lighting – Interior. Of the 32 total lighting measures evaluated this year, 26 were interior lighting measures. The evaluation team adjusted measure savings for the following reasons:

- The team’s *ex ante* calculations excluded therms waste heat factors (WHFs) for interior lighting measures. The team calculated WHF therm penalties for cost-effectiveness testing but did not include them in *ex post* gross savings.
- The team adjusted the fixture quantity of one new construction lighting power density measure to match the COMcheck documentation provided. The modification resulted in a 101% realization rate for both kWh and kW savings.
- The team modified the electric WHF values used for two measures to reflect the heating equipment represented in the space, specified in the tracking data and the project application, resulting in kWh realization rates of 56% and 89%.

- The team modified the space type for one new construction measure, which affected the electric WHF values and CFs used to document savings, resulting in kWh and kW realization rates of 95% and 109%, respectively.
- The team made changes to the number of baseline fixtures, number of installed fixtures, and wattage of fixtures based on a review of invoices, counts of fixtures during the inspection, and a review of lighting specification sheets. The team adjusted two measures for these reasons, resulting in kWh realization rates of 93% and 101%.

Lighting – Exterior. The evaluation team reviewed six exterior lighting measures and adjusted savings for the following reasons:

- The final application quantity and wattage for two measures did not match the supporting documentation. The team revised quantities and wattages to match the specifications and invoices provided as part of the application package. The modifications resulted in kWh realization rates of 87% and 119%.

Table 203 shows the complete list of lighting measure subcategories in the 2024 C&I population. The sum of units refers to the type of units specified within the Illinois TRM v12.0 algorithms. Units can refer to the number of lamps, bulbs, fixtures, watts reduced, or linear feet reduced depending on the specific measure subcategory algorithm. The sum of measures refers to the count of completed measures within each measure subcategory across all C&I programs. The team sampled at the measure level for each program, sampling 32 lighting measures (from the 1,752 total lighting measures).

Table 203. 2024 C&I Programs Lighting Measures by Subcategory

MEASURE SUBCATEGORY	SUM OF UNITS	SUM OF MEASURES	SUM OF SAMPLED MEASURES
Interior Lighting	708,779.74	1,303	26
Daylight Sensor (Indoor Only)	2609	3	
Delamping 4 Ft Fluor.	769	18	
Delamping 8 Ft Fluor.	162	4	
Dual Occupancy & Daylight Sensor	35,820	5	
LED - Interior	14,969	249	3
LED 1x4 Fixture	4	2	
LED 1x4 Fixture Replacing 1-Lamp Fluor.	695	5	
LED 1x4 Fixture Replacing 2-Lamp Fluor.	3,165	58	
LED 1x4 Fixture Replacing 3-Lamp Fluor.	16	2	
LED 1x4 Fixture w/ LLLC	17	4	
LED 2x2 Fixture	204	7	
LED 2x2 Fixture Replacing 2-Lamp Fluor.	465	20	
LED 2x2 Fixture Replacing 3-Lamp Fluor.	27	3	
LED 2x4 Fixture	390	10	

MEASURE SUBCATEGORY	SUM OF UNITS	SUM OF MEASURES	SUM OF SAMPLED MEASURES
LED 2x4 Fixture Replacing 2-Lamp Fluor.	406	18	
LED 2x4 Fixture Replacing 3-Lamp Fluor.	6,468	38	
LED 2x4 Fixture Replacing 4-Lamp Fluor.	5,148	66	1
LED 2x4 Fixture w/ Fixture Mounted Occ.	31	1	
LED 2x4 Fixture w/ LLLC	1,055	19	1
LED Exit Sign	118	17	
LED High Bay	30	3	
LED High Bay Replacing 4-Lamp Fluor.	559	15	
LED High Bay Replacing 6-Lamp Fluor.	953	24	
LED High Bay Replacing 8-Lamp Fluor.	136	1	
LED Interior Replacing HID ≤ 175W	1,483	43	1
LED Interior Replacing HID 1000W	298	4	1
LED Interior Replacing HID 176-250W	55	3	
LED Interior Replacing HID 251-400W	1,177	67	1
LED Interior Replacing HID176-250W	265	13	
LED Low Bay (≤ 10,000 lumens)	39	4	
LED Low Bay Replacing 3-Lamp Fluor.	50	1	
LED Tube	16,021	107	1
LED Tube Relamp Replacing 2 Ft Fluor.	2,230	29	
LED Tube Relamp Replacing 4 Ft Fluor.	87,478	228	4
LED Tube Relamp Replacing 4 Ft HO Fluor.	1,894	7	1
LED Tube Relamp Replacing 8 Ft Fluor.	1,041	14	
Lighting System Exceeding ASHRAE 90.1-2007	7,192.34	135	10
Occupancy Sensor	51,5242.40	51	2
Other Interior	98	5	
Exterior Lighting	11,235	449	6
Exterior Occupancy Sensor	11,235	10	
LED - Exterior	612	82	2
LED Exterior Replacing HID ≤ 175W	1,481	98	2
LED Exterior Replacing HID 1000W	232	29	1
LED Exterior Replacing HID 176-250W	110	25	
LED Exterior Replacing HID 251-400W	1,259	152	1
LED Exterior Replacing HID176-250W	675	53	

MEASURE SUBCATEGORY	SUM OF UNITS	SUM OF MEASURES	SUM OF SAMPLED MEASURES
Total	724,383.74	1,752	38

Table 204 shows the *ex ante* savings and the measure-specific realization rates from the sampled lighting measures in the 2024 C&I programs. For the lighting measure category, the team extrapolated the randomly sampled realization rates to the rest of the lighting population by program. Later in this chapter, Table 204 shows the complete set of extrapolated realization rates by program.

Table 204. 2024 C&I Programs *Ex ante* Savings & Realization Rates for Sampled Lighting Measures

PROGRAM	SAMPLED <i>EX ANTE</i>			REALIZATION RATES (KWH)		REALIZATION RATES (KW)	
	KWH	KW	THERMS	HAND PICKED	RANDOM	HAND PICKED	RANDOM
Custom	2,520,855.82	560.663	-	93%	94%	93%	95%
SEM	N/A	N/A	N/A	100%	100%	100%	100%
NC	2,541,821.40	463.862	-	100%	94%	100%	100%
Prescriptive	1,725,672.51	358.033	-	100%	99%	100%	100%
SBDI	404,812.93	72.358	-	100%	100%	100%	100%
Total	7,193,162.66	1,454.916	N/A				

Figure 76 below, shows measure-level savings and realization rates for each measure sampled. Each program is represented with a different color. The figure shows the size of the *ex ante* measure savings compared with the resulting realization rate. The SBDI program measures performed with the most consistency, while New Construction and Custom programs' measures had the most variability. The SBDI and SEM programs' measures tended to be smaller, while the New Construction and Custom programs' measures were generally the largest.

Figure 76. 2024 C&I Programs Sampled Lighting Measures *Ex ante* Impact and Realization Rates

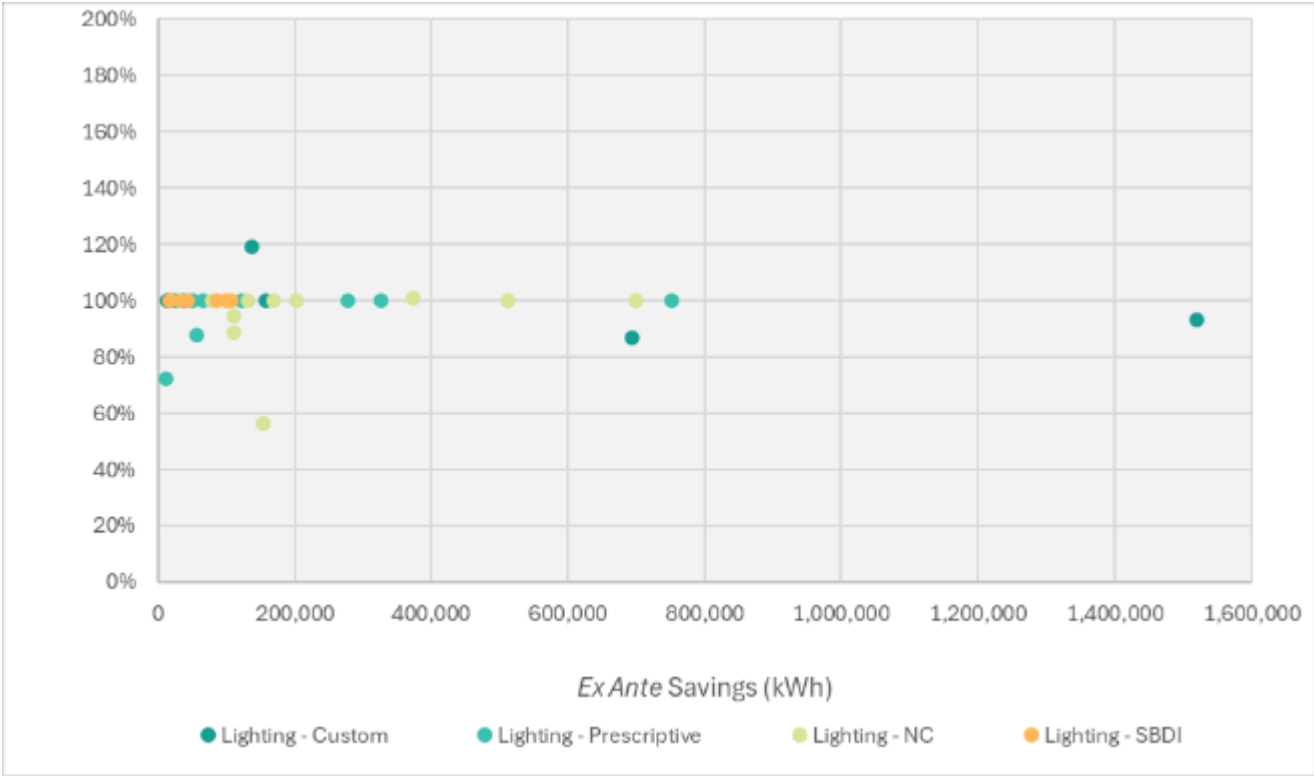


Table 205 highlights notable differences between *ex ante* and *ex post* gross savings from the measures sampled.

Table 205. 2024 C&I Programs Notable Differences Between *Ex ante* & *Ex post* Gross Sources

MEASURE CATEGORY	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Lighting	<i>Ex ante</i> savings are from IL TRM v12.0 volume II C&I. Application data submitted provides the basis for calculation assumptions.	Illinois TRM v12.0, including CFs. All inputs were verified through project documentation or interviews conducted	Project documentation demonstrated different installed wattages, quantities, space types and space heating types than represented in <i>ex ante</i> calculations.

Waste Heat Factor - Therm Penalties

WHFs are adjustments applied to lighting measures to represent the heating penalties resulting from more efficient lighting. The program does not report therm WHFs in the *ex ante* calculations. Electric WHF penalties are minor in comparison with therm WHF penalties, and we reported them within both *ex ante* and *ex post* savings.

In discussions with NIPSCO, the evaluation team did not include negative therm WHFs in *ex post* therm calculations. However, Table 206 shows the therm penalties included in cost-effectiveness calculations. This table shows the therm penalties calculated for randomly sampled and handpicked interior lighting measures and the proportions of those penalties when compared to cumulative population interior lighting savings. The team applied these to the remaining unsampled interior lighting measures and summed them to derive the total therm penalty estimates for all programs. Between handpicked and randomly sampled measures, there was a -72,908.45 therm penalty from sampled interior lighting measures. When extrapolated to the remaining population of interior lighting measures, the total therm penalty is -480,645.49 therms for the entire C&I portfolio.

Table 206. 2024 C&I Programs Waste Heat Factor Penalties

PROGRAM	WASTE HEAT FACTOR THERM PENALTY	
	EX ANTE	EX POST
Custom	-	(37,613.57)
SEM	-	-
New Construction	-	(159,199.08)
Prescriptive	-	(279,740.65)
SBDI	-	(4,092.18)
Total C&I Portfolio	-	(480,645.49)

Non-Lighting Measures

The evaluation team sampled at least one measure from most non-lighting measure categories across the five C&I programs.

Table 207 lists the number of measures, savings, and sample sizes for each program. The team evaluated 97 non-lighting measures, representing a range of measure categories. HVAC measures constituted the greatest proportion of non-lighting measure categories (n=49) followed by refrigeration (n=24) and compressed air (n=10).

Table 207. 2024 C&I Programs Sampled Non-Lighting Measures

MEASURE CATEGORY /PROGRAM ^A	NUMBER OF MEASURES				SAMPLED EX ANTE			PROPORTION OF PROGRAM SAVINGS EVALUATED		
	TOTAL	SAMPLE TOTAL	HAND PICKED	RANDOM	KWH	KW	THERMS	KWH	KW	THERM
Compressed Air										
Custom	264	9	1	8	1,968,452.00	-	-	10%	0%	N/A
NC	1	1	-	1	72,914.00	12.000	-	100%	100%	N/A

MEASURE CATEGORY /PROGRAM ^a	NUMBER OF MEASURES				SAMPLED <i>EX ANTE</i>			PROPORTION OF PROGRAM SAVINGS EVALUATED		
	TOTAL	SAMPLE TOTAL	HAND PICKED	RANDOM	KWH	KW	THERMS	KWH	KW	THERM
Controls										
Custom	15	1	-	1	57,572.00	-	-	7%	N/A	0%
NC	4	1	-	1	-	-	3,111.00	N/A	N/A	23%
HVAC										
Custom	89	14	2	12	418,125.76	2.265	150,139.00	31%	12%	30%
NC	131	12	2	10	351,854.42	-	194,434.00	20%	0%	34%
Prescriptive	245	16	-	16	89,255.86	22.038	20,659.00	7%	11%	11%
SBDI	144	7	-	7	-	-	10,178.10	N/A	N/A	6%
Kitchen										
Prescriptive	6	1	-	1	-	-	9,644.00	0%	0%	91%
Motors										
Custom	14	1	-	1	17,853.00	-	-	1%	N/A	N/A
NC	27	2	-	2	276,311.00	-	-	11%	0%	N/A
Process										
Custom	21	2	1	1	189,527.00	-	110,000.00	12%	N/A	70%
NC	2	1	-	1	631,439.00	-	-	83%	N/A	N/A
Refrigeration										
Custom	8	2	-	2	29,265.00	-	1,952.00	13%	N/A	20%
SEM	18	10	-	10	28,022.46	3.040	-	62%	63%	N/A
NC	7	2	-	2	20,765.60	-	-	4%	0%	N/A
Prescriptive	71	3	-	3	731,898.00	79.425	-	35%	35%	N/A
SBDI	165	7	2	5	218,094.40	24.002	-	15%	14%	N/A
VFD										
Prescriptive	7	1	-	1	63,121.14	9.852	-	67%	59%	N/A
Water Heat										
Custom	3	-	-	-	-	-	-	-	-	-
NC	13	2	-	2	2,464.00	-	390.00	100%	N/A	2%
Prescriptive	14	2	-	2	-	-	1,429.00	N/A	N/A	22%
Total					5,166,934.64	152.66	501,936.10			

^a Table excludes Study, as that measure category did not record any energy savings, only incentives and costs, therefore was not sampled as part of the impact evaluation. The table includes data only for programs where measures were present.

The evaluation team adjusted savings for several of the sampled measures, which resulted in realization rates that deviated from 100%. The following paragraphs summarize the reasons for the adjustments the evaluation team made that had the greatest impact on realization rates.

Compressed Air

The compressed air measures that we sampled in 2024 included mostly compressed air leak repairs, and all of the realization rates for these measures deviated from 100% because the evaluation team used the Indiana TRM Workbook v1.0 for the savings algorithm in *ex post* calculations, while *ex ante* savings referenced Wisconsin TRM 2022. Additionally, three of the six leak measures had discrepancies in hours of use and quantity. The compressed air leak measures resulted in realization rates ranging from 93% to 120%.

A single new Variable Speed Drive (VSD) air compressor installation measure was sampled and received a 100% realization rate.

Controls

The evaluation team sampled two controls measures from the 2024 population, both of which related to thermostat installations. One new construction measure received a 0% realization rate due to the measure performance meeting, but not exceeding, current code for new construction (ASHRAE 90.1-2007 or IECC 2018). *Ex ante* savings referenced Illinois TRM v12.0 for this measure and claimed a baseline of manual against the installed programmable performance case. However, Illinois TRM v12.0 states the current code baseline is a programmable thermostat, and the measure is therefore not applicable to new construction measures, only to existing buildings where the baseline could be considered manual. The Illinois TRM v12.0 does not distinguish a savings performance difference between programmable and smart thermostats, just between manual and non-manual (programmable, smart, Wi-Fi controlled, etc.). Since this measure was a new construction application, *ex post* analysis determined that the measure did not achieve any savings as claimed.

The program derived the *ex ante* savings for the second controls measure (Custom program) from the 2015 Indiana TRM, while the evaluated savings utilize the Illinois TRM v12.0 algorithm and equivalent full load hour (EFLH) values mapped to Indiana cities from the Indiana TRM Workbook v1.0. The deemed savings per square foot differ between these two sources, but most of the impact on realization rate (55% kWh) was due to the Illinois TRM EFLH being half the value of the 2015 Indiana TRM.

HVAC

Within the HVAC measure category, we sampled seven furnace unit heater installations. Vendor and implementor custom energy models supported the savings claimed for these measures. The team reviewed the energy model inputs against the application data and Illinois TRM v12.0 reference data. The team adjusted the vendor provided savings calculations to align more closely with the Illinois TRM v12.0—specifically, updating the stratification rate to 0.8°F/foot and the envelope R-value to assume new construction meets ASHRAE 90.1-2007 code and assuming that existing buildings meet 50% of code R-value. The modifications to the *ex ante* calculations resulted in deviations from *ex ante* therms savings ranging from 64% to 121% individually, but collectively 88% therms realization.

The evaluation team sampled 16 boiler tune-up measures. We modified the calculated savings for all sampled measures to reference the Illinois TRM v12.0 rather than the deemed savings value used in *ex ante* savings calculations. Modifications to the sampled measures resulted in individual measure therms realization rates between 92% to 126% and an overall therms realization rate of 104% for this measure subcategory.

The evaluation team adjusted the *ex ante* savings for one sampled measure significantly to correct an error in the equipment quantity, resulting in a realization rate of 24%. This sampled measure was pursued as part of a portfolio of buildings within a single school district, which provided one project completion report containing all equipment installed at all facilities pursuing the same measure. The evaluation team observed more measure-level tracking data reporting inconsistency in measures pursued in a portfolio approach, presumably due to the collective reporting documentation developed by the customer's vendor. Specifically, the 2024 Prescriptive program's tracking data reported the boiler tune-up measure in two different ways; in some instances, there was one measure entry for each piece of equipment (one boiler MBH for quantity), and in some instances, there was one measure entry containing the total quantity for all equipment (all boilers in that facility grouped together with cumulative MBH reported for quantity). For this sampled measure, the evaluation team found six boilers reported under one measure entry (with cumulative MBH reported), and in error, six additional measures for the same equipment recorded for that Parent Project. While not all boiler tune-up measures for this school were part of the sample selected, the evaluation team did find this same error for all boiler tune-up measures this school district pursued as part of a multi-facility boiler tune-up implementation effort.

We sampled eight boiler and new furnace installation measures in the HVAC category. The program derived the *ex ante* savings claimed for these measures from the Indiana 2015 TRM, while *ex post* savings were derived from the Illinois Workbook v1.0, which referenced Illinois TRM v12.0 but provided guidelines for baseline efficiency date changes. The evaluation team used the project start date to determine efficiency baselines appropriate for each measure evaluated. Various adjustments to the *ex ante* calculations, including a different source algorithm, different EFLH values, and in some cases different baseline efficiencies, resulted in modified therms savings for all measures and realization rates ranging from 77% to 190% individually but 101% cumulatively.

There were several HVAC replacement measures evaluated, and most received at or near a 100% realization rate. The evaluation team adjusted the EFLH throughout based on Indiana TRM Workbook v1.0 references. We adjusted two additional measures to match the federal baseline standard referenced in the Indiana TRM Workbook v1.0 based on the project start date specified, resulting in kWh realization rates of 59% and 47%. Another measure was additionally modified for HOU input errors, resulting in a kWh realization rate of 80%.

We sampled two HVAC controls measures, and both received therms realization rates of 100%.

Kitchen

We sampled one small kitchen measure, which received a 5% therms realization rate due to an error in the *ex ante* savings calculation. The source of *ex ante* savings was the Illinois TRM v12.0, which has an incorrectly written therms savings algorithm that erroneously includes the x1000 multiplier meant only for electric savings calculations. This was the only measure of its type in the 2024 C&I population.

Motors

All three sampled motors measures received 100% electric realization rates.

Process

The evaluation team sampled three process measures. Two measures received 100% electric realization rates. We adjusted one handpicked gas process measure very slightly due to a rounding error made between the *ex ante* calculations and the application, resulting in a therms realization rate of 97%.

Refrigeration

Refrigeration measures were a new focus of the SBDI program this year and were therefore sampled in a higher ratio than in prior years. Refrigeration measures were present in all five C&I programs, and all 23 sampled electric measures received 100% electric kWh realization rates. Most measures that claimed kW demand savings were adjusted to utilize the Indiana TRM Workbook v1.0 CF values (0.97 CF) instead of the Illinois TRM v12.0 CF values (1.0 CF), resulting in slightly reduced kW demand savings realization rates. The evaluation team additionally adjusted some of these measures' kW savings for various reasons including algorithm calculation errors, transcription errors between the spreadsheet savings calculation and the final application, and rounding errors. Overall, the kW realization rate of the refrigeration category was 107%. There was one gas refrigeration measure, originally categorized as "other," which received a 100% therms realization rate.

VFD

The variable frequency drive (VFD) population of measures was small in 2024 (seven, all in the Prescriptive program), and we sampled a single measure in the 2024 evaluation. These measures are all air compressor VFD installations. It appears that the Prescriptive program categorizes these measures as VFD, while the Custom and New Construction programs categorize similar measures as compressed air. The evaluation team sampled one VFD measure that received a 104% kWh realization rate (107% kW realization rate) due to *ex ante* calculations using fixed deemed savings per motor horsepower values and *ex post* calculations following the Illinois TRM v12.0 algorithm for savings calculation.

Water Heat

We sampled four water heat measures, one with electric savings and three with gas savings. Three received at or near 100% realization. In two of these measures, the evaluation team made modifications to the input temperature to match the Illinois TRM v12.0 deemed value (instead of Indiana 2015 TRM deemed values used in *ex ante*) savings. The final water heat measure sampled received a 17% therms realization rate due to different sources for savings calculations between *ex ante* (MEMD) and *ex post* (Illinois TRM v12.0).

Non-Lighting Measure Category Summary

Table 208, below, shows the *ex ante* savings and the measure-specific realization rates from sampled non-lighting measures in the 2024 C&I programs. The team only applied measure-specific realization rates from the handpicked sampled measures to those specific measures and extrapolated the randomly sampled realization rates to the rest of the non-lighting population by program. Later in this chapter, Table 210 shows the complete set of extrapolated realization rates by program.

Table 208. 2024 C&I Programs Realization Rates for Sampled Non-Lighting Measures

PROGRAM	REALIZATION RATES (KWH)		REALIZATION RATES (KW)		REALIZATION RATES (THERMS)	
	HANDPICKED	RANDOM	HANDPICKED	RANDOM	HANDPICKED	RANDOM
Custom	100%	94%	N/A	86%	97%	110%
SEM	N/A	100%	N/A	99%	N/A	100%
New Construction	N/A	100%	N/A	109%	75%	91%
Prescriptive	N/A	100%	N/A	109%	N/A	70%
SBDI	100%	100%	106%	105%	N/A	99%

Figure 77 and Figure 78 illustrate the distribution of savings and realization rates for each sampled measure by program and by fuel source. The highest realization rate variability was in the smallest measures sampled. The largest impact kWh measures (process and compressed air) realized 100% savings. Most of the largest kWh measures fell into the process, compressed air, controls, motors, and refrigeration measure categories. There was more variability within therms realization rates with most larger measures clustered around 100% realization but most smaller impact measures varying from 100%. The highest variability was in the HVAC measures, specifically industrial furnace measures. There were several very small measures (water heat, controls, and kitchen) that received near 0% realization rates, which influenced the overall realization rate slightly downward.

Figure 77. 2024 C&I Programs Sampled Non-Lighting Electric Measures *Ex ante* Impact and Realization Rates

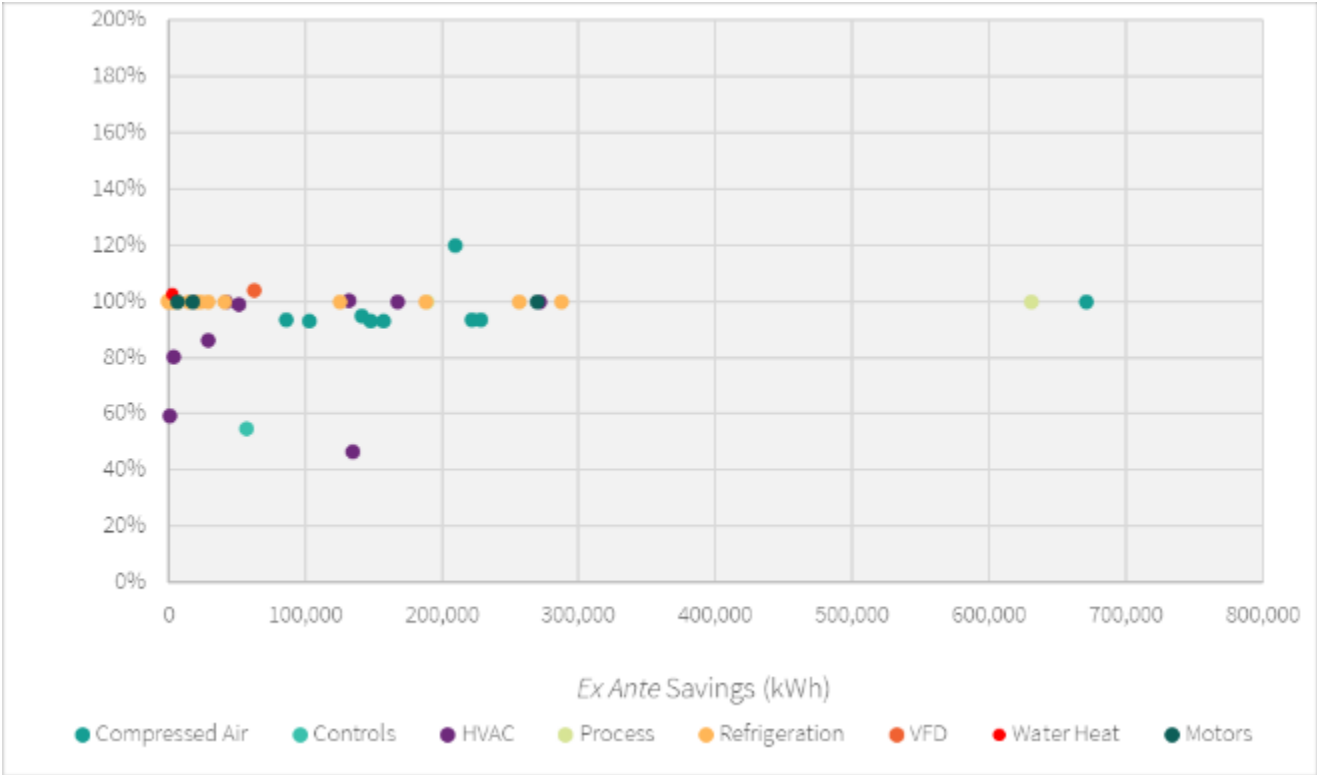


Figure 78. 2024 C&I Programs Sampled Non-Lighting Gas Measures *Ex ante* Impact and Realization Rates

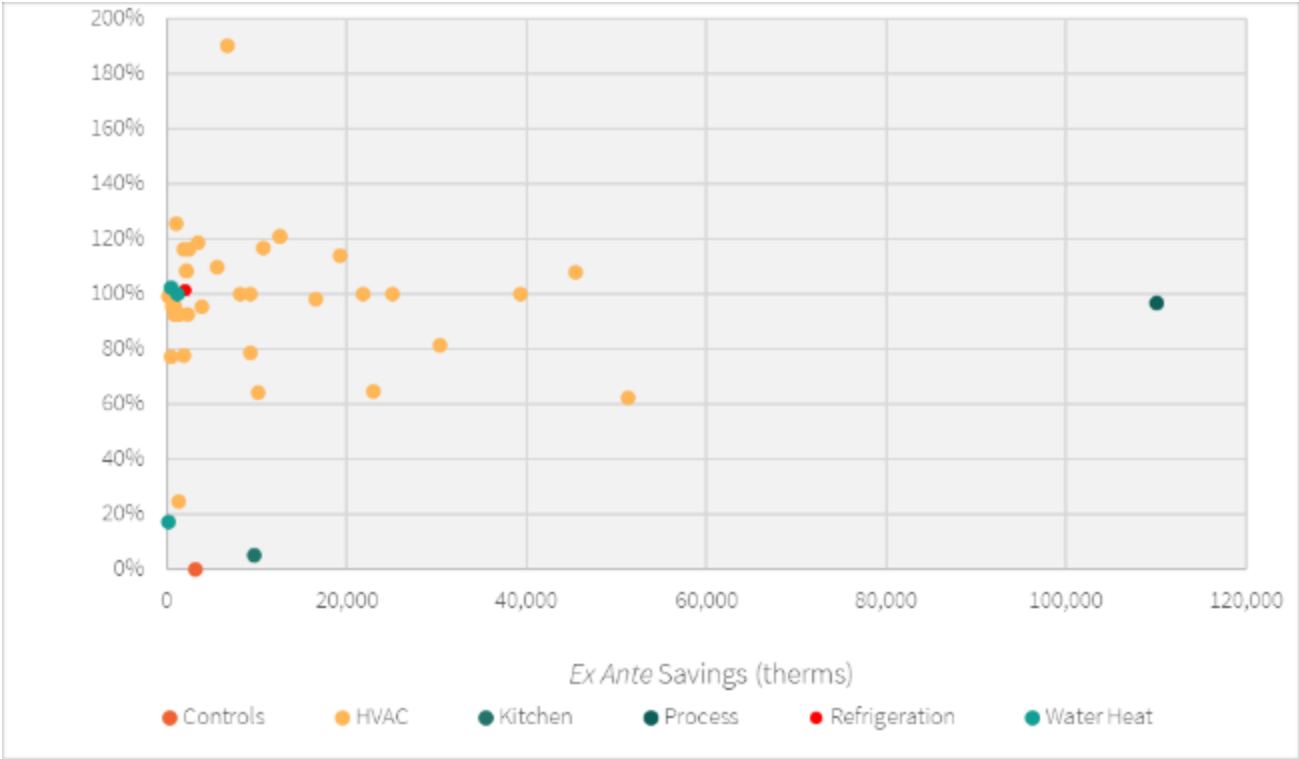


Table 209 summarizes notable differences between *ex ante* and *ex post* gross savings for sampled non-lighting measures.

Table 209. 2024 C&I Programs Notable Differences Between *Ex ante* & *Ex post* Gross Sources

MEASURE CATEGORY	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
Compressed Air	<i>Ex ante</i> savings were determined through deemed values from the IN 2015 TRM for VFD measures, and from WI TRM v2022 for compressed air system leak repair measures.	IL TRM v12.0 for VFD measures, and IN TRM Workbook v1.0 for leak measures. All inputs were verified through project documentation, virtual site visits or interviews.	Modifications made to the savings algorithm utilized for <i>ex ante</i> calculations.
Controls	<i>Ex ante</i> savings were determined by the IL TRM v12.0 (NC) and IN 2015 TRM (Custom)	IL TRM v12.0. All inputs were verified through project documentation, virtual site visits or interviews.	Modifications made to correct the baseline assumptions made in <i>ex ante</i> calculations, and to the source utilized to calculate savings.

MEASURE CATEGORY	EX ANTE SOURCES AND ASSUMPTIONS	EX POST GROSS SOURCES AND ASSUMPTIONS	PRIMARY REASONS FOR DIFFERENCES
HVAC	<i>Ex ante</i> savings were determined by the IL TRM v12.0, and IN 2015 TRM. Destratification furnaces used furnace vendor custom calculations and modeling software to determine savings.	IL TRM v12.0 for all sampled measures except destratification furnace measures, which were verified through the modeling outputs and vendor and adjusted to align with IL TRM v12.0 specifications for this measure. All inputs were verified through project documentation, virtual site visits or interviews.	Modifications made to EFLH, Baseline % Efficiency, CF, and HOU values, confirmed by application documentation and customer interviews. Modifications made to correct calculation errors in <i>ex ante</i> calculations.
Kitchen	<i>Ex ante</i> savings were determined by the IL TRM v12.0	IL TRM v12.0. All inputs were verified through project documentation, virtual site visits or interviews.	Modifications made to correct a calculation error in <i>ex ante</i> savings calculation algorithm utilized.
Motor	<i>Ex ante</i> savings were determined through custom calculations	Custom calculations. All inputs were verified through project documentation, virtual site visits or interviews.	No modifications were made to <i>ex ante</i> calculations.
Process	<i>Ex ante</i> savings were determined through custom engineering calculations	Custom calculations. All inputs were verified through project documentation, virtual site visits or interviews.	Modifications made to correct a rounding error in <i>ex ante</i> calculations.
Refrigeration	<i>Ex ante</i> savings were determined by the IL TRM v12.0	IL TRM v12.0 for savings algorithm, IN TRM Workbook v1.0 for CF values for standalone refrigerators only. All inputs were verified through project documentation, virtual site visits or interviews.	Modifications made to correct kW calculation errors in <i>ex ante</i> savings, and CF values differed between <i>ex ante</i> and <i>ex post</i> sources slightly for standalone equipment.
VFD	<i>Ex ante</i> savings were determined by deemed savings derived from IL TRM v12.0	IL TRM v12.0. All inputs were verified through project documentation, virtual site visits or interviews.	Savings calculation input values were modified to reflect measure-specific inputs
Water Heat	<i>Ex ante</i> savings were determined by the IN 2015 TRM, MEMD 2024, MEMD 2020.	IL TRM v12.0. All inputs were verified through project documentation, virtual site visits or interviews.	Modifications made to the reference for savings calculations resulted in different savings outputs.

Adjustment Summary—All C&I Measures

Table 210 provides the realization rates for lighting and non-lighting measures by each C&I program. The evaluation team determined cumulative realization rates by extrapolating the realization rates of randomly sampled measures to the full population. The handpicked sample realization rate has a greater effect on the cumulative realization rate when those measures are larger and constitute a greater portion of savings.

Table 210. 2024 C&I Programs Sample Realization Rates

PROGRAM/MEASURE CATEGORY	HANDPICKED SAMPLE REALIZATION RATE			RANDOM SAMPLE REALIZATION RATE		
	KWH	KW	THERMS	KWH	KW	THERMS
Custom Program						
Lighting	93%	93%	N/A	94%	95%	N/A
Non-Lighting	100%	N/A	97%	94%	86%	110%
SEM Program						
Lighting	N/A	N/A	N/A	N/A	N/A	N/A
Non-Lighting	N/A	N/A	N/A	100%	99%	N/A
New Construction Program						
Lighting	100%	100%	N/A	94%	100%	N/A
Non-Lighting	N/A	N/A	75%	100%	109%	91%
Prescriptive Program						
Lighting	100%	100%	N/A	99%	100%	N/A
Non-Lighting	N/A	N/A	N/A	100%	109%	70%
SBDI Program						
Lighting	100%	100%	N/A	100%	100%	N/A
Non-Lighting	100%	106%	N/A	100%	105%	99%

Summary C&I Program Realization Rates and *Ex Post* Gross Savings

Table 211 through Table 213 show the program's *ex ante* reported savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms.

As shown in Table 211, the lighting measure category achieved a high electric realization rate of 96%. Realization rates were also very consistent across the non-lighting measure category with an average rate of 96%, largely affected by the Custom program's non-lighting realization rate of 94% and balanced by all other programs at 100% realization rate, as shown in Table 210, above. The compressed air measure category accounted for 55% of the non-lighting *ex post* gross electric savings and achieved a program wide realization rate of 94%. The overall realization rate for electric savings across all C&I programs and measures in 2024 was 96%.

Table 211. 2024 C&I Programs *Ex ante* & *Ex post* Gross Electric Energy Savings

MEASURE CATEGORY	EX ANTE ^A ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	REALIZATION RATE
Lighting	38,239,548.64	38,239,548.68	38,135,547.80	36,860,791.84	96%
Non-Lighting	36,770,726.67	36,770,726.67	36,770,726.67	35,126,172.03	96%

MEASURE CATEGORY	EX ANTE ^A ELECTRIC ENERGY SAVINGS (KWH/YR.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	EX POST GROSS ELECTRIC ENERGY SAVINGS (KWH/YR.)	REALIZATION RATE
Study	-	-	-	-	N/A
Compressed Air	20,605,427.34	20,605,427.34	20,605,427.34	19,334,265.07	94%
Controls	837,160.00	837,160.00	837,160.00	783,585.32	94%
HVAC	4,354,850.95	4,354,850.95	4,354,850.95	4,266,113.80	98%
Kitchen	12,267.54	12,267.54	12,267.54	12,247.48	100%
Motors	4,202,657.22	4,202,657.22	4,202,657.22	4,089,851.97	97%
Process	2,327,439.00	2,327,439.00	2,327,439.00	2,226,855.45	96%
Refrigeration	4,333,578.39	4,333,578.39	4,333,578.39	4,316,062.47	100%
VFD	94,882.23	94,882.23	94,882.23	94,727.06	100%
Water Heat	2,464.00	2,464.00	2,464.00	2,463.41	100%
Total C&I Programs Savings	75,010,275.31	75,010,275.35	74,906,274.47	71,986,963.87	96%

Note: Totals may not sum properly due to rounding.

As shown in Table 212 below, the C&I portfolio collectively achieved a 100% demand savings realization rate driven primarily by the lighting measure category, which made up 91% of the *ex ante* demand savings and achieved a realization rate of 99%. The non-lighting demand realization rates varied by measure category with most measure categories achieving higher than 100% realization rates except for the compressed air measure category (94%). The collective non-lighting category achieved a 107% demand savings realization rate.

Table 212. 2024 C&I Program *Ex ante* and *Ex post* Gross Peak Demand Reduction

MEASURE CATEGORY	EX ANTE ^A PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)	REALIZATION RATE
Lighting	7,211.472	7,211.472	7,183.941	7,136.410	99%
Non-Lighting	718.213	718.213	718.213	766.002	107%
Study	-	-	-	-	N/A
Compressed Air	34.280	34.280	34.280	32.208	94%
Controls	-	-	-	-	N/A
HVAC	243.298	243.298	243.298	261.196	107%
Kitchen	0.724	0.724	0.724	0.790	109%
Motors	2.761	2.761	2.761	3.013	109%

MEASURE CATEGORY	<i>EX ANTE</i> ^A PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	<i>EX POST</i> GROSS PEAK DEMAND REDUCTION (KW/YR.)	REALIZATION RATE
Process	-	-	-	-	N/A
Refrigeration	420.422	420.422	420.422	450.546	107%
VFD	16.728	16.728	16.728	18.250	109%
Water Heat	-	-	-	-	N/A
Total C&I Programs Savings	7,929.685	7,929.685	7,902.155	7,902.412	100%

Note: Totals may not sum properly due to rounding.

As shown in Table 213, below, realization rates among gas measure categories were the most inconsistent of the fuel types in 2024. The C&I portfolio had a gas realization rate of 95% primarily due to the HVAC measure category, which contains 84% of the *ex ante* therm savings for the C&I portfolio and received 94% realization. Many of the adjustments made in the 2024 evaluation affected gas savings achievement, particularly in the kitchen and HVAC measure categories.

Table 213. 2024 C&I Programs *Ex ante* and *Ex post* Gross Natural Gas Savings

MEASURE CATEGORY	<i>EX ANTE</i> ^a NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	<i>EX POST</i> GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	REALIZATION RATE
Lighting	-	-	-	-	N/A
Non-Lighting	1,715,923.06	1,712,277.23	1,708,381.84	1,630,775.34	95%
Study	-	-	-	-	N/A
Compressed Air	-	-	-	-	N/A
Controls	68,241.89	68,241.89	68,241.89	72,366.74	106%
HVAC	1,441,509.88	1,441,516.78	1,437,621.39	1,356,644.63	94%
Kitchen	10,601.00	10,601.00	10,601.00	7,410.27	70%
Motors	-	-	-	-	N/A
Process	157,982.60	154,329.87	154,329.87	158,943.04	101%
Refrigeration	9,584.20	9,584.20	9,584.20	10,505.65	110%
VFD	-	-	-	-	N/A
Water Heat	28,003.49	28,003.49	28,003.49	24,905.02	89%
Total C&I Programs Savings	1,715,923.06	1,712,277.23	1,708,381.84	1,630,775.34	95%

Note: Totals may not sum properly due to rounding.

Table 214 shows the realization rates and *ex post* gross savings values for each program and the overall C&I portfolio. The lighting measure category represented a high proportion of electric savings for the Prescriptive, New Construction, and SBDI programs. As such, the high electric realization rate for lighting drove the overall electric realization rate for those programs. In contrast, a higher proportion of Custom program electric savings are from non-lighting measures; therefore, the realization rate aligns with the lower non-lighting measure realization rates.

Table 214. 2024 C&I Programs *Ex post* Gross Savings and Realization Rates

MEASURE CATEGORY/ PROGRAM	EX POST GROSS SAVINGS			REALIZATION RATE		
	KWH	KW	THERMS	KWH	KW	THERMS
Custom Program	32,599,258.57	1,380.544	766,150.32	94%	94.1%	106%
Lighting	7,977,552.11	1,345.800	-	93.6%	94.3%	N/A
Non-Lighting	24,621,706.46	34.744	766,150.32	93.8%	85.8%	106.3%
SEM Program	45,162.75	4.796	-	100%	99%	N/A
Lighting	-	-	-	N/A	N/A	N/A
Non-Lighting	45,162.75	4.796	-	100.0%	99.1%	N/A
NC Program	15,927,647.82	1,979.625	542,684.10	96%	101%	89%
Lighting	10,338,731.29	1,913.415	-	94.5%	100.3%	N/A
Non-Lighting	5,588,916.53	66.210	542,684.10	100.0%	109.1%	89.2%
Prescriptive Program	19,449,217.63	3,943.739	148,289.94	99%	101%	70%
Lighting	16,038,744.53	3,466.200	-	98.6%	100.0%	N/A
Non-Lighting	3,410,473.10	477.540	148,289.94	99.8%	109.1%	69.9%
SBDI Program	3,965,677.10	593.708	173,650.99	100%	101%	99%
Lighting	2,505,763.91	410.996	-	100.0%	100.0%	N/A
Non-Lighting	1,459,913.19	182.71	173,650.99	100.0%	104.7%	99.3%
Total C&I	71,986,963.87	7,902.413	1,630,775.34	96%	100%	95%

Ex Post Net Savings

For the 2024 C&I program evaluation, the evaluation team conducted a participant survey for the SBDI program, focused on calculating NTG ratios. We did not conduct a participant survey for any other C&I program; we derived the scores for those programs from the 2023 participant survey analysis. Table 215 shows the freeridership, spillover, and NTG ratios for the C&I programs.

Table 215. 2024 C&I Programs Net-to Gross Ratios, By Program

PROGRAM	FREERIDERSHIP A	PARTICIPANT SPILLOVER	NTG
Custom ^b	24%	0%	76%
SEM ^b	0%	0%	100%

PROGRAM	FREERIDERSHIP A	PARTICIPANT SPILLOVER	NTG
New Construction ^b	48%	0%	52%
Prescriptive ^b	21%	0%	79%
SBDI ^b	24%	1%	77%

^a Weighted by survey sample *ex post* gross program MMBtu savings.

^b Custom, SEM, NC and Prescriptive Programs were not surveyed for analysis in 2024. Values represented for these programs are derived from 2023 analysis from 2023 participant surveys.

Freeridership

To determine freeridership, the evaluation team asked respondents questions about whether they would have installed equipment of the same efficiency level, at the same time, and in same amount in absence of the C&I programs. We did this to understand their intention to install equipment and the influence of the program. By combining the intention score with the influence score, the team produced a freeridership score for the program by averaging savings-weighted intention and influence freeridership scores.

Intention Freeridership

The evaluation team estimated intention freeridership scores for all participants, based on their responses to the intention-focused freeridership questions. These questions are aimed at understanding what the customer would have done in the absence of the program and the incentive. In 2024, the SBDI program's participants who responded to the survey indicated that they would be less likely to install the efficiency measure that they pursued if not for the program as compared against the participation survey results of 2023. However, in both years, several respondents confirmed that they had ordered or installed the measure before knowing about the program (4 of 10 in 2023, 3 of 31 in 2024). The 2023 and 2024 SBDI program intention freeridership scores are shown in Table 216.

Table 216. SBDI Program Intention Freeridership Results

YEAR	RESPONSES	INTENTION FREERIDERSHIP SCORE ^A
2023	10	64%
2024	31	36%

^a The freeridership score was weighted by survey sample *ex post* gross program MMBtu savings.

Influence Freeridership

The evaluation team assessed the influence of freeridership by asking participants how important various elements of the program were in their decision-making process. These questions are aimed at understanding how much the program's design exerted influence on the customer's decision to participate. The respondents' maximum influence ratings ranged from 1 (not at all important) to 4 (very important). A maximum score of 1 meant the customer ranked all factors from the table as not at all important, while a maximum score of 4 meant the customer ranked at least one factor as very important.

Table 217 shows the SBDI program elements that participants rated for importance along with a count and average rating for each factor. The most important factor that influenced the customer’s purchase decision was a recommendation from a contractor or vendor. The next two most important factors were the incentive provided and previous participation in the program. Customers ranked the information provided by NIPSCO on saving opportunities as least influential to their decision-making.

Table 217. 2024 SBDI Program Influence Freeridership Responses

INFLUENCE RATING	INFLUENCE SCORE	RECOMMENDATION FROM CONTRACTOR OR VENDOR	PREVIOUS PARTICIPATION IN A NIPSCO ENERGY EFFICIENCY PROGRAM	THE NIPSCO INCENTIVE	INFORMATION PROVIDED BY NIPSCO ON ENERGY SAVING OPPORTUNITIES
1 – Not at all important	100%	0	1	1	1
2	75%	0	0	1	2
3	25%	4	2	3	3
4 – Very important	0%	22	13	22	14
Not Sure / Not Applicable	50%	5	15	4	11
Average Rating		3.8	3.7	3.7	3.5

Table 218 shows the influence freeridership results with a maximum influence rating of 3.9 for the SBDI program.

Table 218. 2024 SBDI Program Influence Freeridership Score

MAXIMUM INFLUENCE RATING	INFLUENCE SCORE	COUNT	TOTAL SURVEY SAMPLE EX POST MMBTU SAVINGS	INFLUENCE SCORE MMBTU SAVINGS
1 – Not at all important	100%	0	0	0
2	75%	0	0	0
3	25%	3	110	28
4 – Very important	0%	26	2,128	0
Not Applicable	50%	2	570	285
Average Maximum Influence Rating – Simple Average				3.9
Average Influence Score				11%

^a The average *influence* score above for the 2024 SBDI program was weighted by *ex post* gross MMBtu program savings.

Final Freeridership

The evaluation team calculated the mean of the intention and the influence scores to estimate final freeridership for the SBDI program:

$$Final\ Freeridership = \frac{Intention\ FR\ Score + Influence\ FR\ Score}{2}$$

A higher freeridership score translates to more savings, which are deducted from the gross savings estimates. In comparison to 2023 SBDI freeridership scores, the 2024 participant survey responses demonstrated that the program components were a stronger influence to pursue the efficiency measure, weighted by savings (average influence score of 14% in 2023). Table 219 lists the intention, influence, and final freeridership scores for the SBDI program in 2023 and 2024. The 2024 final freeridership score of 24% demonstrates lower freeridership than in 2023 (39%) with the most change between 2023 and 2024 occurring on the intention side of the freeridership score calculation.

Table 219. SBDI Program Freeridership Score

YEAR	INTENTION SCORE	INFLUENCE SCORE	FREERIDERSHIP SCORE
2023	64%	14%	39%
2024	36%	11%	24%

Participant Spillover

The evaluation team estimated participant spillover measure savings using specific information about participants determined through the evaluation using the Illinois TRM v12.0 as a baseline reference. The team estimated the percentage of program participant spillover by dividing the sum of additional spillover savings (as reported by survey respondents) by the total gross savings achieved by all survey respondents. The evaluation team found that two respondents who purchased additional LED lighting in 2024 thought the SBDI program participation was very important in their purchase decision, and they did not receive a rebate. The spillover savings estimated for the additional LED lighting was attributed to the SBDI program, resulting in a 1% participant spillover ratio estimate for the SBDI program, rounded to the nearest whole percent, as shown Table 220. The 2023 SBDI participant spillover ratio was 0%.

Table 220. 2024 SBDI Participant Spillover Results

YEAR	SPILOVER SAVINGS (MMBTU)	PARTICIPANT PROGRAM SAVINGS (MMBTU)	PARTICIPANT SPILOVER
2024	16.77	2,809.90	1%

Resulting Net Savings

Table 221 shows the resulting net electric savings, demand reduction, and natural gas savings for the SBDI program by measure.

Table 221. 2024 C&I SBDI Program *Ex post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION				EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS	NTG	KWH	KW	THERMS
HVAC	-	-	173,650.99	77%	-	-	133,711.26
Lighting	2,505,763.91	410.996	-	77%	1,929,438.21	316.467	-
Refrigeration	1,459,913.19	182.713	-	77%	1,124,133.16	140.689	-
Total Savings	3,965,677.10	593.708	173,650.99		3,053,571.37	457.155	133,711.26

Table 222 shows the resulting net electric savings, demand reduction, and natural gas savings for all C&I programs using 2023 NTG results for programs other than SBDI.

Table 222. 2024 C&I Programs Summary *Ex post* Net Savings

PROGRAM	EX POST GROSS SAVINGS/REDUCTION				EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS	NTG	KWH	KW	THERMS
Custom	32,599,258.57	1,380.544	766,150.32	76%	24,775,436.51	1,049.213	582,274.24
SEM	45,162.75	4.796	-	100%	45,162.75	4.796	-
NC	15,927,647.82	1,979.625	542,684.10	52%	8,282,376.87	1,029.405	282,195.73
Prescriptive	19,449,217.63	3,943.739	148,289.94	79%	15,364,881.93	3,115.554	117,149.06
SBDI	3,965,677.10	593.708	173,650.99	77%	3,053,571.37	457.155	133,711.26
Total C&I Programs	71,986,963.87	7,902.413	1,630,775.34		51,521,429.42	5,656.124	1,115,330.29

Table 223 shows the NTG results for each fuel.

Table 223. 2024 C&I Programs Net-to-Gross results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	75,010,275.31	71,986,963.87	72%	51,521,429.42
Peak Demand Reduction (kW)	7,929.685	7,902.413	72%	5,656.124
Natural Gas Energy Savings (therms/yr.)	1,715,923.06	1,630,775.34	68%	1,115,330.29

Process Evaluation

In 2024, the evaluation team conducted a short participant survey to assess NTG for the SBDI program.

For the SEM program evaluation, the team conducted an in-depth interview with the field engineer from TRC who implements the program. We attempted to do in-depth interviews with the two 2024 SEM program participants, but they were not responsive to our requests.

SBDI Participant Survey

The following section presents our findings from the SBDI participant survey.

Survey Sampling Strategy

Due to the low SBDI program participation numbers, the evaluation team opted to use a census sample of participants. After removing cases with no useable contact information, our census included 165 program participants. Using phone and email recruitment, the evaluation team surveyed 29 customers who participated in the program, which was about 18% of the sample. The following section describes the results related to program satisfaction. The NTG results are summarized above in the *Ex Post* Net Savings section.

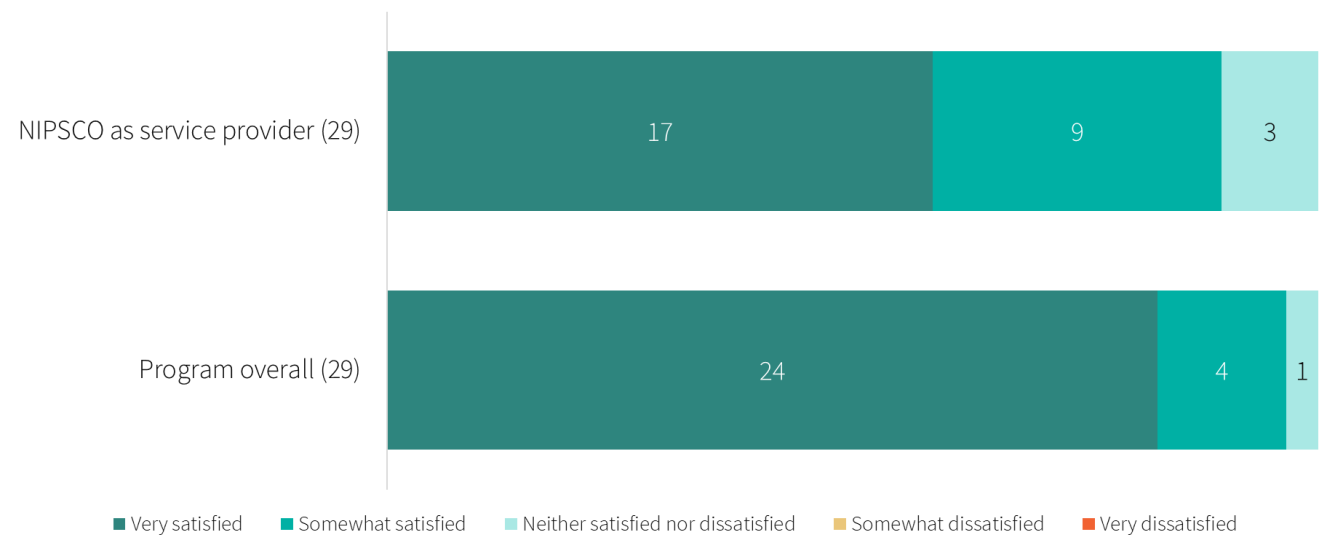
Participant Feedback

The following sections describe results related to SBDI survey respondents’ satisfaction with the program and firmographics.

Satisfaction With Program and NIPSCO

Survey respondents gave NIPSCO’s SBDI program high satisfaction ratings overall and to all aspects of the program. Overall, all but one were “very satisfied” or “somewhat satisfied” with the SBDI program. Most customers (26 out of 29) were also “very satisfied” or “somewhat satisfied” with NIPSCO as their energy service provider. Figure 79, below, shows the satisfaction scores for these.

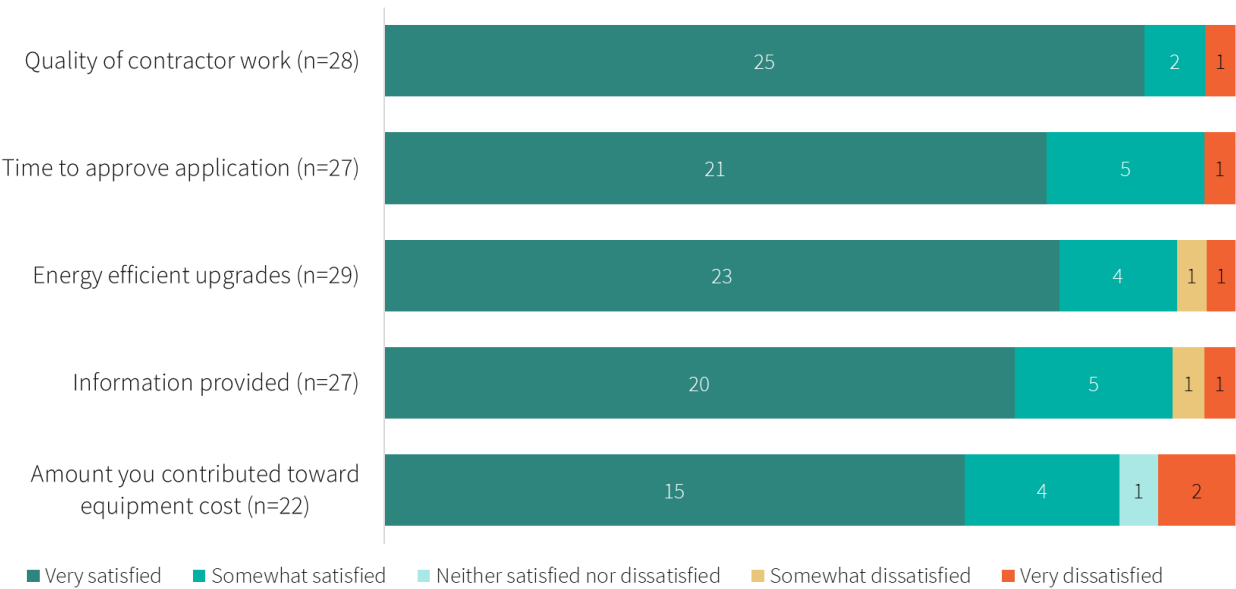
Figure 79. 2024 SBDI Participant Satisfaction with the Program Overall and NIPSCO as a Service Provider



Source: 2024 SBDI Participant Survey Question C.2 “How satisfied are you with NIPSCO’s SBDI program overall? Would you say you are...” and C.4 “How satisfied are you with NIPSCO overall as your organization’s utility service provider? Would you say you are...”

Most respondents were “somewhat satisfied” or “very satisfied” with each of the program components described in the survey. Respondents gave the quality of work by the vendor or contractor and the post-inspection approval process the highest satisfaction ratings in the cases of 27 out of 28 and 26 out of 27 respondents, respectively. Respondents were least satisfied with the amount they had to pay toward equipment costs (19 out of 22 were “very satisfied” or “somewhat satisfied”). Figure 80, below, shows the satisfaction ratings respondents gave to each of these aspects.

Figure 80. 2024 SBDI Participant Satisfaction with Various Program Aspects



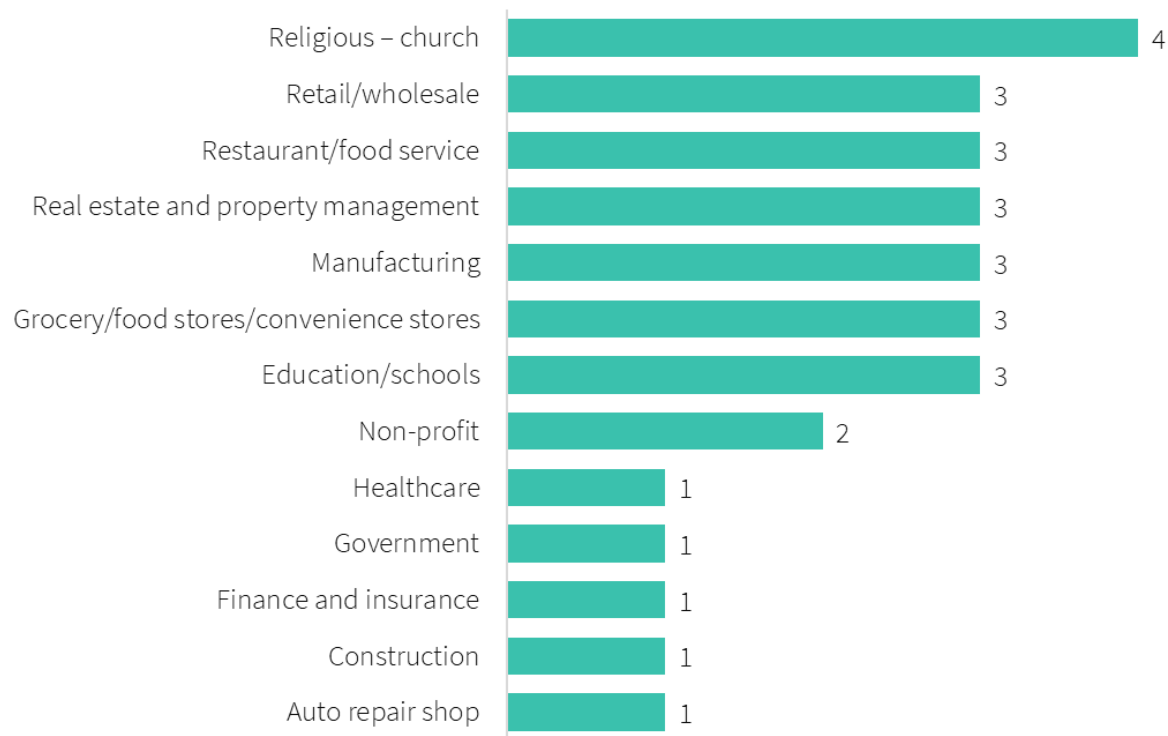
Source: 2024 SBDI Participant Survey Question C.1 “Next, we would like to ask you about some different components of the SBDI program. Please rate your level of satisfaction with each of these components...”

Firmographics

Respondents to the survey were predominantly owners of the buildings that received efficient upgrades (22 out of 29). In contrast, only six respondents said they leased the building, and one said, “Don’t know.”

The types of participating organizations who responded to the SBDI survey in 2024 were varied. The most common type was religious organizations, of which there were four. Figure 81, below, shows the counts of industry types among respondents.

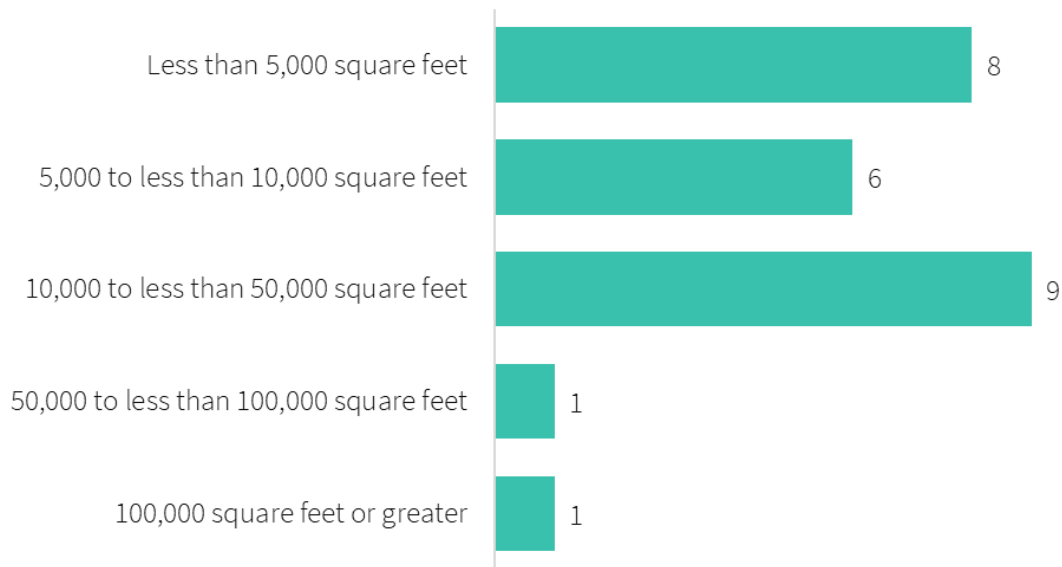
Figure 81. 2024 SBDI Participant Survey Respondents Industry Types



Source: 2024 SBDI Participant Survey Question F.1 “What industry is your organization in?” (n=29)

The most common building size ranges among respondents were “10,000 to less than 50,000 square feet,” which was the answer for nine respondents, and “Less than 5,000 square feet,” which was the answer for eight of the respondents. Figure 82, below, shows the counts for building sizes among survey respondents.

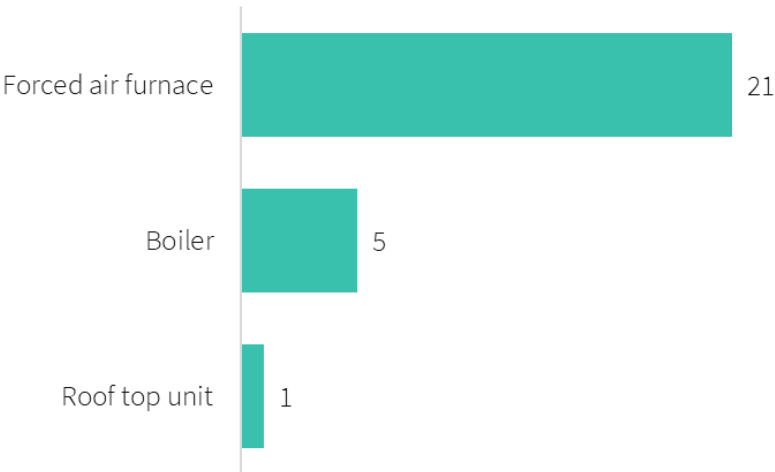
Figure 82. 2024 SBDI Participant Survey Respondents Building Sizes



Source: 2024 SBDI Participant Survey Question F.2 “What is the approximate square footage of space in the facility where you made the efficiency improvements?” (n=25)

By a wide margin, respondents most frequently heated their facilities (26 respondents). Only two respondents said they heated with electricity, and one facility used heating oil. Forced air furnaces were the most common type of equipment for space heating reported by 21 respondents followed by boilers reported by five and one reported using a rooftop unit. Two were unsure what type of space heating equipment they used. Figure 83 shows the breakdown of space heating equipment types used by respondents.

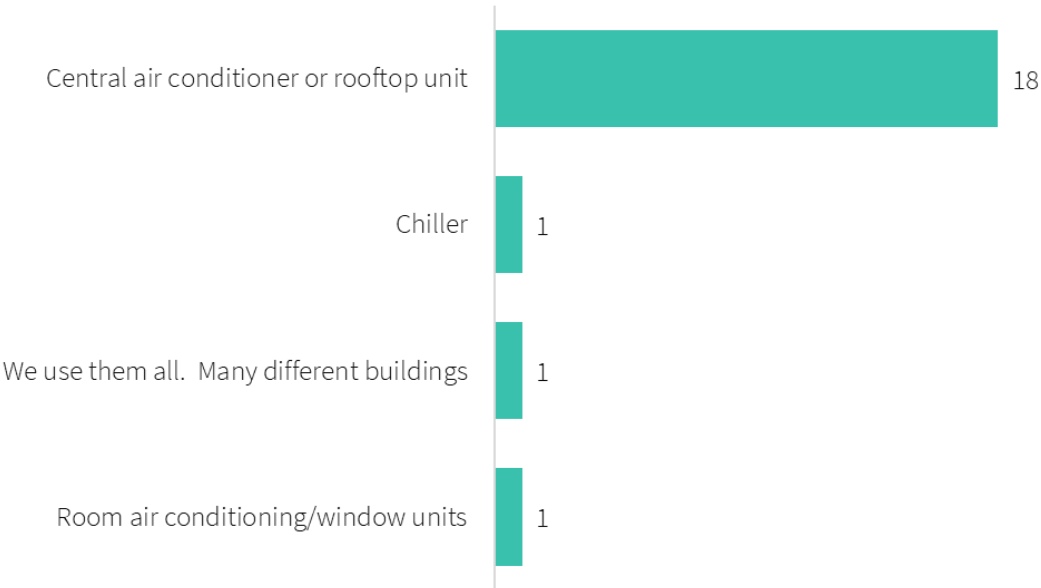
Figure 83. 2024 SBDI Participant Survey Respondents Type of Space Heating Used



Source: 2024 SBDI Participant Survey Question F.4 “What is the type of space heating used in the facility?” (n=27)

Out of 28 survey respondents, 23 who answered the space cooling question said their facilities had space cooling while five said they did not, and one was not sure. Figure 84, below, shows the types of space cooling used among the 23 respondents who had it. Two said they did not know what type of space cooling their building had.

Figure 84. 2024 SBDI Participant Survey Respondents Cooling Equipment Used



Source: 2024 SBDI Participant Survey Question F.6 “What is the type of space cooling used in the facility?” (n=21)

Nineteen respondents said they use natural gas for water heating, and eight said they use electric.

SEM Program

The SEM program's participants in 2024 included six project sites and two Parent Project companies. These sites had a total of 18 measures installed through the program.

Due to the low program participation rate, we attempted to interview all the project participant contacts (n=3) and the TRC field engineer (n=1) to evaluate the program processes. Since we were unable to reach any program participants for an interview, this evaluation draws solely on the in-depth field engineer interview. As part of that evaluation, the ILLUME team sought to answer the following research questions:

- How has the program changed since 2023?
- How is the program described to the customer? How is it differentiated from other programs?
- What kind of feedback are field engineers hearing from participants?
- To what extent are field engineers promoting or facilitating the sharing of experiences and lessons learned among participants?
- How has adding other facility types in the past year affected the program?
- What is the difference for SEM customers from SBDI or Prescriptive program offerings?
- How do customers learn about the program?

Program Process

The field engineer, a semiretired refrigeration specialist working two hours per day, serves as the main point of contact for the program. They are also the primary recruiter and often site auditor as well as the person connecting participants with refrigeration contractors to install upgrades. They primarily work with two contractors who “really know ECMs” but say the limited number of allies with this expertise is “probably our biggest hindrance.” They believe the higher incentives offered in neighboring Illinois pull qualified contractors into that state from Indiana and suggest if NIPSCO matched ComEd refrigeration incentives it would bring more qualified contractors back into Indiana, removing that bottleneck.

The SEM program, as the field engineer described it, is very similar to the refrigeration measures offered through the Prescriptive program, and they sometimes refer prospective participants to other NIPSCO programs or federal resources like Rural Energy for America Program (REAP). The services offered through the SEM program appear to be fashioned by the in-depth knowledge and educational instincts of the engineer, adding value for the customers. For example, during initial walkthroughs of facilities, the field engineer will point out low- or no-cost things customers can do to save energy that can benefit the customer but would not be counted as part of SEM program savings. As the field engineer describes it, “I walk through with a flashlight and point out things[;] they write them down.”

Based on our interview with the field engineer, the NIPSCO SEM program does not currently include some typical SEM program offerings described in the program abstract like benchmarking, energy planning and management, goal setting, staff trainings, and seeking out “continuous and evolving improvements” at customers’ facilities.

Program Activity

In 2024, customers installed following measures through the SEM program:

- Commercial glass door refrigerators (ENERGY STAR model replacing non-ENERGY STAR model)
- Commercial glass door freezers (ENERGY STAR model replacing non-ENERGY STAR model)
- Walk-in cooler strip curtains (added to walk-in units that do not have them)
- Walk-in freezer strip curtains (added to walk-in units that do not have them)
- Electronically Commutated Motor (ECM) cooler motors (added to units with no ECM or evaporator fan controls)
- Evaporator fan controls (replacing continuously running fans)

The field engineer described two ways they recruit SEM program participants, coordinating with contractors in the refrigeration sector: They reach out directly to commercial refrigeration equipment owners using an “extensive database,” and they also work with key account managers at NIPSCO to connect with their national key accounts. Sometimes the field engineer makes initial contact; sometimes the contractors do.

The engineer noted that this is the first year they promoted the program to grocery stores, which are prime candidates for refrigeration upgrades. They also pointed out that the incentive rates for the SEM and Prescriptive programs were adjusted this year, so they are the same for ECM motors. The engineer observed that the big chains already have things like ECMs installed: “[T]hey did it 15-20 years ago. But the smaller chains still need them and don’t really know what an ECM is.” They pointed out that ECMs “have a faster payback than for LEDs,” which is particularly important for smaller business owners who they describe as having tighter profit margins and looking for anything that will allow them to reduce operating expenses.

The field engineer tries to educate customers on efficiency options as part of the SEM program but observed that “the business developers that are out there doing the Prescriptive program can do the same.” They see the opportunity for lots of savings in refrigeration for the grocery sector noting, “I can save them \$1,000 a year[,] which is pretty simple. That’s the same as bringing in another \$100,000 worth of business.” They also mentioned some other refrigeration measures or practices that “don’t really cost anything or cost very little but save a lot” including automatic door closers on freezers, anti-sweat heater controls, and cleaning condensers. These were not listed as measures installed by SEM program participants as part of that program in 2024, but the first two are available as measures in the Prescriptive program. The engineer mentions them to customers who can consider whether to implement them.

Customer Experience

The field engineer described that customers are “really happy. When you do a lot of ECMs you see a dramatic drop in energy use.” They described an instance where a contractor put in ECMs and a controller in a store, and they went in and graphed the performance compared to their old equipment; the customer was happy to see the data. They also noted that if a customer has multiple stores, when they see what savings they can achieve with refrigeration measures in one of their stores, they often want to have their other stores make those changes, as well.

The field engineer mentioned that they have gotten a lot of compliments over the years on the program application (in Excel spreadsheet format) because it makes it easy for customers and contractors.

The field engineer also observed that most grocery store owners do not want to have any upgrades installed in their stores during the fourth calendar quarter because that is when they make most of their money for the year. Therefore, utility program bonuses to encourage participation are best offered during the first nine months of the year.

Conclusions and Recommendations

CONCLUSION 1: INCONSISTENCY IN MEASURE AND PROJECT GROUPING, WHICH RESULTED IN DUPLICATE BOILER TUNE-UP MEASURE ENTRIES, LED TO A PRESCRIPTIVE NATURAL GAS REALIZATION RATE OF 70%.

The evaluation team observed inconsistency in 2024 in how the Prescriptive program reported boiler tune-up measure savings, particularly for portfolio projects. Boiler tune-up measures appear to be reported in two different ways within the 2024 Prescriptive program tracking data: In some instances, there is one measure entry for each piece of equipment (one boiler MBH for quantity), and in some instances, there is one measure entry containing the total quantity for all equipment (all boilers in that facility grouped together with cumulative MBH reported for quantity). As an example, for a randomly sampled Prescriptive program measure, the evaluation team found six boilers reported under one measure entry (with cumulative MBH reported), and in error, six additional measures for the same equipment recorded for that Parent Project. While not all boiler tune-up measures for this school were part of the sample selected, the evaluation team did find this same error for all boiler tune-up measures this school district pursued as part of a multi-facility boiler tune-up implementation effort.

Recommendations:

- Establish a consistent, documented method for measure documentation and tracking database entry. The evaluation team would recommend making one measure entry per single piece of equipment to reduce the potential for duplication risks as the measure rolls up to the project and the customer levels.

CONCLUSION 2: WHILE PROGRAM LEVEL REALIZATION RATES FOR THE C&I PROGRAMS WERE CLOSE TO 100%, REALIZATION RATES FOR SOME MEASURE CATEGORIES WERE LOW DUE TO OUTDATED RESOURCES USED IN EX ANTE SAVINGS CALCULATIONS.

The Custom program's electric energy realization rate (94%) and the New Construction program's natural gas realization rate (89%) were most influenced by sampled measures where *ex ante* savings calculations used outdated sources. For several measures across all C&I programs, *ex ante* savings referenced the Indiana 2015 TRM calculation and inputs. Additionally, throughout most measure categories across all C&I programs, the evaluation team found instances where *ex ante* savings referenced Indiana 2015 TRM EFLH values even when the rest of the calculation referenced the Illinois TRM v12.0. The differences between the EFLH values and baseline efficiency standards as compared to Illinois TRM v12 (*ex post*) were the greatest influencing factors on realization rates for all C&I programs.

Recommendations:

- Update any savings calculations or assumptions from the Indiana 2015 TRM with those available in the Indiana TRM Workbook v1.0 and the Illinois TRM (the most current version at start of program year).
- Revise all Indiana 2015 TRM EFLH references to EFLH values in the Illinois TRM mapped to Indiana cities as specified in the Indiana Workbook TRM v1.0.

CONCLUSION 3: GOAL ACHIEVEMENT VARIED SUBSTANTIALLY ACROSS PROGRAMS AND ENERGY SAVINGS TYPES.

Many programs achieved some or all savings goals, and some programs significantly overachieved or underachieved goals. The SBDI program significantly overachieved on all goals, particularly the gas goal. The program had no gas saving measures recorded in the first three quarters of 2024, but after offering a bonus incentive for space heating boiler tune-ups in Q4, it greatly surpassed the gas savings goal for the year with virtually all gas savings coming from that measure. The SEM program significantly underachieved on all goals; this was likely due to program capacity challenges. The Prescriptive program underachieved on electric energy and demand goals but significantly overachieved on its gas goal. The Custom program performed well against electric energy and gas savings goals, while underachieving the kW demand savings goal. The New Construction program performed well against the electric energy and demand savings goals but slightly underachieved the gas savings goal. The shift from ASHRAE 90.1-2207 to IECC 2018 for a new construction baseline likely introduced some uncertainty in goal achievement potential for that program in 2024.

Recommendation:

- Examine the circumstances of the SBDI bonus incentive promotion and concurrent program activity, as well as budget spent, to evaluate whether and how it can be duplicated in future years.

CONCLUSION 4: THE SEM PROGRAM IS LIKELY RUNNING AT OR NEAR CAPACITY GIVEN THE CURRENT CONDITIONS AND RESOURCES AVAILABLE.

The program has only one field engineer focused on refrigeration who is working two hours per day. That field engineer works with only two qualified contractors available to install ECMs in Indiana because others are choosing to work in Illinois to benefit from ComEd's higher incentives for refrigeration. These conditions limit the potential for the SEM program to expand. If NIPSCO has a goal of increasing participation in and savings from the SEM program, it could consider ways to grow the program.

Recommendations:

- Increase SEM program incentive levels (as well as those for the Custom and Prescriptive programs) for refrigeration measures in order to match those offered in Illinois. This will help attract a larger number of qualified refrigeration efficiency contractors to work in Indiana.
- Add staff to work with and learn from the current field engineer. The new staff could help expand the reach of the program and could be trained to take over for the current field engineer when they retire.
- Consider options, such as an uplift or spillover analysis, to better understand the impact of the SEM program and actions by the field engineer. Especially if program expansion is a goal, NIPSCO may want to complete additional studies on the effects of field engineer referrals to other programs and identification of low- and no-cost energy saving suggestions that customers act on (which might be counted as savings under a more standard model SEM program).

CONCLUSION 5: SBDI PROGRAM FREERIDERSHIP SURVEY RESULTS INDICATE HIGH INTENTION FREERIDERSHIP AND POSSIBLE INCONSISTENCIES IN PROGRAM IMPLEMENTATION.

Three SBDI survey respondents indicated that they had already purchased, and in some cases, had already installed the equipment they received an incentive for prior to the contractor arriving on site. This finding appears to indicate that the program may not always be implemented as designed with the contractor providing and installing the equipment. The 2023 report presented this same conclusion, and it continues to be a concern for 2024 given 2024 survey findings.

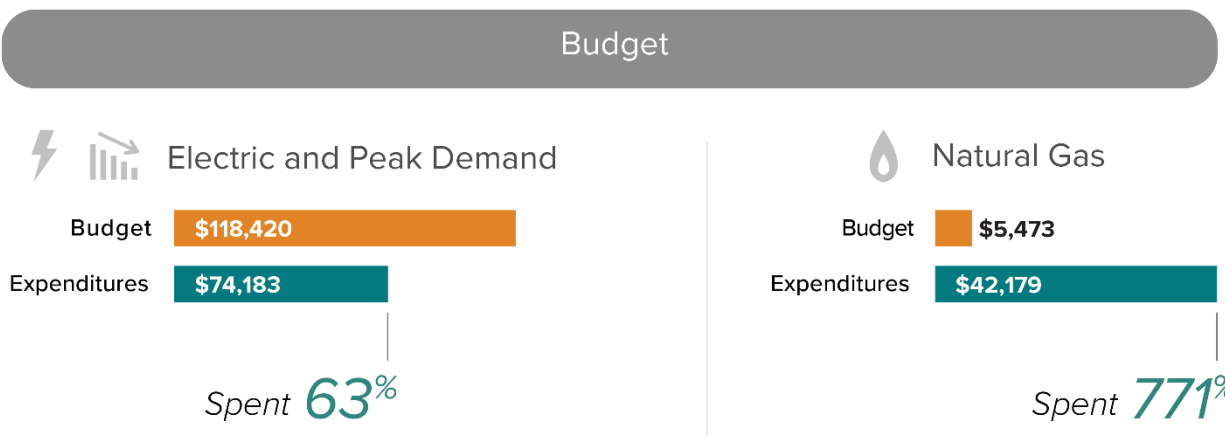
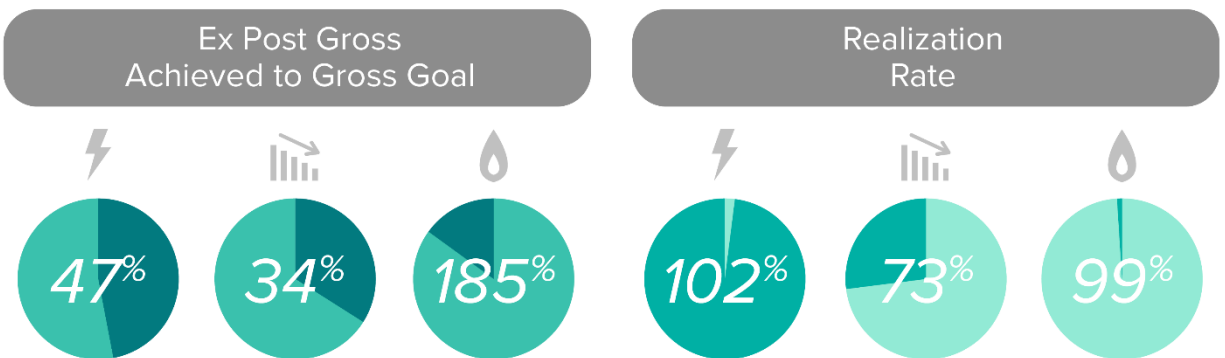
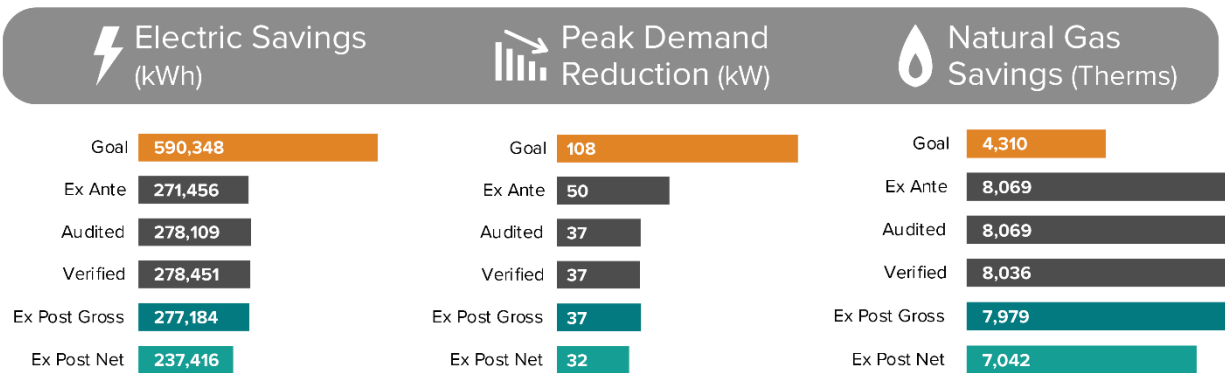
Recommendations:

- Ensure the SBDI program delivery matches the program abstract process narrative, which states that the trade ally will identify potential measures that could benefit the customer and then install those measures.
- Conduct targeted outreach for the SBDI program to those who have not yet participated in the program.

C&I MARKETPLACE



- The program exceeded its natural gas therms savings goals, achieving 185% of the goal.
- Realization rates varied across measures due to measure calculation errors in some Ex Ante savings calculations.



Program Design and Delivery

The Commercial and Industrial (C&I) Online Marketplace (OLM) program provides instant discounts to eligible businesses on energy saving kits through their online store. The purpose of the program is to help remove the financial barrier associated with the initial cost of setting up these energy-efficient alternatives. In 2024, the C&I OLM program was implemented by TRC, who partnered with a new vendor, Enervee, to implement it. Enervee was responsible for building, hosting, and maintaining the C&I OLM program’s website; verifying customer accounts; handling customer orders; shipping products to customers; and answering customer questions and concerns. Because this year saw the shift to a new website implementer manager, the kits did not launch until July 2024, resulting in a much more limited window for purchasing kits than in past years. This led to smaller program goals and lower participation overall.

In 2024, NIPSCO offered kits to C&I customers at no cost. The kits were available to order during the following periods:

- July 16-25
- September 17-26
- November 18-27

To participate in the program, customers visit the online store website, add the kits they would like to receive to their shopping cart, and provide their account information at checkout. Enervee then ships the kits directly to customers’ business addresses within five to eight days, and customers may return kits up to 30 days after receipt. Participants must be active NIPSCO C&I customers within designated rate schedules and must receive the corresponding electric or natural gas service for the product they are selecting. Kits purchased through the C&I Online Marketplace are not eligible for rebates through other NIPSCO programs.

Table 224 lists the measures offered through the C&I Online Marketplace in 2024. A single customer account can order up to five kits (any combination) in a calendar year. In 2024, NIPSCO offered a Water Saver Kit, a Conservation Kit, and an Office Kit. The incentive value of these kits ranges from \$88.80 to \$120.11 per kit. The average expected useful life of the kits ranges from eight to nine years, weighted by the energy savings each measure within the kit contributes.

Table 224. 2024 C&I OLM Program Kit Contents and Summary Metrics

PRODUCTS	QTY	INCENTIVE VALUE (PER UNIT)	EUL
Water Saver Kits (650074, 650075)		\$88.80 ^a	8
Pre-Rinse Spray Valve	1	\$51.47	5
Showerhead 1.5 GPM	1	\$5.98	10
Bathroom Aerator 1.0 GPM	2	\$1.12	10
Kitchen Aerator 1.5 GPM	1	\$2.92	10
Hot Water Temp Card	1	\$0.92	2
Pipe Insulation Tape	15 (ft)	\$4.02	15
Conservation Kits (650076, 650077)		\$120.11 ^a	8
Pre-Rinse Spray Valve	1	\$51.47	5
Bathroom Aerator 1.0 GPM	2	\$1.12	10

PRODUCTS	QTY	INCENTIVE VALUE (PER UNIT)	EUL
Kitchen Aerator 1.5 GPM	1	\$2.92	10
Pipe Insulation Tape	15 (ft)	\$4.02	15
Advanced Power Strip	1	\$21.46	7
Foam Outlet Gasket	10	\$0.13	20
Smart Plug	4	\$3.35	7
Office Kits (650078, 650079)		\$115.82 ^a	9
LED Desk Lamp	1	\$14.27	15
Advanced Power Strip	1	\$21.46	7
Bathroom Aerator 1.0 GPM	2	\$1.12	10
Kitchen Aerator 1.5 GPM	1	\$2.92	10
Hot Water Temp Card	1	\$0.92	2
Fridge Thermometer	1	\$1.79	0
Foam Outlet Gasket	10	\$0.13	20
Foam Switch Gasket	10	\$0.13	20
TCP LED Exit Sign Retrofit	2	\$20.80	5

^a The total incentive value for each kit includes sales tax, insert cost and shipping and handling costs, and therefore does not sum from the per unit kit contents shown in this table.

Changes from the 2023 Design

The C&I OLM program saw a handful of programmatic changes in 2024, the most significant of which was a change in implementer. This change resulted in a late program launch in July and limited windows for ordering kits—they were only available in three- 10-day windows, instead of always being available. The measures included in the kits were updated in 2024: the Water Saver Kit no longer included a desk lamp, and the Office Kits included both outlet and switch gaskets. There was also a new Conservation Kit that included mostly gas savings measures, an advanced power strip, and a smart plug. Lastly, the program removed the “a la carte” offerings.

As discussed in the following section, these changes also greatly reduced the savings goals and the program’s budget.

Program Performance

The C&I OLM program exceeded the natural gas therms savings goals, achieving 185% of the goal. The program fell short of its electric energy savings and kW demand savings goal, achieving 47% and 34% of the goal set for the program, respectively, due to the mix of measures distributed in 2024. The program offerings and distribution channels changed considerably from 2023 to 2024, resulting in significantly reduced 2024 program goals. The 2024 electric energy savings, natural gas savings, and kW demand savings goals were 14%, 5% and 14% of the 2023 goals, respectively. Similarly, the 2024 *ex ante* electric, demand, and natural gas savings achieved were 20%, 39% and 44% of the 2023 *ex ante* savings achieved, respectively. The program distributed 860 individual kits in 2024, compared to 666 kits in 2023. There were 214 unique participants (premise numbers) in 2024, compared to 253 in 2023.

Table 225 summarizes savings for the full year of program performance, including program savings goals.

Table 225. 2024 C&I OLM Program Saving Summary

METRIC	GROSS SAVINGS GOAL	EX ANTE	AUDITED	VERIFIED	EX POST GROSS	EX POST NET	EX POST GROSS GOAL ACHIEVEMENT
Electric Energy Savings (kWh/yr.)	590,347.50	271,456.29	278,108.78	278,451.33	277,183.82	237,415.59	47%
Peak Demand Reduction (kW)	107.791	50.305	36.825	36.825	36.825	32.328	34%
Natural Gas Energy Savings (therms/yr.)	4,310.00	8,068.67	8,068.67	8,036.43	7,979.39	7,041.69	185%

The evaluation team made several calculation corrections to the kit contents, which made up most of the adjustment impact on realization rates. The lower realization rate for kW demand savings is due to an error described in the *Audited and Verified Savings* section of this chapter. There were no adjustments made to in-service rate (ISR) values, water heater fuel saturation ratios, and space heating fuel saturation ratios as we did not collect 2024 participant survey data. We applied net-to-gross (NTG) values from 2023 for the 2024 evaluation year. Table 226 outlines the *ex post* and NTG adjustment factors applied to the 2024 evaluation.

Table 226. 2024 C&I OLM Program Adjustment Factors

METRIC	REALIZATION RATE (%) ^a	FREERIDERSHIP	SPILOVER	NTG (%) ^b
Electric Energy Savings (kWh/yr.)	102%	14%	0%	86%
Peak Demand Reduction (kW)	73%	12%	0%	88%
Natural Gas Energy Savings (therms/yr.)	99%	12%	0%	88%

^a Realization Rate is defined as *ex post* gross savings divided by *ex ante* savings.

^b NTG is defined as *ex post* net savings divided by *ex post* gross savings.

While the expenditures within each fuel type deviate from their specific budgets in 2024, as seen in Table 227, the overall expenditure was 94% of the overall 2024 budget for the program. The 2024 program year total budget was less than 20% of the 2023 program year total budget. The disproportionate natural gas spend was due to a credit and re-bill in December 2024 to readjust the cost of the kits for tax and the incentive split between electric and gas. Since budgets are set in January for the program year, the budget was not adjusted for this change, resulting in a 771% spend.

Table 227. 2024 C&I OLM Program Expenditures

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Electric	\$118,420.01	\$74,183.19	63%
Natural Gas	\$5,472.94	\$42,179.14	771%

FUEL	PROGRAM BUDGET	PROGRAM EXPENDITURES	BUDGET SPENT (%)
Total	\$123,892.95	\$116,362.33	94%

Evaluation Methodology

To inform the 2024 NIPSCO C&I OLM program evaluation, the evaluation team completed the following research activities:

- **Program staff interviews and discussions**, to understand the program’s process, delivery, and design.
- **Documentation and materials review**, to provide context on the program’s implementation.
- **Tracking data analysis**, to audit and verify the accuracy of the program’s participation data.
- **Engineering analysis**, to review the program’s savings assumptions and algorithms for reasonableness and accuracy.

The team did not conduct a process evaluation for the C&I OLM this program cycle due to the switch in vendors and the late kickoff of the program.

Impact Evaluation

The evaluation team completed the impact evaluation to answer the following research questions:

- What assumptions were used to develop savings estimates? Are there any updates that the program should make?
- What are the *ex post* program savings? Do these suggest any needed updates to the program’s design, delivery, or savings assumptions?
- Did the program meet its participation and savings goals?

For all measure types, the evaluation team compared our engineering calculations to NIPSCO’s *ex ante* savings, basing our savings methodologies and inputs for each measure on the Illinois TRM v12.0.

Audited and Verified Savings

To develop an audited measure quantity and savings, the evaluation team first checked the program tracking data for duplicates or other data quality issues. To audit program savings, the evaluation team performed the following reviews to verify alignment with the program’s scorecard:

- **Audited product quantity.** The team reviewed program tracking data provided by the implementer and audited the number of energy efficiency measures and kits distributed.
- **Confirmed measure-level savings calculations.** The team reviewed per-measure and per-kit savings calculations in the documentation provided by NIPSCO.
- **Reviewed savings estimates.** The team confirmed the program-level total savings reported in the scorecard.

Audited Quantities of Kits

Table 228 shows the number of reported and audited kits distributed through the C&I OLM program in 2024. The evaluation team checked the reported *ex ante* values against the program tracking data and found no discrepancies.

Table 228. 2024 C&I OLM Program Tracking Data and Audited Kit Quantities

KIT TYPE	MEASURE ID	TRACKING DATA	AUDITED
Water Savers - Dual	650074	124	124
Water Savers - Elec Only	650075	34	34
Conservation Kit - Elec Only	650076	68	68
Conservation Kit - Dual	650077	231	231
Office Kit - Dual	650078	328	328
Office Kit - Elec Only	650079	75	75
Total		860	860

Kit and Measure Savings Review

The evaluation team reviewed the kit and measure savings documentation, which contained measure-level and kit-level savings.⁵² NIPSCO's implementer included ISR values from this program's past evaluation efforts in the *ex ante* assumptions for the C&I OLM measures. The program documentation included rates to adjust savings for ISRs, water heater fuel saturation, and space heating fuel saturation.

Upon review of this document, the evaluation team found that measure-level savings values in the tracking data mostly aligned with NIPSCO's kit savings documentation and reported kWh savings aligned with program design savings calculations. Corrections made in the tracking data audit included any calculation or transcription errors, as described in Table 229, below. Table 229 also highlights notable differences between *ex ante* and audited calculations and inputs for applicable measures.

Table 229. 2024 C&I OLM Program Notable Differences Between *Ex Ante* and Audited Calculations

MEASURE, KITS IMPACTED	EX ANTE VALUE	AUDITED VALUE	MODIFICATION MADE
kWh Savings All Measures,	Unrounded kWh savings output value	kWh savings output value	<i>Ex ante</i> calculations did not round kWh electric energy savings values at the measure level to two decimal places, while the collective kit was rounded to two decimal places. The evaluation

⁵² TRC Companies. October 3, 2024. 2024.10.03 NIPSCO C&I 24-26 Program Design v1.1.0

MEASURE, KITS IMPACTED	EX ANTE VALUE	AUDITED VALUE	MODIFICATION MADE
All Kits		rounded to two decimal places	team rounded the calculated kWh savings value at the measure level to two decimal places and at the kit level to two decimal places. The impact of this error is very slight, resulting in a 0.01 kWh difference between <i>ex ante</i> and audited savings per kit for the Conservation Kits only.
Bath Aerator, All Kits	Qty of 4 (Effectively)	Qty of 2	<i>Ex ante</i> calculations incorporate kit quantity of aerators in both the kWh electric energy savings and the kW demand savings calculations. The kW demand savings calculation is built on the kWh energy savings output, which resulted in double counting the kit quantity in the demand savings output. This measure is found within all kits distributed, so this error impacts the demand savings of all kits.
LED Desk Lamp, LED Exit Sign, Office Kits	%ElecHeat metric not applied to therms savings	%ElecHeat metric applied to therms savings calculation	<i>Ex ante</i> calculated therms savings without reducing the output value by the electric heat saturation rate (11%). The evaluation team calculated therms savings with the addition of (1 - %ElecHeat) multiplied to the savings algorithm.
LED Desk Lamp	$\Delta kWh = (((WattsBase - WattsEE) / 1000) * ISR * Hours * IFkWh$	$\Delta kWh = (((WattsBase - WattsEE) / 1000) * ISR * Hours * WHFe + (\%ElecHeat * KWHHeat Penalty)$	<i>Ex ante</i> calculated kWh savings by multiplying by IFkWh values, which are meant to be applied to the kWh waste heat factor algorithm, and omitted multiplying by the WHFe metric. The evaluation team followed the Illinois TRM v12 WHF algorithms to calculate the kWh savings.
LED Exit Sign	$\Delta kWh Heat Penalty = -0.45$	$\Delta kWh Heat Penalty = -2.05$	<i>Ex ante</i> applied %ElecHeat metric twice, applying it to the kWh Heat Penalty calculation and to the kWh savings calculation. The kWh savings calculation incorporates the kWh heating penalty, making the %ElecHeat metric applied twice. The evaluation team applied the %ElecHeat metric to the kWh savings calculation only, not to the kWh Heat Penalty metric additionally, according to the Illinois TRM v12.0 algorithm.
LED Desk Lamp	$\Delta kWh Heat Penalty = 17.75$	$\Delta kWh Heat Penalty = -7.12$	The kWh Heat Penalty metric is meant to be a negative value, <i>ex ante</i> calculations did not add the negative sign to the IFkWh metric. The evaluation team used the IFkWh electric resistance heat value of -0.154 kWh for unknown space type, to align with the kWh Heat Penalty metric in the <i>ex ante</i> calculation of the LED Exit Sign measure rather than the IFkWh value for electric heat pump.

Table 230 shows the comparison between the reported *ex ante* savings values in the program tracking data and the program design savings calculations. We then calculated the savings impact for each individual measure and compared it to the *ex ante* savings. These values make up the audited savings reported. The values below report per-measure values, not total savings from the entire C&I OLM program population.

Table 230. 2024 C&I OLM Program *Ex Ante* and Audited Per-Kit Savings

MEASURE	EX ANTE SAVINGS			AUDITED SAVINGS		
	KWH	KW	THERMS	KWH	KW	THERMS
Water Savers - Dual	370.13	0.082	20.07	370.13	0.050	20.07

MEASURE	EX ANTE SAVINGS			AUDITED SAVINGS		
	KWH	KW	THERMS	KWH	KW	THERMS
Water Savers - Elec Only	370.13	0.082	-	370.13	0.050	-
Conservation Kit - Elec Only	390.19	0.040*	-	390.20	0.028	-
Conservation Kit - Dual	390.19	0.040*	14.33	390.20	0.028	14.33
Office Kit - Dual	238.98	0.063	6.92	255.48	0.051	6.92
Office Kit - Elec Only	238.98	0.063	-	255.48	0.051	-

*Note: The kW demand savings reported in Captures tracking data differs from what is represented in the above table due to an error in Captures data entry for Conservation Kits distributed in the first two distribution waves of the program year. *Ex ante* has been defined as the savings reported by the 2024 year-end scorecard, reflected above.

Verified Savings

In prior evaluation years, the evaluation team calculated verified savings using ISR values obtained through the C&I OLM program participant survey. The evaluation team did not field a participant survey for the 2024 evaluation, so we used ISR values from the 2023 participant survey analysis. The program implementers also applied ISR values from the 2023 evaluation to *ex ante* measure-level savings, so there is no deviation between *ex ante* and verified ISR values. Table 231 lists the *ex ante* and verified ISR values for all program-installed measures.

Table 231. 2024 C&I OLM Program ISR by Measure

MEASURES	QUANTITY PER KIT	EX ANTE / VERIFIED ISR	EX ANTE / VERIFIED ISR SOURCE
Water Saver Kits			
Pre-Rinse Spray Valve	1	33%	2023 NIPSCO C&I OLM Survey
Showerhead 1.5 GPM	1	10%	2023 NIPSCO C&I OLM Survey
Bathroom Aerator 1.0 GPM	2	88%	2023 NIPSCO C&I OLM Survey
Kitchen Aerator 1.5 GPM	1	42%	2023 NIPSCO C&I OLM Survey
Hot Water Temp Card	1	10%	2023 NIPSCO C&I OLM Survey
Pipe Insulation Tape	15	42%	2023 NIPSCO C&I OLM Survey
Conservation Kits			
Pre-Rinse Spray Valve	1	33%	2023 NIPSCO C&I OLM Survey
Bathroom Aerator 1.0 GPM	2	34%	2023 NIPSCO C&I OLM Survey
Kitchen Aerator 1.5 GPM	1	34%	2023 NIPSCO C&I OLM Survey
Pipe Insulation Tape	15	42%	2023 NIPSCO C&I OLM Survey
Advanced Power Strip	1	82%	2023 NIPSCO C&I OLM Survey
Foam Outlet Gasket	10	38%	2023 NIPSCO C&I OLM Survey
Smart Plug	4	28%	IL TRM v12.0 Vol. 2. pg. 965

MEASURES	QUANTITY PER KIT	EX ANTE / VERIFIED ISR	EX ANTE / VERIFIED ISR SOURCE
Office Kits			
LED Desk Lamp	1	69%	2023 NIPSCO C&I OLM Survey
Advanced Power Strip	1	82%	2023 NIPSCO C&I OLM Survey
Bathroom Aerator 1.0 GPM	2	34%	2023 NIPSCO C&I OLM Survey
Kitchen Aerator 1.5 GPM	1	34%	2023 NIPSCO C&I OLM Survey
Hot Water Temp Card	1	10%	2023 NIPSCO C&I OLM Survey
Fridge Thermometer	1	N/A	No energy savings for the measure
Foam Outlet Gasket	10	38%	2023 NIPSCO C&I OLM Survey
Foam Switch Gasket	10	38%	2023 NIPSCO C&I OLM Survey
TCP LED Exit Sign Retrofit	2	33%	2023 NIPSCO C&I OLM Survey

Table 232 summarizes the comparison between *ex ante* and verified savings. To calculate the verified measure quantity, the evaluation team multiplied the audited measure quantity by the ISR. Since ISRs by measure did not differ between the evaluation team and the implementation team, verified savings values do not differ from audited savings values. The values reported are for a single kit and do not represent the entire C&I OLM program population.

Table 232. 2024 C&I OLM Program *Ex Ante* and Verified Per-Kit Savings

KIT TYPE	EX ANTE SAVINGS			VERIFIED SAVINGS		
	KWH	KW	THERMS	KWH	KW	THERMS
Water Savers - Dual	370.13	0.082	20.07	370.13	0.050	19.81
Water Savers - Elec Only	370.13	0.082	-	370.13	0.050	-
Conservation Kit - Elec Only	390.19	*0.040	-	390.20	0.028	-
Conservation Kit - Dual	390.19	*0.040	14.33	390.20	0.028	14.33
Office Kit - Dual	238.98	0.063	6.92	256.33	0.051	6.92
Office Kit - Elec Only	238.98	0.063	-	256.33	0.051	-

*Note: The kW demand savings reported in Captures tracking data differs from what is represented in the above table due to an error in Captures data entry for Conservation Kits distributed in the first two distribution waves of the program year. *Ex ante* has been defined as the savings reported by the 2024 year end scorecard, reflected above.

Ex Post Gross Savings

The evaluation team referred to the Illinois TRM v12.0 to calculate *ex post* gross electric energy savings, demand reduction, and natural gas savings. Through the engineering review, the team found differences between *ex ante* and *ex post* gross savings. The following sections summarize the team's findings and recommendations based on the engineering review.

Fuel Saturation

In 2024, the program required C&I OLM program kit recipients to provide data on their water heater fuel source and their space heating fuel source when ordering kits online. The evaluation team used this data to calculate saturation rates for space heating and for water heating used in the *ex post* gross savings results. The 2024 data for space heating fuel types resulted in the same ratio as in 2023.

The 2024 data for water heating fuel type resulted in a significantly higher gas-to-electric ratio than found in prior evaluation years. The program is smaller than prior years, potentially leading to skewed values, and the prior year ratio aligns with the national average fuel ratio for water heating equipment. Therefore, the evaluation team elected to use the 2023 water heating saturation rate. For 2024, *ex ante* calculations relied on the 2023 EM&V results for both metrics to determine the fuel saturation ratios by measure. Table 233 outlines the fuel saturation metrics used in 2024.

Table 233. 2024 C&I OLM Program Water Heater Fuel Saturation

SAVINGS TYPE	ELECTRIC WATER HEATING SATURATION RATE	NATURAL GAS WATER HEATING SATURATION RATE	ELECTRIC SPACE HEATING SATURATION RATE	NATURAL GAS SPACE HEATING SATURATION RATE
<i>Ex Ante</i>	48%	52%	11%	89%
<i>Ex Post</i> Gross	48%	52%	11%	89%

Waste Heat Factor – Therm Penalties

The C&I OLM program did not report therm waste heat factors (WHFs) in the *ex ante* calculations, and per discussions with NIPSCO, the evaluation team did not include negative therm WHFs in the *ex post* therm calculations. Electric (kWh and kW demand) WHF penalties are minor in comparison with therm waste heat factor penalties and were reported within *ex post* savings. To calculate WHFs, the team used values from the Illinois TRM v12.0, matching the space type to the space types used for hours of use (HOU) and coincidence factor (CF), and weighted the WHF by the space heating saturation rate (e.g., 89% WHF impact for gas heating and AC; 11% WHF impact for electric heating).

Table 234 shows the therm WHF penalties by applicable kit for the total 2024 population for inclusion in cost-effectiveness calculations. There was a -364.08 therm penalty for the entire C&I OLM program in 2024. The penalty is much lower than in 2022 and 2023 because there were fewer interior light bulbs distributed in 2024.

Table 234. 2024 C&I OLM Program WHF Penalties

APPLICABLE MEASURES	WHF PENALTY BY INDIVIDUAL MEASURE (THERMS)	POPULATION OF KIT COUNTS	WHF PENALTY TOTAL POPULATION
Office Kit - Dual Fuel			
Desk Lamp	-0.75	328	-246.00
LED Exit Sign Retrofit	-0.36	328	-118.08
Total			-364.08

Ex Post Gross Savings Summary

Table 235 shows the *ex ante* deemed savings and *ex post* gross per-measure savings for 2024 C&I OLM program measures. The primary reasons for deviations this evaluation year are described in the *Audited Savings* section above. The *ex ante* calculations uniformly referenced Illinois TRM v12.0, which aligned with the evaluation team's reference, resulting in no deviation due to reference source. The evaluation team made one adjustment to the measure-level savings calculations in *ex post*; the showerhead measure references Illinois TRM v12.0, which indicates the baseline showerhead gallons per minute (GPM) should be 2.5, instead of the 2.67 GPM referenced in *ex ante* calculations.

Table 235. 2024 C&I OLM Program *Ex Ante* and *Ex Post* Gross Per-Measure Savings Values

MEASURE	QUANTITY IN KIT	EX ANTE SAVINGS			EX POST GROSS SAVINGS		
		KWH	KW	THERMS	KWH	KW	THERMS
Water Saver Kits							
Pre-Rinse Spray Valve	1	168.06	0.000	7.61	168.06	0.000	7.61
Showerhead 1.5 GPM	1	63.08	0.006	3.44	53.91	0.006	2.72
Bathroom Aerator 1.0 GPM	2	104.17	0.065	5.65	104.17	0.033	5.65
Kitchen Aerator 1.5 GPM	1	33.80	0.011	1.84	33.80	0.011	1.84
Hot Water Temp Card	1	1.02	0.000	0.07	1.02	0.000	0.07
Pipe Insulation Tape	15	0.00	0.000	1.46	0.00	0.000	1.46
Conservation Kits							
Pre-Rinse Spray Valve	1	168.06	0.00	7.61	168.06	0.000	7.61
Bathroom Aerator 1.0 GPM	2	40.25	0.025	2.18	40.25	0.013	2.18
Kitchen Aerator 1.5 GPM	1	27.37	0.009	1.49	27.37	0.009	1.49
Pipe Insulation Tape	15	0.00	0.000	1.46	0.00	0.000	1.46
Advanced Power Strip	1	91.88	0.000	0.00	91.88	0.000	0.00
Foam Outlet Gasket	10	6.69	0.006	1.59	6.69	0.006	1.59
Smart Plug	4	55.95	0.000	0.00	55.95	0.000	0.00
Office Kits							
LED Desk Lamp	1	36.39	0.013	0.00	54.14	0.013	0.00
Advanced Power Strip	1	91.88	0.000	0.00	91.88	0.000	0.00
Bathroom Aerator 1.0 GPM	2	40.25	0.025	2.18	40.25	0.013	2.18
Kitchen Aerator 1.5 GPM	1	27.37	0.009	1.49	27.37	0.009	1.49
Hot Water Temp Card	1	1.02	0.000	0.07	1.02	0.000	0.07
Fridge Thermometer	1	0.00	0.000	0.00	0.00	0.000	0.00
Foam Outlet Gasket	10	6.69	0.006	1.59	6.69	0.006	1.59
Foam Switch Gasket	10	6.69	0.006	1.59	6.69	0.006	1.59
TCP LED Exit Sign Retrofit	2	28.69	0.004	0.00	28.74	0.004	0.00

Realization Rates

The next three tables (Table 236 through Table 238) show the program's *ex ante* reported savings, audited savings, verified savings, *ex post* gross savings, and total program realization rates for kWh, kW, and therms for the total population of the C&I OLM program. As noted above, the calculation errors identified and modified at the audited stage of the evaluation drove nearly all deviations this evaluation year.

Table 236. 2024 C&I OLM Program *Ex Ante* and *Ex Post* Gross Electric Energy Savings

MEASURE	<i>EX ANTE</i> ^a ELECTRIC ENERGY SAVINGS (kWh/yr.)	AUDITED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	VERIFIED GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	<i>EX POST</i> GROSS ELECTRIC ENERGY SAVINGS (kWh/yr.)	REALIZATION RATE
Water Saver Kits					
Pre-rinse Spray Valve	26,552.74	26,553.48	26,553.48	26,553.48	100%
Showerhead 1.5 GPM	9,965.97	9,966.64	9,966.64	8,517.78	85%
Bath Aerator 1.0 GPM	16,459.62	16,458.86	16,458.86	16,458.86	100%
Kitchen Aerator 1.5 GPM	5,341.14	5,340.40	5,340.40	5,340.40	100%
Hot Water Temp Card	160.78	161.16	161.16	161.16	100%
Pipe Insulation Tape	0.00	0.00	0.00	0.00	N/A
Conservation Kits					
Pre-Rinse Spray Valve	50,248.55	50,249.94	50,249.94	50,249.94	100%
Bath Aerator 1.0 GPM	12,034.55	12,034.75	12,034.75	12,034.75	100%
Kitchen Aerator 1.5 GPM	8,182.34	8,183.63	8,183.63	8,183.63	100%
Pipe Insulation Tape	0.00	0.00	0.00	0.00	N/A
Advanced Power Strip	27,472.27	27,472.12	27,472.12	27,472.12	100%
Foam Outlet Gasket	2,000.85	2,000.31	2,000.31	2,000.31	100%
Smart Plug	16,729.06	16,729.05	16,729.05	16,729.05	100%
Office Kits					
LED Desk Lamp	14,666.19	21,475.87	21,818.42	21,818.42	149%
Advanced Power Strip	37,027.84	37,027.64	37,027.64	37,027.64	100%
Bath Aerator 1.0 GPM	16,220.49	16,220.75	16,220.75	16,220.75	100%
Kitchen Aerator 1.5 GPM	11,028.37	11,030.11	11,030.11	11,030.11	100%
Hot Water Temp Card	410.09	411.06	411.06	411.06	100%
Fridge Thermometer	0.00	0.00	0.00	0.00	N/A
Foam Outlet Gasket	2,696.80	2,696.07	2,696.07	2,696.07	100%
Foam Switch Gasket	2,696.80	2,696.07	2,696.07	2,696.07	100%
LED Exit Sign Retrofit	11,563.31	11,400.87	11,400.87	11,582.22	100%
Total Program Savings	271,456.29*	278,108.78	278,451.33	277,183.82	102%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent audited values since the scorecard provides only savings totals.

Table 237. 2024 C&I OLM Program *Ex Ante* and *Ex Post* Gross Peak Demand Reduction

MEASURE	EX ANTE ^a PEAK DEMAND REDUCTION (KW/YR.)	AUDITED GROSS PEAK DEMAND REDUCTION (KW/YR.)	VERIFIED GROSS PEAK DEMAND REDUCTION (KW/YR.)	EX POST GROSS PEAK DEMAND REDUCTION (KW/YR.)	REALIZATION RATE
Water Saver Kits					
Pre-Rinse Spray Valve	0.000	0.000	0.000	0.000	N/A
Showerhead 1.5 GPM	0.948	0.948	0.948	0.948	100%
Bathroom Aerator 1.0 GPM	10.270	5.214	5.214	5.214	51%
Kitchen Aerator 1.5 GPM	1.738	1.738	1.738	1.738	100%
Hot Water Temp Card	0.000	0.000	0.000	0.000	N/A
Pipe Insulation Tape	0.000	0.000	0.000	0.000	N/A
Conservation Kits					
Pre-Rinse Spray Valve	0.000	0.000	0.000	0.000	N/A
Bath Aerator 1.0 GPM	7.475	3.887	3.887	3.887	52%
Kitchen Aerator 1.5 GPM	2.691	2.691	2.691	2.691	100%
Pipe Insulation Tape	0.000	0.000	0.000	0.000	N/A
Advanced Power Strip	0.000	0.000	0.000	0.000	N/A
Foam Outlet Gasket	1.794	1.794	1.794	1.794	100%
Smart Plug	0.000	0.000	0.000	0.000	N/A
Office Kits					
LED Desk Lamp	5.239	5.239	5.239	5.239	100%
Advanced Power Strip	0.000	0.000	0.000	0.000	N/A
Bath Aerator 1.0 GPM	10.075	5.239	5.239	5.239	52%
Kitchen Aerator 1.5 GPM	3.627	3.627	3.627	3.627	100%
Hot Water Temp Card	0.000	0.000	0.000	0.000	N/A
Fridge Thermometer	0.000	0.000	0.000	0.000	N/A
Foam Outlet Gasket	2.418	2.418	2.418	2.418	100%
Foam Switch Gasket	2.418	2.418	2.418	2.418	100%
LED Exit Sign Retrofit	1.612	1.612	1.612	1.612	100%
Total Program Savings	50.305	36.825	36.825	36.825	73%

Note: Totals may not sum properly due to rounding.

^a Values presented at a measure-level represent audited values since the scorecard provides only savings totals.

Table 238. 2024 C&I OLM Program *Ex Ante* and *Ex Post* Gross Natural Gas Savings

MEASURE	<i>EX ANTE</i> ^A NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	AUDITED GROSS NATURAL GAS ENERGY (THERMS/YR.)	VERIFIED GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	<i>EX POST</i> GROSS NATURAL GAS ENERGY SAVINGS (THERMS/YR.)	REALIZATION RATE
Water Saver Kits					
Pre-Rinse Spray Valve	943.64	943.64	943.64	943.64	100%
Showerhead 1.5 GPM	426.56	426.56	394.32	337.28	79%
Bath Aerator 1.0 GPM	700.60	700.60	700.60	700.60	100%
Kitchen Aerator 1.5 GPM	228.16	228.16	228.16	228.16	100%
Hot Water Temp Card	8.68	8.68	8.68	8.68	100%
Pipe Insulation Tape	181.04	181.04	181.04	181.04	100%
Conservation Kits					
Pre-Rinse Spray Valve	1,757.91	1,757.91	1,757.91	1,757.91	100%
Bath Aerator 1.0 GPM	503.58	503.58	503.58	503.58	100%
Kitchen Aerator 1.5 GPM	344.19	344.19	344.19	344.19	100%
Pipe Insulation Tape	337.26	337.26	337.26	337.26	100%
Advanced Power Strip	0.00	0.00	0.00	0.00	N/A
Foam Outlet Gasket	367.29	367.29	367.29	367.29	100%
Smart Plug	0.00	0.00	0.00	0.00	N/A
Office Kits					
LED Desk Lamp	0.00	0.00	0.00	0.00	N/A
Advanced Power Strip	0.00	0.00	0.00	0.00	N/A
Bath Aerator 1.0 GPM	715.04	715.04	715.04	715.04	100%
Kitchen Aerator 1.5 GPM	488.72	488.72	488.72	488.72	100%
Hot Water Temp Card	22.96	22.96	22.96	22.96	100%
Fridge Thermometer	0.00	0.00	0.00	0.00	N/A
Foam Outlet Gasket	521.52	521.52	521.52	521.52	100%
Foam Switch Gasket	521.52	521.52	521.52	521.52	100%
LED Exit Sign Retrofit	0.00	0.00	0.00	0.00	N/A
Total Program Savings	8,068.67	8,068.67	8,036.43	7,979.39	99%

Note: Totals may not sum properly due to rounding.

^A Values presented at a measure-level represent audited values since the scorecard provides only savings totals.

Ex Post Net Savings

The evaluation team calculated freeridership and participant spillover using survey data collected from the 2023 C&I OLM program participant survey, as we did not conduct a participant survey for the 2024 evaluation.

The 2023 survey focused exclusively on questions related to kit offerings (Water Saver and Office were available that year). Details on the freeridership and spillover analysis can be found in the 2023 DSM Portfolio Evaluation report. Table 239 shows the NTG ratios by measure, which are relatively high across measures, indicating that most customers would not have purchased this equipment on their own if they had not received the kits through the C&I OLM program.

Table 239. 2024 C&I OLM Program NTG Ratios by Measure

MEASURE ^a	RESPONSES (n)	FREERIDERSHIP ^b	PARTICIPANT SPILLOVER	NTG
LED Desk Lamp	46	16%	0%	84%
Pre-Rinse Spray Valve	16	10%	0%	90%
Showerhead	9	14%	0%	86%
Bathroom Aerator	25	8%	0%	92%
Kitchen Aerator	24	14%	0%	86%
Hot Water Temp card	25	5%	0%	95%
Pipe Insulation Tape	17	23%	0%	77%
Advanced Power Strip	47	23%	0%	77%
Fridge Thermometer	29	20%	0%	80%
Switch and Outlet Gaskets ^c	29	14%	0%	86%
Exit Sign Retrofit	28	20%	0%	80%

^a Note that the smart plug measure was not included in the PY 2023 kits and therefore not surveyed in PY 2023 to determine freeridership or spillover. The program-level average *ex post* gross MMBtu savings weighted NTG value derived from 2023 surveyed measures was applied to the smart plug measure category in PY 2024 analysis.

^b This score is an average weighted by verified quantity of measure installed.

^c Switch and outlet gaskets were a combined single measure in PY 2023 kits and the participant survey analysis. In PY 2024, the evaluation team broke these out into two separate measures with the same savings. PY 2024 analysis uses the same PY 2023 - determined NTG values for each separate measure.

Table 240 presents the resulting net electric savings, demand reduction, and natural gas savings.

Table 240. 2024 C&I OLM Program *Ex Post* Net Savings

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
LED Desk Lamp	21,818.42	5.239	0.00	84%	18,327.47	4.401	0.00
Pre-Rinse Spray Valve	76,803.42	0.000	2,701.55	90%	69,123.08	0.000	2,431.40
Showerhead 1.5 GPM	8,517.78	0.948	337.28	86%	7,325.29	0.815	290.06
Bathroom Aerator 1.0 GPM	44,714.36	14.340	1,919.22	92%	41,137.21	13.193	1,765.68
Kitchen Aerator 1.5 GPM	24,554.14	8.056	1,061.07	86%	21,116.56	6.928	912.52
Hot Water Temp Card	572.22	0.000	31.64	95%	543.61	0.000	30.06
Pipe Insulation Tape	0.00	0.000	518.30	77%	0.00	0.000	399.09

MEASURE	EX POST GROSS SAVINGS/REDUCTION			NTG	EX POST NET SAVINGS/REDUCTION		
	KWH	KW	THERMS		KWH	KW	THERMS
Advanced Power Strip	64,499.76	0.000	0.00	77%	49,664.82	0.000	0.00
Fridge Thermometer	0.00	0.000	0.00	80%	0.00	0.000	0.00
Foam Outlet Gasket	4,696.38	4.212	888.81	86%	4,038.89	3.622	764.38
Foam Switch Gasket	2,696.07	2.418	521.52	86%	2,318.62	2.079	448.51
TCP LED Exit Sign Retrofit	11,582.22	1.612	0.00	80%	9,265.78	1.290	0.00
Smart Plug ^a	16,729.05	0.000	0.00	87%	14,554.27	0.000	0.00
Total Savings	277,183.82	36.825	7,979.39		237,415.59	32.328	7,041.69

Note: Total may not sum due to rounding.

^a Note that the program did not include a smart plug measure in the PY 2023 kits and therefore not surveyed in PY 2023 to determine freeridership or spillover. The program-level average *ex post* gross MMBtu savings weighted NTG value derived from 2023 surveyed measures was applied to the smart plug measure category in PY 2024 analysis.

Table 241 shows the NTG results for each fuel.

Table 241. 2024 C&I OLM Program NTG Results by Fuel Type

SAVINGS TYPE	EX ANTE GROSS SAVINGS	EX POST GROSS SAVINGS	NTG RATIO (%)	EX POST NET SAVINGS
Electric Energy Savings (kWh/yr.)	271,456.29	277,183.82	86%	237,415.59
Peak Demand Reduction (kW)	50.305	36.825	88%	32.328
Natural Gas Energy Savings (therms/yr.)	8,068.67	7,979.39	88%	7,041.69

Conclusions and Recommendations

CONCLUSION 1: THE PROGRAM EXCEEDED ITS NATURAL GAS THERMS SAVINGS GOALS, ACHIEVING 185% OF THE GOAL.

Though the program fell short of its electric energy kWh and kW demand savings goals, the program exceeded other savings goals despite considerable shifts in program design.

CONCLUSION 2: THE LONGEVITY OF THE C&I OLM PROGRAM WILL DEPEND ON REENGAGING EXISTING CUSTOMERS IN ADDITION TO REACHING NEW CUSTOMERS.

Most of the current kit components are one-time installations of durable goods with long expected useful lifetimes (EUL). The weighted EUL of each kit is between eight and nine years, which means existing customers will not be in the market for the same components for another nine years. As the program continues to mature and the small business market becomes more saturated, staff will need to strategize ways to reengage the existing or returning customer base with new products to ensure the longevity of the program.

Recommendation:

- Consider expanding program offerings and kit components to meet the needs of new and returning customers with products viable for an online marketplace distribution platform.
- Consider offering industry-specific kits again or developing industry-specific messaging for existing kits, especially if there is a target industry for future iterations of the C&I OLM and monitor the effects on uptake with targeted customer segments. Industry-specific kits could aid in expanding to a new customer base.

CONCLUSION 3: REALIZATION RATES VARIED ACROSS MEASURES DUE TO MEASURE CALCULATION ERRORS IN SOME *EX ANTE* SAVINGS CALCULATIONS.

The implementation team updated *ex ante* savings calculations to reference the Illinois TRM v12.0 and the 2023 evaluation report (for ISR and fuel saturation findings), representing the most geographically relevant and current data available to support estimated savings. However, the evaluation team identified calculation errors in both total kit savings and individual measures, which made up most *ex post* savings deviations in the 2024 evaluation findings. These errors are detailed within Table 98.

Recommendation:

- Revisit the accuracy of savings calculations specifically for LED lamps, LED exit signs, bath aerators, and showerheads, if these products will be part of the 2025 kits.

APPENDIX

- Appendix 1. Home Rebates Program
- Appendix 2. Retail Products Program
- Appendix 3. Home Energy Assessment Program
- Appendix 4. Income-Qualified Weatherization Program
- Appendix 5. Multi-Family Direct Install Program
- Appendix 6. Appliance Recycling Program
- Appendix 7. Behavioral Program (no appendix this year)
- Appendix 8. Residential New Construction Program
- Appendix 9. School Education Program
- Appendix 10. Homelife Calculator Program
- Appendix 11. Residential Online Marketplace Program
- Appendix 12. Commercial and Industrial (C&I) Programs
- Appendix 13. C&I Online Marketplace (OLM) Program

Appendix 1. Home Rebates Program

Algorithms and Assumptions

This appendix contains the assumptions used in electric savings, demand reduction, and gas savings algorithms for the measures within the Energy Efficiency Rebates program.

Furnaces

The program tracking data contained 2,728 natural gas furnaces. Per the Illinois TRM v12.0, the evaluation team used the following natural gas savings algorithm for furnaces:

$$\Delta \text{therms} = (1 - ER) \times \left(\frac{CAP \times EFLH_H}{(1 - Derating_{EE})} \times \left(\frac{AFUE_{EE} \times (1 - Derating_{EE})}{AFUE_{BASE} \times (1 - Derating_{BASE})} - 1 \right) \right) \times 0.00001$$
$$+ ER \times \left(\frac{CAP \times EFLH_H}{(1 - Derating_{EE})} \times \left(\frac{AFUE_{EE} \times (1 - Derating_{EE})}{AFUE_{EXIST} \times (1 - Derating_{BASE})} - 1 \right) \right) \times 0.00001$$

Where:

CAP	=	Capacity of the furnace in Btu/h
EFLH _H	=	Equivalent full-load heating hours
AFUE _{EE}	=	Efficiency of the installed furnace
AFUE _{BASE}	=	Efficiency of the baseline furnace
AFUE _{EXIST}	=	Efficiency of the existing furnace
Derating _{EE}	=	Efficient furnace AFUE derating
Derating _{BASE}	=	Base furnace AFUE derating
ER	=	Early replacement rate
0.00001	=	Factor to convert from Btu/h to therms

In addition to natural gas therm savings, the Illinois TRM v12.0 also identifies cooling, heating, and circulation kWh savings for furnaces associated with the code ECM installed with the furnace; however, these savings are only eligible for early replacement measures. The evaluation team applied these savings combined with the furnace early replacement rate to furnaces not installed alongside an air conditioner installed through the program in 2021, 2022, and 2023.

These deemed savings are based on the existing cooling system and furnace size. In cases where the reported household has no central cooling system or the cooling system is unknown, the Illinois TRM v12.0 suggests multiplying the kWh saved value by two tons for furnaces <70 kBTU, by three tons for furnaces 70 kBTU–90 kBTU, and by four tons for furnaces 90+ kBTU. The evaluation team used the average kWh savings based on the reported cooling system where they were able, and a furnace multiplier based on the installed furnace capacity. If a central cooling system was reported, the evaluation team used a program average cooling capacity. Following from the Indiana TRM (v2.2), the evaluation team applied no demand savings or fossil fuel impacts associated with the ECM. The Illinois TRM v12.0 algorithm is outlined below:

$$\Delta kWh = ER \times CAP_{ECM} \times kWhSavingsPerTon$$

Where:

- CAP_{ECM} = Average cooling capacity or furnace capacity multiplier
- ER = Early replacement rate
- kWhSavingsPerTon= Blower fan kWh savings per ton of cooling

The evaluation team obtained CAP and AFUE_{EE} for each unit from the *ex ante* data and the EFLH_H from the 2023 billing analysis results based on location. It assigned an AFUE_{BASE} and AFUE_{EXIST} of 80% and 64.4% based on the Illinois TRM v12.0. The 2024 participant survey, based on 47 responses, determined that 21% of participants replaced broken units. Based on this early replacement rate and following the Illinois TRM v12.0 practices for time of sale and early replacement furnaces, the evaluation team produced weighted savings that blend savings from replacing an existing stock AFUE furnace and a broken code AFUE furnace. Table 242 shows the mean values for 2024.

Table 242. 2024 Furnace Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
Capacity (Furnace)	74,069.26	Actual from program tracking data
Capacity (Cooling)	33,495.56	2024 Program Average Air Conditioner Capacity
EFLH	989.39	2023 billing analysis, values vary based on nearest city to project location
AFUE ee	0.963	Actual from program tracking data
AFUE Base ^a	0.80	Illinois TRM v12.0
AFUE Exist ^a	0.644	Illinois TRM v12.0
Derating ^a	0.064	For all derating factors
ER	21%	2024 Participation Survey
kWhSavingsPerTon	220.92	Illinois TRM v12.0

^a Constants

Evaluated unit therm savings range from 82.75 to 382.41 therms, with an average value of 208.44 therms. The *ex ante* data assigned deemed savings of 171.81 therms. The overall natural gas realization rate for this measure category is 121%. This difference is largely due to the additional early replacement savings; furthermore, small differences due to using actual instead of assumed AFUE (96.3% average) and capacity (74,069.26 Btuh average) resulted in *ex post* savings that deviated from *ex ante* savings. In addition to natural gas savings, the Illinois TRM assigns kWh cooling savings associated with the furnace ECM installed alongside existing air conditioners to furnaces. Aligning with previous EM&V findings, *ex ante* did not apply these savings to furnaces resulting in deemed *ex ante* savings of zero kWh compared with average *ex post* gross savings of 102.50 kWh. Table 243 highlights these results.

Table 243. Detailed Results from Furnaces

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
2,728	171.81 therms	208.44 therms	121%

Furnaces – Legacy 2023 Measure

In the 2024 tracking data, there were 1,821 furnaces considered Legacy 2023 measures for which the evaluation team assigned a deemed savings value of 189.4 therms and 67.6 kWh. These deemed savings are the *ex post* gross per measure savings from the 2023 evaluation. Reference the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the evaluation team calculated this measure.

Ex ante used a deemed therm savings value of 130.42 therms compared with evaluated therm savings of 189.40, resulting in a therm savings realization rate of 145% for the Furnaces – Legacy 2023 Measure.

Air Conditioners

In the 2024 tracking data, there were 538 air conditioners. The evaluation team used the following equation from the Illinois TRM v12.0 to calculate energy savings from the SEER upgrade for air conditioners:

$$\Delta kWh = (1 - ER) \times \frac{CAP}{1,000} \times EFLH_c \times \left(\frac{1}{(SEER2_{BASE} \times (1 - DeratingCool_{BASE}))} - \frac{1}{(SEER2_{EE} \times SEER2_{adj} \times (1 - DeratingCool_{EE}))} \right) + ER \times \frac{CAP}{1,000} \times EFLH_c \times \left(\frac{1}{(SEER2_{EXIST} \times (1 - DeratingCool_{BASE}))} - \frac{1}{(SEER2_{EE} \times SEER2_{adj} \times (1 - DeratingCool_{EE}))} \right)$$

Where:

CAP	=	Total cooling capacity in Btu/h
EFLH _c	=	Equivalent full-load cooling hours from TRM (2.2)
SEER2 _{BASE}	=	Baseline SEER2 value for time-of-sale replacements
SEER2 _{EXIST}	=	Baseline SEER2 value for early replacements
SEER2 _{EE}	=	Installed SEER value
SEER2 _{adj}	=	Adjustment percentage to account for in-situ performance
DeratingCool _{EE}	=	Efficient AC SEER derating
DeratingCool _{BASE}	=	Base AC SEER derating
ER	=	Early replacement rate

The evaluation team obtained CAP and SEER2_{EE} from the *ex ante* data and EFLH_c from the Indiana TRM (v2.2) based on project location. The 2024 participant survey, based on 58 responses, determined that 14% of AC installations were early replacements. Based on these percentages and following the Illinois TRM v12.0

practices for time of sale and early replacement air conditioners, the evaluation team produced a weighted baseline SEER2 that blends federal code ($SEER2_{BASE} = 13.4$) for broken unit replacements and building stock findings ($SEER2_{EXIST} = 10.5925$) from the Indiana TRM (v2.2) for working replacements.

Per the Indiana TRM (v2.2), the evaluation team used the following algorithm to calculate demand reduction for sites that received an air conditioner:

$$\Delta kW = \left((1 - ER) \times \frac{CAP}{1,000} \times \left(\frac{1}{(EER2_{BASE} \times (1 - DeratingCool_{BASE}))} - \frac{1}{(EER2_{EE} \times (1 - DeratingCool_{EE}))} \right) + ER \times \frac{CAP}{1,000} \times \left(\frac{1}{(EER2_{EXIST} \times (1 - DeratingCool_{BASE}))} - \frac{1}{(EER2_{EE} \times (1 - DeratingCool_{EE}))} \right) \right) \times CF$$

Where:

- $EER2_{BASE}$ = Baseline EER2 value for time-of-sale replacements
- $EER2_{EXIST}$ = Baseline EER2 value for early replacements
- $EER2_{EE}$ = Installed efficiency
- CF = Coincidence factor

To account for a lack of efficient EER2 in the tracking data, the evaluation team used an efficient EER2 according to the AHRI database to calculate demand reduction. This produced an average efficient EER2 of approximately 9.99, resulting in a demand reduction realization rate of 9%. Table 244 shows the mean values for 2024.

Table 244. 2024 Air Conditioner Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
Capacity	33,495.56	Actual from program tracking data
EFLHc	702.71	Indiana TRM (v2.2), values assigned based on nearest TRM city to project location
SEER2base ^a	13.40	Illinois TRM v12.0
SEER2exist	10.59	Indiana TRM (v2.2)
SEER2adj	1.00	Illinois TRM v12.0
SEER2ee	15.92	Actual from program tracking data
EER2base ^a	10.60	Illinois TRM v12.0
EER2exist ^a	7.2	Illinois TRM v12.0
EER2ee	9.99	AHRI Database
ER	14%	2024 Participant Survey
CF ^a	0.81	Indiana TRM (v2.2)

Small differences due to using actual instead of assumed SEER2, EER2, and capacity; differences between assumed EER2ee (12.4 from 2022 EM&V report) and actual EER2ee (varies from 9.47-14.10) based on AHRI data; and additional early replacement savings all contributed to *ex post* savings deviating from *ex ante* savings. However, the largest driver is due to differences in approach between calculating the EFLHc values because

the evaluation team used the Indiana TRM (v2.2) to calculate and average EFLHc of 702.71 based on nearest TRM city and the *ex-ante* calculation sourced a value of 427.48 from the 2022 EM&V report. Table 245 highlights these results.

Table 245. Detailed Results from Air Conditioners

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
538	223.38 kWh	394.46 kWh	177%
	0.731 kW	0.600 kW	82%

Air Conditioner – Legacy 2023 Measure

In the 2024 tracking data, there were 261 Air Conditioner – Legacy 2023 measures. This measure is a Legacy 2023 measure for which the evaluation team assigned a deemed savings value of 289.18 kWh and 0.218 kW. These deemed savings are the *ex post* gross per measure savings from the 2023 evaluation. Refer to the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the evaluation team calculated this measure. *Ex ante* used a deemed kWh savings value of 673.27 kWh, and 0.748 kW compared with evaluated kWh and kW savings of 289.18 kWh and 0.218 kW, resulting in an electric energy savings and demand reduction realization rate of 43% and 29%, respectively, for the Air Conditioner – Legacy 2023 Measures.

Air Conditioner and Air-Source Heat Pump Tune-up

In the 2024 tracking data, there were 378 air conditioners and three air source heat pump tune-ups. Per the Illinois TRM v12.0, the evaluation team used the following savings algorithm for air conditioner tune-ups:

$$\Delta kWh_{CAC} = EFLH_{COOL} \times \frac{Btuh_{COOL}}{1,000} \times \frac{1}{SEER2_{CAC}} \times MF_E$$

And air source heat pump tune-ups:

$$\Delta kWh_{ASHP} = EFLH_{COOL} \times \frac{Btuh_{COOL}}{1,000} \times \frac{1}{SEER2_{ASHP}} \times MF_E + EFLH_{heat} \times \frac{Btuh_{heat}}{1000} \times \frac{1}{HSPF2_{ASHP}} \times MF_E$$

Where:

- EFLH = Equivalent full-load cooling or heating hours from Indiana TRM (2.2) or the 2023 billing analysis results
- Btuh = Cooling or heating capacity of equipment in Btuh
- SEER2 = SEER2 efficiency of existing central air conditioning or air source heat pump unit receiving maintenance
- HSPF2 = Heating season performance factor of existing air source heat pump unit receiving maintenance
- 1,000 = Conversion from Btuh to kBtuh
- MF_E = Maintenance energy savings factor

The evaluation team obtained EFLH_c from the Indiana TRM (v2.2) based on project location. Of the 378 units for this measure, 245 listed Btuh_{cool} in number of tons. For measures where the tons of cooling were provided, the evaluation team assumed average capacities from the air conditioner replacement tracking data for each unique reported tons of cooling with an overall average of 33,719.6 Btuh. Only five units listed SEER2, and, therefore, the evaluation team assumed a default SEER2 of 9.5 from the Illinois TRM v12.0. For capacity and SEER2 values where the tons of cooling were not provided, the evaluation team assumed the program an average air conditioner capacity and SEER2 of 33,264.7 Btuh and 9.5, respectively.

Per the Illinois TRM v12.0, the evaluation team used the following algorithm to calculate demand reduction for sites that received an air conditioner tune-up:

$$\Delta kW = Btuh_{cool} \times \frac{1}{EER2_{EE} \times 1,000} \times MF_D \times CF$$

Where:

- MF_E = Maintenance demand reduction factor
- CF = Summer peak coincidence factor
- EER2 = EER2 efficiency of existing unit receiving maintenance

To account for a lack of efficient EER2 in the tracking data, the evaluation team used the method of using the default formula in the Illinois TRM v12.0 to calculate EER2 based on the SEER2 input. This resulted in an overall EER2 value of 8.8. Table 246 shows the mean values for 2024.

Table 246. 2024 AC Tune Up Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
Btuhcool cac	33,719.6	Actual and averages from program tracking data
Btuhcool ashp	36,844.0	Actual and averages from program tracking data
EFLHcool	709	Indiana TRM (v2.2), values assigned based on nearest TRM city to project location
EFLHheat	989	2023 Billing Analysis
SEER2cac	9.5	Illinois TRM v12.0
SEER2ashp	9.5	Illinois TRM v12.0
HSPF2ashp	5.8	Illinois TRM v12.0
MFe ^a	0.05	Illinois TRM v12.0
EER2	8.8	Illinois TRM v12.0
MFd ^a	0.02	Illinois TRM v12.0
CF ^a	0.81	Illinois TRM v12.0
^a Constants		

Higher average cooling capacity and lower EER2 and SEER2 values drove slightly higher energy savings in 2024. However, the largest driver for significantly higher savings was the assumption of larger EFLHcool values for both air conditioner and air source heat pump tune-ups. The evaluation team assumed EFLHcool values of 709, which it determined using nearest-city mapping in the Indiana TRM (v2.2), whereas *ex ante* savings used a value of 430.1 and 419.4 sourced from the 2022 EM&V report. Table 247 highlights these results.

Table 247. Detailed Results from AC and ASHP Tune Ups

	AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
AC	378	47.17 kWh	125.57 kWh	266%
		0.043 kW	0.062 kW	144%
ASHP	3	225.15 kWh	429.26 kWh	191%
		0.113 kW	0.070 kW	62%

Air Conditioner and Air Source Heat Pump Tune-up – Legacy 2023 Measure

In the 2024 tracking data, there were 98 Air Conditioner Tune-Up Legacy – 2023 measures and one Air Source Heat Pump Tune-up Legacy – 2023 measure. The evaluation team assigned deemed savings values of 126.51 kWh and 0.062 kW for 2023 Legacy air conditioner tune-ups and deemed savings values of 346.73 kWh and 0.055 kW for 2023 Legacy air source heat pump tune-ups. These deemed savings are the *ex post* gross per measure savings from the 2023 evaluation. Refer to the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the evaluation team calculated this measure.

For air conditioner tune-ups, *ex ante* used a deemed kWh savings value of 44.34 kWh and 0.101 kW compared with evaluated kWh and kW savings of 126.51 kWh and 0.062 kW, resulting in an electric energy savings and demand reduction realization rate of 285% and 62%, respectively, for the air conditioner Tune-Up – Legacy 2023 measures. For air source heat pump tune-ups, *ex ante* used a deemed kWh savings value of 199.57 kWh and 0.063 kW compared with evaluated kWh and kW savings of 346.73 kWh and 0.055 kW, resulting in an electric energy savings and demand reduction realization rate of 174% and 87%, respectively, for the Air Source Heat Pump Tune-Ups – Legacy 2023 measures.

Boilers

There were 24 boiler measures reported as part of the program in 2024. Per the Illinois TRM v12.0, the evaluation team used the following savings algorithm for boilers:

$$\Delta therm s = (1 - ER) \times \frac{\left(EFLH_H \times CAP_{input} \times \left(\frac{AFUE_{EE}}{AFUE_{BASE}} - 1\right)\right)}{100,000} + ER \times \frac{\left(EFLH_H \times CAP_{input} \times \left(\frac{AFUE_{EE}}{AFUE_{EXIST}} - 1\right)\right)}{100,000}$$

Where:

EFLH _H	=	Equivalent full-load heating hours from 2023 billing analysis
CAP _{input}	=	Input capacity of equipment in Btuh
AFUE _{ee}	=	AFUE efficiency of efficient boiler
AFUE _{base}	=	AFUE efficiency of federal baseline boiler
AFUE _{exist}	=	AFUE efficiency of existing boiler
100,000	=	Conversion from Btuh to therms
ER	=	Early replacement rate

Evaluated savings used the reported model number to look up all 2024 boiler heating capacity and AFUE in the AHRI database. Table 248 shows the mean values for 2024.

Table 248. 2024 Boiler Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE - 92% AFUE	SOURCE
Capacity	118,208.33	Actual from program tracking data
EFLH	986.86	2023 billing analysis, values vary based on nearest city to project location
AFUE ee	0.95	Actual from program tracking data
AFUE Base ^a	0.84	Illinois TRM v12.0
AFUE Exist ^a	0.616	Illinois TRM v12.0
ER	16%	2024 Participation Study
^a Constants		

Small differences between *ex ante* and evaluated savings are due to the evaluation team using each unit’s specific reported AFUE and capacities to calculate savings. Differences in approach between the 2022 EM&V report and the Illinois TRM v12.0, less early replacement savings, and lower average capacity drove lower Therm savings than *ex ante*. Table 249 highlights these results.

Table 249. Detailed Results from Boilers

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
24	256.60 therms	230.74 therms	90%

Boiler – Legacy 2023 Measure

In the 2024 tracking data, there were 34 Boiler Legacy – 2023 measures. This measure is a Legacy 2023 measure for which the evaluation team assigned a deemed savings value of 281.28 therms. These deemed savings are the *ex post* gross per measure savings from the 2023 evaluation. Reference the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the evaluation team calculated this measure.

Ex ante used a deemed therm savings value of 207.24 therms compared with evaluated therm savings of 281.28 therms, resulting in a therm savings realization rate of 136% for the Boiler – Legacy 2023 measures.

Air Source Heat Pumps

In the 2024 tracking data, there were 24 air source heat pumps. The evaluation team used the following algorithm from the Illinois TRM v12.0 to calculate the total electric energy savings:

$$\begin{aligned} \Delta kWh &= (1 - ER) \\ &\times \left(\left(\frac{\left(\frac{CoolingLoad}{DuctlessSave} \times \left(\frac{1}{SEER2_{BASE} \times (1 - DeratingCool_{BASE})} \right) \right) - \left(CoolingLoad \times \left(\frac{1}{SEER2_{EE} \times (1 - DeratingCool_{EE})} \right) \right)}{1,000} \right) \right. \\ &+ \left(\frac{\left(\frac{HeatLoadDisp}{DuctlessSave} \right) \times \left(\frac{1}{HSPF2_{BASE} \times HSPF2_{adj} \times (1 - DeratingCool_{BASE})} \right)}{1,000} \right) \\ &\left. - \left(\frac{HeatLoadDisp \times \left(\frac{1}{HSPF2_{EE} \times HSPF2_{adj} \times (1 - DeratingHeat_{EE})} \right)}{1,000} \right) \right) \end{aligned}$$

And the addition of early replacement savings:

$$\begin{aligned} \Delta kWh_{ER} &= ER \\ &\times \left(\left(\frac{\left(\frac{CoolingLoad}{DuctlessSave} \times \left(\frac{1}{SEER2_{EXIST} \times (1 - DeratingCool_{BASE})} \right) \right) - \left(CoolingLoad \times \left(\frac{1}{SEER2_{EE} \times (1 - DeratingCool_{EE})} \right) \right)}{1,000} \right) \right. \\ &+ \left(\frac{\left(\frac{HeatLoadDisp}{DuctlessSave} \right) \times \left(\frac{1}{HSPF2_{EXIST} \times HSPF2_{adj} \times (1 - DeratingCool_{BASE})} \right)}{1,000} \right) \\ &\left. - \left(\frac{HeatLoadDisp \times \left(\frac{1}{HSPF2_{EE} \times HSPF2_{adj} \times (1 - DeratingHeat_{EE})} \right)}{1,000} \right) \right) \end{aligned}$$

Where:

CoolingLoad	=	Annual cooling load for the building
DuctlessSave	=	Factor used to adjust displaced ducted heating or cooling load
SEER2 _{BASE}	=	Baseline SEER2
SEER2 _{EE}	=	Efficient SEER2
SEER2 _{EXIST}	=	Existing SEER2
DeratingCool	=	Efficient and base ASHP cooling derating

HeatLoadDisp	=	Total heating capacity × EFLH _H × heat load factor
EFLH _H	=	Equivalent full-load heating hours derived via 2023 billing analysis
HSPF2 _{BASE}	=	Baseline heating seasonal performance factor
HSPF2 _{EE}	=	Efficient heating seasonal performance factor
HSPF2 _{EXIST}	=	Existing heating seasonal performance factor
HSPF2 _{adj}	=	Adjustment % to account for in-situ performance
ER	=	Early replacement rate

The evaluation team used CAP_C and CAP_H values from model lookups in the AHRI equipment database. The evaluation team also found SEER2_{EE} and HSPF2_{EE} in the AHRI database and used EFLH_C values from the Indiana TRM (v2.2) and EFLH_H from the 2023 billing analysis, based on project location. The evaluation team assumed SEER2_{BASE} and HSPF2_{BASE} to be 14.3 and 7.5, respectively.

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW = \frac{CAP_C}{1,000} \times \left(\left(\frac{1}{DuctlessSave} \right) \times \left(\frac{(1 - ER)}{(EER_{BASE} \times (1 - DeratingCool_{BASE}))} + \frac{ER}{(EER_{EXIST} \times (1 - DeratingCool_{BASE}))} \right) - \frac{1}{(EER_{EE} \times (1 - DeratingCool_{EE}))} \right) \times CF$$

The evaluation team assumed an EER2_{BASE} of 8.5 according to the Illinois TRM v12.0 and a CF of 0.81, also based on the Illinois TRM v12.0. The evaluation team found EER2_{EE} in the AHRI database. Table 250 shows the mean values for 2024.

Table 250. 2024 ASHP Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
CAP _C	19,325.00	Actual from AHRI equipment database
EFLH _C	427.08	Indiana TRM (v2.2); values vary based on nearest city to project location
SEER2 _{base} ^a	14.30	Illinois TRM v12.0
SEER2 _{ee}	20.92	Actual from AHRI equipment database
SEER2 _{exist} ^a	9.5	Illinois TRM v12.0
SEER _{adj}	1	Illinois TRM v12.0
CAP _H	18,708.33	Actual from AHRI equipment database
EFLH _H	997.66	2023 billing analysis, values vary based on nearest city to project location
HSPF2 _{base} ^a	7.5	Illinois TRM v12.0

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
HSPF2ee	9.89	Actual from AHRI equipment database
HSPF2exist ^a	4.4	Illinois TRM v12.0
HSPF2adj	1.00	Illinois TRM v12.0
EER2base	8.5	Illinois TRM v12.0
EER2 exist ^a	7.4	Illinois TRM v12.0
EER2ee	12.3	Actual from AHRI equipment database
Derating Factors	0.1	Illinois TRM v12.0
DuctlessSave	1	Illinois TRM v12.0
ER	16%	2024 Participant Survey
CF ^a	0.81	Illinois TRM v12.0
^a Constants		

The evaluation team used EFLH values from the Illinois TRM v12.0 and 2023 billing analysis and AHRI-verified capacities and efficiencies for this analysis. Using the AHRI-verified capacity, additional early replacement savings, and differences in assumed algorithms made *ex post* savings vary from *ex ante* savings. Table 251 highlights these results.

Table 251. Detailed Results from Air Source Heat Pumps

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
24	887.97 kWh	1,095.98 kWh	123%
	0.602 kW	0.589 kW	98%

Air Source Heat Pump – Legacy 2023 Measure

In the 2024 tracking data, there were 38 Air Source Heat Pump - Legacy 2023 measures for which the evaluation team assigned a deemed savings value of 946.37 kWh and 0.444 kW. These deemed savings are the *ex post* gross per measure savings from the 2023 evaluation. Reference the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the evaluation team calculated this measure.

Ex ante used a deemed kWh savings value of 654.44 kWh and 0.423 kW compared with evaluated kWh and kW savings of 946.37 kWh and 0.444 kW, resulting in an electric energy savings and demand reduction realization rate of 145% and 105%, respectively, for the Air Source Heat Pump - Legacy 2023 measures.

Smart Wi-Fi Thermostats

There were 1,479 smart Wi-Fi thermostats installed through the program in 2024. Several evaluated savings cases exist within this measure category, and each was established within the measure name with delivered unit population splits shown in Table 252.

Table 252. HVAC Configurations for Thermostat Measures and *Ex Ante* savings

MEASURE NAME-DEFINED CONFIGURATION	COUNT OF UNITS ^A	EX ANTE UNIT SAVINGS		
		KWH	KW	THERMS
Natural gas heat with no air conditioner	635	0.00	0.000	68.86
Natural gas heat with air conditioner	797	96.62	0.174	68.86
Electric resistance heating with air conditioner	10	1,434.82	0.089	0.00
Heat pump	30	810.67	0.000	0.00
Air conditioner only	7	96.62	0.174	0.00
^a These quantities reflect physical unit counts, and therefore may not match the scorecard, which counted both fuel types for dual-fuel measures.				

Table 253 shows the mean values for 2024.

Table 253. 2024 Thermostat Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE - GAS HEATING ONLY	2024 MEAN VALUE - ELECTRIC COOLING AND GAS HEATING	2024 MEAN VALUE - ELECTRIC COOLING AND HEATING	2024 MEAN VALUE - ELECTRIC COOLING ONLY	2024 MEAN VALUE - HEAT PUMP	SOURCE
CAPC	-	33,495.56	33,495.56	33,495.56	34,515.91	Actual from the program tracking data when possible or average of program ACs or heat pumps
EER2*	10	10	10	10	10	Illinois TRM v12.0
EFLHC	614.88	704.23	709.00	662.71	703.60	Indiana TRM (v2.2), values vary based on nearest city to project location
Heating Reduction (smart)	0.081	0.081	0.081	0.081	0.081	2024 Participant Survey; weighted average
Heating Reduction (programmable)	0.062	0.062	0.062	0.062	0.062	Illinois TRM v12.0
HF	0.965	0.965	0.965	0.965	0.965	Illinois TRM v12.0
Gas Heating Consumption	998	1005	1005	1005	1005	Illinois TRM v12.0; varies by city
Electric Heating Consumption	-	-	20,777	-	12,222	Illinois TRM v12.0, values vary based on nearest city to project location
Cooling Reduction	0.084	0.084	0.084	0.084	0.084	Illinois TRM v12.0
SEER2	11.40	11.40	11.40	11.40	11.40	Illinois TRM v12.0
CF	0.34	0.34	0.34	0.34	0.34	Illinois TRM v12.0
Cooling Demand Reduction	0.164	0.164	0.164	0.164	0.164	Illinois TRM v12.0
Fe	0.0314	.0314	.0314	.0314	.0314	Illinois TRM v12.0

To determine energy savings for air conditioning and electric heat sites, the evaluation team used the following equations. For natural gas heating with air conditioning and for air conditioning alone:

$$\Delta kWh = (\%AC * \left(\frac{EFLH_c * CAP_c * \frac{1}{SEER2}}{1000} \right) * Cooling Reduction * Eff ISR Cool) + (\%Electric Heat * Electric Heating Consumption * Heating Reduction * HF * Eff ISR Heat + (\Delta Therms Heating * F_e * 29.3))$$

For heat pump systems:

$$\Delta Therms = \%Gas Heat * Gas Heating Consumption * Heating Reduction * HF * Eff ISR Heat$$

Where:

CAP _c	=	System cooling capacity
SEER2	=	System SEER2
EFLH _c (2.2)	=	Equivalent full-load cooling hours from Indiana TRM
Cooling Reduction	=	Reduction in household cooling energy consumption
Electric Heating Consumption	=	Varies based on city
HF	=	Housing factor
F _e	=	Fan energy factor
Gas Heating Consumption	=	Household gas heating consumption; varies by city
Heating Reduction	=	Reduction in household heating energy consumption
%Gas heat	=	0 or 1 depending on system
%AC	=	0 or 1 depending on system

Here, the standard cooling CF of 0.34 is used, but divided by two:

$$\Delta kW = \%AC \times \frac{CAP_c}{EER2 \times 1,000} \times CF \times Cooling Demand Reduction \times Eff ISR Cool$$

In this evaluation, the program delivered 1,479 thermostats, 73 of which (5%) were the second thermostat delivered to a given site. The evaluation team investigated the behavior of customers who received more than one thermostat for NIPSCO's 2019 program year. In the 2019 evaluation, the evaluation team obtained survey responses from 58 participants who received two thermostats and found that all of them were using both thermostats to control their homes' HVAC systems.

However, the billing analysis did not show that sites receiving more than one thermostat saw savings that were statistically different from those receiving only one.⁵³ However, because we did not find any NIPSCO thermostats that were given away to adjacent sites, we did not grant any savings to second thermostats.

The overall kWh realization rate for this measure category is 139%, the overall kW realization rate is 136%, and the overall natural gas realization rate is 108%. Table 254 highlights these results.

Table 254. Detailed Results from Thermostats

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
1,479	78.67 kWh	109.59 kWh	139%
	0.095 kW	0.124 kW	130%
	66.67 therms	72.03 therms	108%

Wi-Fi Thermostats – Legacy 2023 Measure

In the 2024 tracking data, there were 802 Wi-Fi Thermostat – Legacy 2023 measures for which the evaluation team assigned deemed *ex post* gross per measure savings from the 2023 evaluation. The average deemed *ex post* gross savings were 52.57 kWh, 0.120 kW, and 51.09 therms. Reference the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the evaluation team calculated this measure.

Ex ante used an average deemed kWh savings value of 66.24 kWh, 0.070 kW, and 15.10 therms, resulting in electric energy savings, demand reduction, and therm savings realization rates of 79%, 172%, and 338%, respectively, for the Wi-Fi Thermostat – Legacy 2023 measures.

Heat Pump Water Heater

In the 2024 tracking data, there were 13 heat pump water heaters. The evaluation team used the following algorithm to calculate savings for water heaters:

$$\Delta kWh = \left(\frac{\left(\frac{1}{UEF_{BASE}} - \frac{1}{UEF_{EE}} \right) \times GPD \times Household \times 365.25 \times \gamma_{Water} \times (T_{out} - T_{in}) \times 1.0}{3412} \right) + CoolingImpact - ElecHeatImpact + Deh_{reduction}$$

Where:

- GPD = Gallons per day per person
- Household = Average number of people per household
- 365.25 = Days per year
- γ_{Water} = Specific weight of water; 8.33 lb. per gallon
- T_{in} = Supply temperature
- T_{out} = Water heater setpoint

⁵³ Cadmus. 2019 *Evaluation, Measurement, and Verification Final Report*. Prepared for: Dayton Power and Light. May 6, 2020. PDF page 218, Cadmus report page 56. <http://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=762b0518-9da9-459b-9ef1-d8026bcc147f>

UEF _{BASE}	=	Baseline uniform energy factor
UEF _{EE}	=	Efficient uniform energy factor
3412	=	Conversion from Btu to kWh
CoolingImpact	=	Cooling savings from heat in home to water heat
ElecHeatImpact	=	Electric heating cost from conversion of heat in home to water heat
Deh _{Reduction}	=	Savings resulting from reduced dehumidification

The evaluation team applied groundwater temperature based on the nearest city and calculated an assumed a water temperature setpoint of 125°F. kWh_{cooling}, kWh_{heating}, and Deh_{Reduction} per measure basis using algorithms and assumptions from the Illinois TRM v12.0.

The current standard for residential water heater efficiency is the uniform UEF.⁵⁴ The UEF required by code is a function of tank volume, heater type (instant or storage), and draw pattern (very small, low, medium, high). The evaluation team looked up these parameters in the AHRI database for units delivered for this measure category.

The team also used its actual rated efficient UEF determined from the AHRI database for that model to calculate savings. The evaluation team used the following algorithm from the Illinois TRM v12.0 to calculate demand reduction:

$$\Delta kW = \frac{\Delta kWh}{Hours} \times CF$$

Where:

DkWh	=	kWh savings
Hours	=	Full load hours of water heater
CF	=	Coincidence factor

Table 255 shows the mean values for 2024.

Table 255. 2024 Water Heater Mean Values

INDEPENDENT VARIABLES	2024 HEAT PUMP WATER HEATER MEAN VALUES	SOURCES
UEFbase	0.92	Applied based on equipment tank volume, heater type, and draw patterns found in the AHRI equipment database and in accordance with DOE standards
UEFee	3.72	Actual from AHRI equipment database
Tin	57.8	Indiana TRM (v2.2), values vary based on nearest city to project location
GPD ^a	17.6	Illinois TRM v12.0
Hours ^a	2,533	Illinois TRM v12.0

⁵⁴ UEF became the standard on July 13, 2015.

https://www.energy.gov/sites/prod/files/2015/03/f20/water_heater_conversionfactor_nopr.pdf

INDEPENDENT VARIABLES	2024 HEAT PUMP WATER HEATER MEAN VALUES	SOURCES
Heating Impact	4.604	Varies based on UEF values; Input assumptions from the IL TRM v12.0
Cooling Impact	47.12	Varies based on UEF values; Input assumptions from the IL TRM v12.0
Deh reduction ^a	72	Illinois TRM v12.0
LF ^a	0.22	Illinois TRM v12.0
ηHeat ^a	0.68	Illinois TRM v12.0
%NaturalGas ^a	63%	Indiana TRM (v2.2)
^a Constants		

The resulting average evaluated unit electric energy and demand reduction savings were 2,295.04 kWh and 0.426 kW, respectively, compared to average *ex ante* values of 2,040.22 kWh and 0.097 kW, for a kWh realization rate of 112% and kW realization rate of 439% for this measure category. Table 256 highlights these results.

Table 256. Detailed Results from Water Heaters

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
13	2,040.22 kWh	2,295.04 kWh	112%
	0.097 kW	0.426	439%

Heat Pump Water Heaters – Legacy 2023 Measure

In the 2024 tracking data, there were 10 Heat Pump Water Heater – Legacy 2023 measures for which the evaluation team assigned deemed *ex post* gross per measure savings from the 2023 evaluation. The average deemed *ex post* gross savings were 2,393.97 kWh and 0.418 kW. Reference the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the evaluation team calculated this measure.

Ex ante used an average deemed kWh savings and demand reduction value of 2,150.81 kWh and 0.102 kW, respectively, resulting in electric energy savings and demand reduction savings realization rates of 111%, and 409%, respectively, for the Heat Pump Water Heater - Legacy 2023 measures.

Pool Pump

In the 2024 tracking data, there were four pool pumps. The evaluation team applied the savings approach outlined in the Illinois TRM v12.0, where savings are dependent on the installed weighted energy factor, orientation, and tier:

$$\Delta kWh = (Gallons \times Turnovers \times (\frac{1}{WEF_{base}} - \frac{1}{WEF_{ESTAR}})) \times \frac{Days}{1,000}$$

Where:

WEF_{BASE} = Weighted energy factor of baseline pump (gal/Wh)

WEF_{ESTAR} = Weighted energy factor of efficient pump (gal/Wh)

Gallons	=	Capacity of the pool
Turnovers	=	Desired number of pool water turnovers per day
Days	=	Number of days per year that the swimming pool is operational
1,000	=	Conversion from WH to kWh

The team determined each model’s configuration and tier from the ENERGY STAR qualified products list (QPL) and assigned savings according to the savings shown above. For models that the team could not find through look ups, we assumed the reported configuration and tier. The evaluation team calculated *ex ante* values also using the Illinois TRM v12.0. Differences between *ex ante* savings and *ex post* savings come from different than reported model configurations and tiers confirmed during look ups. Where configurations and tiers were the same between *ex ante* and *ex post*, savings were the same.

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW = \left(\frac{\left(\frac{kWh}{Day} \right)_{BASE}}{\left(\frac{Hrs}{Day} \right)_{BASE}} - \frac{\left(\frac{kWh}{Day} \right)_{ESTAR}}{\left(\frac{Hrs}{Day} \right)_{ESTAR}} \right) \times CF$$

Where:

kWh/Day	=	Daily energy consumption of pool pump
Hrs/Day	=	Daily run hours of pool pump (gallons × turnovers / GPM)
CF	=	Summer peak coincidence factor

Table 257 shows the mean values for 2024 pool pumps.

Table 257. 2024 Pool Pump Mean Values

INDEPENDENT VARIABLES	MEAN VALUE-ESTAR IN-GROUND	MEAN VALUE-CEE TIER 1 ABOVE GROUND	SOURCE
WEFestar	6.31	3.49	Configuration and Tier according to ENERGY STAR QPL Look up; Values from Illinois TRM v11.0 table
WEFbase ^a	4.63	2.57	Illinois TRM v12.0
Gallons ^a	22,000	7,540	Illinois TRM v12.0
Turnovers ^a	2	2	Illinois TRM v12.0
Days ^a	122	122	Illinois TRM v12.0
GPMbase ^a	43.6	44.7	Illinois TRM v12.0
GPMestar ^a	32.20	27.3	Illinois TRM v12.0
CF ^a	0.831	0.831	Illinois TRM v12.0
^a Constants			

Table 258 highlights Pool Pump results.

Table 258. Detailed Results from Pool Pumps

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
4	248.70 kWh	248.70 kWh	100%
	0.464 kW	0.349 kW	75%

Pool Pump – Legacy 2023 Measure

In the 2024 tracking data, there was one Pool Pump Legacy – 2023 measure for which the evaluation team assigned deemed *ex post* gross per measure savings from the 2023 evaluation. The average deemed *ex post* gross savings were 316.24 kWh and 0.214 kW. Reference the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the team calculated this measure.

Ex ante used an average deemed kWh savings and demand reduction value of 316.24 kWh and 0.215 kW, respectively, resulting in electric energy savings and demand reduction savings realization rates of 100% and 100%, respectively, for the Pool Pump – Legacy 2023 measure.

Air Purifiers

In the 2024 tracking data, there were 54 air purifiers. The evaluation team applied the savings approach outlined in the Illinois TRM v12.0 where savings are dependent on the installed model’s smoke free clean air delivery rate (CADR) and partially on mode power consumption:

$$\Delta kWh = kWh_{BASE} - kWh_{eff}$$

Where

$$kWh_{BASE} = hours \times \left(\frac{SmokeCADR_{BASE}}{SmokeCADRperWatt_{BASE} \times 1,000} \right) + (8,760 - hours) \times \frac{PartialOnModePower_{BASE}}{1,000} \times IQAdj$$

$$kWh_{eff} = hours \times \left(\frac{SmokeCADR_{eff}}{SmokeCADRperWatt_{eff} \times 1,000} \right) + (8,760 - hours) \times \frac{PartialOnModePower_{eff}}{1,000}$$

And

kWh _{BASE}	=	Annual electrical usage for baseline unit (kWh)
kWh _{eff}	=	Annual electrical usage for efficient unit (kWh)
hours	=	Annual active operating hours
SmokeCADR _{Base}	=	Smoke CADR for baseline units
SmokeCADRperWatt _{BASE}	=	Smoke CADR delivery rate per watt for baseline units
PartialOnModePower _{BASE}	=	Partial on mode power for baseline units (Watts)
1000	=	Conversion factor from watts to kilowatts
SmokeCADR _{eff}	=	Smoke CADR for efficient units
SmokeCADRperWatt _{eff}	=	Smoke CADR delivery rate per watt for efficient units
PartialOnModePower _{eff}	=	Partial on mode power for efficient units (Watts)

IQAdj = Baseline adjustment for IQ program participants

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW = \frac{\Delta kWh}{Hours} \times CF$$

Where:

Hours = Average hours of use per year

CF = Summer peak coincidence factor

The team determined each model's smoke free CADR from the ENERGY STAR QPL and assigned savings according to the savings shown above. The *ex ante* values were calculated using the Illinois TRM v12.0. Differences between *ex ante* savings and *ex post* savings come from different CADR than reported found during look ups. Table 259 documents the mean values for 2024.

Table 259. 2024 Air Purifier Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE-CADR 30-99	2024 MEAN VALUE-CADR 101-149	2024 MEAN VALUE-CADR 150-199	2024 MEAN VALUE-CADR ≥200	SOURCE
SmokeCADRbase	83.30	127.60	175.20	289.22	Efficient CADR from ENERGY STAR QPL Look up; Base look up from Illinois TRM v12.0
SmokeCADRperWattbase	1.64	1.83	1.94	1.89	Efficient CADR from ENERGY STAR QPL Look up; Base look up from Illinois TRM v12.0
PartialOnModePowerbase	2.00	2.00	2.00	2.00	Efficient CADR from ENERGY STAR QPL Look up; Base look up from Illinois TRM v12.0
SmokeCADReff	78.63	131.00	178.42	276.79	ENERGY STAR QPL Look up
SmokeCADRperWattEff	2.94	3.78	4.73	4.70	ENERGY STAR QPL Look up
PartialOnModePowerEff	0.38	0.62	0.56	0.77	ENERGY STAR QPL Look up
Hours ^a	5840	5840	5840	5840	Illinois TRM v12.0

INDEPENDENT VARIABLES	2024 MEAN VALUE-CADR 30-99	2024 MEAN VALUE-CADR 101-149	2024 MEAN VALUE-CADR 150-199	2024 MEAN VALUE-CADR ≥200	SOURCE
CF ^a	0.667	0.667	0.667	0.667	Illinois v12.0
^a Constants					

Table 260 highlights air purifier results.

Table 260. Detailed Results from Air Purifiers

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
54	433.70 kWh	405.53 kWh	94%
	0.050 kW	0.046kW	94%

Clothes Dryers

In the 2024 tracking data, there were 49 clothes dryers. The evaluation team used the following algorithm from the Illinois TRM v12.0 to calculate savings for clothes dryers:

$$\Delta kWh = \left(\left(\frac{Load \times IQAdj}{CEF_{base}} \right) - \frac{Load}{CEF_{eff}} \right) * N_{cycles} * \%Electric$$

Where:

Load	=	The average total weight (lbs) of clothes per drying cycle
CEF _{base}	=	Combined energy factor (lbs/kWh) of the baseline unit
CEF _{EE}	=	Combined energy factor (lbs/ kWh) of the ENERGYSTAR unit
N _{cycles}	=	Number of dryer cycles per year
%Electric	=	The percentage of overall savings coming from electricity
IQAdj	=	Baseline adjustment for IQ program participants

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

Hours	=	Annual run hours of clothes dryer
CF	=	Summer peak coincidence factor

The evaluation team determined the clothes dryer energy type and installed CEF from model number look ups in the ENERGY STAR QPL. *Ex ante* assumed an electric energy type for all installed clothes dryers, a

deemed energy savings value of 200.15 kWh, and demand savings of 0.027 kW. Table 261 shows the mean values for 2024.

Table 261. 2024 Clothes Dryers Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
Load ^a	8.12	Illinois TRM v12.0
CEFbase ^a	3.05	Illinois TRM v12.0
CEFEE	4.79	Actual from ENERGY STAR QPL Look up
Ncycles ^a	283.00	Illinois TRM v12.0
%electric ^a	100%	Illinois TRM v12.0
IQAdj ^a	1	Illinois TRM v12.0
^a Constants		

Table 262 highlights clothes dryer results.

Table 262. Detailed Results from Clothes Dryers

TRACKING DATA	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
49	200.15	228.18 kWh	114%
	0.027 kW	0.031 kW	112%

Dehumidifiers

In the 2024 tracking data, there were 56 dehumidifiers. The evaluation team used the following algorithm from the Illinois TRM v12.0 to calculate savings for dehumidifiers:

$$\Delta kWh = \left(\frac{Avg\ Capacity * .0473}{24} * Hours \right) * \left(\frac{IQAdj}{L/kWh_{Base}} - \frac{1}{L/kWh_{Eff}} \right)$$

Where:

- Avg Capacity = Average capacity of the unit (pints/day)
- .0473 = Conversion for pints to liters
- 24 = Conversion from liters/day to liters/hour
- Hours = Run hours per year
- L/kWh = Liters of water per kWh consumed
- IQAdj = Baseline adjustment for IQ program participants

The evaluation team determined unit-specific average capacity and water removal per kWh values by looking up reported model numbers in the ENERGY STAR QPL.

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

Hours = Annual operating hours
 CF = Summer peak coincidence factor

Table 263 shows the mean values for 2024.

Table 263. 2024 Dehumidifiers Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE - (CAPACITY ≤ 25 PINTS/DAY) (≥ 1.57 L/KWH)	2024 MEAN VALUE - (CAPACITY 26 - 50 PINTS/DAY) (≥ 1.80 L/KWH)	SOURCE
Average Capacity	22.59	44.90	Actual from ENERGY STAR QPL Look up
Federal Standard L/kWh	1.30	1.60	Illinois TRM v12.0
L/kWh	1.70	1.86	Actual from ENERGY STAR QPL Look up
Pints to Liters ^a	0.473	0.473	Illinois TRM v12.0
Run Hours/year ^a	2,200	2,200	Illinois TRM v12.0
Hours/day ^a	24.00	24.00	Illinois TRM v12.0
IQAdj ^a	1	1	Illinois TRM v12.0

Table 264. Detailed Results from Dehumidifiers

TRACKING DATA	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
56	115.59 kWh	169.10 kWh	146%
	0.027 kW	0.038 kW	145%

Dehumidifier – Legacy 2023 Measure

In the 2024 tracking data, there were six Dehumidifier – Legacy 2023 measures for which the evaluation team assigned deemed *post* gross per measure savings from the 2023 evaluation. The average deemed *ex post* gross savings were 166.35 kWh and 0.038 kW. Reference the 2023 NIPSCO Home Rebates evaluation *Appendix* for details on how the evaluation team calculated this measure.

Ex ante used an average deemed kWh savings and a demand reduction value of 113.33 kWh and 0.026 kW, respectively, resulting in electric energy savings and demand reduction savings realization rates of 147%, and 145%, respectively for the Dehumidifier – Legacy 2023 measure.

Room Air Conditioners

In the 2024 tracking data, there were 28 room air conditioners. The evaluation team used the following algorithm from the Illinois TRM v12.0 to calculate savings for room air conditioners:

$$\Delta kWh = (1 - ER) \times \frac{\left(FLH_{RoomAC} \times \frac{Btu}{H} \times \left(\frac{1}{CEER_{base}} - \frac{1}{CEER_{ee}} \right) \right)}{1,000} + ER \times \frac{\left(FLH_{RoomAC} \times \frac{Btu}{H} \times \left(\frac{1}{(EER_{exist} \times 1.01)} - \frac{1}{CEER_{ee}} \right) \right)}{1,000}$$

Where:

FLH _{RoomAC}	=	Full load hours of room air conditioner
Btu/H	=	Size of rebated unit
EER _{exist}	=	Efficiency of existing unit
1.01	=	Factor to convert EER to CEER
CEER _{base}	=	Combined energy efficiency ratio of baseline unit
CEER _{ee}	=	Combined energy efficiency ratio of actual unit
ER	=	Early replacement rate

The evaluation team determined unit-specific average capacity and water removal per kWh values by looking up reported model numbers in the ENERGY STAR QPL.

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW = \left((1 - ER) \times \frac{\left(\frac{Btu}{H} \times \left(\frac{1}{(CEER_{base} \times 1.01)} - \frac{1}{(CEER_{ee} \times 1.01)} \right) \right)}{1,000} + ER \times \frac{\left(\frac{Btu}{H} \times \left(\frac{1}{EER_{exist}} - \frac{1}{(CEER_{ee} \times 1.01)} \right) \right)}{1,000} \right) \times CF$$

Where:

CF	=	Summer peak coincidence factor

Table 265 shows the mean values for 2024.

Table 265. 2024 Room Air Conditioner Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
FLH _{RoomAC}	256.36	Indiana TRM (v2.2), values assigned based on nearest TRM city to project location
Btu/H	10,357.14	Actual from ES Lookup
CEER _{base} ^a	10.85	Illinois TRM v12.0
EER _{exist}	7.7	Illinois TRM v12.0
CEER _{ee}	15.04	Actual from ES Lookup
CF ^a	0.30	Illinois TRM v12.0
ER	16%	Participant Survey

Table 266. Detailed Results from Room Air Conditioners

TRACKING DATA	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
28	62.64 kWh	83.08 kWh	133%
	0.071 kW	0.098 kW	137%

Refrigerator Replacement

In the 2024 tracking data, there were 98 refrigerator replacements. The evaluation team used the following equations to calculate electric energy savings for refrigerator replacement. (Note: there are no natural gas savings associated with this measure.)

$$\Delta kWh = ((1 - ER) \times (UEC_{base} * IQAdj) - UEC_{ee}) + (ER \times ((UEC_{exist} * IQAdj) - UEC_{ee}))$$

Where:

- UEC_{base} = Unit energy consumption of base refrigerator in kWh
- UEC_{exist} = Unit energy consumption of existing refrigerator in kWh
- UEC_{ee} = Unit energy consumption of efficient refrigerator in kWh
- ER = Early replacement rate
- IQAdj = Baseline adjustment for IQ program participants

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW = \frac{\Delta kWh}{8760} * TAF * LSAF$$

Where:

- TAF = Temperature adjustment factor

LSAF = Load shape adjustment factor for existing unit
 8760 = Annual hours of use

Table 267 lists the assumptions and source of each assumption for the refrigerator replacement measure savings calculations.

Table 267. *Ex Post* Variable Assumptions for Refrigerator Replacement

INPUT	VALUE	SOURCE
UEC _{base}	508.77	Illinois TRM v12.0; Energy Star look up
UEC _{exist}	830.08	Illinois TRM v12.0; Energy Star loop-up
UEC _{efficient}	459.04	Illinois TRM v12.0
TAF	1.25	Illinois TRM v12.0
LSAF	1.057	Illinois TRM v12.0
Conversion Factor	8760	Hours per year
IQAdj	1	Illinois TRM v12.0
ER	16%	2024 Participant Survey

Table 268. Detailed Results from Refrigerator Replacement

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
98	53.05 kWh	101.15 kWh	191%
	0.008 kW	0.015kW	200%

Freezers

In the 2024 tracking data, there were six freezers. The evaluation team used the following equations to calculate electric energy savings for freezers. There are no natural gas savings associated with this measure.

$$\Delta kWh = (kWh_{base} * IQAdj) - kWh_{ESTAR}$$

Where:

kWh_{base} = Baseline kWh consumption per year
 kWh_{ESTAR} = ENERGY STAR kWh consumption per year
 IQAdj = Baseline adjustment for IQ program participants

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

Hours = Full load hours per year
 CF = Summer peak coincidence factor

Table 269 lists the assumptions and source of each assumption for the freezer measure savings calculations.

Table 269. *Ex Post* Variable Assumptions for Freezers

INPUT	VALUE	SOURCE
kWh _{base}	495.73	Illinois TRM v12.0; Energy Star look up
KWh _{ESTAR}	446.25	Illinois TRM v12.0; Energy Star look up
Hours	5890	Illinois TRM v12.0
CF	0.83	Indiana TRM (v2.2)
IQAdj	1	Illinois TRM v12.0

Table 270. Detailed Results from Freezer

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
6	27.80 kWh	49.48 kWh	178%
	0.004 kW	0.007kW	175%

Dishwashers

In the 2024 tracking data, there were 92 dishwashers. The evaluation team used the following equations to calculate electric energy savings for dishwashers. (Note: There are no natural gas savings associated with this measure.)

$$\Delta kWh = ((kWh_{base} - kWh_{ESTAR}) \times (\%kWh_{op} + (\%kWh_{heat} \times \%Electric_{DHW})))$$

Where:

- kWh_{base} = Baseline kWh consumption per year
- kWh_{ESTAR} = ENERGY STAR kWh consumption per year
- %kWh_{op} = Percentage of dishwasher energy consumption used for unit operation
- %kWh_{heat} = Percentage of dishwasher energy consumption used for water heating
- %Electric_{DHW} = Percentage of DHW savings assumed to be electric

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

- Hours = Full load hours per year
- CF = Summer peak coincidence factor

Table 271 lists the assumptions and source of each assumption for the dishwasher's measure savings calculations.

Table 271. *Ex Post* Variable Assumptions for Dishwashers

INPUT	VALUE	SOURCE
kWh _{base}	307	Illinois TRM v12.0
KWh _{ESTAR}	240; 252	Illinois TRM v12.0
%kWh _{op}	0.44	Illinois TRM v12.0
%kWh _{heat}	0.56	Illinois TRM v12.0
%Electric _{DHW}	1	Illinois TRM v12.0
Hours	353	Illinois TRM v12.0
CF	0.026	Illinois TRM v12.0

Table 272. Detailed Results from Dishwasher

AUDITED COUNT	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
92	68.17 kWh	68.17 kWh	100%
	0.005 kW	0.005 kW	101%

Clothes Washers

In the 2024 tracking data, there were 124 clothes washers. The evaluation team used the following algorithm from the Illinois TRM v11.0 to calculate savings for clothes washers:

$$\Delta kWh = \left[Capacity \times \frac{1}{IMEF_{base}} \times N_{cycles} \times (\%CW_{base} + (\%DHW_{base} \times \%ElectricDHW) + (\%Dryer_{base} \times \%ElectricDryer)) \right] - \left[Capacity \times \frac{1}{IMEF_{eff}} \times N_{cycles} \times (\%CW_{eff} + (\%DHW_{eff} \times \%ElectricDHW) + (\%Dryer_{eff} \times \%ElectricDryer)) \right]$$

Where:

Capacity	=	Clothes washer capacity
IMEF _{base}	=	Integrated modified energy factor of baseline unit
IMEF _{eff}	=	Integrated modified energy factor of efficient unit
N _{cycles}	=	Number of wash cycles per year
%CW	=	Percentage of total energy consumption for clothes washer
%DHW	=	Percentage of total energy consumption for water heating
%Dryer	=	Percentage of total energy consumption for dryer operation
%ElectricDHW	=	Percentage of DHW savings assumed to be electric
%ElectricDryer	=	Percentage of dryer savings assumed to be electric

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

- Hours = Annual run hours of clothes washer
- CF = Summer peak coincidence factor

The evaluation team determined the clothes washer load configuration and installed IMEF from model number look ups in the ENERGY STAR QPL. *Ex ante* assumed a deemed energy savings value of 112.97 kWh and demand savings of 0.015 kW. Table 273 shows the mean values for 2024.

Table 273. 2024 Clothes Washers Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
Capacity	4.89	ES QPL look up by model number
IMEF _{base}	1.71	Illinois TRM v12.0
IMEF _{eff}	2.62	Actual from ENERGY STAR QPL Look up
Ncycles ^a	295	Illinois TRM v12.0
%CWbase ^a	6.7%	Illinois TRM v12.0
%CWeff	7.2%	Actual from ENERGY STAR QPL Look up
%DHWbase ^a	15.8%	Illinois TRM v12.0
%DHWeff	11.3%	Actual from ENERGY STAR QPL Look up
%Dryerbase ^a	77.5%	Illinois TRM v12.0
%Dryereff	81.4%	Actual from ENERGY STAR QPL Look up
%ElectricDHW	100%	Illinois TRM v12.0
%ElectricDryer	100%	Illinois TRM v12.0
Hours ^a	295	Illinois TRM v12.0
CF ^a	0.038	Illinois TRM v12.0
^a Constants		

Higher average capacity drove slightly higher energy savings in 2024. However, the largest driver for significantly higher savings was that the evaluation team looked up IMEFeff values in the Energy Star QPL database where *ex ante* assumed default values from the Illinois TRM v12.0. Table 247 highlights these results.

Table 274 highlights clothes washer results.

Table 274. Detailed Results from Clothes Washers

TRACKING DATA	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE

124	112.98 kWh	275.20 kWh	244%
	0.015 kW	0.035 kW	244%

Ceiling Fan

In the 2024 tracking data, there were two ceiling fans. The evaluation team used the following algorithm from the Illinois TRM v11.0 to calculate savings for ceiling fans:

$$\Delta kWh_{fan} = \left[\frac{Days \times FanHours}{1,000} \times ((\%Low_{base} \times WattsLow_{base}) + (\%Med_{base} \times WattsMed_{base}) + (\%High_{base} \times WattsHigh_{base})) \right] - \left[\frac{Days \times FanHours}{1,000} \times ((\%Low_{ES} \times WattsLow_{ES}) + (\%Med_{ES} \times WattsMed_{ES}) + (\%High_{ES} \times WattsHigh_{ES})) \right]$$

Where:

Days	=	Days used per year
FanHours	=	Daily fan “on hours”
%Low	=	Percent of time spent at Low speed
%Med	=	Percent of time spent at medium speed
%High	=	Percent of time spent at high speed
WattsLow	=	Fan wattage at low speed
WattsMed	=	Fan wattage at medium speed
WattsHigh	=	Fan wattage at high speed

The evaluation team used the following algorithm to calculate demand reduction:

$$\Delta kW_{fan} = \left(\frac{(WattsHigh_{base} - WattsHigh_{ES})}{1000} \right) \times CF_{fan}$$

Where:

CF _{fan}	= Summer peak coincidence factor for ventilation savings

Table 275. 2024 Ceiling Fan Mean Values

INDEPENDENT VARIABLES	2024 MEAN VALUE		SOURCE
Days	365.25		Illinois TRM v12.0
FanHours	3		Illinois TRM v12.0
%LOW _{base}	40%		Illinois TRM v12.0
%LOW _{ES}	40%		Illinois TRM v12.0
%Med _{base}	40%		Illinois TRM v12.0

INDEPENDENT VARIABLES	2024 MEAN VALUE	SOURCE
%Med _{ES}	40%	Illinois TRM v12.0
%High _{base}	20%	Illinois TRM v12.0
%High _{ES}	20%	Illinois TRM v12.0
WattsLow _{base}	15	Illinois TRM v12.0
WattsLow _{ES}	3.70	Actual ES QPL look up
WattsMed _{base}	34	Illinois TRM v12.0
WattsMed _{ES}	14	Illinois TRM v12.0
WattsHigh _{base}	67	Illinois TRM v12.0
WattsHigh _{ES}	30.6	Actual ES QPL look up
CF _{fan}	0.24	Indiana TRM v2.2
^a Constants		

Table 276 highlights ceiling fan results.

Table 276. Detailed Results from Ceiling Fan

TRACKING DATA	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
2	20.82 kWh	21.70. kWh	104%
	0.011 kW	0.009 kW	82%

Smart Vents

In the 2024 tracking data, there were two smart vents. The evaluation team used the deemed savings from the NIPSCO 2021 Market Potential Study to determine savings for smart vents:

Table 277. Detailed Results from Smart Vents

TRACKING DATA	EX ANTE DEEMED SAVINGS PER MEASURE	EX POST GROSS AVERAGE SAVINGS PER MEASURE	REALIZATION RATE
2	593.00 kWh	198.00 kWh	33%
	0.253 kW	0.320 kW	126%

Appendix 2. Retail Products Program

Algorithms and Assumptions

This appendix contains the assumptions for electric energy savings, peak demand reduction, and natural gas energy savings algorithms for the measures within the Retail Products program. All measures follow guidance from the Indiana TRM Workbook v1.0 and the Illinois TRM v12.0.

Detailed information on the analysis and supporting assumptions for the following Retail Products program measures are included within this appendix:

Table 278 lists the assumptions reviewed for the *ex post* per-measure savings.

Table 278. Retail Products Program Measure Assumptions Reviewed

MEASURE	REVIEWED ASSUMPTIONS
LEDs	New and baseline wattages, house of use, waste heat factors, coincidence factors
Connected LED	New and baseline wattages, hours of use, waste heat factors, coincidence factor, standby power consumption, lighting control savings
LED Nightlights	New and baseline wattages, hours of use
Refrigerator Replacement	New and baseline energy use
Advanced Power Strip	Deemed savings, hours of use, coincidence factor
Air Purifier	Smoke CADR, efficiency rating, hours of use, coincidence factor
Clothes Dryer	Average load size, annual dryer cycles, efficiency rating, hours of use, coincidence factor
Bathroom Exhaust Fan	CFM, efficiency rating, hours of use, coincidence factor

The algorithms and assumptions the evaluation team used to calculate *ex post* savings for each of these measures follow.

LEDs

The team used the following equations to calculate electric energy and peak demand savings, as well as natural gas energy penalties, for LEDs:

$$kWh \text{ savings per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (Hours) * (WHF_e) * (ISR)}{1,000}$$

$$kW \text{ reduction per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * Coincidence \text{ Factor} * (WHF_d) * (ISR)}{1,000}$$

$$therm \text{ savings per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (Hours) * HF * .03412 * (ISR)}{\eta_{heat} * 1,000}$$

Where:

W_{base}	= Wattage of the bulb being replaced, W
W_{LED}	= Wattage of the LED bulb, W
Daily hours of use	= Average hours of use per day, hr
WHF_e	= Waste heat factor for energy to account for HVAC interactions with lighting (depends on location)
WHF_d	= Waste heat factor for demand to account for HVAC interactions with lighting (depends on location)
HF	= Heating Factor or percentage of lighting savings that must be heated
Coincidence Factor	= Summer peak coincidence factor
365	= Number of days per year, days/yr.
1,000	= Constant to convert watts to kW
ISR	= In-service rate

Table 279 lists the input assumptions and the source of each assumption for the LED measure savings calculations.

Table 279. *Ex Post* Variable Assumptions for LEDs

INPUT	VALUE	SOURCE
W_{base}	varies	ENERGY STAR Qualified Products List (QPL) for lumens, UMP for baseline equivalent
W_{LED}	actual	Actual installed wattage
Hours (omnidirectional)	1089	Illinois TRM v12.0
Hours (directional, decorative)	763	Illinois TRM v12.0
Hours (task, under-cabinet, tube)	730	Illinois TRM v12.0
Leakage (percentage of bulbs leaving utility jurisdiction)	0%	Illinois TRM v12.0
WHF_e (omnidirectional, task, under-cabinet, tube)	1.051	Illinois TRM v12.0
WHF_e (directional, decorative)	1.046	Illinois TRM v12.0
WHF_d (omnidirectional, task, under-cabinet, tube)	1.093	Illinois TRM v12.0
WHF_d (directional, decorative)	1.083	Illinois TRM v12.0
HF	0.49	Illinois TRM v12.0
CF (omnidirectional)	0.128	Illinois TRM v12.0
CF (directional, decorative)	0.109	Illinois TRM v12.0
CF (task, under-cabinet, tube)	0.119	Illinois TRM v12.0
Eff_{heat}	0.7	Illinois TRM v12.0
Conversion Factor	1000	Convert watts to kW
Conversion Factor	365	Convert years to days
Conversion Factor	0.03412	Convert kWh to therms
ISR (bulb)	98%	Illinois TRM v12.0

INPUT	VALUE	SOURCE
ISR (fixture)	100%	Illinois TRM v12.0

Connected LEDs

The team used the following equations to calculate the electric energy and peak demand savings, as well as natural gas energy penalties, for connected LEDs.

$$kWh \text{ savings per lamp} = \left(\frac{WattsEE * Hours * SVGe * WHFe}{1,000} - Standby kWh \right) * ISR$$

$$kW \text{ reduction per lamp} = \left(\frac{WattsEE * SVGd * WHFd}{1,000} \right) * CF * ISR$$

$$therm \text{ penalty per lamp} = - \left(\frac{WattsEE * Hours * SVGe}{1,000} - Standby kWh \right) * \left(\frac{HF * 0.03412}{\eta_{Heat}} \right) * ISR$$

Table 280 lists the input assumptions and the sources of each assumption for the connected LED measure savings calculations.

Table 280. *Ex Post* Variable Assumptions for Connected LEDs

INPUT	VALUE	SOURCE
WattsEE	actual	Program data
Hours	1089	Illinois TRM v12.0
WHFe	1.051	Illinois TRM v12.0
WHFd	1.093	Illinois TRM v12.0
CF	0.128	Illinois TRM v12.0
ISR	98%	Illinois TRM v12.0
SVGe	0.37	Illinois TRM v12.0
SVGd	0.37	Illinois TRM v12.0
Standby kWh	actual	Actual from manufacturer spec sheet
HF	0.49	Illinois TRM v12.0
η_{Heat}	0.70	Illinois TRM v12.0

LED Nightlights

The team used the following equations to calculate electric energy savings for LED nightlights:

$$kWh \text{ savings} = \frac{(WattsBase - WattsEE) * Hours * WHFe * ISR}{1,000}$$

$$therms \text{ penalty} = \frac{-(WattsBase - WattsEE) * Hours * HF * 0.03412 * ISR}{1,000 * \eta_{Heat}}$$

Table 281 lists the input assumptions and the source of each assumption for the nightlights measure savings calculations.

Table 281. *Ex Post* Variable Assumptions for LED Nightlights

INPUT	VALUE	SOURCE
WattsBase	7	IL TRM v12.0
WattsEE	actual	Program data
Hours	4,380	IL TRM v12.0
WHFe	1.054	IL TRM v12.0
HF	0.49	IL TRM v12.0
ηHeat	0.70	IL TRM v12.0
ISR	98%	IL TRM v12.0

Refrigerator Replacement

The evaluation team used the following equations to calculate electric energy savings for refrigerator replacement. There are no natural gas savings associated with this measure.

$$kWh = UEC_{base} - UEC_{efficient}$$

$$kW = \frac{kWh}{8766} * TAF * LSAF$$

Where:

UEC_{base} = Unit energy consumption of baseline refrigerator in kWh

UEC_{efficient} = Unit energy consumption of efficient refrigerator in kWh

TAF = Temperature adjustment factor

LSAF = Load shape adjustment factor for existing unit

8766 = Annual hours of use

Table 282 lists the assumptions and the sources of each assumption for the refrigerator replacement measure savings calculations.

Table 282. *Ex Post* Variable Assumptions for Refrigerator Replacement

INPUT	VALUE	SOURCE
UEC _{base}	618.7	Illinois TRM v12.0 Value shown is the program average, not the value used to calculate savings for each participant
UEC _{efficient}	562.3	Actual model specification. Value shown is the program average, not the value used to calculate savings for each participant
TAF	1.25	Illinois TRM v12.0
LSAF	1.057	Illinois TRM v12.0
Conversion Factor	8766	Hours per year

Air Purifier

The team used the following equation from Illinois TRM v12.0 to calculate the electric energy savings and peak demand savings for air purifiers:

$$\Delta kWh = kWh_{base} - kWh_{eff}$$

$$kWh_{base} = hours * SmokeCADR_{base} / (SmokeCADR_{perwatt_{base}} * 1000)) + (8760 - hours) * PartialOnModePower_{base} / 1000)$$

$$kWh_{eff} = hours * SmokeCADR_{eff} / (SmokeCADR_{perwatt_{eff}} * 1000)) + (8760 - hours) * PartialOnModePower_{eff} / 1000)$$

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

kWh_base	=	Annual Electrical usage for baseline unit (kWh)
kWh_eff	=	Annual electrical usage for efficient unit (kWh)
Hours	=	Annual active operating hours
SmokeCADR_base	=	Smoke CADR for baseline unit
SmokeCADR_per_watt_base	=	Smoke CADR delivery rate per watt for baseline unit
PartialOnModePower_base	=	Partial On Model Power for baseline units by category
SmokeCADR_eff	=	Smoke CADR for efficient unit
SmokeCADR_per_watt_eff	=	Smoke CADR delivery rate per watt for efficient unit
PartialOnModePower_eff	=	Partial On Model Power for efficient units by category
CF	=	Summer Peak Coincidence Factor for measure

Table 283 lists the input assumptions and the source of each assumption for the air purifier measure savings calculations.

Table 283. *Ex Post* Variable Assumptions for Air Purifiers

INPUT	VALUE	SOURCE
SmokeCADR_base	varies	IL TRM v12.0
SmokeCADR_eff	actual	Actual from ENERGY STAR
SmokeCADR_per_watt_base	varies	IL TRM v12.0
SmokeCADR_per_watt_eff	actual	Actual from ENERGY STAR
PartialOnModePower_base	varies	IL TRM v12.0
PartialOnModePower_eff	actual	Actual from ENERGY STAR
Hours	5840	IL TRM v12.0
CF	0.667	IL TRM v12.0

Advanced Power Strips – Tier 1

The team used the following equation to calculate electric energy savings for APSs:

$$kWh \text{ savings} = kWh * ISR$$

$$kW \text{ reduction} = \frac{kWh \text{ savings}}{Hours} * CF$$

Where:

kWh	=	Annual kWh savings per unit
ISR	=	In-service rate
Hours	=	Annual hours APS provides savings
CF	=	Summer Peak Coincidence Factor for measure

Table 284 lists the input assumptions and the source of each assumption for the APSs measure savings calculations.

Table 284. *Ex Post* Variable Assumptions for APSs

INPUT	VALUE	SOURCE
kWh (7-plug)	103	IL TRM v12.0
kWh (5-plug)	56.5	IL TRM v12.0
ISR	78%	NIPSCO OLM value
Hours	7,129	IL TRM v12.0
CF	0.80	IL TRM v12.0

Advanced Power Strip – Tier 2

The evaluation team used the following equations from Illinois TRM v12.0 to calculate electric energy and peak demand savings for APSs – tier 2:

$$\Delta kWh = ERP * BaselineEnergy_{AV} * ISR$$

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

ERP	=	Energy Reduction Percentage
BaselineEnergy_AV	=	Baseline kWh of unit
ISR	=	In-service rate
Hours	=	Annual hours APS provides savings
CF	=	Summer Peak Coincidence Factor for measure

Table 285 lists the assumptions and the source of each assumption for APS – tier 2 measure savings calculations.

Table 285. *Ex Post* Variable Assumption for APS – Tier 2

INPUT	VALUE	SOURCE
ERP (infrared only)	40%	IL TRM v12.0
ERP (infrared and occupancy sensor)	25%	IL TRM v12.0
Baseline Energy _{AV}	466	IL TRM v12.0
ISR (Infrared only)	73%	IL TRM v12.0
ISR (infrared and occupancy sensor)	83%	IL TRM v12.0
Hours	4,380	IL TRM v12.0
CF	0.80	IL TRM v12.0

Clothes Dryer

The evaluation team used the following algorithms from the Illinois TRM v12.0 to calculate savings and demand reduction for clothes dryers:

$$\Delta kWh = \left(\frac{Load}{CEF_{base}} - \frac{Load}{CEF_{eff}} \right) * N_{cycles} * \%Electric$$

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

Load	=	Average weight of clothes per cycle
CEF_base	=	Baseline unit Combined Energy Factor
CEF_eff	=	Efficient unit Combined Energy Factor
N_cycles	=	Number of cycles per year
%Electric	=	Percent of overall savings from electricity
Hours	=	Annual run hours
CF	=	Summer Peak Coincidence Factor for measure

Table 286 lists the assumptions and the source of each assumption for clothes dryer measure savings calculations.

Table 286. *Ex Post* Variable Assumptions for Clothes Dryers

INDEPENDENT VARIABLES	VALUE	SOURCE
Load	8.45	Illinois TRM v12.0
CEFbase	3.11	Illinois TRM v12.0
CEFE	actual	Actual from ENERGY STAR QPL Look up
Ncycles ^a	283	Illinois TRM v12.0

INDEPENDENT VARIABLES	VALUE	SOURCE
%electric ^a	100%	Illinois TRM v12.0

Bathroom Exhaust Fan

The evaluation team used the following algorithms from the Illinois TRM v12.0 to calculate savings and demand reduction for bathroom exhaust fans:

$$\Delta kWh = CFM * Hours * \frac{\left(\frac{1}{\eta_{baseline}} - \frac{1}{\eta_{efficient}} \right)}{1000}$$

$$\Delta kW = \frac{\Delta kWh}{Hours} * CF$$

Where:

CFM	=	Nominal capacity of exhaust fan
Hours	=	Annual run hours
n, baseline	=	Baseline fan efficiency
n, efficient	=	Efficient fan efficiency
CF	=	Summer Peak Coincidence Factor for measure

Table 287 lists the assumptions and the source of each assumption for bathroom exhaust fan measure savings calculations.

Table 287. *Ex Post* Variable Assumptions for Bathroom Exhaust Fans

INDEPENDENT VARIABLES	VALUE	SOURCE
CFM	actual	Actual from ENERGY STAR QPL Look up
Hours	1,089	Illinois TRM v12.0
η _{baseline}	varies	Illinois TRM v12.0
η _{efficient}	actual	Actual from ENERGY STAR QPL Look up
CF	0.135	Illinois TRM v12.0

Appendix 3. Home Energy Assessment (HEA) Program

Algorithms and Assumptions

This appendix contains the assumptions used in electric savings, demand reduction, and gas savings algorithms for the measures within the Home Energy Assessment program. The team examined each assumption behind the algorithms to capture savings and compared it against both the Illinois TRM v12.0 and guidance from the Indiana TRM v1.0. Detailed information on the analysis and supporting assumptions for the following Home Energy Assessment program measures are included within this appendix:

- LEDs
- Kitchen faucet aerators
- Bathroom faucet aerators
- Low-flow showerheads
- Shower Starts
- Pipe wraps
- Attic insulation
- Duct sealing
- Water heater wraps
- Advanced thermostats
- Air sealing
- Outlet gaskets

Table 288 lists the assumptions of the *ex post* per-measure savings.

Table 288. Home Energy Assessments Program Measures

MEASURE	REVIEWED ASSUMPTIONS
LEDs	New and baseline wattages, house of use, waste heat factors, coincidence factors
Kitchen Faucet Aerator	New and baseline flow rates, people per house, minutes of use per day, faucets per home, water temperatures, water heater fuel type and efficiency
Bathroom Faucet Aerator	New and baseline flow rates, people per house, minutes of use per day, faucets per home, water temperatures, water heater fuel type and efficiency
Low-Flow Showerhead	New and baseline flow rates, people per house, minutes of use per day, showerheads per home, water temperatures, water heater fuel type and efficiency
Shower Start	New and baseline flow rates, people per house, showerheads per home, minutes of use per day, water temperatures, water heater fuel type and efficiency, and wasted seconds per shower
Pipe Wrap	New and baseline R-values, pipe diameter, water heater recovery efficiency
Duct Sealing	New and baseline distribution efficiencies, full load heating and cooling hours, capacities, and efficiencies of heating and cooling equipment
Attic Insulation	Void space and compression factor, pre-install and post-install R-values, square footage of installed insulation
Water Heater Wrap	New and baseline R-values, Surface Area of water heater, difference in temperature between the hot water and ambient
Advanced Thermostat	Heating and cooling consumption, full load hours, heating and cooling reduction, and HVAC efficiencies
Air Sealing	Infiltration, HVAC efficiencies, N factors, heating and cooling hours
Outlet Gaskets	Per-gasket deemed savings

The algorithms and assumptions the evaluation team used to calculate *ex post* savings for each of these measures follow.

LEDs

The team used the following equations to calculate electric energy and peak demand savings, as well as natural gas energy penalties, for LEDs:

$$kWh \text{ savings per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (Hours) * (WHF_e)}{1,000}$$

$$kW \text{ reduction per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * Coincidence \text{ Factor} * (WHF_d)}{1,000}$$

$$therm \text{ savings per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (Hours) * HF * 0.03412}{eff_{heat} * 1,000}$$

Where:

W_{base}	= Wattage of the bulb being replaced, W
W_{LED}	= Wattage of the LED bulb, W
Daily hours of use	= Average hours of use per day, hr
Leakage	= Adjustment for utility
WHF_e	= Waste heat factor for energy to account for HVAC interactions with lighting (depends on location)
WHF_d	= Waste heat factor for demand to account for HVAC interactions with lighting (depends on location)
WHF_g	= Waste heat factor for gas to account for HVAC interactions with lighting (depends on location)
CF	= Summer peak coincidence factor
eff_{heat}	= Heating system efficiency
365	= Number of days per year, days/yr.
1,000	= Constant to convert watts to kW
0.03412	= Constant to convert kWh to therms

Table 289 lists the input assumptions and source of each assumption for the LED measure savings calculations.

Table 289. *Ex Post* Variable Assumptions for LEDs

INPUT	VALUE	SOURCE
W_{base} (Candelabra, Globe)	40	ENERGY STAR Qualified Products List (QPL) for lumens, UMP for baseline equivalent
W_{base} (A-Line)	43	ENERGY STAR QPL for lumens, UMP for baseline equivalent

INPUT	VALUE	SOURCE
W_{base} (PAR38)	120	ENERGY STAR QPL for lumens, UMP for baseline equivalent
W_{base} (Downlight Retrofit)	72.8	ENERGY STAR QPL for lumens, UMP for baseline equivalent
W_{LED} (Candelabra)	4.5	Actual installed wattage
W_{LED} (Globe)	6	Actual installed wattage
W_{LED} (A-Line)	9	Actual installed wattage
W_{LED} (PAR38)	14.5	Actual installed wattage
W_{LED} (Downlight Retrofit)	13	Actual installed wattage
Hours (A-line)	1089	Illinois TRM v12.0
Hours (Candelabra, Globe, Par38, Downlight Retrofit)	763	Illinois TRM v12.0
Leakage	0	Illinois TRM v12.0
WHFe	1.06	Illinois TRM v12.0
WHFd	1.11	Illinois TRM v12.0
HF	0.49	Illinois TRM v12.0
Coincidence Factor (A-line)	0.128	Illinois TRM v12.0
Coincidence Factor (Candelabra, Globe, Par38, Downlight Retrofit)	0.109	Illinois TRM v12.0
Eff_{heat}	0.7	Illinois TRM v12.0
Conversion Factor	1000	Convert watts to kW
Conversion Factor	365	Convert years to days
Conversion Factor	0.03412	Convert kWh to therms

Kitchen and Bathroom Faucet Aerators

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for low-flow kitchen and bathroom faucet aerators:

$$kWh\ savings = (GPM_{base} - GPM_{low\ flow}) * MPD * \frac{PH}{FH} * DF * 8.33 * (T_{mix} - T_{inlet}) * \frac{365}{RE * 3412}$$

$$kW\ savings = (GPM_{base} - GPM_{low\ flow}) * 60 * DF * 8.33 * \frac{T_{mix} - T_{inlet}}{RE * 3412} * CF$$

$$therm\ savings = (GPM_{base} - GPM_{low\ flow}) * MPD * \frac{PH}{FH} * DF * 8.33 * (T_{mix} - T_{inlet}) * \frac{365}{RG * 100,000}$$

Where:

- GPM_{base} = Gallons per minute of baseline faucet aerator
- $GPM_{low-flow}$ = Gallons per minute of low-flow faucet aerator
- ISR = In-service rate, or fraction of units that get installed

MPD	=	Average minutes of faucet use per person per day
PH	=	Average number of people per household
FH	=	Average number of faucets per household
DF	=	Percentage of water flowing down the drain
T _{mix}	=	Mixed water temperature exiting faucet, °F
T _{inlet}	=	Cold water temperature entering the DWH system, °F (depends on location)
RE	=	Recovery efficiency of electric hot water heater
RG	=	Recovery efficiency of natural gas hot water heater
CF	=	Summer peak coincidence factor
60	=	Minutes per hour
8.3	=	Specific weight of water in pounds per gallon
3,412	=	Constant to convert Btu to kWh
365	=	Days of faucet use per year
100,000	=	Constant to convert Btu to therms

Table 290 lists the assumptions and source of each assumption for kitchen and bathroom faucet aerator measure savings calculations.

Table 290. *Ex Post* Variable Assumption for Kitchen and Bathroom Faucet Aerators

INPUT	VALUE	SOURCE
GPM _{base} (Kitchen)	1.63	Illinois TRM v12.0
GPM _{base} (Bathroom)	1.53	Illinois TRM v12.0
GPM _{low-flow} (Kitchen)	0.94	Illinois TRM v12.0
GPM _{low-flow} (Bathroom)	0.94	Illinois TRM v12.0
MPD (Kitchen)	4.5	Illinois TRM v12.0
MPD (Bathroom)	1.6	Illinois TRM v12.0
PH	2.56	Illinois TRM v12.0
FH (Kitchen)	1.0	Illinois TRM v12.0
FH (Bathroom)	2.83	Illinois TRM v12.0
DF (Kitchen)	0.75	Illinois TRM v12.0
DF (Bathroom)	0.9	Illinois TRM v12.0
T _{mix} (Kitchen)	93.00	Illinois TRM v12.0
T _{mix} (Bathroom)	86.00	Illinois TRM v12.0
T _{inlet}	50.7	Illinois TRM v12.0
RE	0.98	Illinois TRM v12.0
RG	0.78	Illinois TRM v12.0

INPUT	VALUE	SOURCE
CF (Kitchen)	0.022	Illinois TRM v12.0
Conversion Factor	60	Minutes per hour
Conversion Factor	8.33	Specific weight of water in pounds per gallon
Conversion Factor	3,412	Constant to convert Btu to kWh
Conversion Factor	365.25	Days of faucet use per year
Conversion Factor	100,000	Constant to convert Btu to therms

Low-Flow Showerheads

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for low-flow showerheads:

$$kWh\ savings = (GPM_{base} - GPM_{low\ flow}) * MS * \frac{SPH}{SH} * 8.33 * (T_{mix} - T_{inlet}) * \frac{365.25}{RE * 3412}$$

$$kW\ savings = (GPM_{base} - GPM_{low\ flow}) * 60 * 8.33 * \frac{T_{mix} - T_{inlet}}{RE * 3412} * CF$$

$$therm\ savings = ISR * (GPM_{base} - GPM_{low\ flow}) * MS * \frac{SPH}{SH} * 8.33 * (T_{mix} - T_{inlet}) * \frac{365.25}{RG * 100,000}$$

Where:

GPM _{base}	=	Gallons per minute of baseline showerhead
GPM _{low-flow}	=	Gallons per minute of low-flow showerhead
ISR	=	In-service rate, or fraction of units that get installed
MS	=	Average number of minutes per shower event
SPH	=	Average number of shower events per day
SH	=	Average number of showerheads per household
T _{mix}	=	Mixed water temperature exiting faucet, °F
T _{inlet}	=	Cold water temperature entering the DWH system, °F (depends on location)
RE	=	Recovery efficiency of electric hot water heater
RG	=	Recovery efficiency of natural gas hot water heater
CF	=	Summer peak coincidence factor
60	=	Minutes per hour
8.3	=	Specific weight of water in pounds per gallon
3,412	=	Constant to convert Btu to kWh
365	=	Days of faucet use per year
100,000	=	Constant to convert Btu to therms

Table 291 lists the assumptions and source of each assumption for low-flow showerhead measure savings calculations.

Table 291. *Ex Post* Variable Assumptions for Low-Flow Showerheads

INPUT	VALUE	SOURCE
GPM _{base}	2.24	Illinois TRM v12.0
GPM _{low-flow}	1.5	Actual
MS	7.8	Illinois TRM v12.0
SPH	1.040	NIPSCO 2022 Survey Results
SH	1.79	Illinois TRM v12.0
T _{mix}	101	Illinois TRM v12.0
T _{inlet}	50.70	Illinois TRM v12.0
RE	0.98	Illinois TRM v12.0
RG	0.78	Illinois TRM v12.0
CF	0.0278	Illinois TRM v12.0
Conversion Factor	60	Minutes per hour
Conversion Factor	8.33	Specific weight of water in pounds per gallon
Conversion Factor	3,412	Constant to convert Btu to kWh
Conversion Factor	365.25	Days of faucet use per year

Shower Start

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for Shower Start attachments:

$$kWh \text{ savings} = GPM * \frac{8.33}{3412} * (T_{out} - T_{in}) * \frac{SPH}{SH} * \frac{WS}{RE} * 365.25$$

$$kW \text{ savings} = kWh \text{ savings} * \frac{CF}{Hours}$$

$$therm \text{ savings} = GPM * \frac{8.33}{100,000} * (T_{out} - T_{in}) * \frac{SPH}{SH} * \frac{WS}{RG} * 365.25$$

Where:

- GPM = Flow rate (in gallons per minute) of the showerhead equipped with a Shower Start attachment. Varies depending on whether the attachment was installed on an existing showerhead or installed along with a new low-flow showerhead.
- ISR = In-service rate, or fraction of units that get installed
- SPH = Average number of shower events per day
- SH = Average number of showerheads per household
- WS = Number of shower minutes saved by Shower Start attachment
- T_{out} = Mixed water temperature exiting faucet, °F
- T_{in} = Cold water temperature entering the DWH system, °F (depends on location)

RE	=	Recovery efficiency of electric hot water heater
RG	=	Recovery efficiency of natural gas hot water heater
CF	=	Summer peak coincidence and energy-to-demand factor
8.3	=	Specific weight of water in pounds per gallon
3,412	=	Constant to convert Btu to kWh
365	=	Days of faucet use per year
100,000	=	Constant to convert Btu to therms

Table 292 lists the assumptions and source of each assumption for Shower Start measure savings calculations.

Table 292. *Ex Post* Variable Assumptions for Shower Start

INPUT	VALUE	SOURCE
GPM _{base}	2.24	Illinois TRM v12.0
GPM _{low-flow}	1.5	Actuals. Used for projects where a Shower Start was installed along with a new low-flow showerhead.
SPH	1.040	NIPSCO 2022 Survey Results
SH	1.79	Illinois TRM v12.0
WS	0.89	Illinois TRM v12.0
T _{mix}	101	Illinois TRM v12.0
T _{inlet}	50.70	Illinois TRM v12.0
RE	0.98	Illinois TRM v12.0
RG	0.78	Illinois TRM v12.0
CF	0.0023	Illinois TRM v12.0
Hours	14.09	Illinois TRM v12.0
Conversion Factor	8.33	Specific weight of water (pounds per gallon)
Conversion Factor	3,412	Constant to convert Btu to kWh
Conversion Factor	365.25	Days of faucet use per year

Pipe Wrap

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for pipe wrap:

$$kWh \text{ savings} = \left(\frac{1}{R_{Exist}} - \frac{1}{R_{New}} \right) * \frac{L * C * \Delta T * 8,766}{\eta_{DHW} * 3,412}$$

$$kW \text{ savings} = \frac{kWh \text{ savings}}{8,766}$$

$$therm \text{ savings} = \left(\frac{1}{R_{Exist}} - \frac{1}{R_{New}} \right) * \frac{L * C * \Delta T * 8,766}{\eta_{DHW} * 100,000}$$

Where:

R_{Exist}	=	Pipe heat loss coefficient (R-value) of uninsulated pipe existing
R_{New}	=	Pipe heat loss coefficient (R-value) of insulated pipe
L	=	Feet of pipe from water heating source covered by pipe wrap
C	=	Circumference of pipe in feet
ΔT	=	Average temperature difference between supplied water and ambient air temperature
η_{DHWE}	=	Recovery efficiency of electric water heater
η_{DHWG}	=	Recovery efficiency of gas water heater
8,760	=	Hours per year
3,412	=	Constant to convert Btu to kWh
100,000	=	Constant to convert Btu to therms

Table 293 lists the assumptions and source of each assumption for pipe wrap savings calculations.

Table 293. *Ex Post* Variable Assumptions for Pipe Wrap

INPUT	VALUE	SOURCE
R_{Exist}	0.5210	Illinois TRM v12.0
R_{New}	5.1410	Actuals. Based on insulation R-value of 4.6 (average of program data insulation values) and bare-pipe R-value of 0.48 (per Illinois TRM v12.0).
L	7.78	Value shown is the program average, not the value used to calculate savings for each participant.
C	0.21	Actuals. Based on assumed pipe diameter of 0.75 inches
ΔT	60	Illinois TRM v12.0
η_{DHWE}	.98	Illinois TRM v12.0
η_{DHWG}	.78	Illinois TRM v12.0
Conversion Factor	3,412	Constant to convert Btu to kWh
Conversion Factor	8,766	Constant to convert hours to years
Conversion Factor	100,000	Constant to convert Btu to therms

Attic Insulation

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for attic insulation:

$$kWh_{savings} = kWh_{cooling} + kWh_{heatingElectric} + kWh_{heatingFurnace}$$

$$kWh_{cooling} = \frac{\left(\left(\frac{1}{R_{old}} - \frac{1}{R_{attic}} \right) * A_{attic} * (1 - FF) * 24 * CDD * DUA \right)}{1000 * eff_{cool}} * ADJ_{ac} * IE_{nc}$$

$$kWh_{heatingElectric} = \frac{\left(\left(\frac{1}{R_{old}} - \frac{1}{R_{attic}} \right) * A_{attic} * (1 - FF) * 24 * HDD \right)}{eff_{elecheat} * 3412} * ADJ_{aeh}$$

$$kWh_{heatingFurnace} = (therm\ savings) * F_e * 29.3 * ADJ_{ahf}$$

$$kW\ savings = kWh_{cooling} / EFLH_{cooling} * CF$$

$$therm\ savings = \frac{\left(\left(\frac{1}{R_{old}} - \frac{1}{R_{attic}} \right) * A_{attic} * (1 - FF) * 24 * HDD \right)}{eff_{gasheat} * 100000} * ADJ_{agh} * IE_{nc}$$

Where:

R_{old}	= R-value of existing assembly and any existing insulation
R_{attic}	= R-value of new attic assembly
A_{attic}	= Total area of insulated attic (kft ²)
FF	= Adjustment to account for area of framing
CDD	= Cooling degree days
DUA	= Discretionary use adjustment
Eff _{cool}	= Seasonal energy efficiency ratio (SEER) of system
ADJ _{ac}	= Adjustment for cooling savings to account for inaccuracies of engineering algorithms
IE _{nc}	= Income eligibility net correction
HDD	= Heating degree days
Eff _{elecheat}	= Efficiency of electric heating system
ADJ _{aeh}	= Adjustment for electric heating savings to account for inaccuracies of engineering algorithms
F_e	= Furnace fan energy consumption as a percentage of annual fuel consumption
EFLH _{cooling}	= Full load hours of air conditioner
CF	= Coincidence factor
Eff _{gasheat}	= Efficiency of gas heating system
ADJ _{agh}	= Adjustment for gas heating savings to account for inaccuracies of engineering algorithms
24	= Hours per day
1,000	= Btu per kBtu
3,412	= Btu per kWh
29.3	= kWh per therm
100,000	= Btu per therm

Table 294 lists the assumptions and source of each assumption for attic insulation savings calculations.

Table 294. *Ex Post* Variable Assumptions for Attic Insulation

INPUT	VALUE	SOURCE
R_{old}	6.02	NIPSCO program data
R_{attic}	40.60	NIPSCO program data
A_{attic}	1.08	Value shown is the program average, not the value used to calculate savings for each participant.
FF	0.07	Illinois TRM v12.0
CDD	1053	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
DUA	0.75	Illinois TRM v12.0
Eff_{cool}	10.0	Illinois TRM v12.0
ADJ_{ac}	1.14	Illinois TRM v12.0
IE_{nc}	1.1	Illinois TRM v12.0
HDD	4771	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
$Eff_{elecheat}$	1.32	Illinois TRM v12.0
ADJ_{aeh}	0.63	Illinois TRM v12.0
Fe	0.0314	Illinois TRM v12.0
$EFLH_{cooling}$	712	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
CF	0.68	Illinois TRM v12.0
$Eff_{gasheat}$	0.72	Illinois TRM v12.0
ADJ_{ahf}	1.13	Illinois TRM v12.0
Conversion Factor	24	Constant to convert days to hours
Conversion Factor	1000	Constant to convert Btu to kBtu
Conversion Factor	3412	Constant to convert Btu to kWh
Conversion Factor	29.3	Constant to convert therms to kWh
Conversion Factor	10000	Constant to convert Btu to therms

Duct Sealing

The evaluation team used the following equations to calculate electric and natural gas energy savings for duct sealing:

$$kWh\ savings = kWh_{cool} + kWh_{heat}$$

$$kWh_{cool} = \frac{DE_{coolafter} - DE_{coolbefore}}{DE_{coolafter}} * \frac{EFLH_{cool} * Btuh_{cool} * TRF_{cool}}{SEER * 1,000}$$

$$kWh_{heat} = \frac{DE_{heatafter} - DE_{heatbefore}}{DE_{heatafter}} * \frac{EFLH_{heat} * Btuh_{heat} * TRF_{heat}}{Eff_{elecheat} * 3,412}$$

$$kW \text{ savings} = \frac{kWh_{cool}}{EFLH_{cool}} * CF$$

$$therm \text{ savings} = \frac{DE_{heatafter} - DE_{heatbefore}}{DE_{heatafter}} * \frac{EFLH_{heat} * Btuh_{heat} * TRF_{heat} * Eff_{gasheat}}{Eff_{system} * 100,000}$$

Where:

DE _{coolafter}	= Cooling distribution efficiency after duct sealing
DE _{coolbefore}	= Cooling distribution efficiency before duct sealing
DE _{heatafter}	= Heating distribution efficiency after duct sealing
DE _{heatbefore}	= Heating distribution efficiency before duct sealing
EFLH _{cool}	= Full load cooling hours
EFLH _{heat}	= Full load heating hours
BtuH _{cool}	= Cooling capacity of cooling equipment (Btu per hour)
BtuH _{heat}	= Heating capacity of heating equipment (Btu per hour)
SEER	= Seasonal average efficiency of air conditioning equipment
TRF _{cool}	= Thermal regain factor for cooling
Eff _{elecheat}	= Efficiency in COP of heating equipment
TRF _{heat}	= Thermal regain factor for heating
CF	= Coincidence factor
Eff _{gasheat}	= Gas heating equipment efficiency
Eff _{system}	= Pre-duct sealing heating system efficiency
1,000	= Btu per kWh
3,412	= Btu per kWh
100,000	= Btu per therm

Table 295 lists the assumptions and source of each assumption for the duct sealing savings calculations.

Table 295. *Ex Post* Variable Assumptions for Duct Sealing

INPUT	VALUE	SOURCE
DE _{coolafter}	0.79	Building Performance Institute (as recommended by the Illinois TRM v12.0)
DE _{coolbefore}	0.65	Building Performance Institute (as recommended by the Illinois TRM v12.0)
DE _{heatafter}	0.85	Building Performance Institute (as recommended by the Illinois TRM v12.0)
DE _{heatbefore}	0.76	Building Performance Institute (as recommended by the Illinois TRM v12.0)

INPUT	VALUE	SOURCE
EFLH _{heat}	1,723	Illinois TRM v12.0. Values assigned based on nearest TRM city. Value shown is the program average, not the value used to calculate savings for each participant
EFLH _{cool}	689	Illinois TRM v12.0. Values assigned based on nearest TRM city. Value shown is the program average, not the value used to calculate savings for each participant
SEER	10.0	Illinois TRM v12.0
TRF _{cool}	0.4	Illinois TRM v12.0
Eff _{elecheat}	1.32	Illinois TRM v12.0
BtuH _{cool}	31,763	Illinois TRM v12.0
BtuH _{heat}	80,000	Illinois TRM v12.0
TRF _{heat}	0.4	Illinois TRM v12.0
CF	0.68	Illinois TRM v12.0
Eff _{gasheat}	0.83	Illinois TRM v12.0
Eff _{gassystem}	0.7	Illinois TRM v12.0
Conversion Factor	1,000	Converts Btu to kBtu
Conversion Factor	3,412	Converts Btu to kWh
Conversion Factor	100,000	Converts Btu to therms

Water Heater Wrap

The evaluation team used the following equations to calculate electric and natural gas energy savings for water heater wraps:

$$kWh = \frac{\left(\frac{1}{R_{base}} - \frac{1}{R_{insul}}\right) * A_{base} * \Delta T * hours}{3412 * \eta_{DHW}}$$

$$kW = \frac{kWh}{hours} * CF$$

Where:

- R_{base} = Baseline thermal resistance
- R_{insul} = Insulated thermal resistance
- A_{base} = Surface area of tank prior to adding tank wrap
- ΔT = Average temperature difference between outside air and tank water
- hours = Hours in a year
- η_{DHW} = Recovery efficiency of hot water tank
- CF = Coincidence factor
- 3412 = Btu per kWh

Table 296 lists the assumptions and source of each assumption for the water heater wrap savings calculations.

Table 296. *Ex Post* Variable Assumptions for Water Heater Wrap

INPUT	VALUE	SOURCE
R _{base}	0.062	Illinois TRM v12.0
R _{insul}	1.00	Illinois TRM v12.0
A _{base}	0.03	Illinois TRM v12.0
ΔT	60	Illinois TRM v12.0
hours	8766	Illinois TRM v12.0
η _{DHW}	.98	Illinois TRM v12.0
CF	1	Illinois TRM v12.0
Conversion Factor	3,412	Converts Btu to kWh

Advanced Thermostat

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for advanced thermostats:

$$kWh \text{ cooling savings} = \frac{FLH * Capacity}{SEER2 * 1000} * CR$$

$$kWh \text{ heating savings} = HC_{elec} * HR * HF + Therms * F_e * 29.3$$

$$kWh \text{ savings} = kWh \text{ cooling} + kWh \text{ heating}$$

$$kW \text{ savings} = \frac{CDR * Capacity * CF}{EER2 * 1000}$$

$$therms \text{ savings} = GHC * HR * HF$$

Where:

FLH	=	Full load cooling hours for the air conditioning equipment
Capacity	=	Size of the cooling unit in Btu/hr
SEER2	=	Seasonal energy efficiency ratio of the cooling equipment
CR	=	Cooling reduction; the percent reduction in cooling energy consumption
HC _{elec}	=	Electric heating consumption in kWh
HR	=	Heating reduction; the percent reduction in heating energy consumption
HF	=	Household factor
F _e	=	Furnace fan energy consumption
CDR	=	Cooling demand reduction
CF	=	Coincidence factor
EER2	=	Energy efficiency ratio of the cooling equipment
GHC	=	Gas heating consumption in therms

1000 = Converts kW to W
 29.3 = Converts therms to kWh

Table 297 lists the assumptions and source of each assumption for the advanced thermostats measure.

Table 297. *Ex Post* Variable Assumptions for Advanced Thermostats

INPUT	VALUE	SOURCE
FLH	701	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
Capacity	33,600	Illinois TRM v12.0
SEER2	11.4	Illinois TRM v12.0
CR	0.084	Illinois TRM v12.0
HC _{elec}	20,688	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
HR	0.085	Illinois TRM v12.0
HF	1	Illinois TRM v12.0
F _e	0.0314	Illinois TRM v12.0
CDR	0.164	Illinois TRM v12.0
CF	0.34	Illinois TRM v12.0
EER2	10	Illinois TRM v12.0
GHC	1,001	Illinois TRM v12.0 Value shown is the program average, not the value used to calculate savings for each participant
Conversion Factor	1000	Converts kW to W
Conversion Factor	29.3	Converts therms to kWh

Air Sealing

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for air sealing:

$$kWh \text{ cooling savings} = \frac{\Delta CFM50}{N_{cool}} * \frac{60 * 24 * CDD * DUA * 0.018}{1000 * Eff_{cool}} * LM * ADJ_{asc} * IE_{nc}$$

$$kWh \text{ heating savings} = \frac{\Delta CFM50}{N_{heat}} * \frac{60 * 24 * HDD * 0.018}{3412 * Eff_{elecheat}} + therm \text{ savings} * F_e * 29.3 * ADJ_{ashf}$$

$$kW \text{ savings} = \frac{kWh \text{ cooling savings}}{EFLH_{cool}} * CF$$

$$therm\ savings = \frac{\Delta CFM50}{N_{factor}} * \frac{60 * 24 * HDD * 0.018}{100000 * Eff_{gasheat}} * ADJ_{asfh} * IE_{nc}$$

Where:

$\Delta CFM50$	=	Change in infiltration at 50 Pascal pressure differential in cubic feet per minute
N_{factor}	=	Conversion from 50 Pascal air flow to natural air flow
CDD	=	Cooling degree days
DUA	=	Discretionary use adjustment
Eff_{cool}	=	Cooling equipment efficiency
LM	=	Latent multiplier to account for latent cooling demand
ADJ_{asc}	=	Adjustment for cooling savings to account for inaccuracies in engineering algorithms
IE_{NC}	=	Income eligible net correction
HDD	=	Heating degree days
$Eff_{elecheat}$	=	Electric heating equipment efficiency
F_e	=	Furnace fan energy consumption
ADJ_{ashf}	=	Adjustment for fan savings during heating season to account for inaccuracies in engineering algorithms
$EFLH_{cool}$	=	Effective full load cooling hours
CF	=	Coincidence factor
$Eff_{gasheat}$	=	Gas heating equipment efficiency
ADJ_{asfh}	=	Adjustment for fossil heating savings to account for inaccuracies in engineering algorithms
24*60	=	Minutes per day
0.018	=	Btu/ (cubic foot * F) (specific heat of air)
1,000	=	Btu per kBtu
3,412	=	Btu per kWh
29.3	=	kWh per therm
100,000	=	Btu per therm

Table 298 lists the assumptions and source of each assumption for the air sealing measure.

Table 298. *Ex Post* Variable Assumptions for Air Sealing

INPUT	VALUE	SOURCE
$\Delta CFM50$	1034.67	Value assigned based on program data. Value shown is the program average, not the value used to calculate savings for each participant.
N_{cool}	34.4	Illinois TRM v12.0
N_{heat}	21.1	Illinois TRM v12.0
CDD	1,047	Illinois TRM v12.0

INPUT	VALUE	SOURCE
DUA	0.75	Illinois TRM v12.0
Eff _{cool}	10.0	Illinois TRM v12.0
LM	3.2	Illinois TRM v12.0
ADJ _{asc}	1	Illinois TRM v12.0
IE _{nc}	1.0	Illinois TRM v12.0
HDD	4798	Illinois TRM v12.0
Eff _{elec} heat	1.32	Illinois TRM v12.0
F _e	0.0314	Illinois TRM v12.0
ADJ _{ashf}	1	Illinois TRM v12.0
EFLH _{cool}	702	Illinois TRM v12.0
CF	0.68	Illinois TRM v12.0
Eff _{gas} heat	0.72	Illinois TRM v12.0
ADJ _{asfh}	1	Illinois TRM v12.0
Conversion Factor	60*24	Converts minutes to days
Conversion Factor	1000	Converts Btu to kBtu
Conversion Factor	0.018	Specific heat capacity of air
Conversion Factor	29.3	Converts therms to kWh
Conversion Factor	100000	Converts Btu to therms
Conversion Factor	3412	Converts Btu to kWh

Outlet Gaskets

The evaluation team used the following equations to calculate electric and natural gas energy savings for outlet gasket air sealing:

$$kWh = n * ADJ * (kWh_{heat} + kWh_{cool})$$

$$kW = \frac{n * kWh_{cool} * CF}{FLH_{cool}}$$

$$therms = N * ADJ * therms_{gasket}$$

Where:

n	=	Number of outlet gaskets installed
ADJ	=	Adjustment factor
kWh _{heat}	=	Per-unit heating savings
kWh _{cool}	=	Per-unit cooling savings
CF	=	Coincidence factor
FLH _{cool}	=	Full load cooling hours

$$\text{therms}_{\text{gasket}} = \text{Per-unit gas savings}$$

Table 299 lists the assumptions and source of each assumption for the outlet gasket measure.

Table 299. *Ex Post* Variable Assumptions for Outlet Gaskets

INPUT	VALUE	SOURCE
n	10	Actual number of installed gaskets
ADJ	.80	Illinois TRM v12.0
kWh _{heat}	7.65	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
kWh _{cool}	1.18	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
CF	0.68	Illinois TRM v12.0
FLH _{cool}	687	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
therms _{gasket}	0.37	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.

Appendix 4. IQW Program

Algorithms and Assumptions

This appendix contains the assumptions used in electric savings, demand reduction, and gas savings algorithms for the measures within the IQW program. The team examined each assumption behind the algorithms to capture savings and compared it against the Illinois TRM v11.0, the Indiana TRM (v2.2), the Pennsylvania TRM 2016, and the Uniform Methods Project. Detailed information on the analysis and supporting assumptions for the following IQW program measures are included within this appendix:

- LEDs
- Kitchen faucet aerators
- Bathroom faucet aerators
- Low-flow showerheads
- Shower Starts
- Pipe wraps
- Attic insulation
- Duct sealing
- Programmable thermostats
- Refrigerator replacements
- Air sealing
- Advanced thermostats
- Outlet Gaskets

Table 300 lists the assumptions of the *ex post* per-measure savings.

Table 300. IQW Program Measures

MEASURE	REVIEWED ASSUMPTIONS
LEDs	New and baseline wattages, house of use, waste heat factors, coincidence factors
Kitchen Faucet Aerator	New and baseline flow rates, people per house, minutes of use per day, faucets per home, water temperatures, water heater fuel type and efficiency
Bathroom Faucet Aerator	New and baseline flow rates, people per house, minutes of use per day, faucets per home, water temperatures, water heater fuel type and efficiency
Low-Flow Showerhead	New and baseline flow rates, people per house, minutes of use per day, showerheads per home, water temperatures, water heater fuel type and efficiency
Shower Start	New and baseline flow rates, people per house, showerheads per home, minutes of use per day, water temperatures, water heater fuel type and efficiency, and wasted seconds per shower
Pipe Wrap	New and baseline R-values, pipe diameter, water heater recovery efficiency
Duct Sealing	New and baseline distribution efficiencies, full load heating and cooling hours, capacities, and efficiencies of heating and cooling equipment
Attic Insulation	Void space and compression factor, pre-install and post-install R-values, square footage of installed insulation
Air Sealing	Heating and cooling equipment efficiencies, infiltration values, and weather data
Programmable Thermostats	Heating consumption, heating reduction, and heating efficiency
Refrigerator Replacement	New and baseline energy use
Advanced Thermostats	Heating and cooling consumption, heating and cooling reduction, and efficiencies
Outlet Gaskets	Per-gasket deemed savings

The algorithms and assumptions the evaluation team used to calculate *ex post* savings for each of these measures follow.

LEDs

The team used the following equations to calculate electric energy and peak demand savings, as well as natural gas energy penalties, for LEDs:

$$kWh \text{ savings per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (Hours) * (WHF_e)}{1,000}$$

$$kW \text{ reduction per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * Coincidence \text{ Factor} * (WHF_d)}{1,000}$$

$$therm \text{ savings per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (Hours) * HF * .03412}{\eta_{heat} * 1,000}$$

Where:

W_{base}	= Wattage of the bulb being replaced, W
W_{LED}	= Wattage of the LED bulb, W
Daily hours of use	= Average hours of use per day, hr
WHF_e	= Waste heat factor for energy to account for HVAC interactions with lighting (depends on location)
WHF_d	= Waste heat factor for demand to account for HVAC interactions with lighting (depends on location)
HF	= Heating factor or percentage of lighting savings that must be heated
CF	= Summer peak coincidence factor
365	= Number of days per year, days/yr.
1,000	= Constant to convert watts to kW

Table 301 lists the input assumptions and source of each assumption for the LED measure savings calculations.

Table 301. *Ex Post* Variable Assumptions for LEDs

INPUT	VALUE	SOURCE
W_{base} (Candelabra, Globe)	40	ENERGY STAR Qualified Products List (QPL) for lumens, UMP for baseline equivalent
W_{base} (A-Line)	43	ENERGY STAR QPL for lumens, UMP for baseline equivalent
W_{base} (PAR38)	120	ENERGY STAR QPL for lumens, UMP for baseline equivalent
W_{base} (Downlight Retrofit)	72.8	ENERGY STAR QPL for lumens, UMP for baseline equivalent
W_{LED} (Candelabra)	4.5	Actual installed wattage

INPUT	VALUE	SOURCE
W _{LED} (Globe)	6	Actual installed wattage
W _{LED} (A-Line)	9	Actual installed wattage
W _{LED} (PAR38)	15	Actual installed wattage
W _{LED} (Downlight Retrofit)	13	Actual installed wattage
Hours (A-line)	1089	Illinois TRM v12.0
Hours (Candelabra, Globe, Par38, Downlight Retrofit)	763	Illinois TRM v12.0
Leakage	0	Illinois TRM v12.0
WHFe	1.06	Illinois TRM v12.0
WHFd	1.11	Illinois TRM v12.0
HF	0.49	Illinois TRM v12.0
Coincidence Factor (A-line)	0.128	Illinois TRM v12.0
Coincidence Factor (Candelabra, Globe, Par38, Downlight Retrofit)	0.109	Illinois TRM v12.0
Eff _{heat}	0.7	Illinois TRM v12.0
Conversion Factor	1000	Convert watts to kW
Conversion Factor	365	Convert years to days
Conversion Factor	0.03412	Convert kWh to therms

Kitchen and Bathroom Faucet Aerators

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for low-flow kitchen and bathroom faucet aerators:

$$kWh\ savings = (GPM_{base} - GPM_{low\ flow}) * MPD * \frac{PH}{FH} * DF * 8.33 * (T_{mix} - T_{inlet}) * \frac{365}{RE * 3412}$$

$$kW\ savings = (GPM_{base} - GPM_{low\ flow}) * 60 * DF * 8.33 * \frac{T_{mix} - T_{inlet}}{RE * 3412} * CF$$

$$therm\ savings = (GPM_{base} - GPM_{low\ flow}) * MPD * \frac{PH}{FH} * DF * 8.33 * (T_{mix} - T_{inlet}) * \frac{365}{RG * 100,000}$$

Where:

GPM _{base}	=	Gallons per minute of baseline faucet aerator
GPM _{low-flow}	=	Gallons per minute of low-flow faucet aerator
ISR	=	In-service rate, or fraction of units that get installed
MPD	=	Average minutes of faucet use per person per day
PH	=	Average number of people per household
FH	=	Average number of faucets per household
DF	=	Percentage of water flowing down the drain

T_{mix}	=	Mixed water temperature exiting faucet, °F
T_{inlet}	=	Cold water temperature entering the DWH system, °F (depends on location)
RE	=	Recovery efficiency of electric hot water heater
RG	=	Recovery efficiency of natural gas hot water heater
CF	=	Summer peak coincidence factor
60	=	Minutes per hour
8.3	=	Specific weight of water in pounds per gallon
3,412	=	Constant to convert Btu to kWh
365	=	Days of faucet use per year
100,000	=	Constant to convert Btu to therms

Table 302 lists the assumptions and source of each assumption for kitchen and bathroom faucet aerator measure savings calculations.

Table 302. *Ex Post* Variable Assumption for Kitchen and Bathroom Faucet Aerators

INPUT	VALUE	SOURCE
GPM _{base} (Kitchen)	1.63	Illinois TRM v12.0
GPM _{base} (Bathroom)	1.53	Illinois TRM v12.0
GPM _{low-flow} (Kitchen)	0.94	Illinois TRM v12.0
GPM _{low-flow} (Bathroom)	0.94	Illinois TRM v12.0
MPD (Kitchen)	4.5	Illinois TRM v12.0
MPD (Bathroom)	1.6	Illinois TRM v12.0
PH	2.56	Illinois TRM v12.0
FH (Kitchen)	1.0	Illinois TRM v12.0
FH (Bathroom)	2.83	Illinois TRM v12.0
DF (Kitchen)	0.75	Illinois TRM v12.0
DF (Bathroom)	0.9	Illinois TRM v12.0
T_{mix} (Kitchen)	93.00	Illinois TRM v12.0
T_{mix} (Bathroom)	86.00	Illinois TRM v12.0
T_{inlet}	50.7	Illinois TRM v12.0
RE	0.98	Illinois TRM v12.0
RG	0.78	Illinois TRM v12.0
CF	0.022	Illinois TRM v12.0
Conversion Factor	60	Minutes per hour
Conversion Factor	8.33	Specific weight of water in pounds per gallon

INPUT	VALUE	SOURCE
Conversion Factor	3,412	Constant to convert Btu to kWh
Conversion Factor	365.25	Days of faucet use per year
Conversion Factor	100,000	Constant to convert Btu to therms

Low-Flow Showerheads

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for low-flow showerheads:

$$kWh\ savings = (GPM_{base} - GPM_{low\ flow}) * MS * \frac{SPH}{SH} * 8.33 * (T_{mix} - T_{inlet}) * \frac{365.25}{RE * 3412}$$

$$kW\ savings = (GPM_{base} - GPM_{low\ flow}) * 60 * 8.33 * \frac{T_{mix} - T_{inlet}}{RE * 3412} * CF$$

$$therm\ savings = ISR * (GPM_{base} - GPM_{low\ flow}) * MS * \frac{SPH}{SH} * 8.33 * (T_{mix} - T_{inlet}) * \frac{365.25}{RG * 100,000}$$

Where:

GPM _{base}	=	Gallons per minute of baseline showerhead
GPM _{low-flow}	=	Gallons per minute of low-flow showerhead
ISR	=	In-service rate, or fraction of units that get installed
MS	=	Average number of minutes per shower event
SPH	=	Average number of shower events per day
SH	=	Average number of showerheads per household
T _{mix}	=	Mixed water temperature exiting faucet, °F
T _{inlet}	=	Cold water temperature entering the DWH system, °F (depends on location)
RE	=	Recovery efficiency of electric hot water heater
RG	=	Recovery efficiency of natural gas hot water heater
CF	=	Summer peak coincidence factor
60	=	Minutes per hour
8.3	=	Specific weight of water in pounds per gallon
3,412	=	Constant to convert Btu to kWh
365	=	Days of faucet use per year
100,000	=	Constant to convert Btu to therms

Table 303 lists the assumptions and source of each assumption for low-flow showerhead measure savings calculations.

Table 303. *Ex Post* Variable Assumptions for Low-Flow Showerheads

INPUT	VALUE	SOURCE
GPM _{base}	2.24	Illinois TRM v12.0
GPM _{low-flow}	1.5	Actual
MS	7.8	Illinois TRM v12.0
SPH	1.040	NIPSCO 2022 Survey Results
SH	1.79	Illinois TRM v12.0
T _{mix}	101	Illinois TRM v12.0
T _{inlet}	50.70	Illinois TRM v12.0
RE	0.98	Illinois TRM v12.0
RG	0.78	Illinois TRM v12.0
CF	0.0278	Illinois TRM v12.0
Conversion Factor	60	Minutes per hour
Conversion Factor	8.33	Specific weight of water in pounds per gallon
Conversion Factor	3,412	Constant to convert Btu to kWh
Conversion Factor	365.25	Days of faucet use per year

Shower Start

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for shower start attachments:

$$kWh \text{ savings} = GPM * \frac{8.33}{3412} * (T_{out} - T_{in}) * \frac{SPH}{SH} * \frac{WS}{RE} * 365.25$$

$$kW \text{ savings} = kWh \text{ savings} * \frac{CF}{Hours}$$

$$therm \text{ savings} = GPM * \frac{8.33}{100,000} * (T_{out} - T_{in}) * \frac{SPH}{SH} * \frac{WS}{RG} * 365.25$$

Where:

GPM	=	Flow rate (in gallons per minute) of the showerhead equipped with a Shower Start attachment. Varies depending on whether the attachment was installed on an existing showerhead or installed along with a new low-flow showerhead.
ISR	=	In-service rate, or fraction of units that get installed
SPH	=	Average number of shower events per day
SH	=	Average number of showerheads per household
WS	=	Number of shower minutes saved by Shower Start attachment
T _{out}	=	Mixed water temperature exiting faucet, °F
T _{in}	=	Cold water temperature entering the DWH system, °F (depends on location)

RE	=	Recovery efficiency of electric hot water heater
RG	=	Recovery efficiency of natural gas hot water heater
CF	=	Summer peak coincidence and energy-to-demand factor
8.3	=	Specific weight of water in pounds per gallon
3,412	=	Constant to convert Btu to kWh
365	=	Days of faucet use per year
100,000	=	Constant to convert Btu to therms

Table 304 lists the assumptions and source of each assumption for shower start measure savings calculations.

Table 304. *Ex Post* Variable Assumptions for Shower Start

INPUT	VALUE	SOURCE
GPM _{base}	2.24	Illinois TRM v12.0
GPM _{low-flow}	1.5	Actuals. Used for projects where a shower start was installed along with a new low-flow showerhead.
SPH	1.040	NIPSCO 2022 Survey Results
SH	1.79	Illinois TRM v12.0
WS	0.89	Illinois TRM v12.0
T _{mix}	101	Illinois TRM v12.0
T _{inlet}	50.70	Illinois TRM v12.0
RE	0.98	Illinois TRM v12.0
RG	0.78	Illinois TRM v12.0
CF	0.0023	Illinois TRM v12.0
Hours	14.09	Illinois TRM v12.0
Conversion Factor	8.33	Specific weight of water (pounds per gallon)
Conversion Factor	3,412	Constant to convert Btu to kWh
Conversion Factor	365.25	Days of faucet use per year

Pipe Wrap

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for Pipe Wrap:

$$kWh \text{ savings} = \left(\frac{1}{R_{Exist}} - \frac{1}{R_{New}} \right) * \frac{L * C * \Delta T * 8,766}{\eta_{DHWE} * 3,412}$$

$$kW \text{ savings} = \frac{kWh \text{ savings}}{8,766}$$

$$therm \text{ savings} = \left(\frac{1}{R_{Exist}} - \frac{1}{R_{New}} \right) * \frac{L * C * \Delta T * 8,766}{\eta_{DHWG} * 100,000}$$

Where:

R_{Exist}	=	Pipe heat loss coefficient (R-value) of uninsulated pipe existing
R_{New}	=	Pipe heat loss coefficient (R-value) of insulated pipe
L	=	Feet of pipe from water heating source covered by pipe wrap
C	=	Circumference of pipe in feet
ΔT	=	Average temperature difference between supplied water and ambient air temperature
η_{DHWE}	=	Recovery efficiency of electric water heater
η_{DHWG}	=	Recovery efficiency of gas water heater
8,766	=	Hours per year
3,412	=	Constant to convert Btu to kWh
100,000	=	Constant to convert Btu to therms

Table 305 lists the assumptions and source of each assumption for pipe wrap savings calculations.

Table 305. *Ex Post* Variable Assumptions for Pipe Wrap

INPUT	VALUE	SOURCE
R_{Exist}	0.5210	Illinois TRM v12.0
R_{New}	5.1410	Actuals. Based on insulation R-value of 4.6 (average of program data insulation values) and bare-pipe R-value of 0.48 (per Illinois TRM v12.0).
L	7.90	Value shown is the program average, not the value used to calculate savings for each participant.
C	0.21	Actuals. Based on assumed pipe diameter of 0.75 inches
ΔT	60	Illinois TRM v12.0
η_{DHWE}	.98	Illinois TRM v12.0
η_{DHWG}	.78	Illinois TRM v12.0
Conversion Factor	3,412	Constant to convert Btu to kWh
Conversion Factor	8,766	Constant to convert hours to years
Conversion Factor	100,000	Constant to convert Btu to therms

Attic Insulation

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for attic insulation:

$$kWh_{savings} = kWh_{cooling} + kWh_{heatingElectric} + kWh_{heatingFurnace}$$

$$kWh_{cooling} = \frac{\left(\left(\frac{1}{R_{old}} - \frac{1}{R_{attic}} \right) * A_{attic} * (1 - FF) * 24 * CDD * DUA \right)}{1000 * eff_{cool}} * ADJ_{ac} * IE_{nc}$$

$$kWh_{heatingElectric} = \frac{\left(\left(\frac{1}{R_{old}} - \frac{1}{R_{attic}} \right) * A_{attic} * (1 - FF) * 24 * HDD \right)}{eff_{elecheat} * 3412} * ADJ_{aeh}$$

$$kWh_{heatingFurnace} = (therm\ savings) * F_e * 29.3 * ADJ_{ahf}$$

$$kW\ savings = kWh_{cooling} / EFLH_{cooling} * CF$$

$$therm\ savings = \frac{\left(\left(\frac{1}{R_{old}} - \frac{1}{R_{attic}} \right) * A_{attic} * (1 - FF) * 24 * HDD \right)}{eff_{gasheat} * 100000} * ADJ_{agh} * IE_{nc}$$

Where:

R _{old}	= R-value of existing assembly and any existing insulation
R _{attic}	= R-value of new attic assembly
A _{attic}	= Total area of insulated attic (kft) ²
FF	= Adjustment to account for area of framing
CDD	= Cooling degree days
DUA	= Discretionary use adjustment
Eff _{cool}	= Seasonal energy efficiency ratio (SEER) of system
ADJ _{ac}	= Adjustment for cooling savings to account for inaccuracies of engineering algorithms
IE _{nc}	= Income eligibility net correction
HDD	= Heating degree days
Eff _{elecheat}	= Efficiency of electric heating system
ADJ _{aeh}	= Adjustment for electric heating savings to account for inaccuracies of engineering algorithms
F _e	= Furnace fan energy consumption as a percentage of annual fuel consumption
EFLH _{cooling}	= Full load hours of air conditioner
CF	= Coincidence factor
Eff _{gasheat}	= Efficiency of gas heating system
ADJ _{agh}	= Adjustment for gas heating savings to account for inaccuracies of engineering algorithms
24	= Hours per day
1,000	= Btu per kBtu
3,412	= Btu per kWh
29.3	= kWh per therm
100,000	= Btu per therm

Table 306 lists the assumptions and source of each assumption for attic insulation savings calculations.

Table 306. *Ex Post* Variable Assumptions for Attic Insulation

INPUT	VALUE	SOURCE
R_{old}	6.02	NIPSCO program data
R_{attic}	40.60	NIPSCO program data
A_{attic}	1.08	Value shown is the program average, not the value used to calculate savings for each participant.
FF	0.07	Illinois TRM v12.0
CDD	1041	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
DUA	0.75	Illinois TRM v12.0
Eff_{cool}	10.0	Illinois TRM v12.0
ADJ_{ac}	1.14	Illinois TRM v12.0
IE_{nc}	1.1	Illinois TRM v12.0
HDD	4779	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
$Eff_{elec\ heat}$	1.32	Illinois TRM v12.0
ADJ_{aeh}	0.63	Illinois TRM v12.0
Fe	0.0314	Illinois TRM v12.0
$EFLH_{cooling}$	701	Illinois TRM v12.0. Value shown is the program average, not the value used to calculate savings for each participant.
CF	0.68	Illinois TRM v12.0
$Eff_{gas\ heat}$	0.72	Illinois TRM v12.0
ADJ_{ahf}	1.13	Illinois TRM v12.0
Conversion Factor	24	Constant to convert days to hours
Conversion Factor	1000	Constant to convert Btu to kBtu
Conversion Factor	3412	Constant to convert Btu to kWh
Conversion Factor	29.3	Constant to convert therms to kWh
Conversion Factor	10000	Constant to convert Btu to therms

Duct Sealing

The evaluation team used the following equations to calculate electric and natural gas energy savings for duct sealing.

$$kWh\ savings = kWh_{cool} + kWh_{heat}$$

$$kWh_{cool} = \frac{DE_{cool\ after} - DE_{cool\ before}}{DE_{cool\ after}} * \frac{EFLH_{cool} * Btuh_{cool} * TRF_{cool}}{SEER * 1,000}$$

$$kWh_{heat} = \frac{DE_{heatafter} - DE_{heatbefore}}{DE_{heatafter}} * \frac{EFLH_{heat} * Btuh_{heat} * TRF_{heat}}{Eff_{elecheat} * 3,412}$$

$$kW \text{ savings} = \frac{kWh_{cool}}{EFLH_{cool}} * CF$$

$$therm \text{ savings} = \frac{DE_{heatafter} - DE_{heatbefore}}{DE_{heatafter}} * \frac{EFLH_{heat} * Btuh_{heat} * TRF_{heat} * Eff_{gasheat}}{Eff_{system} * 100000}$$

Where:

- DE_{coolafter} = Distribution efficiency after duct sealing
- DE_{coolbefore} = Distribution efficiency before duct sealing
- DE_{heatafter} = Distribution efficiency after duct sealing
- DE_{heatbefore} = Distribution efficiency before duct sealing
- EFLH_{cool} = Full load cooling hours
- EFLH_{heat} = Full load heating hours
- BtuH_{cool} = Cooling capacity of cooling equipment (Btu per hour)
- BtuH_{heat} = Heating capacity of heating equipment (Btu per hour)
- SEER = Seasonal average efficiency of air conditioning equipment
- TRF_{cool} = Thermal regain factor for cooling
- Eff_{elecheat} = Efficiency in COP of heating equipment
- TRF_{heat} = Thermal regain factor for heating
- CF = Coincidence factor
- Eff_{gasheat} = Gas heating equipment efficiency
- Eff_{system} = Pre duct sealing heating system efficiency
- 1,000 = Btu per kWh
- 3,412 = Btu per kWh
- 100,000 = Btu per therm

Table 307 lists the assumptions and source of each assumption for the smart duct sealing savings calculations.

Table 307. *Ex Post* Variable Assumptions for Duct Sealing

INPUT	VALUE	SOURCE
DE _{coolafter}	0.79	Building Performance Institute (as recommended by the Illinois TRM v12.0)
DE _{coolbefore}	0.65	Building Performance Institute (as recommended by the Illinois TRM v12.0)

INPUT	VALUE	SOURCE
$DE_{\text{heatafter}}$	0.85	Building Performance Institute (as recommended by the Illinois TRM v12.0)
$DE_{\text{heatbefore}}$	0.76	Building Performance Institute (as recommended by the Illinois TRM v12.0)
$EFLH_{\text{heat}}$	1,724	Illinois TRM v12.0. Values assigned based on nearest TRM city. Value shown is the program average, not the value used to calculate savings for each participant
$EFLH_{\text{cool}}$	695	Illinois TRM v12.0. Values assigned based on nearest TRM city. Value shown is the program average, not the value used to calculate savings for each participant
SEER	10.0	Illinois TRM v12.0
TRF_{cool}	0.4	Illinois TRM v12.0
$Eff_{\text{elec}}_{\text{heat}}$	1.32	Illinois TRM v12.0
$BtuH_{\text{cool}}$	31,763	Illinois TRM v12.0
$BtuH_{\text{heat}}$	80,000	Illinois TRM v12.0
TRF_{heat}	0.4	Illinois TRM v12.0
CF	0.68	Illinois TRM v12.0
$Eff_{\text{gas}}_{\text{heat}}$	0.83	Illinois TRM v12.0
$Eff_{\text{gas}}_{\text{system}}$	0.7	Illinois TRM v12.0
Conversion Factor	1,000	Converts Btu to kWh
Conversion Factor	3,412	Converts Btu to kWh
Conversion Factor	100,000	Converts Btu to therms

Programmable Thermostat

The evaluation team used the following equations to calculate electric and natural gas energy savings for programmable thermostats. There are no summer peak coincidence demand savings associated with this measure.

$$kWh \text{ savings} = HC_{\text{elec}} * HR * HF + therm \text{ savings} * F_e * 29.3$$

$$therm \text{ savings} = HC_{\text{gas}} * HR * HF$$

Where:

HC_{elec} = Electric heating consumption in kWh

HR = Heating reduction

HF = Household factor

F_e = Furnace fan energy consumption

HC_{gas} = Gas heating consumption in therms

29.3 = kWh per therm

Table 308 lists the assumptions and source of each assumption for the smart thermostat measure savings calculations.

Table 308. *Ex Post* Variable Assumptions for Programmable Thermostats

INPUT	VALUE	SOURCE
HC _{elec}	17,723.41	Illinois TRM v12.0. Values assigned based on nearest TRM city. Value shown is the program average, not the value used to calculate savings for each participant
HR	0.062	Illinois TRM v12.0
HF	1	Illinois TRM v12.0
F _e	0.0314	Illinois TRM v12.0
HC _{gas}	858	Illinois TRM v12.0
Conversion Factor	29.3	Conversion from therms to kWh

Refrigerator Replacement

The evaluation team used the following equations to calculate electric energy savings for refrigerator replacement. There are no natural gas savings associated with this measure.

$$kWh = UEC_{existing} - UEC_{efficient}$$

$$kW = \frac{kWh}{8760} * TAF * LSAF$$

Where:

- UEC_{existing} = Unit energy consumption of existing refrigerator in kWh
- UEC_{efficient} = Unit energy consumption of efficient refrigerator in kWh
- TAF = Temperature adjustment factor
- LSAF = Load shape adjustment factor for existing unit
- 8760 = Annual hours of use

Table 309 lists the assumptions and source of each assumption for the refrigerator replacement measure savings calculations.

Table 309. *Ex Post* Variable Assumptions for Refrigerator Replacement

INPUT	VALUE	SOURCE
UEC _{exist}	836.8	Illinois TRM v12.0 Value shown is the program average, not the value used to calculate savings for each participant
UEC _{efficient}	374.8	Actual model specification. Value shown is the program average, not the value used to calculate savings for each participant
TAF	1.25	Illinois TRM v12.0
LSAF	1.06	Illinois TRM v12.0

INPUT	VALUE	SOURCE
Conversion Factor	8760	Hours per year

Air Sealing

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for air sealing:

$$kWh \text{ cooling savings} = \frac{\Delta CFM50}{N_{cool}} * \frac{60 * 24 * CDD * DUA * 0.018}{1000 * Eff_{cool}} * LM * ADJ_{asc} * IE_{nc}$$

$$kWh \text{ heating savings} = \frac{\Delta CFM50}{N_{heat}} * \frac{60 * 24 * HDD * 0.018}{3412 * Eff_{eleheat}} + therm \text{ savings} * F_e * 29.3 * ADJ_{ashf}$$

$$kW \text{ savings} = \frac{kWh \text{ cooling savings}}{EFLH_{cool}} * CF$$

$$therm \text{ savings} = \frac{\Delta CFM50}{N_{factor}} * \frac{60 * 24 * HDD * 0.018}{100000 * Eff_{gasheat}} * ADJ_{asfh} * IE_{nc}$$

Where:

$\Delta CFM50$	=	Change in infiltration at 50 Pascal pressure differential in cubic feet per minute
N_{factor}	=	Conversion from 50 Pascal air flow to natural air flow
CDD	=	Cooling degree days
DUA	=	Discretionary use adjustment
Eff_{cool}	=	Cooling equipment efficiency
LM	=	Latent multiplier to account for latent cooling demand
ADJ_{asc}	=	Adjustment for cooling savings to account for inaccuracies in engineering algorithms
IE_{NC}	=	Income-eligible net correction
HDD	=	Heating degree days
$Eff_{eleheat}$	=	Electric heating equipment efficiency
F_e	=	Furnace fan energy consumption
ADJ_{ashf}	=	Adjustment for fan savings during heating season to account for inaccuracies in engineering algorithm
$EFLH_{cool}$	=	Effective full load cooling hours
CF	=	Coincidence factor
$Eff_{gasheat}$	=	Gas heating equipment efficiency
ADJ_{asfh}	=	Adjustment for fossil heating savings to account for inaccuracies in engineering algorithms

24*60	=	Minutes per day
0.018	=	Btu/(cubic foot * F) (specific heat of air)
1,000	=	Btu per kBtu
3,412	=	Btu per kWh
29.3	=	kWh per therm
100,000	=	Btu per therm

Table 310 lists the assumptions and source of each assumption for the air sealing measure.

Table 310. *Ex Post* Variable Assumptions for Air Sealing

INPUT	VALUE	SOURCE
$\Delta CFM50$	1034.67	Value assigned based on program data. Value shown is a program average which was used for the analysis.
N_{cool}	34.4	Illinois TRM v12.0
N_{heat}	21.1	Illinois TRM v12.0
CDD	785	Illinois TRM v12.0
DUA	0.75	Illinois TRM v12.0
Eff_{cool}	10.0	Illinois TRM v12.0
LM	3.24	Illinois TRM v12.0
ADJ_{asc}	1	Illinois TRM v12.0
IE_{nc}	1.1	Illinois TRM v12.0
HDD	4784	Illinois TRM v12.0
$Eff_{elec\,heat}$	1.32	Illinois TRM v12.0
F_e	0.0314	Illinois TRM v12.0
ADJ_{ashf}	1	Illinois TRM v12.0
$EFLH_{cool}$	702	Illinois TRM v12.0
CF	0.68	Illinois TRM v12.0
$Eff_{gas\,heat}$	0.72	Illinois TRM v12.0
ADJ_{asfh}	1	Illinois TRM v12.0
Conversion Factor	60*24	Converts minutes to days
Conversion Factor	1000	Converts Btu to kBtu
Conversion Factor	0.018	Specific heat capacity of air
Conversion Factor	29.3	Converts therms to kWh
Conversion Factor	100000	Converts Btu to therms
Conversion Factor	3412	Converts Btu to kWh

Advanced Thermostat

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for advanced thermostats:

$$kWh \text{ cooling savings} = \frac{FLH * Capacity}{SEER2 * 1000} * CR$$

$$kWh \text{ heating savings} = HC_{elec} * HR * HF + Therms * F_e * 29.3$$

$$kWh \text{ savings} = kWh \text{ cooling} + kWh \text{ heating}$$

$$kW \text{ savings} = \frac{CDR * Capacity * CF}{EER2 * 1000}$$

$$therms \text{ savings} = GHC * HR * HF$$

Where:

FLH	=	Full load cooling hours for the air conditioning equipment
Capacity	=	Size of the cooling unit in Btu/hr
SEER2	=	Seasonal energy efficiency ratio of the cooling equipment
CR	=	Cooling reduction; the percent reduction in cooling energy consumption
HC _{elec}	=	Electric heating consumption in kWh
HR	=	Heating reduction; the percent reduction in heating energy consumption
HF	=	Household factor
F _e	=	Furnace fan energy consumption
CDR	=	Cooling demand reduction
CF	=	Coincidence factor
EER2	=	Energy efficiency ratio of the cooling equipment
GHC	=	Gas heating consumption in therms
1000	=	Converts kW to W
29.3	=	Converts therms to kWh

Table 311 lists the assumptions and source of each assumption for the advanced thermostats measure.

Table 311. *Ex Post* Variable Assumptions for Advanced Thermostats

INPUT	VALUE	SOURCE
FLH	701	Illinois TRM v12.0. Value shown is a program average which was used for the analysis.
Capacity	33,600	Illinois TRM v12.0
SEER2	11.4	Illinois TRM v12.0
CR	0.084	Illinois TRM v12.0

INPUT	VALUE	SOURCE
HC _{elec}	20,644	Illinois TRM v12.0. Value shown is a program average which was used for the analysis.
HR	0.085	Illinois TRM v12.0
HF	1	Illinois TRM v12.0
F _e	0.0314	Illinois TRM v12.0
CDR	0.16	Illinois TRM v12.0
CF	0.34	Illinois TRM v12.0
EER2	10	Illinois TRM v12.0
GHC	999	Illinois TRM v12.0
Conversion Factor	1000	Converts kW to W
Conversion Factor	29.3	Converts therms to kWh

Outlet Gaskets

The evaluation team used the following equations to calculate electric and natural gas energy savings for outlet gasket air sealing.

$$kWh = n * ADJ * (kWh_{heat} + kWh_{cool})$$

$$kW = \frac{n * kWh_{cool} * CF}{FLH_{cool}}$$

$$therms = N * ADJ * therms_{gasket}$$

Where:

n	=	Number of outlet gaskets installed
ADJ	=	Adjustment factor
kWh _{heat}	=	Per unit heating savings
kWh _{cool}	=	Per unit cooling savings
CF	=	Coincidence factor
FLH _{cool}	=	Full load cooling hours
therms _{gasket}	=	Per unit gas savings

Table 312 lists the assumptions and source of each assumption for the outlet gasket measure.

Table 312. *Ex Post* Variable Assumptions for Outlet Gaskets

INPUT	VALUE	SOURCE
n	10	Actual number of installed gaskets
ADJ	.80	Illinois TRM v12.0

INPUT	VALUE	SOURCE
kWh _{heat}	7.65	Illinois TRM v12.0. Value shown is a program average which was used for the analysis.
kWh _{cool}	1.18	Illinois TRM v12.0. Value shown is a program average which was used for the analysis.
CF	0.68	Illinois TRM v12.0
FLH _{cool}	687	Illinois TRM v12.0. Value shown is a program average which was used for the analysis.
therms _{gasket}	0.37	Illinois TRM v12.0. Value shown is a program average which was used for the analysis.

Appendix 5. MFDI Program

Algorithms and Assumptions

This appendix contains the assumptions for electric energy savings, peak demand reduction, and natural gas energy savings algorithms for the measures within the MFDI program. The evaluation team examined each assumption used by the algorithms to capture savings and compared them with the Indiana TRM Workbook v1.0 and Illinois TRM v12.0, as well as other state and industry approaches.

Detailed information on the analysis and supporting assumptions for the following MFDI program measures are included within this appendix:

- LED light bulbs
- Bathroom faucet aerators (1.0 gpm)
- Kitchen aerators (1.5 gpm)
- Low-flow showerheads (1.5 gpm)
- Thermostats
- Pipe wrap

Table 313 lists our assumptions for the *ex post* per measure savings.

Table 313. MFDI Program Measures

MEASURE	REVIEWED ASSUMPTIONS
LEDs	New and baseline wattages, hours of use, waste heat factors, coincidence factors
Low-Flow Showerheads	New and baseline flow rates, occupants per dwelling, minutes of use per day, showerheads per home, water temperatures, water heater fuel type and efficiency
Faucet Aerators	New and baseline flow rates, occupants per dwelling, minutes of use per day, faucets per home, water temperatures, water heater fuel type and efficiency
Pipe Wrap	New and existing pipe heat loss factor, interior pipe circumference, length of pipe, average temperature difference between outside air temperature and supplied water, hours per year, recovery efficiency
Thermostats	Furnace energy consumption, housing factor, heating consumption for electric and gas equipment types, and energy savings fractions for heating and cooling

The algorithms and assumptions the evaluation team used to calculate *ex post* savings for each of these measures follow.

Faucet Aerators

The evaluation team used equations and assumptions from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for bathroom and kitchen faucet aerators:

$$\Delta kWh = \%ElecDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * DF * \left(\frac{365.25 * PPH}{FPH} \right) * EPG_{elec} * ISR$$

$$\Delta kW = \frac{\Delta kWh * CF}{Hours}$$

$$\Delta Therms = \%FossilDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * DF * \left(\frac{365.25 * PPH}{FPH} \right) * EPG_{gas} * ISR$$

Table 314. 2024 MFDI Program *Ex Post* Variable Assumptions for Faucet Aerators

VARIABLE	VALUE		SOURCE
	BATHROOM	KITCHEN	
Baseline flow rate (GPMbase)	1.53	1.63	Illinois TRM v12.0
Low-flow rate (GPMlow)	0.94	0.94	Illinois TRM v12.0
Baseline faucet usage in minutes/person/day (Lbase)	1.6	4.5	Illinois TRM v12.0
Baseline faucet usage in minutes/person/day (Llow)	1.6	4.5	Illinois TRM v12.0
People per household (PPH)	2.1	2.1	Illinois TRM v12.0
Faucets per household (FPH)	1.5	1	Illinois TRM v12.0
Drain recovery factor (DF)	0.90	0.75	Illinois TRM v12.0
kWh per gallon of water used (EPGelec)	0.0879	0.1054	Illinois TRM v12.0
Therms per gallon of water used (EPGgas)	0.0044	0.0053	Illinois TRM v12.0
Hours	21.99	98.68	Illinois TRM v12.0
Coincidence factor (CF)	0.022	0.022	Illinois TRM v12.0
ISR	91%	91%	NYSEG/RG&E Impact and Process Evaluation

Showerheads

The evaluation team used equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for low-flow showerheads:

$$\Delta kWh = \%ElecDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * SPCD * \left(\frac{365.25 * PPH}{SPH} \right) * EPG_{elec} * ISR$$

$$\Delta kW = \frac{\Delta kWh * CF}{Hours}$$

$$\Delta Therms = \%FossilDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * SPCD * \left(\frac{365.25 * PPH}{SPH} \right) * EPG_{gas} * ISR$$

Table 315. 2024 MFDI Program *Ex Post* Variable Assumptions for Low-Flow Showerheads

VARIABLE	VALUE	SOURCE
Baseline flow rate (gpm _{base})	2.35	Illinois TRM v12.0
Low-flow rate (gpm _{low})	1.5	Illinois TRM v12.0
Baseline showerhead usage in minutes/person/day (L _{base})	7.8	Illinois TRM v12.0
Baseline low-flow showerhead usage in minutes/person/day (L _{low})	7.8	Illinois TRM v12.0
People per household (PPH)	2.1	Illinois TRM v12.0
Showers/capita/day (SPCD)	0.60	Illinois TRM v12.0
Showerheads per house (SPH)	1.3	Illinois TRM v12.0
kWh per gallon of water used (EPG _{elec})	0.1253	Illinois TRM v12.0
Therms per gallon of water used (EPG _{gas})	0.0063	Illinois TRM v12.0
Hours	224	Illinois TRM v12.0
Coincidence factor (CF)	0.0278	Illinois TRM v12.0
ISR	100%	NYSEG/RG&E Impact and Process Evaluation

Pipe Wrap

The evaluation team used equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction per foot of pipe wrap:

$$\Delta kWh = \%Electric_{DHW} * \left(\frac{1}{R_{exist}} - \frac{1}{R_{new}} \right) * C_{inside} * L_{effective} * \Delta T * 8,766 * ISR / (\eta_{DHW} * 3,412)$$

$$\Delta kW = \frac{\Delta kWh}{8766}$$

$$\Delta Therms = \%Fossil_{DHW} * \left(\frac{1}{R_{exist}} - \frac{1}{R_{new}} \right) * C_{inside} * L_{effective} * \Delta T * 8,766 * ISR / (\eta_{DHW} * 100,000)$$

Table 316. 2023 Efficient Products Program *Ex Post* Variable Assumptions for Pipe Wrap

VARIABLE	VALUE	SOURCE
R-value of uninsulated pipe (R _{exist})	0.4825	Illinois TRM v12.0 average of ½" and ¾" pipe
R-value after new pipe insulation (R _{new})	5.1025	Average of two program models (0.0444 and 0.521) added to existing R-value
Pipe length (L _{effective})	0.8475	Program information (which listed six feet of insulation per participant) with Illinois TRM v12.0 assuming first three feet is vertical
Pipe circumference (C _{inside})	0.1741	Illinois TRM v12.0 average of ½" and ¾" pipe
Temperature change (ΔT)	60	Illinois TRM v12.0

VARIABLE	VALUE	SOURCE
$\eta_{DHW\_electric}$	0.98	Illinois TRM v12.0
η_{DHW_gas}	0.78	Illinois TRM v12.0
ISR	95%	2024HEA participant survey

LEDs

The team used the following equations to calculate electric energy and peak demand savings, as well as natural gas energy penalties, for LEDs:

$$kWh \text{ savings per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (ISR) * (Hours) * (WHF_e)}{1,000}$$

$$kW \text{ reduction per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (ISR) * Coincidence \text{ Factor} * (WHF_d)}{1,000}$$

$$therm \text{ savings per lamp} = \frac{(W_{base} - W_{LED}) * (1 - Leakage) * (ISR) * (Hours) * HF * .03412}{\eta_{heat} * 1,000}$$

Table 317 lists the input assumptions and source of each assumption for the LED measure savings calculations.

Table 317. *Ex Post* Variable Assumptions for LEDs

INPUT	VALUE	SOURCE
W_{base} (Candelabra, Globe)	40	ENERGY STAR QPL for lumens, UMP for baseline equivalent
W_{base} (A-Line)	43	ENERGY STAR QPL for lumens, UMP for baseline equivalent
W_{base} (PAR38)	120	ENERGY STAR QPL for lumens, UMP for baseline equivalent
W_{LED} (Candelabra)	4.5	Actual installed wattage
W_{LED} (Globe)	6	Actual installed wattage
W_{LED} (A-Line)	9	Actual installed wattage
W_{LED} (PAR38)	15	Actual installed wattage
Hours (A-line)	1089	Illinois TRM v12.0
Hours (Candelabra, Globe, PAR38)	763	Illinois TRM v12.0
Leakage	0	Illinois TRM v12.0
WHFe	1.04	Illinois TRM v12.0
WHFd	1.07	Illinois TRM v12.0
HF	0.49	Illinois TRM v12.0
Coincidence Factor (A-line)	0.128	Illinois TRM v12.0
Coincidence Factor (Candelabra, Globe, PAR38)	0.109	Illinois TRM v12.0
Eff_{heat}	0.7	Illinois TRM v12.0
Conversion Factor	1000	Convert watts to kW

INPUT	VALUE	SOURCE
Conversion Factor	365	Convert years to days
Conversion Factor	0.03412	Convert kWh to therms
ISR	87%	NYSEG/RG&E Impact and Process Evaluation

Advanced Thermostat

The evaluation team used the following equations to calculate electric energy, peak demand, and natural gas energy savings for advanced thermostats:

$$kWh \text{ cooling savings} = \frac{FLH * Capacity}{SEER2 * 1000} * CR * ISR$$

$$kWh \text{ heating savings} = HC_{elec} * HR * HF * ISR + Therms * F_e * 29.3$$

$$kWh \text{ savings} = kWh \text{ cooling} + kWh \text{ heating}$$

$$kW \text{ savings} = \frac{CDR * Capacity * CF * ISR}{EER2 * 1000}$$

$$therms \text{ savings} = GHC * HR * HF * ISR$$

Table 318 lists the assumptions and source of each assumption for the advanced thermostats measure.

Table 318. *Ex Post* Variable Assumptions for Advanced Thermostats

INPUT	VALUE	SOURCE
Cooling Full Load Hours (FLH)	629	Illinois TRM v12.0
Cooling Capacity (Capacity)	28,000	Illinois TRM v12.0
SEER2	11.4	Illinois TRM v12.0
Cooling Reduction (CR)	0.084	Illinois TRM v12.0
Electric Heating Consumption (HC _{elec})	20,777	Illinois TRM v12.0
Heating Reduction (HR)	0.085	Illinois TRM v12.0
Household Factor (HF)	0.65	Illinois TRM v12.0
Furnace fan energy consumption (F _e)	0.0314	Illinois TRM v12.0
Cooling Demand Reduction (CDR)	0.164	Illinois TRM v12.0
Coincidence Factor (CF)	0.34	Illinois TRM v12.0
EER2	10	Illinois TRM v12.0
Gas Heating Consumption (GHC)	1,005	Illinois TRM v12.0
Conversion Factor	1000	Converts kW to W
Conversion Factor	29.3	Converts therms to kWh
IS	80%	NYSEG/RG&E Impact and Process Evaluation

Appendix 6. Appliance Recycling Program

Algorithms and Assumptions

This appendix contains the assumptions used in the electric savings and demand reduction algorithms for the measures within the Appliance Recycling program. For the 2023 program year, the evaluation team estimated per-unit energy and demand savings estimates for recycled refrigerators and freezers using algorithms and variable assumptions from the Illinois TRM v12.0. The evaluation team used the Illinois TRM v12.0 and 2023 Indiana TRM v1.0 to estimate recycled room air conditioner energy and demand savings. The evaluation team used the Pennsylvania TRM (2026) and 2023 Indiana TRM v1.0 to estimate savings for dehumidifier recycling. The section below details information on the analysis and supporting assumptions for the Appliance Recycling program measures in this appendix.

Refrigerators and Freezers

The evaluation team used the regression model recommended in the Illinois TRM v12.0 to estimate savings resulting from the Appliance Recycling program. Table 319 lists the Illinois TRM v12.0 model specification used to estimate the annual unit energy consumption (UEC) of refrigerators recycled in 2024, along with the model’s estimated coefficients.

Table 319. 2024 Appliance Recycling Program Refrigerator Unit Energy Consumption Regression Model Estimates

INDEPENDENT VARIABLES	COEFFICIENT
Intercept	83.324
Age (years)	3.678
Dummy: Manufactured pre-1990	485.037
Size (cubic feet)	27.149
Dummy: Side-by-Side	406.779
Dummy: Primary	161.857
Interaction: Unconditioned Space * HDDs ^a /365.25	-11.067
Interaction: Unconditioned Space * CDDs ^a /365.25	15.366

^a. The evaluation team derived heating degree days (HDDs) and cooling degree days (CDDs) from the weighted average from TMY4 data for weather stations mapped to participating appliance zip codes. TMY4 uses median daily values for a variety of weather data collected from 1998 through 2023.

The coefficient value indicates the marginal impact on per-unit energy consumption of a one-point increase in the independent variable. For example, as shown in Table 320, an increase of one cubic foot in refrigerator size resulted in an increase of 27.149 kWh in annual consumption. In the case of dummy variables, the coefficient value represented the difference in consumption if the given condition proved true. For example, the evaluation team’s refrigerator model used a coefficient of 161.857 for the variable indicating whether a refrigerator was a primary unit; thus, with all else equal, a primary refrigerator consumed 161.857 kWh per year more than a secondary unit.

Table 320 lists the regression model recommended in the Illinois TRM v12.0 used to estimate the annual UEC of freezers recycled in 2024, along with the model’s estimated coefficients.

Table 320. 2024 Appliance Recycling Program Freezer Unit Energy Consumption Regression Model Estimates

INDEPENDENT VARIABLES	COEFFICIENT
Intercept	132.122
Age (years)	12.130
Dummy: Manufactured pre-1990	156.181
Size (cubic feet)	31.839
Dummy: Chest Freezer	-19.709
Interaction: Unconditioned Space * HDDs	-12.755
Interaction: Unconditioned Space * CDDs	9.778

Table 321 lists the mean values derived from 2024 data used to estimate the annual UEC of refrigerators recycled in 2024, along with the model’s estimated coefficients. It also includes our model coefficients and means derived from 2024 data for recycled freezers.

Table 321. 2024 Appliance Recycling Program Participant Mean Variables and Model Coefficients

	INDEPENDENT VARIABLES	2024 MEAN VALUE	2024 MODEL COEFFICIENT
Refrigerator	Intercept	1.00	83.324
	Age (years)	21.626	3.678
	Dummy: Manufactured pre-1990	0.111	485.037
	Size (cubic feet)	19.433	27.149
	Dummy: Side-by-Side	0.260	406.779
	Dummy: Primary	0.379	161.857
	Interaction: Unconditioned Space * HDDs ^a	8.128	-11.067
	Interaction: Unconditioned Space * CDDs ^a	1.124	15.366
Freezer	Intercept	1.00	132.122
	Age (years)	26.825	12.130
	Dummy: Manufactured pre-1990	0.183	156.181
	Size (cubic feet)	15.564	31.839
	Dummy: Chest Freezer	0.344	-19.709

INDEPENDENT VARIABLES	2024 MEAN VALUE	2024 MODEL COEFFICIENT
Interaction: Unconditioned Space * HDDs	9.962	-12.755
Interaction: Unconditioned Space * CDDs	1.383	9.778

^a(CDDs) and HDDs are weighted averages based on TMY4 data from weather stations mapped to participating appliance zip codes.

Per-Unit Energy Consumption

The following regression model shows how the evaluation team used the Illinois TRM v12.0-defined model. For the refrigerator UEC calculation, this included average appliance characteristics:

$$UEC_{Ref} = [83.324 + (3.678 * (21.626 \text{ years old})) + (485.037 * (11.1\% \text{ units manufactured before 1990})) + (27.149 * 19.433 \text{ unit size ft.}^3) + (406.779 * 26.0\% \text{ side-by-side units}) + (161.857 * 37.9\% \text{ primary usage}) + (-8.128 * 8.003 \text{ unconditioned HDDs}) + (15.366 * 1.124 \text{ Unconditioned CDDs})] = 839 \text{ kWh/Year}$$

The following regression model shows how the evaluation team used the UMP-defined model. For the freezer UEC calculation, this included average appliance characteristics:

$$UEC_{Frz} = [132.122 + (12.130 * (26.825 \text{ years old})) + (156.181 * (18.3\% \text{ units manufactured before 1990})) + (31.839 * 15.564 \text{ unit size ft.}^3) + (-19.709 * 34.4\% \text{ units that are chest freezers}) + (-12.755 * 9.962 \text{ unconditioned HDDs}) + (9.778 * 1.383 \text{ Unconditioned CDDs})] = 861 \text{ kWh/Year}$$

Using the values from Table 322, the evaluation team estimated the *ex post* annual UEC for an average program refrigerator and freezer.

Table 322. 2024 Appliance Recycling Program Average Unit Energy Consumption by Appliance Type

MEASURE	AVERAGE PER-UNIT ENERGY CONSUMPTION (KWH/YEAR)
Refrigerators	864
Freezers	844

Demand Impacts

To calculate demand reduction, the team used the coincidence factors shown in Table 323, drawn from the Illinois TRM v12.0, to calculate per-measure demand reduction for refrigerators and freezers. The evaluation team used the following equation to calculate demand reduction separately for refrigerator and freezer appliance measures.

$$kW \text{ reduction} = \frac{\text{Average PerUnit Energy Consumption kWh/Year}}{8,766} * CF$$

Where:

CF = Coincident factor defined as summer kW/average kW
= 1.081 for Refrigerators
= 1.028 for Freezers

Table 323. 2024 Appliance Recycling Program Demand Reduction Assumptions for Appliance Recycling Program–Recycled Refrigerators and Freezers

VARIABLE	RECYCLED APPLIANCE VALUE
CF – Coincident Factor – Refrigerators	1.081
CF – Coincident Factor – Freezers	1.028

Using the values from Table 324, the evaluation team estimated the *ex post* annual gross peak demand reduction for an average program refrigerator and freezer.

Table 324. 2024 Appliance Recycling Program Average Unit Energy Demand Reduction by Appliance Type

APPLIANCE	AVERAGE PER-UNIT GROSS PEAK DEMAND REDUCTION (KW/YEAR)
Refrigerators	0.103
Freezers	0.101

Part-Use Factor

Applying the part-use factors calculated from the 2023 survey to the modeled annual consumption and demand reduction from Table 323 and Table 324 yielded average gross, per-unit energy savings and demand reductions. Table 325 shows the average per-unit gross annual energy savings and demand reduction values, part-use factors and the part-use adjusted per-unit gross energy savings, and peak demand reduction values used as final *ex post* gross per-unit values for the 2024 evaluation.

Table 325. 2023 Appliance Recycling Program *Ex Post* Per-Unit Energy Savings and Demand Reduction

SAVINGS TYPE	AVERAGE PER-UNIT ANNUAL ENERGY SAVINGS (KWH/YEAR)	AVERAGE PER-UNIT ANNUAL PEAK DEMAND REDUCTION (KW/YEAR)	PART-USE FACTOR	EX POST PER-UNIT GROSS ENERGY SAVINGS (KWH/YEAR)	EX POST PER-UNIT PEAK DEMAND REDUCTION (KWH/YEAR)
Refrigerators	839	0.103	0.92	772.00	0.095
Freezers	861	0.101	0.89	766.00	0.090

Dehumidifiers

Dehumidifier recycling is not included in the 2023 Indiana TRM v1.0 or the Illinois TRM v12.0; therefore, the evaluation team used the default values from the Pennsylvania TRM (2026) to calculate *ex post* per-measure energy savings. The Pennsylvania TRM (2026) established the energy savings values for dehumidifier recycling using actual metered residential dehumidifier usage data. The metered data was best fit with a polynomial, which is second order in temperature humidity index and first order in capacity. The evaluation team applied the default, average usage and savings values provided in the Pennsylvania TRM (2026) for the most similar climate region identified (Allentown). The evaluation team used the CDD65 value for the closest Indiana TRM v1.0 reference city (all were South Bend) for dehumidifier participants to match the closest Pennsylvania TRM

reference city (Allentown) CDD65 value and applied the default gross savings value in the Pennsylvania TRM for the closest matched reference city (Allentown).

Table 326 shows a summary of the recycled dehumidifier energy savings assumptions and assumption source.

Table 326. 2024 Appliance Recycling Program Energy Savings Assumptions for Recycled Dehumidifier

CLIMATE REGION	REFERENCE CITY	DEFAULT ANNUAL ENERGY SAVINGS	SOURCE
C	Allentown	1,052 kWh	Pennsylvania TRM (2026)

The evaluation team used the Illinois TRM v12.0 new dehumidifier measure prescribed values for hours of use and peak coincidence factor to calculate peak demand reduction using the following equation:

$$kW\ reduction = Ex\ Post\ Gross\ kWh\ Savings/Hours * CF$$

Table 327 shows a summary of the recycled dehumidifier peak demand reduction assumptions and assumption source.

Table 327. 2024 Appliance Recycling Program Energy Savings Assumptions for Recycled Dehumidifier

VARIABLE	DEFAULT ANNUAL ENERGY SAVINGS	SOURCE
Ex Post kWh Savings	1,052 kWh	Pennsylvania TRM (2026)
Hours	2,200	Illinois TRM v12.0
Coincidence Factor (CF)	0.50	Illinois TRM v12.0

Table 328 shows the resulting *ex post* per-unit savings for recycled dehumidifiers.

Table 328. 2024 Appliance Recycling Program Dehumidifiers *Ex Post* Per-Unit Savings

MEASURE	EX POST PER-MEASURE SAVINGS	
	KWH	KW
Dehumidifier	1,052.00	0.239

Room Air Conditioners

The evaluation team used the following equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for recycled room air conditioners:

- $$kWh\ savings = \left(\frac{FLH_{RoomAC} * Btu/H}{1,000}\right) * \left(\frac{1}{\frac{EER_{exist}}{1000}}\right)$$
- $$kW\ reduction = \left(\frac{Btu/H * CF}{1,000}\right) * \left(\frac{1}{\frac{EER_{exist}}{1000}}\right) * CF$$

Where:

- FLH_{RoomAC} = Full-load cooling hours for participants (average across all participants)
- Btu/h = Actual size of the recycled AC in Btu/H units (where 1 ton=12,000 Btu/H)
- EER_{exist} = Energy efficiency rating of the recycled AC
- CF = Coincidence factor, a number between 0 and 1 indicating how many ACs are expected to be in use and saving energy during the peak summer demand period

Table 329 shows a summary of the recycled room air conditioner savings assumptions and assumption source. The evaluation team mapped room air conditioner recycling participants’ service address zip code to the closest Indiana TRM v1.0 reference city. The team then matched the specific Indiana TRM v1.0 reference cities to the Illinois TRM v12.0 reference cities specified in the Indiana TRM v1.0, to apply full-load cooling hours default values from the Illinois TRM v12.0 to develop a weighted average FLH_{RoomAC} value of 258.

Table 329. 2024 Appliance Recycling Program Variable Assumptions for Recycled Room Air Conditioners

VARIABLE	ROOM AIR CONDITIONER VALUE	SOURCE
Full-Load Cooling Hours (FLH _{RoomAC})	258	Indiana TRM v1.0 and IL TRM v12.0
Size of Retired Unit (Btu/H)	8,500	
Energy Efficiency Rating – Existing (EER _{exist})	9.8	IL TRM v12.0
Coincidence Factor (CF)	0.30	

Table 330 shows the resulting *ex post* per-unit savings for recycled room air conditioners.

Table 330. 2024 Appliance Recycling Program Room air Conditioner *Ex- Post* Per-Unit Savings

MEASURE	EX POST PER-UNIT SAVINGS	
	KWH	KW
Room Air Conditioner	223.78	0.260

Appendix 7. Behavioral Program

Data Cleaning

As shown in Table 331 and Table 332, for electric and natural gas customers, respectively, the evaluation team cleaned the billing data to ensure that data it used in the billing analysis contained sufficient pre-period (11) and post-period (2) months in the analysis periods, as well as sufficient billing days. Customers with insufficient post-period data had either moved or disconnected service after their respective waves' inception but before this evaluation period began. As a result, some of the earlier deployment waves appear to have considerably high numbers of customers removed. Treatment and control customers have shown similar rates of attrition for both IQ and non-IQ waves. Waves 3, 4, and 9 have differences in attrition that are greater than five percentage points.

Table 331. 2024 Behavioral Participants Filtered Out by Data Sufficiency Checks for Electric Customers

	WAVE 1		WAVE 1 (IQ)		WAVE 2		WAVE 2 (IQ)		WAVE 3		WAVE 3 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Original randomly assigned homes	96,059	29,063	52,913	15,592	9,338	7,959	5,280	4,707	37,596	6,975	11,404	2,369
Records in billing data for 2022 evaluation	82,272	25,524	45,884	13,418	7,002	6,307	4,502	3,986	29,084	5,753	11,496	2,187
<i>Applied filters:</i>												
Insufficient post-period data	39,590	11,125	20,441	5,153	4,529	3,802	2,300	1,782	16,629	2,961	3,824	573
Insufficient pre-period data	681	293	490	217	67	81	56	48	372	88	132	20
Total Filtered	40,271	11,418	20,931	5,370	4,596	3,883	2,356	1,830	17,001	3,049	3,956	593
FINAL ESTIMATION SAMPLE	42,001	14,106	24,953	8,048	2,406	2,424	2,146	2,156	12,083	2,704	7,540	1,594
ATTRITION RATE	56%	51%	53%	48%	74%	70%	59%	54%	68%	61%	34%	33%

	WAVE 4		WAVE 4 (IQ)		WAVE 5		WAVE 5 (IQ)		WAVE 7		WAVE 7 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Original randomly assigned homes	29,285	6,000	8,962	2,131	26,474	6,977	5,688	1,747	17,718	7,253	5,971	2,630

	WAVE 4		WAVE 4 (IQ)		WAVE 5		WAVE 5 (IQ)		WAVE 7		WAVE 7 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Records in billing data for 2022 evaluation	21,496	4,632	9,032	1,968	22,917	6,391	6,625	1,722	15,603	6,698	6,359	2,552
Applied filters:												
Insufficient post-period data	13,466	2,612	3,144	519	13,912	3,659	1,575	185	8,440	3,352	1,937	518
Insufficient pre-period data	559	121	226	69	379	122	192	47	118	48	51	34
Total Filtered	14,025	2,733	3,370	588	14,291	3,781	1,767	232	8,558	3,400	1,988	552
FINAL ESTIMATION SAMPLE	7,471	1,899	5,662	1,380	8,626	2,610	4,858	1,490	7,045	3,298	4,371	2,000
ATTRITION RATE	74%	68%	37%	35%	67%	63%	15%	15%	60%	55%	27%	24%

	WAVE 8		WAVE 8 (IQ)		WAVE 9		WAVE 9 (IQ)		WAVE 11		WAVE 11 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Original randomly assigned homes	21,740	8,933	3,586	1,582	13,075	5,234	2,454	1,145	11,816	6,492	3,499	2,080
Records in billing data for 2022 evaluation	19,347	8,304	4,352	1,579	11,776	4,924	2,962	1,145	11,182	6,358	3,823	2,076
Applied filters:												
Insufficient post-period data	11,277	4,557	838	58	6,655	2,676	576	52	4,548	2,447	468	103
Insufficient pre-period data	365	164	133	72	322	143	147	68	403	260	188	119
Total Filtered	11,642	4,721	971	130	6,977	2,819	723	120	4,951	2,707	656	222
FINAL ESTIMATION SAMPLE	7,705	3,583	3,381	1,449	4,799	2,105	2,239	1,025	6,231	3,651	3,167	1,854
ATTRITION RATE	65%	60%	6%	8%	63%	60%	9%	10%	47%	44%	9%	11%

	WAVE 12		WAVE 12 (IQ)		WAVE 13		WAVE 13 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Original randomly assigned homes	14,662	6,641	5,048	2,576	42,432	11,152	17,318	4,680
Records in billing data for 2022 evaluation	13,505	6,394	5,681	2,570	42,102	11,152	17,647	4,680

	WAVE 12		WAVE 12 (IQ)		WAVE 13		WAVE 13 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
<i>Applied filters:</i>								
Insufficient post-period data	7,087	3,142	1,030	196	3,005	833	1,905	537
Insufficient pre-period data	479	262	269	171	7,432	2,029	3,148	836
Total Filtered	7,566	3,404	1,299	367	10,437	2,862	5,053	1,373
FINAL ESTIMATION SAMPLE	5,939	2,990	4,382	2,203	31,665	8,290	12,594	3,307
ATTRITION RATE	59%	55%	13%	14%	25%	26%	27%	29%

Table 332. 2024 Behavioral Participants Filtered Out by Data Sufficiency Checks for Natural Gas Customers

	WAVE 1		WAVE 1 (IQ)		WAVE 2		WAVE 2 (IQ)		WAVE 3		WAVE 3 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Original randomly assigned homes	96,059	29,063	52,913	15,592	9,338	7,959	5,280	4,707	37,596	6,975	11,404	2,369
Records in billing data for 2022 evaluation	80,850	25,115	44,734	13,121	6,732	6,113	4,368	3,898	28,270	5,606	11,334	2,159
<i>Applied filters:</i>												
Insufficient post-period data	38,646	10,866	19,719	4,971	4,288	3,648	2,212	1,729	15,944	2,849	3,788	576
Insufficient pre-period data	1,743	648	1,488	543	330	356	239	236	1,089	239	586	111
Total Filtered	40,389	11,514	21,207	5,514	4,618	4,004	2,451	1,965	17,033	3,088	4,374	687
FINAL ESTIMATION SAMPLE	40,461	13,601	23,527	7,607	2,114	2,109	1,917	1,933	11,237	2,518	6,960	1,472
ATTRITION RATE	58%	53%	56%	51%	77%	74%	64%	59%	70%	64%	39%	38%

	WAVE 4		WAVE 4 (IQ)		WAVE 5		WAVE 5 (IQ)		WAVE 6		WAVE 6 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Original randomly assigned homes	29,285	6,000	8,962	2,131	26,474	6,977	5,688	1,747	34,110	8,002	15,500	3,768
Records in billing data for 2022 evaluation	20,649	4,453	8,851	1,939	22,093	6,170	6,546	1,718	31,477	7,423	15,098	3,645

	WAVE 4		WAVE 4 (IQ)		WAVE 5		WAVE 5 (IQ)		WAVE 6		WAVE 6 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
<i>Applied filters:</i>												
Insufficient post-period data	12,655	2,445	3,080	511	13,136	3,426	1,551	196	13,428	3,203	2,815	618
Insufficient pre-period data	1,440	341	782	205	949	295	540	164	842	183	527	130
Total Filtered	14,095	2,786	3,862	716	14,085	3,721	2,091	360	14,270	3,386	3,342	748
FINAL ESTIMATION SAMPLE	6,554	1,667	4,989	1,223	8,008	2,449	4,455	1,358	17,207	4,037	11,756	2,897
ATTRITION RATE	78%	72%	44%	43%	70%	65%	22%	22%	50%	50%	24%	23%

	WAVE 8		WAVE 8 (IQ)		WAVE 9		WAVE 9 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Original randomly assigned homes	21,740	8,933	3,586	1,582	13,075	5,234	2,454	1,145
Records in billing data for 2022 evaluation	18,757	8,081	4,324	1,580	11,423	4,757	2,942	1,144
<i>Applied filters:</i>								
Insufficient post-period data	10,690	4,343	835	72	6,311	2,505	578	63
Insufficient pre-period data	1,342	602	565	271	966	241	445	195
Total Filtered	12,032	4,945	1,400	343	7,277	2,746	1,023	258
FINAL ESTIMATION SAMPLE	6,725	3,136	2,924	1,237	4,146	2,011	1,919	886
ATTRITION RATE	69%	65%	18%	22%	68%	62%	22%	23%

	WAVE 11		WAVE 11 (IQ)		WAVE 13		WAVE 13 (IQ)	
	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.	TREAT.	CONTR.
Original randomly assigned homes	11,816	6,492	3,499	2,080	42,432	11,152	17,318	4,680
Records in billing data for 2022 evaluation	10,989	6,257	3,811	2,072	35,486	9,397	14,263	3,738
<i>Applied filters:</i>								
Insufficient post-period data	4,361	2,363	475	108	3,608	988	2,446	667
Insufficient pre-period data	1,150	711	559	347	8,868	2,377	3,809	1,009
Total Filtered	5,511	3,074	1,034	455	12,476	3,365	6,255	1,676
FINAL ESTIMATION SAMPLE	5,478	3,183	2,777	1,617	23,010	6,032	8,008	2,062
ATTRITION RATE	54%	51%	21%	22%	46%	46%	54%	56%

Regression Analysis

The evaluation team conducted a regression analysis to determine energy savings for treatment and control respondents using two models: PPR and LFER. Both approaches produced unbiased estimates of program savings. The evaluation team reported the PPR results and used the LFER results as a robustness check. Although structurally different, assuming the RCT is well-balanced with respect to the drivers of energy use, the two models should produce similar program savings estimates. Based on our experience analyzing the impacts of similar programs, the savings estimates produced by the PPR approach tend to be more precisely estimated (smaller standard errors) than those produced from the LFER model. This increase in precision occurs because the PPR accounts for groupwide pre-post consumption differences with a continuous term (ADClag) instead of a categorical term (post). Detailed descriptions of both model types are provided below.

Post-Period Regression

The PPR model controls for anomalous differences in energy usage between treatment and control group respondents by using lagged energy use as an explanatory variable. In other words, the model frames energy use in each calendar month of the post-program period as a function of both the treatment variable and energy use in the same calendar month of the pre-program year. The underlying logic is that any small systematic differences between the control and treatment respondents that remain, despite the randomization, will be reflected in differences in their past energy use, which is highly correlated with their current energy use. Including the lagged energy use in the model serves as a control for any such differences. The version the evaluation team estimated includes monthly fixed effects interacting with the pre-program energy use variable. These interaction terms allow pre-program usage to have a different effect on post-program usage in each calendar month.

Equation 1. Post-Period Regression

$$ADC_{kt} = \beta_0 + \beta_1 ADClag_{kt} + \beta_2 Treatment_k + \sum_j \beta_{3j} Month_{jt} + \sum_j \beta_{4j} Month_{jt} * ADClag_{kt} + \epsilon_{kt}$$

Where:

ADC_{kt} = The average daily usage in kilowatt-hours or therms for respondent k during billing cycle t. This is the dependent variable in the model.

$ADClag_{kt}$ = Respondent k's energy use in the same calendar month of the pre-treatment year as calendar month t.

$Treatment_k$ = A binary variable indicating whether respondent k is in the participant group (taking a value of 1) or the control group (taking a value of 0).

$Month_{jt}$ = A binary variable taking a value of 1 when $j=t$ and 0 otherwise.⁵⁵

ϵ_{kt} = The cluster-robust error term for respondent k during billing cycle t that accounts for heteroscedasticity and autocorrelation at the respondent level.

⁵⁵ If there are post-program months, the model has monthly dummy variables, with the dummy variable "month" being the only one to take a value of 1 at time t. These are, in other words, monthly fixed effects.

In this model, β_2 is the estimate of average daily energy savings due to the program. Program savings are the product of the average daily savings estimate and the total number of participant days in the analysis.

LFER

As with the PPR model, the LFER model combines cross-sectional and time series data. Unlike the PPR model, however, the LFER models the full set of pre- and post-program usage data. The regression essentially compares the pre- and post-program energy usage of participants to those in the control group to identify the effect of the program. The purpose of the respondent-specific fixed effect is to capture all systematic cross-respondent variation in electric energy usage that is not captured by the model. Like the lagged usage variable in the PPR model, the fixed effect represents an attempt to control for any small systematic differences between the treatment and control respondents that might occur in the data despite the randomization.

Equation 2. Linear Fixed Effects Regression

$$ADC_{kt} = \beta_{0kt} + \beta_1 Post_t + \beta_2 Treatment_k Post_t + \epsilon_{kt}$$

Where:

ADC_{kt} = The average daily usage in kilowatt-hours or therms for respondent k during billing cycle t. This is the dependent variable in the model.

β_{0kt} = The respondent-specific fixed effect at month-year t.

β_1 = The effect of being in the post-period on energy use to account for non-program effects that impact both the treatment and control groups.

$Post_t$ = A binary variable indicating whether bill cycle t is in the post-program period (taking a value of 1) or in the pre-program period (taking a value of 0).

β_2 = The estimate of treatment effects: the average daily energy savings per household due to behavioral program treatment.

$Treatment_k$ = A binary variable indicating whether respondent k is in the participant group (taking a value of 1) or in the control group (taking a value of 0).

ϵ_{kt} = The cluster-robust error term for respondent k during billing cycle t. Cluster-robust errors account for heteroscedasticity and autocorrelation at the respondent level.

Cross Program Participation Analysis

The HERs sent to treatment respondents included energy saving tips and marketing modules, some of which encouraged respondents to participate in other NIPSCO energy efficiency programs. To assess the interactions between these programs, the evaluation team analyzed both HER program and Behavioral program data for participation overlap to address two factors:

- **Participation lift:** Does the Behavioral program treatment influence participation in other energy efficiency programs?

- **Savings lift and adjustment:** What portion of savings from the Behavioral program was obtained through NIPSCO's other energy efficiency efforts?

As with the energy savings calculations, the control group acts as the counterfactual, for both participation and savings from other programs, to address the above questions and provide unbiased estimates through the RCT model.

First, the evaluation team assessed whether the Behavioral program increased participation in NIPSCO's other energy efficiency programs by comparing participation rates between control and treatment groups. If participation rates in other residential energy efficiency programs were the same across HER treatment and control groups, the savings estimates for HERs from the regression analysis were already net of savings from the other programs, and this indicates that the Behavioral program had no effect on participation in other energy efficiency programs.

However, if the Behavioral program channeled participants into other energy efficiency programs, then savings detected in the HER billing analysis would include savings that those other energy efficiency programs counted. For instance, if the Behavioral program increased participation in the HEA program, the increase in savings could be allocated to either the HER program or to HEAs provided through the Behavioral program (or some portion to each), but it could not be fully allocated to both programs simultaneously.

The evaluation team then calculated participant lift and savings lift and adjustment:

- **Participant lift:** Using participation flags, the evaluation team calculated a participation rate based on the number of accounts (either by individual or by household) that initiated participation in other tracked energy efficiency programs after the first report date. The difference in treatment and control participation in the post-treatment period is the participation lift.
- **Savings lift and adjustment:** The evaluation team estimated the energy savings associated with participation lift in other NIPSCO energy efficiency programs:
 - First the evaluation team calculated annual savings for all measures installed in the post-period.
 - Then, the evaluation team adjusted annual savings for each measure installation by the number of days per year during the post-period in which participants installed the measure while the account was active; this step is necessary to most accurately estimate the savings that the billing analysis would capture.
 - Next, the evaluation team determined the average household net savings per participant day (the number of days a household was active in each period) from other programs in the post-period for both the treatment and control groups.
 - Last, the evaluation team multiplied the average savings per participant day by the number of treatment group participant days in the post-period to identify the incremental savings attributable to other energy efficiency programs.

Appendix 8. Residential New Construction Program

Program Savings Methodology

The evaluation team's impact evaluation of the Residential New Construction program included homes with attributable electric savings and natural gas savings, including the following:

- HERS Legacy Silver Star, Gold Star, and Platinum Star Homes (natural gas and electric)
- HERS Base Silver Star, Gold Star, and Platinum Star Homes (natural gas and electric)
- HERS Plus Silver Star, Gold Star, and Platinum Star Homes (natural gas and electric) ⁵⁶
- Denoted with "+ Natural Gas Furnace 95% AFUE" in the natural gas measure name
- Denoted with "+ Central A/C 15.2 SEER2" in the electric measure name
- Denoted with "Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE" in the measure name
- ENERGY STAR Manufactured Homes
- Envelope only and Envelope + Heat Pump Water Heater (HPWH)
- Single- or double-wide

Estimating 2024 Program Impacts

HERS Legacy measures. The evaluation team applied per-unit realization rates from the 2023 evaluation to the Silver, Gold, and Platinum measures (gas and electric) that were carried over from the 2023 program design.

HERS Base and HERS Plus measures. The evaluation team evaluated gross savings for Residential New Construction program homes by drawing a random representative sample of 71 builder applications from 2024 participants and recorded critical home data such as square footage, insulation levels, air sealing, duct leakage, and HVAC efficiencies from HERS certificates. The evaluation team used this data to inform simulation model prototype values and calculated the sampled prototypes' electric and natural gas savings using REM/Rate v2023 data. Finally, the team applied the sample's realization rate to the overall deemed program savings to estimate *ex post* program-level savings for these measure groups.

The evaluation team found greater savings for electric energy and peak demand savings than the *ex ante* savings for HERS Base and HERS Plus measures. Meanwhile, natural gas savings were higher than *ex ante* assumed savings for HERS Base measures and lower for HERS Plus measures.

ENERGY STAR Manufactured Homes. The evaluation team evaluated gross savings for the program's ENERGY STAR Manufactured Homes by creating two baseline and three efficient models in REM/Rate v2023.

⁵⁶ A participating home can qualify for a HERS Plus rebate for one fuel type and a HERS Base rebate for the other (e.g., Gold 58-57 Gas Only + Natural Gas Furnace 95% AFUE and Gold 58-57 Electric Only). Combo customers received the HERS Plus rebate for both gas and electric fuel types.

The difference between the baseline model and the efficient model equated electric energy and demand savings. The evaluation team found less savings for electric energy and more savings for peak demand than the *ex ante* savings for manufactured home measures.

HERS Certificate Review

The evaluation team reviewed 71 Ekotrope-generated HERS reports out of 525 projects in the 2024 general population.⁵⁷ The sample represents 28 of 233 natural gas service-only homes, 40 of 272 electric- and natural gas- service homes, and three of 11 combo homes (combo fuel type represents a home that received both gas and electric rebates with high-efficient heating and cooling systems installed). No reports represented the single electric-only home.⁵⁸ Based on these reports, the evaluation team compiled the homes’ characteristics, such as their insulation levels, air tightness, equipment efficiencies, and square footage, into a database for energy modeling.

Table 333 shows the number of participating homes in 2024 and the sample of these homes by fuel type.

Table 333. 2024 Residential New Construction Program HERs Certificate Sample by Fuel

FUEL	PARTICIPATING HOMES	SAMPLE
Natural Gas-Only	233	28
Electric and Gas	272	40
Electric-Only	9	0
Combo	11	3
TOTAL	525	71

Table 334 shows the number of participating homes in 2024 and the sample of these homes by measure type.

Table 334. 2024 Residential New Construction Program HERs Certificate Sample by Measure

MEASURE	PARTICIPANT HOMES	PERCENT OF PARTICIPANT TOTAL	SAMPLE	PERCENT OF SAMPLE
Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE and Silver 61-59 Electric-Only	71	14%	10	14%
Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	135	26%	17	24%
Silver 61-59 Gas-Only and Silver 61-59 Electric-Only	62	12%	8	11%
Silver 61-59 Gas-Only	12	2%	1	1%
Silver 61-59 Electric-Only	4	1%	0	0%

⁵⁷ The general population for the 2024 program HERS certificate sample excludes 2023 legacy and manufactured home projects.
⁵⁸ The 2024 program year issued a total of 328 electric rebates, including electric only, electric and natural gas, and combo rebates, and 780 natural gas rebates, including natural gas only, electric and natural gas, and combo rebates.

MEASURE	PARTICIPANT HOMES	PERCENT OF PARTICIPANT TOTAL	SAMPLE	PERCENT OF SAMPLE
Silver 61-59 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	2	0%	1	1%
Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE and Gold 58-57 Electric-Only	34	6%	7	10%
Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	32	6%	4	6%
Gold 58-57 Gas-Only and Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	1	0%	0	0%
Gold 58-57 Gas-Only and Gold 58-57 Electric-Only	38	7%	5	7%
Gold 58-57 Gas-Only	1	0%	0	0%
Gold 58-57 Electric-Only	2	0%	0	0%
Gold 58-57 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	2	0%	1	1%
Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE and Platinum ≤ 56 Electric-Only	34	6%	6	8%
Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	51	10%	6	8%
Platinum ≤ 56 Gas-Only and Platinum ≤ 56 Electric-Only	32	6%	4	6%
Platinum ≤ 56 Gas-Only	2	0%	0	0%
Platinum ≤ 56 Electric-Only + Central A/C15.2 SEER2	2	0%	0	0%
Platinum ≤ 56 Electric-Only	1	0%	0	0%
Platinum ≤ 56 Combo Customer Central A/C 15.2 SEER2 + Natural Gas Furnace 95% AFUE	7	1%	1	1%
TOTAL	525	100%	71	100%

Table 335, below, presents the average home characteristics from the 2024 sample homes as found in the HERS certificates the evaluation team received. The table shows that homes with electric participation were larger than homes with natural gas. Homes with electric participation had a similar air conditioner SEER to homes with gas participation and all homes in the sample had natural gas furnaces. Water heating equipment

consisted of 13 electric water heaters, 29 natural gas tankless, and 29 natural gas storage water heaters in the sampled homes. (All but one of the electric water heaters was in a natural gas rebate home.) No homes in the 2024 sample had heat pump space conditioning or heat pump water heaters. Finally, the evaluation team did not have sufficient data to estimate the percentage of efficient light bulbs for the prototypes since Ekotrope generated certificates do not provide lighting details in rated homes. (All HERS certificates used Ekotrope modeling software.) Instead, the evaluation team updated the models with the assumption that interior, garage, and exterior light bulbs in homes built through the program were 100% efficient (100% LED interior, 99% LED/1% fluorescent exterior and garage).

Homes that participated in HERS Plus tiers were smaller, had greater ceiling insulation, lower wall insulation, and greater foundation wall insulation when compared to homes that participated in HERS Base tiers.

HERS Plus participating homes also had tighter envelopes but leakier ducts than HERS Base homes, and window U-factor was similar between the two tier types. The average HERS Base furnace AFUE was 92.1% and air conditioner SEER was 14.4 compared to HERS Plus averages of 96.5% AFUE and air conditioner SEER 15.0. Finally, all homes with ERVs participated in HERS Plus tiers and participated in both gas and electric incentives.

Table 335. 2024 Residential New Construction Program Home Characteristics

HOME CHARACTERISTIC	ELECTRIC HOMES ^a	NATURAL GAS HOMES ^a	HERS BASE HOMES ^a	HERS PLUS HOMES ^a
Sample Size	71	43	18	53
Participants	516	292	168	371
Precision at 90% Confidence ^b	9%	12%	18%	10%
Home Size	3,368	2,990	3,787	2,706
Ceiling R Value	39.3	42.1	38.7	43.2
Walls R Value	16.1	16.1	17.1	15.7
Basement Wall R Value	12.1	11.8	12.2	13.1
Windows U Factor ^c	0.301	0.298	0.301	0.296
Home Tightness ACH50 ^c	2.85	2.82	2.89	2.79
Duct Tightness CFM25/100 sq. ft. ^c	1.34	1.83	50.06	55.92
Furnace AFUE	94.8	95.3	92.1	96.5
Air Conditioner SEER	14.6	14.9	14.4	15.0
Percent High-Efficiency Lighting	100%	100%	100%	100%
Gas Water Heat Energy Factor	0.834	0.818	0.834	0.816
Electric Water Heat Energy Factor	0.950	0.922	N/A	0.922

HOME CHARACTERISTIC	ELECTRIC HOMES ^a	NATURAL GAS HOMES ^a	HERS BASE HOMES ^a	HERS PLUS HOMES ^a
Home with ERV	7	7	0	7

^a All values rounded.

^b The evaluation team calculated precision estimates based on each year's population and sample size, assuming standard variability. Note that the evaluation team did not calculate confidence and precision for individual metrics.

^c Lower value represents higher efficiency.

Table 336 compares program home characteristics from 2022 to 2024 sampled homes. The table shows that home size, home tightness, and duct tightness have decreased since 2021 while HVAC efficiencies have increased.

Table 336. Residential New Construction Program Home Historical Characteristics

HOME CHARACTERISTIC	PROGRAM YEAR			NOTES
	2022	2023	2024	
Sample Size	62	74	114	
Participants	260	729	808	Participation increased in 2024
Precision at 90% Confidence ^a	9%	9%	7%	
Home Size	3,276	2,424	3,225	Highest in 2024
Ceiling R Value	42	44	40	Slightly lower in 2024
Walls R Value	15	15	16	
Basement Wall R Value	11.2	11.3	12.0	
Windows U Factor ^b	0.292	0.292	0.300	
Home Tightness ACH50 ^b	2.81	2.99	2.84	Tight homes in 2024
Duct Tightness CFM25/100 sq. ft. ^b	1.63	2.12	1.53	Tight ducts in 2024
Furnace AFUE	94.9	95.3	95.0	
Air Conditioner SEER	13.6	14.2	14.7	SEER2 in 2024 converted to SEER, higher due to fed min change in 2023
Percent High-Efficiency Lighting	86%	100%	100%	
Gas Water Heat Energy Factor	0.635	0.845	0.828	Slightly lower in 2024 vs. 2023, much higher than 2022
Electric Water Heat Energy Factor	0.950	0.922	0.940	About the same in 2022

^a Cadmus calculated precision estimates based on each year's population and sample size, assuming standard variability. Cadmus expected most metrics to be estimated at 90% confidence. Note that Cadmus did not calculate confidence and precision for individual metrics.

^b Lower value represents higher efficiency.

HERS Prototype Modeling

The evaluation team updated some of the prototype assumptions in 2024. First, ERV and air cyclers were more common in 2024 HERS certificates than in previous years, representing 10% and 15% of all sampled home ventilation systems, respectively. (Exhaust-only ventilation represented 75% of all sampled homes.)⁵⁹ As a result, the evaluation included ventilation type as a new prototype definition in 2024. (In previous evaluations, ventilation system assumed exhaust-only systems in prototype models.) Homes with ERVs and air cyclers also were associated just with homes that only qualified for HERS Plus incentives.

Additionally, the evaluation included unconditioned basements as a foundation type category based on HERS certificate data; if a foundation R-value for a single-family home was missing and the floor R-value was greater than zero on the HERS certificate, the evaluation team assumed the foundation type to be an unconditioned basement for that home.

To evaluate electric and natural gas savings for the participating homes, the evaluation team developed 26 prototype energy models (17 natural gas and nine electric) using the characteristics of the homes documented in the HERS certificates. The models represented typical characteristics of the sampled participant homes as they varied by water heater type, foundation type, ventilation system type, and nearest weather station. The evaluation team established assumptions for the prototype energy models where the HERS certificates lacked the information necessary to complete the model in REM/Rate. These assumptions reflected typical construction industry methods and included the following:

- Single-family detached building types
- Two stories above grade if the home is greater than 1,800 square feet and contains more than three bedrooms
- Uninsulated slabs for unconditioned and conditioned basements
- R-10 sub-slab insulation for slab-on-grade homes
- 2" x 6" at 16" on center wall framing
- Heating and cooling setpoints at 70°F and 78°F, respectively, for the reference and prototype home
- Exhaust only ventilation efficiency 2.8 CFM/Watt and operates 24 hours per day (baseline airflow equals the design model airflow)⁶⁰

The evaluation used the following assumptions for Air Cycler and ERV ventilation systems:

- Air Cycler ventilation systems operate as an equivalent exhaust only system⁶¹
- ERV systems have 70% Adjusted Sensible Recovery Efficiency (ASRE) and 56% Adjusted Total Recovery Efficiency (ATRE) in the design model⁶²

⁶⁰ The Indiana Residential Code (IRC) requires that exhaust fans have a minimum efficacy of 2.8 cubic feet per minute (cfm) per watt for exhaust fans with an airflow rate of less than 90 cfm.

⁶¹ No measure exists in the IL TRM v12 for CFIS, thus the evaluation assumed no modeled savings for this measure.

⁶² Based on IL TRM v12 default values for single family ERV if brand and model are unknown.

Table 337 shows key input parameters for the baseline home used in the analysis, which referenced 2020 Indiana Statewide Residential Energy Code Version 1 (January 2020) values.⁶³

Table 337. 2024 Residential New Construction Program Baseline Home Characteristics

COMPONENT	BASELINE HOME
Cooling Setpoint	78 (prototype matches baseline)
Heating Setpoint	70 (prototype matches baseline)
Home Size	Same as prototype
Ceiling U-value	0.030
Above Grade Wall U-factor	0.067
Window and Door U-factor	0.035
Slab on grade R-value	10.0
Infiltration (ACH50)	5.0
Duct Leakage (CFM25/CFA)	0.02 supply / 0.02 return
Heating Capacity	Same as prototype
Gas Heat Forced Air AFUE	80%
Gas Heat Hydronic AFUE	82%
Cooling Capacity	Same as prototype
Cooling Efficiency*	14.0 SEER for AC units
ASHP Efficiency*	8.8 HSPF / 15.0 SEER
Lighting	90% LED, 0% Fluorescent
Appliance Efficiency	Same as prototype
Gas DHW	0.59 EF / 0.76 RE / 50 gal
Electric DHW	0.91 EF / 0.98 RE / 50 gal
Ventilation	Exhaust only 2.8 CFM/Watt, airflow same as prototype

*Efficiency values reflect Federal Minimum Efficiency updates to 13.4 SEER2 for air conditioners and 14.3 SEER2/7.5 HSPF2 for heat pumps in the northern region.

The team then developed average weighted therms, kWh, and kW savings by the number of sampled homes that fit into each prototype.

Table 338 shows the natural gas prototypes, as well as the modeled savings using the 2020 Indiana Statewide Residential Energy Code for baseline home characteristics.

⁶³ 2020 Indiana Statewide Residential Energy Code Version 2 was published in July 2022.

Table 338. 2024 Residential New Construction Program Natural Gas Prototype Models

FOUNDATION TYPE	VENTILATION TYPE	WATER HEATER FUEL	WATER HEATER TYPE	NEAREST WEATHER STATION	NUMBER OF HOMES	MODELED THERMS SAVINGS
Conditioned Basement	ERV	Gas	Tankless	South Bend	5	477.18
Conditioned Basement	Exhaust Only	Gas	Tankless	South Bend	16	408.63
Conditioned Basement	Exhaust Only	Gas	Tank	South Bend	21	345.72
Conditioned Basement	Air Cyclor	Gas	Tank	South Bend	1	243.03
Unconditioned Basement	ERV	Electric	Tank	South Bend	1	240.16
Unconditioned Basement	Exhaust Only	Gas	Tankless	South Bend	1	184.66
Slab on Grade	ERV	Gas	Tankless	South Bend	1	290.01
Slab on Grade	Air Cyclor	Gas	Tank	South Bend	1	183.68
Conditioned Basement	Air Cyclor	Gas	Tankless	South Bend	1	711.80
Slab on Grade	Air Cyclor	Electric	Tank	South Bend	1	154.95
Conditioned Basement	Exhaust Only	Gas	Tankless	Fort Wayne	1	375.02
Unconditioned Basement	Exhaust Only	Gas	Tankless	Fort Wayne	2	374.46
Unconditioned Basement	Exhaust Only	Electric	Tank	Fort Wayne	5	211.70
Unconditioned Basement	Air Cyclor	Gas	Tank	Fort Wayne	2	224.72
Slab on Grade	Exhaust Only	Electric	Tank	Fort Wayne	6	175.10
Slab on Grade	Air Cyclor	Gas	Tankless	Fort Wayne	1	194.43
Slab on Grade	Air Cyclor	Gas	Tank	Fort Wayne	4	171.56

Table 339, below, shows the electric prototypes and modeled savings. As with the natural gas homes, the evaluation team weighted the prototype home savings by the number of homes in the sample.

Table 339. 2024 Residential New Construction Program Electric Prototype Models

FOUNDATION TYPE	VENTILATION TYPE	WATER HEATER FUEL	WATER HEATER TYPE	NEAREST WEATHER STATION	NUMBER OF HOMES	MODELED KWH SAVINGS	MODELED KW SAVINGS
Conditioned Basement	ERV	Gas	Tankless	South Bend	5	1098.62	0.555
Conditioned Basement	Exhaust Only	Gas	Tankless	South Bend	15	1213.30	0.432
Conditioned Basement	Exhaust Only	Gas	Tank	South Bend	17	1049.82	0.320
Conditioned Basement	Air Cyclor	Gas	Tank	South Bend	1	1094.38	0.307

Unconditioned Basement	ERV	Electric	Tank	South Bend	1	1111.85	0.363
Unconditioned Basement	Exhaust Only	Gas	Tankless	South Bend	1	702.90	0.240
Slab on Grade	ERV	Gas	Tankless	South Bend	1	500.53	0.168
Slab on Grade	Air Cyclor	Gas	Tank	South Bend	1	992.76	0.096
Conditioned Basement	Exhaust Only	Gas	Tankless	Fort Wayne	1	1021.06	0.428

In addition, the evaluation team investigated ERV savings in prototype models for the 2024 program year. Table 340 shows the average prototype characteristics when grouped by a ventilation system. On average, envelope insulation, window U-value, and duct leakage varies little for prototypes by ventilation system type. Prototypes with ERVs had the highest average furnace AFUE but the lowest average air conditioner SEER2.

Table 340. Residential New Construction Program Average Prototype Characteristics by Ventilation System Type

VENTILATION SYSTEM	FRAMED WALL R-VAUE	WINDOW U-FACTOR	CEILING R-VALUE	FURNACE AFUE	COOLING SEER2	DUCT LEAKAGE (CFM25)	AIR LEAKAGE (ACH50)
Air Cyclor/CFIS (n=9)	16.22	0.28	46.11	96.33	14.79	59.20	3.14
Exhaust Only (n=11)	15.55	0.30	41.45	94.84	14.57	61.55	2.90
ERV (n=6)	16.33	0.29	44.67	96.90	13.70	59.73	3.47

Furthermore, prototypes with ERVs were typically larger than the other prototypes, as shown in Table 341.

Ultimately, prototypes with ERVs save approximately 24% more electric heating and cooling energy per square foot and 13% more gas heating energy than prototypes with exhaust-only ventilation.

Table 341. Residential New Construction Program Prototype Heating and Cooling Savings

VENTILATION SYSTEM	AVERAGE PROTOTYPE HOME AREA (SF)	AVERAGE MODELED ELECTRIC HEATING and COOLING SAVINGS (KWH/SF)	AVERAGE MODELED GAS HEATING SAVINGS (KBTU/SF)
Air Cyclor/CFIS (n=9)	2,209.67	0.174	9.30
Exhaust Only (n=11)	2,612.27	0.170	8.92
ERV (n=6)	2,753.00	0.210	10.08

ENERGY STAR Manufactured Homes Modeling

For the 2024 program year, NIPSCO used the deemed savings from 2023⁶⁴ and added the deemed savings from the Home Rebates program's ENERGY STAR Heat Pump Water Heater - ≥ 2.0 UEF measure (2,040.22 kWh/year) to derive savings for envelope plus heat pump water heater measures. For instance, the ENERGY STAR Manufactured Home Envelope + HPWH (≥ 2.20 UEF) - Single-Wide (w/Gas Heating) measure has a deemed savings value of 4,280.22 kWh/yr, which equals 2,240 kWh/yr (envelope savings) plus 2,040.22 kWh/year (water heater savings). This approach overestimated planned savings because the ENERGY STAR package assumes electric heating in its modeled savings, and the program's measures reference gas heating in the participating home.

To evaluate 2024 program year electric savings for the participating manufactured homes, the evaluation team developed five REM/Rate energy models (two baseline and three design models). The two baseline models consisted of a single-wide and a double-wide manufactured home, both with minimum efficiency gas heat, envelope, and electric storage DHW. The three design models consisted of the following:

- One single-wide unit with efficient gas heat and cooling, efficient envelope, and a heat pump water heater
- One double-wide unit with efficient gas heat and cooling, efficient envelope, and a heat pump water heater
- One double-wide unit with efficient gas heat and cooling, efficient envelope upgrades, and electric storage water heating

The evaluation used the following resources to document each model's characteristics:

- HUD guidelines
 - Baseline conditions regarding the envelope insulation levels and window efficiency
 - Baseline heating, cooling, and DHW equipment efficiency
- Minnesota baseline characterization study
 - Baseline air tightness (6.0 ACH50)⁶⁵
- Building Code
 - Baseline water flow rates
 - Heating /cooling temperature set points (baseline and design)
 - Baseline duct insulation
- ENERGY STAR literature⁶⁶
 - Design home envelope insulation levels

⁶⁴ For the 2023 program year, NIPSCO referenced the ENERGY STAR Manufactured Version 2 Cost Savings Summary to estimate 4,480.00 kWh/year savings for the "ENERGY STAR Manufactured Home - Envelope Only - Double Wide - Electric Savings - V3" measure. NIPSCO used the Envelope Only – Electric Savings (Double-wide) package in Thermal Zone 3 (Chicago, IL) scenario's cost savings value of \$672 and divided by the assumed electric rate \$0.15/kWh. NIPSCO then assumed a single-wide manufactured home would generate 50% of the energy savings of a double wide unit (2,240 kWh/yr).

⁶⁵ Minnesota Manufactured Homes Characterization and Performance Baseline Survey, prepared by Seventhwave, October 2016, page 51. https://mn.gov/commerce-stat/pdfs/card-report-seventhwave_2016.pdf

⁶⁶ https://www.energystar.gov/sites/default/files/asset/document/Manufactured%20Program%20Requirements%20Version%203_Rev%2001.pdf. Retrieved March 24, 2024.

- Design duct air leakage
- Clayton Home literature
 - Home dimensions (baseline and design)
 - 16' x 68' x 7.5' single-wide
 - 28' x 66' x 7.5' double-wide
 - Design home general practices used in manufacturing like methods and materials
 - Design home envelope insulation levels and air leakage
 - Design home window efficiency
 - Design home heating, cooling, and DHW equipment efficiency
- REM/Rate default values (baseline and design)
 - Attic area (calculation)
 - Duct surface area (calculation)
 - Dishwasher, clothes washer, and oven /range energy use
 - Insulation grade (Level I)
 - Gypsum thickness (0.5")
 - Exterior color (medium)
 - Framing factor (default)
 - Performance adjustment (100%)
- Illinois TRM v12 guidance (baseline and design)
 - Refrigerator and clothes dryer energy use

Table 342 outlines the modeling parameters the evaluation team used to calculate savings for the double-wide electric-only manufactured homes and Table 343 **Error! Reference source not found.** outlines the modeling parameters we used to calculate savings for the single-wide, electric-only manufactured homes that received incentives in 2024. The design home reflects the assumed construction methods based on available online information and may not reflect all the characteristics of the actual home, or the assumed characteristics used by ENERGY STAR. For instance, ENERGY STAR assumed no difference in whole-home infiltration while the evaluated models used 6.0 ACH50 in the baseline and 3.0 ACH in the design home, and home dimension assumptions differed slightly (ENERGY STAR model assumed 924 square feet single-wide and 1,568 square feet double-wide).

Table 342. Manufactured Home Modeling Parameter Summary – Double-Wide, Electric-Only

DOUBLE-WIDE - ELECTRIC ONLY WITH GAS HEAT MODEL PARAMETERS			
MODEL TYPE/NAME	BASELINE MANUFACTURED HOME (DOUBLE-WIDE WITH GAS HEAT)	ENERGY STAR MANUFACTURED HOME ENVELOPE + HPWH (≥2.20 UEF) - DOUBLE-WIDE (W/GAS HEATING)	ENERGY STAR MANUFACTURED HOME - ENVELOPE ONLY - DOUBLE-WIDE - ELECTRIC SAVINGS - V3
General Information			
IECC Climate Zone	5A, South Bend	5A, South Bend	5A, South Bend

DOUBLE-WIDE - ELECTRIC ONLY WITH GAS HEAT MODEL PARAMETERS			
Conditioned area (sf)	1,848	1,848	1,848
Volume (cu ft)	13,860	13,860	13,860
Housing Type	Mobile home	Mobile home	Mobile home
Number of stories	1	1	1
Number of Bedrooms	3	3	3
Foundation Type	Open crawl/raised floor	Open crawl/raised floor	Open crawl/raised floor
Framed Floor			
Area (sf)	1,848	1,848	1,848
Joist Size	1.5" x 7.5"; 16" o.c.	1.5" x 7.5"; 16" o.c.	1.5" x 7.5"; 16" o.c.
Floor width (ft)	28.0	28.0	28.0
Outrigger width (ft)	29.5	29.5	29.5
Batt: Uncompressed R-value	R-30	R-22	R-22
Batt: Uncompressed thickness (in)	7	7	7
Blanket: Uncompressed R-value	R-0	R-11	R-11
Blanket: Uncompressed thickness (in)	0	3	3
Center Section Insulation	Batt in Cavities	Batt w/uncompressed blanket	Batt w/uncompressed blanket
Outrigger Insulation	Batt in Cavities	Batt w/uncompressed blanket	Batt w/uncompressed blanket
Above Grade Wall			
Wall Construction	Standard Wood Frame	Standard Wood Frame	Standard Wood Frame
Stud Size	1.5" x 5.5"; 16" o.c.	1.5" x 5.5"; 16" o.c.	1.5" x 5.5"; 16" o.c.
Area (sf)	1,410	1,410	1,410
Continuous R-value	R-0	R-5	R-5
Frame Cavity Insulation R-value	R-21	R-16	R-16
Windows and Opaque Doors			
Window Area (sf)	169.2	169.2	169.2
Window U-factor / SHGC	0.300U / 0.330 SGHC	0.300U / 0.330 SGHC	0.300U / 0.330 SGHC
Door Area (sf)	36.0	36.0	36.0
Door R-value	2.50	3.33	3.33
Storm Door	Yes	Yes	Yes
Ceiling			
Ceiling Width (ft)	28.0	28.0	28.0
Ceiling Rise (ft)	0.0	0.0	0.0

DOUBLE-WIDE - ELECTRIC ONLY WITH GAS HEAT MODEL PARAMETERS			
Truss Height at Center (in)	18.0	18.0	18.0
Heel Height (in)	5.5	5.5	5.5
Ventilation Space (in)	1.0	1.0	1.0
Chord Size (w x h, in)	1.5" x 3.5";16" o.c.	1.5" x 3.5";16" o.c.	1.5" x 3.5";16" o.c.
Ceiling Area (sf)	1,848	1,848	1,848
Attic Area (sf)*	2,310	2,310	2,310
Insulation Type	Blown	Blown	Blown
Unrestricted R-Value	R-38	R-38	R-38
Unrestricted Depth (in)	12.0	12.0	12.0
Space Conditioning			
Heating System Cooling System	Gas Furnace 80% AFUE AC 13.4 SEER2 (14.0 SEER)	Gas Furnace 90% AFUE AC 14.3 SEER2 (15.0 SEER)	Gas Furnace 90% AFUE AC 14.3 SEER2 (15.0 SEER)
Location	Conditioned living space	Conditioned living space	Conditioned living space
Heating Setpoint Temperature	68	68	68
Cooling Setpoint Temperature	78	78	78
Thermostat Type	Manual	Programmable	Programmable
Water Heating and DHW Efficiencies			
Water Heater Type	Conventional	Heat Pump	Conventional
Water Heater Fuel	Electric	Electric	Electric
Water Heater Tank Size (Gal)	40.0	40.0	40.0
Energy Factor	0.933	4.029	0.933
Location	Conditioned Space	Conditioned Space	Conditioned Space
Flowrate <= 2.0 gpm	No	Yes	Yes
Insulation > R-3	No	Yes	Yes
Recirculation	None	None	None
Duct System			
Square feet served	1,848	1,848	1,848
Return Gills	5.0	5.0	5.0
Location	Mobile home belly	Mobile home belly	Mobile home belly
R value	R-8	R-8	R-8
Duct Surface Area (sf)*	499 Supply/462 Return	499 Supply/462 Return	499 Supply/462 Return
Measured Total Air Leakage (CFM25)	74.0	74.0	74.0
Duct Test Conditions	Post construction test	Post construction test	Post construction test
Whole Dwelling Infiltration			
Input type	Blower Door	Blower Door	Blower Door

DOUBLE-WIDE - ELECTRIC ONLY WITH GAS HEAT MODEL PARAMETERS			
Infiltration Value (ACH50)	6.0	3.0	3.0
Shelter Class	2.0	2.0	2.0
Code Verification	Tested	Tested	Tested
Cooling Season Strategy	Natural Ventilation	Natural Ventilation	Natural Ventilation
Mechanical Ventilation			
Mechanical Ventilation	Exhaust only	Exhaust only	Exhaust only
Hours/day	6.0	6.0	6.0
CFM	75.0	75.0	75.0
Fan Watts*	26.2	26.2	26.2
Lighting and Appliances			
Interior Lighting	50% LED/50% CFL	100% LED/0% CFL	100% LED/0% CFL
Exterior Lighting	50% LED/50% CFL	100% LED/0% CFL	100% LED/0% CFL
Garage Lighting	0.0	0.0	0.0
Refrigerator	435 kWh	376.7 kWh	376.7 kWh
Dishwasher*	Fed Min	ENERGY STAR Standard	ENERGY STAR Standard
Clothes Washer*	Standard 2018	ENERGY STAR 2018	ENERGY STAR 2018
Clothes Dryer	Electric 3.11 CEF	Electric 3.93 CEF	Electric 3.93 CEF
Range/Oven*	Electric	Electric	Electric

*REM/Rate default or calculated values

Table 343. Manufactured Home Modeling Parameter Summary – Single-Wide, Electric-Only

SINGLE-WIDE – ELECTRIC-ONLY WITH GAS HEAT MODEL PARAMETERS		
MODEL TYPE/NAME	BASELINE MANUFACTURED HOME (SINGLE-WIDE W GAS HEAT)	ENERGY STAR MANUFACTURED HOME ENVELOPE + HPWH (≥2.20 UEF) SINGLE-WIDE (W/GAS HEATING)
General Information		
IECC Climate Zone	5A, South Bend	5A, South Bend
Conditioned area (sf)	1,088	1,088
Volume (cu ft)	8,160	8,160
Housing Type	Mobile home	Mobile home
Number of stories	1	1
Number of Bedrooms	3	3
Foundation Type	Open crawl/raised floor	Open crawl/raised floor
Framed Floor		
Area (sf)	1,088	1,088

Joist Size	1.5" x 5.5"; 16" o.c.	1.5" x 7.5"; 16" o.c.
Floor width (ft)	16.0	16.0
Outrigger width (ft)	17.5	17.5
Batt: Uncompressed R-value	R-22	R-22
Batt: Uncompressed thickness (in)	7	7
Blanket: Uncompressed R-value	R-0	R-11
Blanket: Uncompressed thickness (in)	n/a	3
Center Section Insulation	Batt in Cavities	Batt w/uncompressed blanket
Outrigger Insulation	Batt in Cavities	Batt w/uncompressed blanket
Above Grade Walls		
Wall Construction	Standard Wood Frame	Standard Wood Frame
Stud Size	1.5" x 5.5"; 16" o.c.	1.5" x 5.5"; 16" o.c.
Area (sf)	1,260	1,260
Continuous R-value	R-0	R-5
Frame Cavity Insulation R-value	R-19	R-16
Windows and Opaque Doors		
Window Area (sf)	151.2	151.2
Window U-factor / SHGC	0.350U / 0.330 SGHC	0.310U / 0.220 SGHC
Door Area (sf)	36.0	36.0
Door R-value	2.50	3.33
Storm Door	Yes	Yes
Ceiling		
Ceiling Width (ft)	16.0	16.0
Ceiling Rise (ft)	0.0	0.0
Truss Height at Center (in)	18.0	18.0
Heel Height (in)	5.5	5.5
Ventilation Space (in)	1.0	1.0
Chord Size (w x h, in)	1.5" x 3.5"; 16" o.c.	1.5" x 3.5"; 16" o.c.
Ceiling Area (sf)	1,088	1,088
Attic Area (sf)*	1,360	1,360
Insulation Type	Blown	Blown
Unrestricted R-Value	R-22	R-38
Unrestricted Depth (in)	12.0	12.0

Space Conditioning		
Heating System Cooling System	Gas Furnace 80% AFUE AC 13.4 SEER2 (14.0 SEER)	Gas Furnace 90% AFUE AC 14.3 SEER2 (15.0 SEER)
Location	Conditioned living space	Conditioned living space
Heating Setpoint Temperature	68	68
Cooling Setpoint Temperature	78	78
Thermostat Type	Manual	Programmable
Water Heating and DHW Efficiencies		
Water Heater Type	Conventional	Heat Pump
Water Heater Fuel	Electric	Electric
Water Heater Tank Size (Gal)	40.0	40.0
Energy Factor	0.933	4.03
Location	Conditioned Space	Conditioned Space
Flowrate <= 2.0 gpm	No	Yes
Insulation > R-3	No	Yes
Recirculation	None	None
Duct System		
Square feet served	1,088	1,088
Return Gills	5.0	5.0
Location	Mobile home belly	Mobile home belly
R value	R-8	R-8
Duct Surface Area (sf)*	293.8 Supply/462 Return	499 Supply/272.0 Return
Measured Total Air Leakage (CFM25)	43.5	43.5
Duct Test Conditions	Post construction test	Post construction test
Whole Dwelling Infiltration		
Input type	Blower Door	Blower Door
Infiltration Value (ACH50)	6.0	3.0
Shelter Class	2.0	2.0
Code Verification	Tested	Tested
Cooling Season Strategy	Natural Ventilation	Natural Ventilation
Mechanical Ventilation		
Mechanical Ventilation	Exhaust only	Exhaust only
Hours/day	6.0	6.0
CFM	75.0	75.0

Fan Watts*	26.2	26.2
Lighting and Appliances		
Interior Lighting	50% LED/50% CFL	100% LED/0% CFL
Exterior Lighting	50% LED/50% CFL	100% LED/0% CFL
Garage Lighting	0.0	0.0
Refrigerator	435 kWh	376.7 kWh
Dishwasher*	Fed Min	ENERGY STAR Standard
Clothes Washer*	Standard 2018	ENERGY STAR 2018
Clothes Dryer	Electric 3.11 CEF	Electric 3.93 CEF
Range/Oven*	Electric	Electric

*REM/Rate default or calculated value

Table 344 shows the modeled usage for the baseline and design manufactured home with savings equal to the delta of the two.

Table 344. 2024 Residential New Construction Program Manufactured Home Model Usage and Savings

MANUFACTURED HOMES - ENERGY USE SUMMARY				
MANUFACTURED HOME MEASURE	UNIT	BASELINE	ENERGYSTAR/CLAYTON HOMES	SAVINGS
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Single- Wide (w/Gas Heating)	Total Electric Consumption (kWh)	7,702.55	4,492.75	3,209.79
	Electric Heating Consumption (kWh)	477.51	297.71	179.80
	Electric Cooling Consumption (kWh)	547.83	235.51	312.31
	Electric Hot Water Consumption (kWh)	3,136.08	634.68	2,501.40
	Electric Lighting and Appliance Consumption (kWh)	3,541.14	3,324.85	216.29
	Peak Summer Total Load (kW)	2.297	1.624	0.673
	Natural Gas Total Consumption (Therms)	476.92	342.91	134.01
ENERGY STAR Manufactured Home Envelope + HPWH (≥2.20 UEF) - Double- Wide (w/Gas Heating)	Total Electric Consumption (kWh)	8,826.34	5,710.44	3,115.91
	Electric Heating Consumption (kWh)	680.18	463.62	216.56
	Electric Cooling Consumption (kWh)	585.37	429.84	155.53
	Electric Hot Water Consumption (kWh)	3,136.11	634.69	2,501.41
	Electric Lighting and Appliance Consumption (kWh)	4,424.70	4,182.29	242.41
	Peak Summer Total Load (kW)	2.898	2.266	0.633
	Natural Gas Total Consumption (Therms)	616.92	464.44	152.48
ENERGY STAR Manufactured Home - Envelope Only - Double-Wide - Electric Savings - V3	Total Electric Consumption (kWh)	8,826.34	7,972.00	854.34
	Electric Heating Consumption (kWh)	680.18	463.62	216.56
	Electric Cooling Consumption (kWh)	585.37	572.38	12.99
	Electric Hot Water Consumption (kWh)	3,136.11	2,753.71	382.39

Electric Lighting and Appliance Consumption (kWh)	4,424.70	4,182.29	242.41
Peak Summer Total Load (kW)	2.898	2.628	0.271
Natural Gas Total Consumption (Therms)	616.92	420.11	196.81

The Envelope + HPWH (≥ 2.20 UEF) – Single-Wide (w/Gas Heating) measure has greater electric savings than the Envelope + HPWH (≥ 2.20 UEF) – Double-Wide (w/Gas Heating) measure primarily due to stricter HUD requirements (baseline) for envelope efficiency in double-wide units than single-wide units.

Calculating Realization Rates

The evaluation team created program-level realization rates by comparing the average weighted evaluated savings informed by the prototype models (*ex post*) to the average weighted reported savings (*ex ante*). The natural gas savings realization rates were 151% (HERS Base), 76% (HERS Plus), and 65% (2023 Legacy), indicating an underestimation in reported savings for HERS Base measures and an overestimation in reported savings for HERS Plus measures.

Realization rates for electric energy were 194% (HERS Base), 134% (HERS Plus), and 110% (2023 Legacy), indicating an underestimation in reported savings for HERS Base measures and HERS Plus measures. Realization rates for electric demand were 136% (HERS Base), 39% (HERS Plus), and 104% (2023 Legacy), indicating an underestimation in reported savings for HERS Base measures and an overestimation in reported savings for HERS Plus measures.⁶⁷ Table 345 shows the realization rates for each HERS incentive type.

Table 345. 2024 Residential New Construction Program HERS Measure Realization Rates

INCENTIVE TYPE	METRIC	SAMPLE	SAMPLE WEIGHTED AVERAGE REPORTED (EX ANTE) SAVINGS	SAMPLE WEIGHTED AVERAGE EVALUATED (EX POST) SAVINGS	REALIZATOIN RATE
HERS Base	Therms Savings	18	244.04	368.32	151%
	kWh Savings	17	563.60	1,092.59	194%
	kW Savings	17	0.280	0.380	136%
HERS Plus	Therms Savings	52	415.32	314.65	76%
	kWh Savings	26	766.36	1,030.01	134%
	kW Savings	26	1.011	0.391	39%
HERS Legacy	Therms Savings	n/a	307.40	201.07	65%
	kWh Savings	n/a	460.63	506.50	110%
	kW Savings	n/a	0.240	0.250	104%

Table 346 shows the realization rates for each ENERGY STAR Manufactured Home incentive type in 2024. The electric kWh realizations rates were 19% for the Envelope Only – Double-Wide – Electric Savings – V3 measure, 48% for the Envelope + HPWH (≥ 2.20 UEF) – Double-Wide (w/Gas Heating) measure, and 75% for the Envelope

⁶⁷ NIPSCO used the results of the 2022 evaluation to inform the 2024 *ex ante* estimate for natural gas. For this report, the evaluation team defined an over- or underestimate as a difference of +/- 15% between the evaluated amount and the reported amount. 2023 Legacy measures were not sampled, and the evaluation applied the realization rates from the 2023 evaluation.

+ HPWH (≥ 2.20 UEF) – Single-Wide (w/Gas Heating) measure, indicating an overestimation in reported savings for these manufactured home measures. The evaluation team did not calculate realization rates for electric demand (zero savings in *ex ante*) and natural gas. (There were no gas savings for electric-only measures.)

Table 346. 2024 Residential New Construction Program ENERGY STAR Manufactured Home Measure Realization Rates

INCENTIVE TYPE	METRIC	REPORTED (EX ANTE) SAVINGS	EVALUATED (EX POST) SAVINGS	REALIZATION RATE
Envelope Only – Double-Wide – Electric Savings - V3	Therms Savings	n/a	n/a	n/a
	kWh Savings	4,480.00	854.34	19%
	kW Savings	0.000	0.633	n/a
Envelope + HPWH (≥ 2.20 UEF) – Double- Wide (w/Gas Heating)	Therms Savings	n/a	n/a	n/a
	kWh Savings	6,520.22	3,115.91	48%
	kW Savings	0.000	0.633	n/a
Envelope + HPWH (≥ 2.20 UEF) – Single- Wide (w/Gas Heating)	Therms Savings	n/a	n/a	n/a
	kWh Savings	4,280.22	3,209.79	75%
	kW Savings	0.000	0.633	n/a

Evaluated Savings Normalized to Home Area

The team normalized the evaluated savings to home area (square feet) for the HERS Base and HERS Plus measures to provide additional savings details to support future program design.

Table 347, below, shows the total evaluated electric energy savings normalized per square foot for each electric tier. Although electric participating homes with HERS Base electric incentives show greater savings per square foot than homes with HERS Plus incentives, approximately 96% of participant home area received HERS Base incentives compared to 4% of home area receiving HERS Plus incentives, which can skew results.

In general, the electric savings per square foot vary with tier level and tier type. The Silver HERS Plus electric tier saved much more than the Silver HERS Base tier (0.615 kWh/sf vs. 0.341 kWh/sf) and Gold HERS Plus tier saved less than the Gold HERS Plus tier at 0.171 kWh/sf and 0.300 kWh/sf, respectively. The Platinum tier showed similar savings between the HERS Base tier (0.342 kWh/sf) and the HERS Plus tier (0.345 kWh/sf). Silver HERS Base and Gold HERS Base demand savings were greater than their respective HERS Plus tiers, but the HERS Plus Platinum tier showed greater demand savings per square foot than the Platinum HERS Base tier. For all HERS Base tiers, electric rebated homes achieved 0.329 kWh/sf and 0.000114 kW/sf, and HERS Plus tiers saved 0.308 kWh/sf and 0.000117 kW/sf in 2024.

Table 347. 2024 Residential New Construction Program Electric Savings Normalized to Square Feet

ELECTRIC TIER	TIER TYPE	TOTAL AREA (SF)	TOTAL KWH	TOTAL KW	KWH/SF	KW/SF
Silver 61-59 Electric-Only	HERS Base	402,953.1	137,289.33	47.949	0.341	0.000119
Silver 61-59 Electric-Only + Central A/C 15.2 SEER2	HERS Plus	3,226.0	1,985.53	0.192	0.615	0.000059
Gold 58-57 Electric-Only	HERS Base	266,094.0	79,803.45	27.162	0.300	0.000102
Gold 58-57 Electric-Only + Central A/C 15.2 SEER2	HERS Plus	12,832.0	2,197.23	1.109	0.171	0.000086
Platinum ≤ 56 Electric-Only	HERS Base	230,689.8	78,999.03	27.804	0.342	0.000121
Platinum ≤ 56 Electric-Only + Central A/C 15.2 SEER2	HERS Plus	20,741.0	7,147.40	2.995	0.345	0.000144
Total HERS BASE		899,736.9	296,091.81	102.916	0.329	0.000114
Total HERS PLUS		36,799.0	11,330.16	4.296	0.308	0.000117
Total ALL		936,535.9	307,421.97	107.212	0.328	0.000114

Table 348, below, shows the total evaluated gas savings normalized per square foot for each tier. In general, the gas savings per square foot for HERS Plus tiers were greater than their respective HERS Base tiers, but the Gold tiers saved less therms/sf than the Silver and Platinum tiers. For all tiers, gas rebated HERS Base tiers saved 0.098 therms/sf and HERS Plus tiers saved 0.115 therms/sf in 2024.

Table 348. 2024 Residential New Construction Program Gas Savings Normalized to Square Feet

GAS TIER	TIER TYPE	TOTAL AREA (SF)	TOTAL THERMS	THERMS/SF
Silver 61-59 Gas-Only	HERS Base	241,478.4	25,810.97	0.107
Silver 61-59 Gas-Only + Natural Gas Furnace 95% AFUE	HERS Plus	496,072.6	56,908.49	0.115
Gold 58-57 Gas-Only	HERS Base	182,749.6	14,093.70	0.077
Gold 58-57 Gas-Only + Natural Gas Furnace 95% AFUE	HERS Plus	201,059.0	22,880.94	0.114
Platinum ≤ 56 Gas-Only	HERS Base	117,976.0	13,076.25	0.111
Platinum ≤ 56 Gas-Only + Natural Gas Furnace 95% AFUE	HERS Plus	291,356.9	34,146.45	0.117
Total HERS BASE		542,204.0	52,980.92	0.098
Total HERS PLUS		988,488.5	113,935.88	0.115
Total ALL		1,530,692.5	166,916.80	0.109

The 2023 Annual Report provided the following values (most conservative between 2022 and 2023 evaluations) for comparison:

- kWh (from 2023): 0.25 kWh/sf
- kW (from 2022): 0.000100 kW/sf
- Gas (from 2023): 0.081 therms/sf (Silver)
0.085 therms/sf (Gold)
0.089 therms/sf (Platinum)

Electric (kWh and demand) and gas savings per square foot increased in 2024 compared to the previous values stated in the 2023 annual report.

Appendix 9. School Education Program

Algorithms and Assumptions

This appendix contains the assumptions used in electric savings, demand reduction, and gas savings algorithms for the measures within the School Education program. The team examined each assumption behind the algorithms to capture savings and compared it against the Illinois TRM v12.0 and the Indiana TRM (v2.2), as well as other state and industry approaches. Detailed information on the analysis and supporting assumptions for the following School Education program measures are included within this appendix:

- Connected LEDs
- Bathroom Faucet Aerators
- Kitchen Faucet Aerators
- Low-Flow Showerheads
- LED Nightlights
- Advanced Power Strips
- Light Switch Gaskets
- Power Outlet Gaskets

Table 349 lists the assumptions of the *ex post* per-measure savings.

Table 349. 2024 School Education Program Measures

MEASURE	REVIEWED ASSUMPTIONS
Connected LED	New and baseline wattages, hours of use, waste heat factors, coincidence factor, standby power consumption, lighting control savings
Bathroom Faucet Aerator	New and baseline flow rates, people per house, minutes of use per day, faucets per home, drain factor, water temperatures, water heater fuel type and efficiency, coincidence factor
Kitchen Faucet Aerator	New and baseline flow rates, people per house, minutes of use per day, faucets per home, drain factor, water temperatures, water heater fuel type and efficiency, coincidence factor
Low-Flow Showerhead	New and baseline flow rates, people per house, minutes of use per day, showerheads per home, water temperatures, water heater fuel type and efficiency, coincidence factor
LED Nightlights	New and baseline wattages, hours of use
Advanced Power Strips	Deemed savings, hours of use, coincidence factor
Light Switch Gaskets	Deemed savings, leakage reduction, heating system fuel type and efficiency, coincidence factor
Power Outlet Gaskets	Deemed savings, leakage reduction, heating system fuel type and efficiency, coincidence factor

The algorithms and assumptions the evaluation team used to calculate *ex post* savings for these measures follow.

Connected LEDs

The team used the following equations to calculate the electric energy and peak demand savings, as well as natural gas energy penalties, for connected LEDs.

$$\begin{aligned}
 kWh \text{ savings per lamp} &= \left(\frac{WattsEE * Hours * SVGe * WHFe}{1,000} - Standby kWh \right) * ISR \\
 kW \text{ reduction per lamp} &= \left(\frac{WattsEE * SVGd * WHFd}{1,000} \right) * CF * ISR \\
 therm \text{ penalty per lamp} &= - \left(\frac{WattsEE * Hours * SVGe}{1,000} - Standby kWh \right) * \left(\frac{HF * 0.03412}{\eta_{Heat}} \right) * ISR
 \end{aligned}$$

Table 350 lists the input assumptions and source of each assumption for the connected LED measure savings calculations.

Table 350. *Ex Post* Variable Assumptions for Connected LEDs

INPUT	VALUE	SOURCE
WattsEE	9	Program data
Hours	1089	Illinois TRM v12.0
WHFe	1.06	Illinois TRM v12.0
WHFd	1.11	Illinois TRM v12.0
CF	0.128	Illinois TRM v12.0
ISR	88%	NIPSCO 2023 parent survey
SVGe	0.37	Illinois TRM v12.0
SVGd	0.37	Illinois TRM v12.0
Standby kWh	1.23	Actual from manufacturer spec sheet
HF	0.49	Illinois TRM v12.0
η_{Heat}	0.70	Illinois TRM v12.0

Faucet Aerators

The evaluation team used equations and assumptions from the Illinois TRM (v12.0) to calculate *ex post* per-measure energy savings and demand reduction for bathroom and kitchen faucet aerators:

$$\begin{aligned}
 \Delta kWh &= \%ElecDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * DF * \left(\frac{365.25 * PPH}{FPH} \right) * EPG_{elec} * ISR \\
 \Delta kW &= \frac{\Delta kWh * CF}{Hours} \\
 \Delta Therms &= \%FossilDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * DF * \left(\frac{365.25 * PPH}{FPH} \right) * EPG_{gas} * ISR
 \end{aligned}$$

Table 351 lists the input assumptions and the source of each assumption for the faucet aerator measure savings calculations.

Table 351. 2024 School Education Program *Ex Post* Variable Assumptions for Faucet Aerators

VARIABLE	VALUE		SOURCE
	BATHROOM	KITCHEN	
Baseline flow rate (GPM _{base})	1.53	1.63	Illinois TRM (v12.0)
Low-flow rate (GPM _{low})	0.94	0.94	Illinois TRM (v12.0)
Baseline faucet usage in minutes/person/day (L _{base})	1.6	4.5	Illinois TRM (v12.0)
Baseline faucet usage in minutes/person/day (L _{low})	1.6	4.5	Illinois TRM (v12.0)
People per household (PPH)	4.87	4.87	NIPSCO 2023 HEW
Faucets per household (FPH)	2.65	1	NIPSCO 2023 Parent Survey
Drain recovery factor (DF)	0.90	0.75	Illinois TRM (v12.0)
kWh per gallon of water used (EPGelec)	0.0879	0.1054	Illinois TRM (v12.0)
Therms per gallon of water used (EPGelec)	0.0038	0.0045	Illinois TRM (v12.0)
Hours	29	229	Illinois TRM (v12.0)
Coincidence factor (CF)	0.022	0.022	Illinois TRM (v12.0)
%ElectricDHW	20-23%	20-23%	NIPSCO 2023 HEW, varies by kit type
%GasDWH	64-70%	64-70%	NIPSCO 2023 HEW, varies by kit type
ISR	38%	40%	NIPSCO 2023 Parent Survey

Showerheads

The evaluation team used equations from the Illinois TRM (v12.0) to calculate *ex post* per-measure energy savings and demand reduction for low-flow showerheads:

$$\Delta kWh = \%ElecDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * SPCD * \left(\frac{365.25 * PPH}{SPH}\right) * EPG_{elec} * ISR$$

$$\Delta kW = \frac{\Delta kWh * CF}{Hours}$$

$$\Delta Therms = \%FossilDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * SPCD * \left(\frac{365.25 * PPH}{SPH}\right) * EPG_{gas} * ISR$$

Table 352 lists the input assumptions and the source of each assumption for the low-flow showerhead measure savings calculations.

Table 352. 2024 School Education Program *Ex Post* Variable Assumptions for Low-Flow Showerheads

VARIABLE	VALUE	SOURCE
Baseline flow rate (gpm _{base})	2.35	Illinois TRM (v12.0)
Low-flow rate (gpm _{low})	1.5	Illinois TRM (v12.0)
Baseline showerhead usage in minutes/person/day (L _{base})	7.8	Illinois TRM (v12.0)
Baseline low-flow showerhead usage in minutes/person/day (L _{low})	7.8	Illinois TRM (v12.0)
People per household (PPH)	4.87	NIPSCO 2023 HEW
Showers/capita/day (SPCD)	0.60	Illinois TRM (v12.0)
Showerheads per house (SPH)	1.95	NIPSCO 2023 Parent Survey
kWh per gallon of water used (EPG _{elec})	0.1253	Illinois TRM (v12.0)
Therms per gallon of water used (EPG _{gas})	0.0054	Illinois TRM (v12.0)
Hours	544	Illinois TRM (v12.0)
Coincidence factor (CF)	0.0278	Illinois TRM (v12.0)
%ElectricDHW	20-23%	NIPSCO 2023 HEW, varies by kit type
%GasDWH	64-70%	NIPSCO 2023 HEW, varies by kit type
ISR	31%	NIPSCO 2023 Parent Survey

LED Nightlights

The team used the following equations to calculate the electric energy savings for LED nightlights:

$$kWh \text{ savings} = \frac{(WattsBase - WattsEE) * IRF * Hours * WHFe * ISR}{1,000}$$

$$therms \text{ penalty} = \frac{-(WattsBase - WattsEE) * IRF * Hours * HF * 0.03412 * ISR}{1,000 * \eta_{Heat}}$$

Table 353 lists the input assumptions and the source of each assumption for the LED Nightlights measure savings calculations.

Table 353. *Ex Post* Variable Assumptions for LED Nightlights

INPUT	VALUE	SOURCE
WattsBase	7	IL TRM v12.0
WattsEE	0.33	Program data
Hours	4,380	IL TRM v12.0
WHFe	1.06	IL TRM v12.0
HF	0.49	IL TRM v12.0
ηHeat	0.70	IL TRM v12.0
IRF	8%	NIPSCO 2023 HEW
ISR	84%	NIPSCO 2023 parent survey

Advanced Power Strips

The team used the following equation to calculate electric energy savings for advanced power strips:

$$kWh \text{ savings} = kWh * ISR$$

$$kW \text{ reduction} = \frac{kWh \text{ savings}}{Hours} * CF$$

Table 354 lists the input assumptions and the source of each assumption for the advanced power strips measure savings calculations.

Table 354. *Ex Post* Variable Assumptions for Advanced Power Strips

INPUT	VALUE	SOURCE
kWh	103	IL TRM v12.0
ISR	86%	NIPSCO 2023 parent survey
Hours	7,129	IL TRM v12.0
CF	80%	IL TRM v12.0

Outlet and Switch Gaskets

The team used the following equation to calculate electric energy savings for outlet and switch gaskets:

$$kWh \text{ savings} = \%ElectricHeat * (kWhCool + kWhHeat) * ADJ_{RxAirsealing} * ISR$$

$$kW \text{ reduction} = \frac{\%Cool * kWh_{cooling}}{FLH_{cooling}} * CF * ISR$$

$$therm \text{ savings} = \%FossilHeat * Therms \text{ per unit} * ADJ_{RxAirsealing} * ISR$$

Table 355 lists the input assumptions and the source of each assumption for the outlet and switch gasket measure savings calculations.

Table 355. *Ex Post* Variable Assumptions for Outlet and Switch Gaskets

INPUT	VALUE	SOURCE
%ElectricHeat	19-27%	NIPSCO 2023 HEW, varies by kit type
%FossilHeat	63-68%	NIPSCO 2023 HEW, varies by kit type
kWh_heating	9.4	IL TRM v12.0 weighted average of Chicago heat pump and electric resistance values
%Cool	87%	Indiana TRM (v1.0), ResStock tab
kWh_cooling	1.2	IL TRM v12.0
ADJ_Rx_Airsealing	0.8	IL TRM v12.0
ISR (Light Switch Gaskets)	22%	NIPSCO 2023 parent survey
ISR (Power Outlet Gaskets)	14%	NIPSCO 2023 parent survey
FLH_cooling	709	IL TRM v12.0, Chicago single family value
CF	0.68	IL TRM v12.0
Therms per unit	0.47	IL TRM v12.0, Chicago value

Teacher and School Characteristics

Table 356 provides an overview of the characteristics of interviewed teachers.

Table 356. 2024 Teacher Interviews - Teacher Characteristics

TEACHER CHARACTERISTICS	HIGH SCHOOL	FIFTH GRADE
Number of Teachers Interviewed (n=8)	6	2
Subjects Taught	- Freshman Biology (Regular, Honors) (2) - Secondary Science (Freshman Biology, Upper-Level Environmental Science) (2) - Sophomore Biology (Biology/Human Systems) (1) - Freshman Earth Science (1)	One fifth-grade class
Teaching Tenure	1–25 years	4 years 18 years
Average Class Size	25 - 37 students (per course section)	25 students

Table 357 shows information about the schools of interviewed teachers.

Table 357. 2024 Teacher Interviews – School Firmographics

SCHOOL FIRMOGRAPHICS	HIGH SCHOOL	FIFTH GRADE
Number of Teachers Interviewed (n=8)	6	2
Number of Schools	4	2
School Location - County	Lake (3) Kosciusko (1)	Elkhart (2)
Grade Levels	9–12th grade (4)	K5–6th grade (1) 5–6th grade (1)
School Type	Public (4)	Public (2)
School Locale	Large Suburban (3) Distant Town (1)	Rural, Fringe (1) Small City (1)
Total Enrollment (Range)	600–700 (1) 2000–3000 (3)	400–500 (1) 900–1000 (1)
Race/Ethnicity Enrollment	Majority White, then Hispanic (3) Majority Black, then Hispanic/White (1)	Majority White, then Hispanic (1) Majority Hispanic, then White (1)
Languages Spoken at Home	Spanish, Serbian, Macedonia, Japanese, Arabic, French	Unknown
Free and reduced-price lunch eligibility	Yes (3) No (1)	Yes (2)

Source: National Center for Education Statistics, Search for Public Schools. <https://nces.ed.gov/ccd/schoolsearch/>

Appendix 10. HomeLife Calculator Program

Algorithms and Assumptions

This appendix contains the assumptions used in electric savings, demand reduction, and gas savings algorithms for the measures within the Homelife Calculator program. The team examined each assumption behind the algorithms to capture savings and compared it against the Illinois TRM v12.0 as well as other state and industry approaches. Detailed information on the analysis and supporting assumptions for the following Residential Homelife Calculator program measures are included within this appendix:

- Connected LEDs
- Bathroom faucet aerators
- Kitchen faucet aerators
- Low-flow showerheads
- LED Nightlights
- Advanced Power Strips
- Light Switch Gaskets
- Power Outlet Gaskets

Table 358 lists the assumptions of the *ex post* per-measure savings.

Table 358. 2024 HomeLife Calculator Program Measures

MEASURE	REVIEWED ASSUMPTIONS
Connected LEDs	New and baseline wattages, hours of use, waste heat factors, coincidence factor, standby power consumption, lighting control savings
Bathroom Faucet Aerators	New and baseline flow rates, people per house, minutes of use per day, faucets per home, drain factor, water temperatures, water heater fuel type and efficiency, coincidence factor
Kitchen Faucet Aerators	New and baseline flow rates, people per house, minutes of use per day, faucets per home, drain factor, water temperatures, water heater fuel type and efficiency, coincidence factor
Low-Flow Showerheads	New and baseline flow rates, people per house, minutes of use per day, showerheads per home, water temperatures, water heater fuel type and efficiency, coincidence factor
LED Nightlights	New and baseline wattages, hours of use
Advanced Power Strips	Deemed savings, hours of use, coincidence factor
Light Switch Gaskets	Deemed savings, leakage reduction, heating system fuel type and efficiency, coincidence factor
Power Outlet Gaskets	Deemed savings, leakage reduction, heating system fuel type and efficiency, coincidence factor

The algorithms and assumptions the evaluation team used to calculate *ex post* savings per measure follow.

Connected LEDs

The team used the following equations to calculate the electric energy and peak demand savings, as well as the natural gas energy penalties, for connected LEDs.

$$kWh \text{ savings per lamp} = \left(\frac{WattsEE * Hours * SVGe * WHFe}{1,000} - Standby kWh \right) * ISR$$

$$kW \text{ reduction per lamp} = \left(\frac{WattsEE * SVGd * WHFd}{1,000} \right) * CF * ISR$$

$$therm \text{ penalty per lamp} = - \left(\frac{WattsEE * Hours * SVGe}{1,000} - Standby kWh \right) * \left(\frac{HF * 0.03412}{\eta_{Heat}} \right) * ISR$$

Table 359 lists the input assumptions and source of each assumption for the connected LED measure savings calculations.

Table 359. *Ex Post* Variable Assumptions for Connected LEDs

INPUT	VALUE	SOURCE
WattsEE	9	Program data
Hours	1089	Illinois TRM v12.0
WHFe	1.06	Illinois TRM v12.0
WHFd	1.11	Illinois TRM v12.0
CF	0.128	Illinois TRM v12.0
ISR	83%	NIPSCO 2023 participant survey
SVGe	0.37	Illinois TRM v12.0
SVGd	0.37	Illinois TRM v12.0
Standby kWh	1.23	Actual from manufacturer spec sheet
HF	0.49	Illinois TRM v12.0
η_{Heat}	0.70	Illinois TRM v12.0

Faucet Aerators

The evaluation team used equations and assumptions from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for bathroom and kitchen faucet aerators:

$$\Delta kWh = \%ElecDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * DF * \left(\frac{365.25 * PPH}{FPH} \right) * EPG_{elec} * ISR$$

$$\Delta kW = \frac{\Delta kWh * CF}{Hours}$$

$$\Delta Therms = \%FossilDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * DF * \left(\frac{365.25 * PPH}{FPH} \right) * EPG_{gas} * ISR$$

Table 360. 2024 HomeLife Program *Ex Post* Variable Assumptions for Faucet Aerators

VARIABLE	VALUE		SOURCE
	BATHROOM	KITCHEN	
Baseline flow rate (GPM _{base})	1.53	1.63	Illinois TRM (v12.0)
Low-flow rate (GPM _{low})	0.94	0.94	Illinois TRM (v12.0)
Baseline faucet usage in minutes/person/day (L _{base})	1.6	4.5	Illinois TRM (v12.0)
Baseline faucet usage in minutes/person/day (L _{low})	1.6	4.5	Illinois TRM (v12.0)
People per household (PPH)	2.56	2.56	Illinois TRM (v12.0)
Faucets per household (FPH)	2.29	1	NIPSCO 2023 Participant Survey
Drain recovery factor (DF)	0.90	0.75	Illinois TRM (v12.0)
kWh per gallon of water used (EPG _{elec})	0.0879	0.1054	Illinois TRM (v12.0)
Therms per gallon of water used (EPG _{elec})	0.0038	0.0045	Illinois TRM (v12.0)
Hours	18	120	Illinois TRM (v12.0)
Coincidence factor (CF)	0.022	0.022	Illinois TRM (v12.0)
%ElectricDHW	16-27%	16-27%	NIPSCO 2023 Participant Survey, varies by kit type
%GasDWH	73-81%	73-81%	NIPSCO 2023 Participant Survey, varies by kit type
ISR	52%	60%	NIPSCO 2023 Participant Survey

Low-Flow Showerheads

The evaluation team used equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for low-flow showerheads:

$$\Delta kWh = \%ElecDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * SPCD * \left(\frac{365.25 * PPH}{SPH}\right) * EPG_{elec} * ISR$$

$$\Delta kW = \frac{\Delta kWh * CF}{Hours}$$

$$\Delta Therms = \%FossilDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * SPCD * \left(\frac{365.25 * PPH}{SPH}\right) * EPG_{gas} * ISR$$

Table 361. 2024 HomeLife Program *Ex Post* Variable Assumptions for Low-Flow Showerheads

VARIABLE	VALUE	SOURCE
Baseline flow rate (gpm _{base})	2.35	Illinois TRM (v12.0)
Low-flow rate (gpm _{low})	1.5	Illinois TRM (v12.0)
Baseline showerhead usage in minutes/person/day (L _{base})	7.8	Illinois TRM (v12.0)
Baseline low-flow showerhead usage in minutes/person/day (L _{low})	7.8	Illinois TRM (v12.0)
People per household (PPH)	2.56	Illinois TRM (v12.0)
Showers/capita/day (SPCD)	0.60	Illinois TRM (v12.0)
Showerheads per house (SPH)	1.74	NIPSCO 2023 Participant Survey
kWh per gallon of water used (EPG _{elec})	0.125	Illinois TRM (v12.0)
Therms per gallon of water used (EPG _{gas})	0.0054	Illinois TRM (v12.0)
Hours	286	Illinois TRM (v12.0)
Coincidence factor (CF)	0.0278	Illinois TRM (v12.0)
%ElectricDHW	16-27%	NIPSCO 2023 Participant Survey, varies by kit type
%GasDHW	73-81%	NIPSCO 2023 Participant Survey, varies by kit type
ISR	48%	NIPSCO 2023 Participant Survey

LED Nightlights

The team used the following equations to calculate electric energy savings for LED nightlights:

$$kWh \text{ savings} = \frac{(WattsBase - WattsEE) * IRF * Hours * WHFe * ISR}{1,000}$$

$$therms \text{ penalty} = \frac{-(WattsBase - WattsEE) * IRF * Hours * HF * 0.03412 * ISR}{1,000 * \eta_{Heat}}$$

Table 362 lists the input assumptions and the source of each assumption for the nightlights measure savings calculations.

Table 362. *Ex Post* Variable Assumptions for LED Nightlights

INPUT	VALUE	SOURCE
WattsBase	7	IL TRM v12.0
WattsEE	0.33	Program data
Hours	4,380	IL TRM v12.0
WHFe	1.06	IL TRM v12.0
HF	0.49	Illinois TRM v12.0
η _{Heat}	0.70	Illinois TRM v12.0
IRF	26%	NIPSCO 2023 Participant Survey

INPUT	VALUE	SOURCE
ISR	88%	NIPSCO 2023 Participant Survey

Advanced Power Strips

The team used the following equation to calculate electric energy savings for advanced power strips:

$$kWh\ savings = kWh * ISR$$

$$kW\ reduction = \frac{kWh\ savings}{Hours} * CF$$

Table 363 lists the input assumptions and source of each assumption for the advanced power strips measure savings calculations.

Table 363. *Ex Post* Variable Assumptions for Advanced Power Strips

INPUT	VALUE	SOURCE
kWh	103	IL TRM v12.0
ISR	89%	NIPSCO 2023 participant survey
Hours	7,129	IL TRM v12.0
CF	80%	IL TRM v12.0

Power Outlet and Light Switch Gaskets

The team used the following equation to calculate electric energy savings for power outlet and light switch gaskets:

$$kWh\ savings = \%ElectricHeat * (kWhCool + kWhHeat) * ADJ_{RxAirsealing} * ISR$$

$$kW\ reduction = \frac{\%Cool * kWh_{cooling}}{FLH_{cooling}} * CF * ISR$$

$$therm\ savings = \%FossilHeat * Therms\ per\ unit * ADJ_{RxAirsealing} * ISR$$

Table 364. *Ex Post* Variable Assumptions for Power Outlet and Light Switch Gaskets

INPUT	VALUE	SOURCE
%ElectricHeat	5-11%	NIPSCO 2023 Participant Survey, varies by kit type
%FossilHeat	85-93%	NIPSCO 2023 Participant Survey, varies by kit type
kWh_heating	9.4	IL TRM v12.0 weighted average of Chicago heat pump and electric resistance values
%Cool	81%	NIPSCO 2023 Participant Survey
kWh_cooling	1.2	IL TRM v12.0
ADJ_Rx_Airsealing	0.8	IL TRM v12.0
ISR (Light Switch Gaskets)	36%	NIPSCO 2023 Participant Survey
ISR (Power Outlet Gaskets)	35%	NIPSCO 2023 Participant Survey

INPUT	VALUE	SOURCE
FLH_cooling	709	IL TRM v12.0, Chicago single family value
CF	0.68	IL TRM v12.0
Therms per unit	0.47	IL TRM v12.0, Chicago value

Appendix 11. Residential Online Marketplace (OLM) Program

Algorithms and Assumptions

This appendix contains the assumptions used in electric savings, demand reduction, and gas savings algorithms for the measures within the Residential OLM program. The team examined each assumption behind the algorithms to capture savings and compared it against the Illinois TRM (v12.0) or the Indiana TRM (v1.0), as well as other state and industry approaches. Detailed information on the analysis and supporting assumptions for the 2024 Residential OLM program measures are included within this appendix:

- Advanced Refrigerator
- Air Purifier
- Wi-Fi Thermostat
- Energy Saver Kit – Smart LED Bulbs (2)
- Energy Saver Kit – Nightlight
- Energy Saver Kit – Low-Flow Showerhead
- Energy Saver Kit – Low-Flow Showerhead with ShowerStart
- Energy Saver Kit – Shower Timer
- Energy Saver Kit – Wi-Fi Thermostat

Advanced Refrigerator

The evaluation team used two equations from the Illinois TRM v12.0 to calculate electric energy and peak demand savings, as well as natural gas energy penalties for advanced refrigerators:

$$kWh\ savings_{Adv.\ Fridge} = (UEC_{base} - UEC_{ee}) * ISR$$
$$kW\ reduction_{Adv.\ Fridge} = \frac{kWh\ savings_{Adv.\ Fridge}}{8,766} * TAF * LSAF$$

Where:

UEC_{base}	=	Annual Unit Energy Consumption of existing unit (kWh)
UEC_{ee}	=	Annual Unit Energy Consumption of ENERGY STAR unit (kWh)
8,766	=	Annual active operating hours (= 5,844) ⁶⁸
TAF	=	Temperature Adjustment Factor
LSAF	=	Load Shape Adjustment Factor
ISR	=	In-service rate

Table 365 below, lists the assumptions and sources of each assumption for APS tier 1 measure savings calculations.

⁶⁸ This value is consistent with the U.S. EPA and U.S. DOE Room Air Purifier Calculator assumption of 16 hours per day (16 * 365.25 = 5,844).

Table 365. *Ex Post* Variable Assumption for APS Tier 1

INPUT	VALUE	SOURCE
UEC _{base}	Actual	Participant data or ENERGY STAR database
UEC _{ee}	Actual	Participant data or ENERGY STAR database
8,766	8,766	IL TRM (v12)
TAF	1.3	IL TRM (v12)
LSAF	1.057	IL TRM (v12)
ISR	1.0	IL TRM (v12)

Air Purifier

The evaluation team used two equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for air purifiers based on clean air delivery rate:

$$\begin{aligned}
 kWh\ savings_{Air\ Purifier} &= (\Delta kWh_{base} - \Delta kWh_{eff}) * ISR \\
 \Delta kWh_{base} &= hours * \left(\frac{SCADR_{base}}{SCADR_{PW_{base}} * 1,000} \right) + \left((8,760 - hours) * \frac{POMP_{base}}{1,000} \right) \\
 \Delta kWh_{eff} &= hours * \left(\frac{SCADR_{eff}}{SCADR_{PW_{eff}} * 1,000} \right) + \left((8,760 - hours) * \frac{POMP_{eff}}{1,000} \right) \\
 kW\ reduction_{Air\ Purifier} &= \frac{kWh\ savings_{Air\ Purifier}}{Hours} * CF
 \end{aligned}$$

Where:

ΔkWh_{base}	=	Annual Electrical Usage for baseline unit (kWh)
ΔkWh_{eff}	=	Annual Electrical Usage for efficient unit (kWh)
Hours	=	Annual active operating hours (= 5,844) ⁶⁹
SCADR _{base}	=	Smoke CADR for baseline units
SCADR _{eff}	=	Smoke CADR for efficient unit
SCADR _{PW_base}	=	Smoke CADR delivery rate per watt for baseline units
SCADR _{PW_eff}	=	Smoke CADR delivery rate per watt for efficient units
POMP _{base}	=	Partial On Model Power for baseline units by category (watts)
POMP _{eff}	=	Partial On Model Power for efficient units by category (watts)

⁶⁹ This value is consistent with the U.S. EPA and U.S. DOE Room Air Purifier Calculator assumption of 16 hours per day (16 * 365.25 = 5,844).

CF	=	Summer peak coincidence factor (= 0.667) ⁷⁰
ISR	=	In-service rate

Table 366 lists the assumptions and source of each assumption for APS tier 1 measure savings calculations.

Table 366. *Ex Post* Variable Assumption for Air Purifier

INPUT	VALUE	SOURCE
SCADR_base	Actual	IL TRM (v12) lookup table
SCADR_eff	Actual	Participant data or ENERGY STAR database
SCADR_PW_base	Actual	IL TRM (v12) lookup table
SmokeCADR_PW_eff	Actual	Participant data or ENERGY STAR database
POMP_base	Actual	IL TRM (v12) lookup table
POMP_eff	Actual	Participant data or ENERGY STAR database
Hours	5,844	IL TRM (v12)
CF	0.667	IL TRM (v12)
ISR	1.0	IL TRM (v12)

Wi-Fi Thermostat

The evaluation team used three main equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy, demand reduction, and gas savings for both free and purchased Wi-Fi thermostats:

$$kWh\ savings_{TStat} = (\Delta kWh_{Cooling} + \Delta kWh_{Heating}) * ISR$$

$$\Delta kWh_{Heat} = \%ElectrHeat * ElecHeat_{Cons} * Heat_{Reduction} * HF + (\Delta Therms * Fe * 29.3)$$

$$\Delta kWh_{Cool} = \%AC * \left(\frac{FLH * Capacity}{SEER2 * 1,000} \right) * Cool_{Reduction}$$

$$kW\ reduction_{TStat} = \%AC * CoolDR * \left(\frac{Capacity}{EER2 * 1,000} \right) * CF * ISR$$

$$Therms_{TStat} = \%FossilHeat * GasHeat_{Cons} * Heat_{Reduction} * HF * ISR$$

Where:

%ElectrHeat	=	Percentage of heating savings assumed to be electric
%FossilHeat	=	Percentage of heating savings assumed to be Natural Gas
ElecHeat _{Cons}	=	Annual household heating consumption for electrically heated homes
GasHeat _{Cons}	=	Annual household heating consumption for gas heated homes

⁷⁰ This value assumes that purifier usage is evenly spread throughout the year; therefore, coincident peak is calculated as 66.7% (5,844 / 8,766).

Heat _{Reduction}	=	Percentage reduction in total house heating energy consumption due to thermostat installed
Cool _{Reduction}	=	Percentage reduction in total house cooling energy consumption due to advanced thermostat installed
CoolDR	=	Assumed average percentage reduction in total household cooling demand
Capacity	=	Size of AC unit
HF	=	Household factor
FLH	=	Annual household full load cooling hours for AC equipment
ΔTherms	=	Therm savings if Natural Gas heating system
Fe	=	Furnace Fan energy consumption as a percentage of fuel consumption
29.3	=	kWh per therm
%AC	=	Fraction of customers with thermostat-controlled air-conditioning
SEER2	=	Seasonal Energy Efficiency Ratio rating of cooling equipment (Btu/kWh)
EER2	=	Energy Efficiency Ratio of existing cooling system (Btu/kWh)
CF	=	Summer peak coincidence factor (= 0.667) ⁷¹
ISR	=	In-service rate
	=	Free Wi-Fi Thermostat = 58%
	=	Purchased Wi-Fi Thermostat = 77.1%

Table 367 lists the assumptions and source of each assumption for Wi-Fi thermostats measure savings calculations.

Table 367. *Ex Post* Variable Assumption for Wi-Fi Thermostats

INPUT	VALUE	SOURCE
Electric heating savings (%ElectrHeat)	100.0%	IL TRM (v12)
Gas heating savings (%GasHeat)	100.0%	IL TRM (v12)
Electric heating consumption (ElecHeat _{Consump})	Lookup Table	IL TRM (v12)
Heating energy consumption (Heat _{Reduction})	8.50%	IL TRM (v12)
Cooling energy consumption (Cool _{Reduction})	8.40%	IL TRM (v12)

⁷¹ This value assumes that purifier usage is evenly spread throughout the year; therefore, coincident peak is calculated as 66.7% (5,844 / 8,766).

INPUT	VALUE	SOURCE
Cooling Demand Reduction (CoolDR)	16.40%	IL TRM (v12)
Capacity of AC unit (Capacity)	Actual	Participant data or ENERGY STAR database
Household Factor (HF)	100.0%	IL TRM (v12)
Annual Household full load cooling hours (FLH)	779	IL TRM (v12)
Natural Gas savings (Δ Therms)	Calculated	IL TRM (v12)
Furnace fan energy consumption (Fe)	3.14%	IL TRM (v12)
kWh to therms (29.3)	29.3	IL TRM (v12)
Fraction of TStat controlled AC (%AC)	82.50%	IL TRM (v12)
Seasonal energy efficiency ratio (SEER2)	11.15	IL TRM (v12)
Energy efficiency ratio (EER2)	10.00	IL TRM (v12)
Electric heating savings (%ElectrHeat)	100.0%	IL TRM (v12)
CF	0.34	IL TRM (v12)
ISR	0.580 / 0.771	2024 Res OLM survey / 2023 Res OLM survey

Energy Saver Kit – Smart LED Bulb (2)

The evaluation team used two equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for smart LEDs:

$$\Delta kWh = \left(\left(\left(\frac{Watts_{EE}}{1,000} \right) * hours * SVGe * WHFe \right) - StandbykWh \right) * (1 - Leakage) * ISR$$

$$\Delta kW = \left(\frac{Watts_{EE}}{1,000} \right) * SVGd * WHFd * (1 - Leakage) * CF * ISR$$

Where:

Watts _{EE}	=	Wattage of the LED bulb (Watts)
Hours	=	Average hours of use per year (hrs.)
SVGe	=	Percentage of annual lighting energy saved by lighting control
SVGd	=	Percentage of annual lighting demand saved by lighting control
WHF _e	=	Waste heat factor for energy to account for HVAC interactions with lighting - depends on location
WHF _d	=	Waste heat factor for demand to account for HVAC interactions with lighting - depends on location
StandbykWh	=	Standby power draw of the controlled lamp (kWh)
Leakage	=	Adjustment to account for the percentage of program bulbs that move out

CF	=	Summer peak coincidence factor
1,000	=	Constant to convert Watts to kW
ISR	=	In-service rate

Table 368 lists the input assumptions and sources of each assumption for the Smart LED measure savings calculations up through June 30, 2023.

Table 368. *Ex Post* Variable Assumptions for Smart LEDs

INPUT	VALUE	SOURCE
Watts _{EE}	9.0	Participant data
SVGe	0.37	IL TRM (v12)
SVGd	0.37	IL TRM (v12)
Hours	1,089	IL TRM (v12)
WHFe	1.06	IL TRM (v12)
WHFd	1.11	IL TRM (v12)
Standbykwh	0.63	IL TRM (v12)
Leakage	0	IL TRM (v12)
Coincidence Factor	0.128	IL TRM (v12)
ISR	0.669	IL TRM (v12)

Energy Saver Kit – Nightlight

The evaluation team used the following equation from the Illinois TRM v12.0 to calculate electric energy savings for LED nightlights:

$$\Delta kWh \text{ savings}_{Nightlight} = \frac{Watts_{base} - Watts_{EE}}{1,000} * (1 - Leakage) * hours * WHFe * ISR$$

$$\Delta kW \text{ reduction}_{Nightlight} = \frac{Watts_{base} - Watts_{EE}}{1,000} * (1 - Leakage) * WHFd * CF * ISR$$

$$\Delta Therms_{Nightlight} = \frac{Watts_{base} - Watts_{EE}}{1,000} * hours * HF * \frac{0.03412}{\eta_{Heat}} * ISR$$

Where:

Watts _{base}	=	Wattage of the bulb being replaced (Watts)
Watts _{EE}	=	Wattage of the LED bulb (Watts)
Hours	=	Average hours of use per year (hrs.)
WHF _e	=	Waste heat factor for energy to account for HVAC interactions with lighting - depends on location

WHF _d	=	Waste heat factor for demand to account for HVAC interactions with lighting - depends on location
Leakage	=	Adjustment to account for the percentage of program bulbs that move out
HF	=	Heating factor or percent of light savings that must be heated
η _{Heat}	=	efficiency in COP of heating equipment
CF	=	Summer peak coincidence factor
1,000	=	Constant to convert Watts to kW
ISR	=	In-service rate

Table 369 lists the input assumptions and source of each assumption for the LED nightlights measure savings calculations.

Table 369. *Ex Post* Variable Assumptions for Nightlights

INPUT	VALUE	SOURCE
Watts _{base}	7.0	IL TRM (v12)
Watts _{EE}	0.3	Participant data
Hours	1,089	IL TRM (v12)
WHFe	1.06	IL TRM (v12)
WHFd	1.11	IL TRM (v12)
Standbykwh	0.63	IL TRM (v12)
Leakage	0	IL TRM (v12)
HF	49%	IL TRM (v12)
η _{Heat}	Lookup Table	IL TRM (v12)
Coincidence Factor	0.128	IL TRM (v12)
ISR	0.772	IL TRM (v12)

Energy Saver Kit – Low-Flow Showerhead

The evaluation team used two equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for low-flow showerheads:

$$\begin{aligned}
 kWh\ savings_{LFSH} &= \%ElecDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * SPCD * \left(\frac{365.25 * PPH}{SPH} \right) * EPG_{elec} \\
 &\quad * ISR \\
 kW\ reduction_{LFSH} &= \frac{kWh\ savings_{LFSH} * CF}{Hours}
 \end{aligned}$$

$$\Delta Therms_{LFSH} = \%FossilDHW * ((GPM_{base} * L_{base}) - (GPM_{low} * L_{low})) * SPCD * \left(\frac{365.25 * PPH}{SPH} \right) * EPG_{gas} * ISR$$

Where:

%ElecDHW	=	Percentage of DHW savings assumed to be electric
GPM _{base}	=	Baseline flow rate of existing showerhead in gallons per minute (gal/min)
GPM _{low}	=	Efficient flow rate of low-flow showerhead in gallons per minute (gal/min)
L _{base}	=	Shower length of baseline showerhead in minutes (min/[ppl*day])
L _{low}	=	Shower length of low-flow showerhead in minutes (min/[ppl*day])
PPH	=	Average number of people per household (ppl/house)
SPCD	=	Showers Per Capita Per Day (shower/[ppl*day])
SPH	=	Average number of showerheads per household (showerhead/house)
EPG _{elec}	=	Energy per gallon of water supplied by electric water heater (kWh/gal) = (8.33 * 1.0 * (ShowerTemp - SupplyTemp)) / (RE _{electric} * 3412) = (8.33 * 1.0 * (101 – 50.7)) / (0.98 * 3412) = 0.1253 kWh/gal
Hours	=	Annual electric DHW recovery hours for faucet use per faucet (hrs.)
CF	=	Summer peak coincidence factor
ISR	=	In-service rate

Table 370 lists the input assumptions and source of each assumption for the kit low-flow showerhead measure savings calculations.

Table 370. *Ex Post* Variable Assumptions for Low-Flow Showerheads

INPUT	VALUE	SOURCE
Electric DHW savings (%ElecDHW)	37%	IN-TRM (v1.0), Tab: ReStock
Gas DHW savings (%GasDHW)	100%	IL TRM (v12)
Baseline flow rate (GPM _{base})	2.35	IL TRM (v12)
Low-flow rate (GPM _{low})	1.5	IL TRM (v12)
Baseline showerhead usage in minutes/person/day (L _{base})	7.8	IL TRM (v12)
Baseline low-flow showerhead usage in minutes/person/day (L _{low})	7.8	IL TRM (v12)
People per household (PPH)	2.42	IL TRM (v12)
Showers/capita/day (SPCD)	0.60	IL TRM (v12)
Showerheads per house (SPH)	1.64	IL TRM (v12)
Energy per gallon of water used (EPG _{elec})	0.125	IL TRM (v12)

INPUT	VALUE	SOURCE
Energy per gallon of water used (EPG _{gas})	0.0054	IL TRM (v12)
Hours	270*	IL TRM (v12)
Coincidence factor (CF)	0.0278	IL TRM (v12)
ISR	0.48	IL TRM (v12)

*The IL TRM value for hours is reported as 286 for efficiency kits; however, this value is calculated using a household size value of 2.56 which is associated with single-family homes. Given that the household type is unknown for participants, and that the program is eligible to all NIPSCO customers regardless of household status, the evaluation utilized the household size value of 2.42 which is appropriate for unknown household types.

Energy Saver Kit – ShowerStart

The evaluation team used the following equations from Illinois TRM v12.0 to calculate electric energy, peak demand, and natural gas energy savings for thermostatic restrictor shower valves (“ShowerStarts”):

$$\Delta kWh\ savings_{ShowerStart} = \%ElecDHW * (GPM_{base} * L_{shower}) * SPCD * \left(\frac{365.25 * PPH}{SPH} \right) * EPG_{elec} * ISR$$

$$EPG_{elec} = \frac{(8.33 * 1.0 * (ShowerTemp - SupplyTemp))}{RE_{elec} * 3,412}$$

$$\Delta kW\ reduction_{ShowerStart} = \frac{\Delta kWh\ savings_{ShowerStart}}{Hours} * CF$$

$$\Delta Therms_{ShowerStart} = \%FossilDHW * (GPM_{base} * L_{shower}) * SPCD * \left(\frac{365.25 * PPH}{SPH} \right) * EPG_{gas} * ISR$$

$$EPG_{gas} = \frac{(8.33 * 1.0 * (WaterTemp - SupplyTemp))}{RE_{gas} * 100,000}$$

Where:

%ElecDHW	=	Percentage of DHW savings assumed to be electric
%GasDHW	=	Percentage of DHW savings assumed to be gas
GPM _{base}	=	Baseline flow rate of existing showerhead in gallons per minute (gal/min)
L _{shower}	=	Shower length of baseline showerhead in minutes (min/[ppl*day])
PPH	=	Average number of people per household (ppl/house)
SPCD	=	Showers Per Capita Per Day (shower/[ppl*day])
SPH	=	Average number of showerheads per household (showerhead/house)
EPG _{elec}	=	Energy per gallon of hot water supplied by electric water heater (kWh/gal)
		= (8.33 * 1.0 * (ShowerTemp - SupplyTemp)) / (RE _{elec} * 3,412)
		= (8.33 * 1.0 * (101 - 50.7)) / (0.98 * 3,412) = 0.125 kWh/gal
EPG _{gas}	=	Energy per gallon of hot water supplied by gas water heater (Therm/gal)
		= (8.33 * 1.0 * (ShowerTemp - SupplyTemp)) / (RE _{gas} * 100,000)

$$= (8.33 * 1.0 * (101 - 50.7)) / (0.78 * 100,000) = 0.0054 \text{ Therms/gal}$$

ShowerTemp	=	Assumed temperature of mixed water (°F)
SupplyTemp	=	Assumed temperature of water entering house (°F)
Hours	=	Annual electric DHW recovery hours for faucet use per faucet (hrs.)
CF	=	Summer peak coincidence factor
8.33	=	Specific weight of water (lb./gallon)
1.0	=	Heat capacity of water (Btu/lb.-°F)
3,412	=	Constant to convert Btu to kWh
365.25	=	Days per year
100,000	=	Constant to convert Btu to therms
ISR	=	In-service rate

Table 371 lists the input assumptions and source of each assumption for the ShowerStart savings calculations.

Table 371. *Ex Post* Variable Assumptions for ShowerStarts

INPUT	VALUE	SOURCE
Electric DHW savings (%ElecDHW)	37%	IN-TRM (v1.0), Tab: ReStock
Gas DHW savings (%GasDHW)	100%	IL TRM (v12)
Baseline flow rate (GPM _{base})	2.35	IL TRM (v12)
Low-flow rate (GPM _{low})	1.5	IL TRM (v12)
Hot water waste time (L _{shower})	0.89	IL TRM (v12)
People per household (PPH)	2.42	IL TRM (v12)
Showers/capita/day (SPCD)	0.60	IL TRM (v12)
Showerheads per house (SPH)	1.64	IL TRM (v12)
Energy per gallon of water used (EPG _{elec})	0.125	IL TRM (v12)
Energy per gallon of water used (EPG _{gas})	0.0054	IL TRM (v12)
Hours	30.9*	IL TRM (v12)
Coincidence factor (CF)	0.0022	IL TRM (v12)
ISR	0.48	IL TRM (v12)

*The IL TRM value for hours is reported as 32.6 for efficiency kits; however, this value is calculated using a household size value of 2.56 which is associated with single-family homes. Given that the household type is unknown for participants, and that the program is eligible to all NIPSCO customers regardless of household status, the evaluation utilized the household size value of 2.42 which is appropriate for unknown household types.

Energy Saver Kit – Shower Timer

The evaluation team did not calculate electric energy, peak demand, and natural gas energy savings for this measure.

Energy Saver Kit – Wi-Fi Thermostat

The evaluation team used four equations from the Illinois TRM v12.0 to calculate *ex post* per-measure energy savings and demand reduction for Wi-Fi thermostats:

$$kWh\ savings_{TStat} = (\Delta kWh_{Cooling} + \Delta kWh_{Heating}) * ISR$$

$$\Delta kWh_{Heat} = \%ElectrHeat * ElecHeat_{Cons} * Heat_{Reduction} * HF + (\Delta Therms * Fe * 29.3)$$

$$\Delta kWh_{Cool} = \%AC * \left(\frac{FLH * Capacity}{SEER2 * 1,000} \right) * Cool_{Reduction}$$

$$kW\ reduction_{TStat} = \%AC * CoolDR * \left(\frac{Capacity}{EER2 * 1,000} \right) * CF * ISR$$

$$Therms_{TStat} = \%FossilHeat * GasHeat_{Cons} * Heat_{Reduction} * HF * ISR$$

Where:

$\%ElectrHeat$	=	Percentage of heating savings assumed to be electric
$\%FossilHeat$	=	Percentage of heating savings assumed to be Natural Gas
$ElecHeat_{Cons}$	=	Annual household heating consumption for electrically heated homes
$GasHeat_{Cons}$	=	Annual household heating consumption for gas heated homes
$Heat_{Reduction}$	=	Percentage reduction in total house heating energy consumption due to thermostat installed
$Cool_{Reduction}$	=	Percentage reduction in total house cooling energy consumption due to advanced thermostat installed
$CoolDR$	=	Assumed average percentage reduction in total household cooling demand
$Capacity$	=	Size of AC unit
HF	=	Household factor
FLH	=	Annual household full load cooling hours for AC equipment
$\Delta Therms$	=	Therm savings if Natural Gas heating system
Fe	=	Furnace Fan energy consumption as a percentage of fuel consumption
29.3	=	kWh per therm
$\%AC$	=	Fraction of customers with thermostat-controlled air-conditioning
$SEER2$	=	Seasonal Energy Efficiency Ratio rating of cooling equipment (Btu/kWh)
$EER2$	=	Energy Efficiency Ratio of existing cooling system (Btu/kWh)

CF = Summer peak coincidence factor (= 0.667)⁷²
 ISR = In-service rate

Table 372 lists the assumptions and sources of each assumption for Wi-Fi thermostats measure savings calculations.

Table 372. *Ex Post* Variable Assumption for Wi-Fi Thermostats

INPUT	VALUE	SOURCE
Electric heating savings (%ElectrHeat)	100.0%	IL TRM (v12)
Gas heating savings (%GasHeat)	100.0%	IL TRM (v12)
Electric heating consumption (ElecHeat _{Consump})	Lookup Table	IL TRM (v12)
Heating energy consumption (Heat _{Reduction})	8.50%	IL TRM (v12)
Cooling energy consumption (Cool _{Reduction})	8.40%	IL TRM (v12)
Cooling Demand Reduction (CoolDR)	16.40%	IL TRM (v12)
Capacity of AC unit (Capacity)	Actual	Participant data or ENERGY STAR database
Household Factor (HF)	100.0%	IL TRM (v12)
Annual Household full load cooling hours (FLH)	Lookup Table	IL TRM (v12)
Natural Gas savings (Δ Therms)	Calculated	IL TRM (v12)
Furnace fan energy consumption (Fe)	3.14%	IL TRM (v12)
kWh to therms (29.3)	29.3	IL TRM (v12)
Fraction of TStat controlled AC (%AC)	82.50%	IL TRM (v12)
Seasonal energy efficiency ratio (SEER2)	11.4	IL TRM (v12)
Energy efficiency ratio (EER2)	10.00	IL TRM (v12)
Electric heating savings (%ElectrHeat)	100.0%	IL TRM (v12)
CF	0.34	IL TRM (v12)
ISR	0.77	2023 Res OLM Survey

⁷² This value assumes that purifier usage is evenly spread throughout the year; therefore, coincident peak is calculated as 66.7% (5,844 / 8,766).

Free Thermostat Promotion Freeridership and Spillover Analysis

Freeridership

Intention Freeridership Score

The evaluation team estimated *intention* freeridership scores for free thermostat promotion participants based on their responses to the *intention*-focused freeridership questions. Table 373 illustrates how initial responses are translated into whether the response is “yes,” “no,” or “partially” indicative of freeridership (in parentheses). The value in brackets is the scoring decrement associated with each response option. Each participant freeridership score starts with 100%, which the evaluation team then decrements based on their responses to the first five questions. The initial intention score calculated from questions F1 to F5 is multiplied by the percentage of original installed quantity that the participants would most likely have purchased without the NIPSCO free thermostat promotion (question F6) to arrive at the final intention score for a participant. After assigning an *intention* freeridership score to every survey respondent who reported installing a program thermostat(n=40), the evaluation team calculated a gross savings-weighted average *intention* freeridership score of 10% for the free thermostat promotion.

Table 373. Raw Survey Responses Translation to Intention Freeridership Scoring Matrix Terminology and Scoring

F1. BEFORE YOU HAD HEARD ABOUT NIPSCO'S ONLINE MARKETPLACE, HAD YOU ALREADY PLANNED TO PURCHASE A SMART THERMOSTAT?	F2. WOULD YOU HAVE PURCHASED THE SAME SMART THERMOSTAT WITHOUT THE FREE THERMOSTAT PROMOTION FROM NIPSCO?	F3. WOULD YOU HAVE PURCHASED A DIFFERENT SMART THERMOSTAT WITHOUT THE FREE THERMOSTAT PROMOTION, OR WOULD YOU HAVE DECIDED NOT TO PURCHASE ONE AT ALL?	F4. WITHOUT THE FREE THERMOSTAT PROMOTION FROM THE NIPSCO ONLINE MARKETPLACE, WHAT KIND OF THERMOSTAT WOULD YOU HAVE PURCHASED?	F5. WHEN WOULD YOU HAVE PURCHASED THE THERMOSTAT IF THE NIPSCO ONLINE MARKETPLACE AND FREE THERMOSTAT PROMOTION HAD NOT BEEN AVAILABLE?	F6. HOW MANY SMART THERMOSTATS WOULD YOU HAVE PURCHASED IF THE FREE THERMOSTAT PROMOTION FROM THE NIPSCO ONLINE MARKETPLACE HAD NOT BEEN AVAILABLE?
Yes (Yes) [-0%]	Yes (Yes) [-0%]	I would have purchased a different thermostat (Yes) [-0%]	Smart thermostat (Yes) [-0%]	At the same time (Yes) [-0%]	OPEN ENDED [Final intention freeridership score = Initial intention freeridership score multiplied by (F7 response ÷ installed quantity)]
No (No) [-50%]	No (No) [-50%]	I would have decided not to purchase one at all (Yes) [-100%]	Programmable thermostat (No) [-100%]	Later, but within 12 months (Partial2) [-50%]	
Don't know (Partial) [-25%]	Don't know (Partial) [-25%]	Don't know (Partial) [-25%]	Manual thermostat (No) [-100%]	Within one to two years (No) [-100%]	
-	-	-	Would not have installed any new thermostat (No) [-100%]	More than two years (No) [-100%]	
-	-	-	Don't know (Partial) [-25%]	Never (No) [-100%]	
-	-	-	-	Don't know (Partial) [-25%]	

Influence Freeridership Score

The evaluation team assessed *influence* freeridership by asking participants how important the following program elements were in their purchasing decision-making process:

- Thesmart thermostat was free from NIPSCO
- Information about energy efficiency that NIPSCO provided
- Previous participation in a NIPSCO energy efficiency program

The evaluation team determined each respondent’s influence freeridership score for a measure using the maximum rating provided for any program element, as shown in Table 374. The evaluation team calculated a gross savings-weighted average *intention* freeridership score of 4% for the free thermostat promotion.

Table 374. 2024 Residential OLM Program Free Thermostat Promotion Influence Freeridership Assignment

MAXIMUM RATING	ASSIGNED INFLUENCE FREERIDERSHIP VALUE
1 – Not at all important	100%
2 – Not too important	75%
3 – Somewhat important	25%
4 – Very important	0%
Don’t know	50%
Not applicable	50%

Final Freeridership

The evaluation team calculated the mean of the *intention* and the *influence* of freeridership components to estimate final freeridership for the free thermostat promotion. A higher freeridership score translates to more savings deducted from the gross savings estimates. Table 375 lists the intention, influence, and final freeridership scores for the 2024 Residential OLM program free thermostat promotion.

Table 375. 2024 Residential OLM Program Free Thermostat Promotion Freeridership Score

MEASURE	INTENTION SCORE	INFLUENCE SCORE	FREERIDERSHIP SCORE
Free Promotion Wi-Fi Thermostats	10%	4%	7%

Participant Spillover

The evaluation team estimated participant spillover measure savings using specific information about participants, determined through the evaluation, using 2024 NIPSCO evaluation results and the Illinois TRM v.12.0 as a baseline reference.⁷³ The evaluation team estimated the percentage of program participant spillover by dividing the sum of additional spillover savings (as reported by survey respondents) by the total gross savings achieved by all survey respondents. The participant spillover estimates for the Residential OLM program free thermostat promotion, rounded to the nearest whole percent, was 0%, as shown in Table 376.

Table 376. 2024 Residential OLM Program Free Thermostat Promotion Participant Spillover Results

MEASURE	SPILLOVER SAVINGS (MMBTU)	PARTICIPANT PROGRAM SAVINGS (MMBTU)	PARTICIPANT SPILLOVER
Free Promotion Wi-Fi Thermostats	0.54	296.0	0%

^a Program savings include *ex post* therms savings in MMBtu calculation

⁷³ Nonparticipant spillover evaluation activities were not conducted for the 2024 program year.

Appendix 12. Commercial & Industrial (C&I) Programs

Algorithms and Assumptions

This appendix contains the assumptions used in electric savings, demand reduction, and gas savings algorithms for the sampled prescriptive measures within the C&I programs. The team examined each assumption behind the algorithms to capture savings, and we compared it against the Indiana TRM Workbook v1.0 and the Illinois TRM v12.0, as well as other state and industry approaches. Detailed information on the *ex post* savings analysis and supporting assumptions for the following C&I program measures are included within this appendix. Table 377 lists the sources and assumptions of the *ex post* per-measure savings for sampled measures.

Table 377. C&I Programs Sampled Measures

MEASURE	EX POST SOURCE	REVIEWED ASSUMPTIONS
Lighting Replacement	TRM IL v12.0, Measure 4.5.4	New and baseline wattages, hours of use, waste heat factors, coincidence factors
Lighting Power Density Reduction	TRM IL v12.0, Measure 4.5.7 ASHRAE 90.1-2007 or IECC 2018	Square footage, baseline allowed watts, installed watts, operating hours, waste heating factors, project start date
Lighting Controls	TRM IL v12.0 Measure 4.5.10	New and baseline wattages, hours of use, waste heat factors, coincidence factors
Refrigeration - ECM Freezer/ Refrigerator Motors	TRM IL v12.0 Measure 4.6.4	Savings per motor, hours of use
Refrigeration – Evap Fan Controls	TRM IL v12.0 Measure 4.6.6	Savings per motor, hours of use
Refrigeration – Auto Door Closers	TRM IL v12.0 Measure 4.6.1	Units, hours of use
Refrigeration – Strip curtains	TRM IL v12.0 Measure 4.6.7	Area of installation, type of installation, hours of use
Refrigeration – New Commercial Refrigeration Equipment	TRM IL v12.0, Measure 4.2.2, IN TRM Workbook v1.0 for CF	Type of equipment, hours of use
HVAC – Heating / Cooling Equipment Replacement	TRM IL v12.0 Several different commercial HVAC measures	Full load heating and cooling hours, equipment capacities, equipment efficiencies

MEASURE	EX POST SOURCE	REVIEWED ASSUMPTIONS
HVAC – VFDs Pumps and Fans	TRM IL v12.0 Measure 4.4.26	Motor size, motor efficiency, average equipment speed, operating hours, power consumption under baseline and VFD control
HVAC – Boiler Tune-Up	TRM IL v12.0 Measure 4.4.2	Equipment heating and cooling capacities, equipment heating and cooling efficiencies, equivalent full load hours
HVAC – Programmable Thermostats	TRM IL v12.0 Measure 4.4.48	Equipment heating and cooling capacities, equipment heating and cooling efficiencies, equivalent full load hours
Kitchen Equipment	TRM IL v12.0 Several Measures	Pounds of food cooked per day, equipment efficiency, idle energy rate, production capacity, preheat time, preheat energy, generally deemed savings per unit
Water Heating	TRM IL v12.0 Measure 4.3.1	Gallons per day of plant, equipment efficiency, equipment hot water temperature setpoint
Compressed Air - VFD	TRM IL v12.0 Measure 4.7.1	Equipment capacity, equipment performance, average CFM load, operating hours
Compressed Air – System Leak Repair	IN TRM Workbook v1.0	CFM reduction, CFM brake horsepower, hours of use

Lighting – Replacement

The evaluation team used the following equations from the Illinois TRM v12.0 vol 2 Measure 4.5.4 to calculate electric energy and peak demand savings, as well as natural gas energy penalties, for all LED bulbs. Note that exterior installed bulbs and fixtures do not have waste heat penalties applied as they have no impact on heating and cooling. Table 378, below, lists the input assumptions and source of each assumption for measure savings calculations.

$$\Delta kWh = \Delta kWh_{Elec} + ((1 - FS_{Gas}) * \Delta kWh_{Heating Penalty})$$

$$\Delta kWh_{Elec} = \frac{(W_{base} - W_{LED}) * (Hours) * (WHF_e)}{1,000}$$

Heating Penalty for electrically heated spaces:

$$\Delta kWh_{Heating Penalty} = \frac{(W_{base} - W_{LED}) * (Hours) * (-IFkWh)}{1,000}$$

Heating Penalty for fossil fuel heated spaces, or if unknown:

$$\Delta therms = FS_{GAS} * \frac{(W_{base} - W_{LED}) * (Hours) * (-IFTtherms)}{1,000}$$

Demand Savings:

$$\Delta kW = \frac{(W_{base} - W_{LED}) * Coincidence Factor * (WHF_d)}{1,000}$$

Table 378. *Ex Post* Variable Assumptions for LED Lighting

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
FS _{Gas}	100%/0%	0% (Electric) or 100% (Gas) flag depending on HVAC system specified by project and energy claimed	IL TRM V.12.0
W _{base}	<i>Actual</i>	Wattage of the bulb/fixture being replaced. Actual replacement specification of project, and quantity specified by project documentation	IL TRM V.12.0
W _{LED}	<i>Actual</i>	Wattage of the LED bulb. Actual replacement specification of project, and quantity specified by project documentation	Specification for product distributed
Hours	<i>Varies</i>	Average hours of use per year, varies by space type of project	IL TRM V.12.0
WHF _e	1.08	Waste heat factor for energy to account for HVAC interactions with lighting. Varies by HVAC system specified by project	IL TRM V.12.0
WHF _d	1.30	Waste heat factor for demand to account for HVAC interactions with lighting. Varies by HVAC system specified by project	IL TRM V.12.0
IFKWH _{ELEC HEAT}	0.154	Waste heat factor for energy to account for HVAC interactions with lighting. Varies by HVAC system specified by project	IL TRM V.12.0
IFTherms _{GAS HEAT}	0.015	Waste heat factor for demand to account for HVAC interactions with lighting. Varies by HVAC system specified by project	IL TRM V.12.0
Conversion Factor day/yr	365	Number of days per year, days/yr.	IL TRM V.12.0
Conversion Factor kW	1,000	Constant to convert watts to kW	IL TRM V.12.0

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
CF	Varies	Summer peak coincidence factor, varies by space type of project	IL TRM V.12.0

Lighting Power Density Reduction

The team used the following equations from the Illinois TRM v12.0 vol. 2 Measure 4.5.7 to calculate electric energy and peak demand savings, as well as natural gas energy penalties, for interior and exterior lighting power density reduction measures. Table 379 lists the input assumptions and sources of each assumption for measure savings calculations.

$$kWh \text{ savings} = \frac{(LPD_{base} - LPD_{EE}) * (AREA) * (HOURS) * (WHF_e)}{1,000}$$

$$kW \text{ reduction} = \frac{(LPD_{base} - LPD_{EE}) * (AREA) * (CF) * (WHF_d)}{1,000}$$

$$therms \text{ savings} = \frac{(LPD_{base} - LPD_{EE}) * (AREA) * (Hours) * (-IFT_{therms})}{1,000}$$

Table 379. *Ex Post* Variable Assumptions – Light Power Density Reduction

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
LPD _{base}	Varies	Allowed lighting power density (watts per square foot) based on energy code requirements for building or space type.	ASHRAE 90.1-2007 Table 9.5.1 or Table 9.6.1 for projects with start date prior to 1/1/2024, and IECC 2018 for post 1/1/2024
LPD _{EE}	Varies	Installed lighting wattage per square foot of the efficient lighting system for building type as determined by site-surveys or design diagrams. Actual installed wattage	COMcheck documentation and project plans provided
1,000	1,000	Conversion factor from watts to kilowatts	IL TRM V.12.0
AREA	Varies	Square footage of building scope, actuals	COMcheck documentation and project plans provided
HOURS	Varies	Annual operating hours of lighting system, actual building schedule, or if unknown by TRM space type	IL TRM v12.0, and project documentation
WHF _e	Varies	Waste heat factor for energy to account for HVAC interactions with lighting (depends on location, building type, and HVAC system type)	IL TRM V.12.0
WHF _d	Varies	Waste heat factor for demand to account for HVAC interactions with lighting (depends on location, building type, and HVAC system type)	IL TRM V.12.0
IFKWH _{ELEC HEAT}	0.154	Waste heat factor for energy to account for HVAC interactions with lighting. Varies by HVAC system specified by project	IL TRM V.12.0

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
IFTherms _{GAS HEAT}	0.015	Waste heat factor for demand to account for HVAC interactions with lighting. Varies by HVAC system specified by project	IL TRM V.12.0 Vol. 2
CF	Varies	Based on building type	IL TRM V.12.0 Vol. 2

Lighting Controls—Occupancy Sensors

The team used the following equations from the Illinois TRM v12.0 vol. 2 Measure 4.5.10 to calculate electric energy and peak demand savings for occupancy sensor measures, as well as natural gas energy penalties. Table 380 lists the input assumptions and source of each assumption for measure savings calculations.

$$kWh \text{ savings} = kW_{controlled} * Hours * (WHF_e) * ESF$$

$$kW \text{ reduction} = kW_{controlled} * (WHF_d) * CF$$

$$therms \text{ savings} = kW_{controlled} * Hours * (-IFTherms) * ESF$$

Table 380. Ex Post Variable Assumptions – Lighting Occupancy Sensors

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
kW _{controlled}	Varies	Total kilowatts controlled per sensor. Based on actual controlled per sensor.	IL TRM v12.0
Hours	Varies	Annual operating hours of system or posted site schedule, or TRM deemed values by space type.	IL TRM v12.0
ESF	Varies	Energy savings factor, specified in the TRM by type of control and baseline control, effectively reduces the hours that lighting is operating.	IL TRM v12.0
WHF _e	Varies	Waste heat factor for energy to account for HVAC interactions with lighting (depends on location, building type, and HVAC system type)	IL TRM v12.0
WHF _d	Varies	Waste heat factor for demand to account for HVAC interactions with lighting (depends on location, building type, and HVAC system type)	IL TRM v12.0
IFKWH _{ELEC HEAT}	0.154	Waste heat factor for energy to account for HVAC interactions with lighting. Varies by HVAC system specified by project	IL TRM V.12.0
IFTherms _{GAS HEAT}	0.015	Waste heat factor for demand to account for HVAC interactions with lighting. Varies by HVAC system specified by project	IL TRM V.12.0
Conversion Factor kW	1,000	Conversion factor from watts to kilowatts	IL TRM V.12.0

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
CF	Varies	Coincidence factor. Based on building type	IL TRM v12.0

Refrigeration—ECM Freezer/Refrigeration Motors, Evaporator Fan Control

The evaluation team used the following equations from the Illinois TRM v12.0 vol. 2 Measure 4.6.4 to calculate electric and demand reduction savings for ECM Freezer and Refrigerator motors and from Measure 4.6.6 to calculate electric and demand reduction savings for Evaporator Fan Controls. Table 381 lists the input assumptions and source of each assumption for measure savings calculations.

$$kWh \text{ savings} = Savings \text{ per motor} * Qty \text{ motors}$$

$$kW \text{ reduction} = \frac{kWh \text{ Savings}}{Hours} * Qty \text{ motors} * CF$$

Table 381. *Ex Post* Variable Assumptions – ECM Freeze/Refrigerator Motors

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Savings per motor (ECM)	Varies	Based on motor rating of installed motor, or deemed values within TRM by horsepower size.	IL TRM v12.0
Savings per motor (Evap)	Varies	Based on motor rating of installed motor, or deemed values within TRM by horsepower size.	IL TRM v12.0
Hours	8,760	Full load hours per year, posted operating hours of equipment or business, or 8760 deemed value.	IL TRM v12.0
CF	1.0	Coincidence factor.	IL TRM v12.0

Refrigeration—Auto Door Closers

The evaluation team used the following deemed values from the Illinois TRM v12.0 vol. 2 Measure 4.6.1 to calculate electric and natural gas energy savings for auto door closers for refrigeration and freezer walk-in spaces. Table 382 lists the input assumptions and source of each assumption for measure savings calculations.

Table 382. *Ex Post* Variable Assumptions – Auto Door Closers

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Deemed kWh savings Cooler	2,399	Deemed kWh savings per door closer (per walk in refrigerated space).	IL TRM v12.0
Deemed kWh savings Freezer	6,949	Deemed kWh savings per door closer (per walk in freezer space).	IL TRM v12.0
Deemed kW savings Cooler	0.621	Deemed kW savings per door closer (per walk in refrigerated space).	IL TRM v12.0

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Deemed kW savings Freezer	1.30	Deemed kW savings per door closer (per walk in freezer space).	IL TRM v12.0

Refrigeration – Strip Curtains for Walk in Coolers/Freezers

The evaluation team used the following equations from the Illinois TRM v12.0 vol. 2 Measure 4.6.7 to calculate electric and natural gas energy savings for strip curtains for refrigeration spaces. Table 383 lists the input assumptions and source of each assumption for measure savings calculations.

$$kWh \text{ savings} = \Delta kWh/sq \text{ ft} * Area$$

$$kW \text{ reduction} = \frac{kWh \text{ Savings}}{Hours} * CF$$

Table 383. *Ex Post* Variable Assumptions – Strip Curtains

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
$\Delta kWh/sq \text{ ft}$	Varies	Average annual kWh savings per square foot of infiltration barrier installed. Deemed values within TRM, depending on space type, cooler or freezer, and baseline condition	IL TRM v12.0
Area	Varies	Actual square footage. If the actual doorway area in SF is unknown, deemed values available in TRM.	IL TRM v12.0
Hours	8,760	Full load hours per year, posted operating hours of equipment or business, or 8760 deemed value.	IL TRM v12.0
CF	1.0	Coincidence factor.	IL TRM v12.0

Refrigeration – New Commercial Refrigeration Equipment

The evaluation team used the following equations from the Illinois TRM v12.0 vol. 2 Measure 4.2.2 to calculate electric and natural gas energy savings for the purchase of new commercial refrigeration equipment, such as ENERGY STAR refrigerators and freezers. Table 384 lists the input assumptions and source of each assumption for measure savings calculations.

$$kWh \text{ savings} = (kWh_{BASE} - kWh_{EE}) * 365.25$$

$$kW \text{ reduction} = \frac{kWh \text{ Savings}}{Hours} * CF$$

Table 384. *Ex Post* Variable Assumptions – Refrigeration Equipment

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
kWh Base	Varies	Baseline maximum daily energy consumption in kWh, calculated from TRM deemed value based on the type and volume of unit.	IL TRM v12.0
kWh EE	Varies	Efficient maximum daily energy consumption in kWh, actual if known. TRM provides default values based on type and volume of unit.	IL TRM v12.0
Conversion Factor days/yr	365.25	Annual days per year	IL TRM v12.0
Hours	8,760	Full load hours per year, posted operating hours of equipment or business, or 8760 deemed value.	IL TRM v12.0
CF	0.97	Coincidence factor.	IN TRM Workbook v1.0

HVAC—Heating/Cooling Equipment Replacement

The evaluation team used the following equations from the Illinois TRM v12.0 vol. 2 from several Commercial HVAC measures to calculate electric and natural gas energy savings for HVAC Equipment Replacements, including AC units, chillers, heat pumps, boilers, and furnaces. Table 385 lists the assumptions and sources of each assumption for measure savings calculations.

$$kWh\ savings_{cool} = TONS * \left(\frac{3.516}{IPLV_{base}} - \frac{3.516}{IPLV_{EE}} \right) * EFLH_{cool}$$

$$kW\ reduction = TONS * \left(\frac{3.516}{COP_{base}} - \frac{3.516}{COP_{EE}} \right) * CF$$

$$therm\ savings = Btuh_{heat} * \left(\frac{1}{EFF_{base}} - \frac{1}{EFF_{EE}} \right) * \frac{EFLH_{heat}}{100,000}$$

Table 385. *Ex Post* Variable Assumptions - Heating / Cooling Equipment Replacement

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
TONS	Varies	Actual cooling capacity of chiller/ packaged unit / AHU / Split system, in tons. Or Btu per hr / 12,000.	Equipment specifications
IPLV _{base}	Varies	Integrated part load value efficiency of the baseline equipment, COP	IL TRM v12.0
IPLV _{EE}	Varies	Integrated part load value efficiency of actual installed equipment, COP	Equipment specifications
EFLH _{cool}	Varies	Equivalent full load hours for cooling, from TRM based on building type and location, hrs./yr. Mapped from IN cities to IL cities	IL TRM v12.0 , direction from IN TRM Workbook v1.0
EFLH _{heat}	Varies	Equivalent full load hours for heating, from TRM based on building type and location, hrs./yr. Mapped from IN cities to IL cities	IL TRM v12.0 direction from IN TRM Workbook v1.0

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
COP _{base}	<i>Varies</i>	Coefficient of performance of the baseline equipment, depends on equipment type	IL TRM v12.0
COP _{EE}	<i>Varies</i>	Actual coefficient of performance of installed equipment	Equipment specifications
CF	<i>Varies</i>	Coincidence factor. Varies by equipment type	IL TRM v12.0
Btuh _{heat}	<i>Varies</i>	Actual capacity of the boiler/ furnace installed, Btu/hr	Equipment specifications
EFF _{base}	<i>Varies</i>	Baseline heating efficiency, based on equipment type	IL TRM v12.0
EFF _{EE}	<i>Varies</i>	Actual heating efficiency of installed equipment	Equipment specifications
AFUE Base	<i>Varies</i>	Existing or baseline Furnace Annual Fuel Utilization Efficiency Rating. Actuals if known, or TRM has default values.	IL TRM v12.0
AFUE Eff	<i>Varies</i>	Efficient Furnace Annual Fuel Utilization Efficiency Rating, actual if known, TRM has default values.	Equipment specifications
Conversion Factor therms	100,000	Conversion factor Btu to therms	IL TRM v12.0
Conversion Factor Wh	3.412	Btu per Wh.	IL TRM v12.0

HVAC—VFD Pumps and Fans

The evaluation team used the following equations from the Illinois TRM v12.0 vol. 2 Measure 4.4.26 to calculate electrical energy savings, summer coincidence peak demand savings, and therms savings associated with this measure. Table 386 below, lists the assumptions and sources of each assumption for measure savings calculations.

$$kWh \text{ savings} = ESF * \left(\frac{BHP}{EFF_i} \right) * HOURS$$

$$kW \text{ reduction} = \left(\frac{BHP}{EFF_i} \right) * DSF$$

Table 386. *Ex Post* Variable Assumptions – VSD Pumps and Fans

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
BHP	<i>Varies</i>	System Brake horsepower of installed equipment. Actuals, equipment specifications	IL TRM v12.0
EFF _i	<i>Varies</i>	Motor efficiency installed or existing. Actual, or 93% if unknown	IL TRM v12.0
Hours	<i>Varies</i>	Operating hours of equipment, from facility interviews or logged data, hrs./yr. TRM provides defaults by space type if unknown.	IL TRM v12.0
ESF	<i>Varies</i>	Energy Savings factor, deemed set of values by space type	IL TRM v12.0

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
DSF	<i>Varies</i>	Demand Savings factor varies by VFD application. deemed set of values by space type and application	IL TRM v12.0

HVAC—Boiler Tune-Up

The evaluation team used the following equations from the Illinois TRM v12.0 vol. 2 Measure 4.4.2 to calculate electrical energy savings, summer coincidence peak demand savings, and therms savings associated with this measure. Table 387 lists the assumptions and sources of each assumption for measure savings calculations.

$$\text{therms savings} = \frac{\text{Cap} * \text{EFLH} * \left(\left(\frac{\text{Eff}_{\text{Before}} + \text{Ei}}{\text{Eff}_{\text{Before}}} \right) - 1 \right)}{100,000}$$

Table 387. *Ex Post* Variable Assumptions – VSD Pumps and Fans

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Cap	<i>Varies</i>	Capacity of boiler, gas input size (Btu/hr), actual	IL TRM v12.0. Existing boiler sizing provided by customer
EFLH Heat		Equivalent full load hours for heating, from TRM based on building type and location, hrs./yr. Mapped from IN cities to IL cities	IL TRM v12.0 Vol 2., direction from IN TRM Workbook v1.0
EFF Before	81.5%	Efficiency of the boiler before the tune up conducted, actual if provided. Default value of 81.5%	IL TRM v12.0 Vol 2.
Ei	2.3%	Efficiency improvement of boiler via the tune up measure, actual if provided, but default is 2.3%. Efficiency of boiler becomes (2.3% + 81.5% = 83.8%. Ideally tune up report should demonstrate ending efficient state of boiler is at least 83.8% efficient to qualify for measure savings.	IL TRM v12.0
Conversion Factor therms	100,000	Conversion Btu to therms	IL TRM v12.0

HVAC—Programmable Thermostats

The evaluation team used the following equations from Illinois TRM v12.0 vol. 2 Measure 4.4.48 Small Commercial Thermostats to calculate electrical energy savings, summer coincidence peak demand savings, and therms savings associated with this measure. Table 388 lists the input assumptions and source of each assumption for measure savings calculations.

$$\Delta kWh = \Delta kWh_{\text{Heating}} + \Delta kWh_{\text{Cooling}}$$

$$\Delta kWh_{\text{Heating}} = \left(\%ElecHeat * \frac{kBtu}{hr_{\text{Heat}}} * \frac{1}{HSPF} * EFLH_{\text{Heat}} * Heating_{\text{Reduction}} * BAF \right) + ((1 - \%ElecHeat) * \Delta Therms * F_e * 29.3)$$

$$\Delta kWh_{Cooling} = \frac{kBtu}{hr_{Cool}} * \frac{1}{SEER} * EFLH_{Cool} * Cooling_{Reduction} * BAF$$

Table 388. *Ex Post* Variable Assumptions – Programmable Thermostats

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
%Elec _{Heat}	0 or 1	Flag for percentage of heating savings assumed to be electric. 0 for gas heating, 1 for electric heating	IL TRM v12.0
kBTU/Hr _{Heat}	87	Capacity of heating equipment in kBtu/hr. Actual, or if unknown 114.5 kBtu/hr. Additionally defined by WI TRM 2024 for small sized commercial packaged system as 87 kBtu/hr default, which is a more appropriate size for small business installations.	IL TRM v12.0 and WI TRM 2024
HSPF _{Base}	5.1	Heating Seasonal Performance Factor Baseline Equipment, in HSPF2 ideally (uniformly use 2 or not), if unknown, use blended value of 5.1 HSPF2	IL TRM v12.0
EFLH _{Heat}	<i>Varies</i>	Equivalent full load hours for heating, from TRM based on building type and location, hrs./yr. Mapped from IN cities to IL cities	IL TRM v12.0, direction from IN TRM Workbook v1.0
Heating Reduction	8.8%	Assumed percentage reduction in total building heating energy consumption	IL TRM v12.0
F _e	7.7%	Furnace fan energy consumption as percentage of annual fuel consumption	IL TRM v12.0
Kbtu/Hr _{cool}	61 or 0	Capacity of the cooling equipment installed in kBtu/hr (1 ton of cooling capacity equals 12 kBtu/hr). 0 for no AC installed or gas only customer	IL TRM v12.0
SEER	13	Seasonal Energy Efficiency Ratio of the cooling equipment, in SEER2 ideally (uniformly use 2 or not). If unknown actual, use code base.	IL TRM v12.0
EFLH _{Cool}	<i>Varies</i>	Equivalent full load hours for cooling, from TRM based on building type and location, hrs./yr. Mapped from IN cities to IL cities	IL TRM v12.0, direction from IN TRM Workbook v1.0
Cooling_ Reduction	17.7%	Average percentage reduction in total building cooling energy consumption due to thermostat installation	IL TRM v12.0
BAF	0.8	Baseline adjustment factor = 1.0, if the baseline Tstat was manual = 0.6, if the baseline Tstat was programmable = 0.8, if the baseline is unknown	IL TRM v12.0
Conversion Factor therms	29.3	KWh per therm	IL TRM v12.0

Kitchen Equipment

The evaluation team used the Illinois TRM v12.0 vol. 2 to calculate savings for all kitchen equipment measures. Most measures relate to purchasing ENERGY STAR certified efficient equipment and result in deemed savings per unit purchased.

Hot Water Heaters

The evaluation team used the following equations from Illinois TRM v12.0 vol. 2 Measure 4.3.1 to calculate electrical energy savings, summer coincidence peak demand savings, and natural gas energy savings for water heater measures. Table 389 lists the assumptions and source of each assumption for measure savings calculations.

$$kWh\ Savings = \frac{((T_{IN} - T_{OUT}) * GPD * yWater * 1) * \left(\frac{1}{UEF_{base}} - \frac{1}{UEF_{EE}}\right)}{3412}$$

$$therms\ Savings = \frac{((T_{IN} - T_{OUT}) * GPD * yWater * 1) * \left(\frac{1}{UEF_{base}} - \frac{1}{UEF_{EE}}\right)}{100,000}$$

Table 389. *Ex Post* Variable Assumptions – Hot Water Heaters

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
GPD	<i>Varies</i>	Average daily hot water consumption, gallons per day. TRM provides calculation and deemed values, in gallons per day and estimates for annual gallons (remove 365 multiplier in latter case)	IL TRM v12.0
Conversion Factor days/yr	365	Day per year	IL TRM v12.0
yWater	8.3	Specific weight of water, lbs/gal	IL TRM v12.0
1	1	Specific heat of water (Btu/gal °F)	IL TRM v12.0
UEF base	<i>Varies</i>	Baseline heating efficiency, 80% for commercial gas DHW greater than 120 gallons, varies by size and function for gas and electric commercial DHW. TRM provides calculation and deemed values	IL TRM v12.0
UEF EE	<i>Varies</i>	Actual heating efficiency of installed equipment. Actuals, equipment specifications. TRM provides calculation based on volume and type.	IL TRM v12.0
T Differential or (T IN – T OUT)	74.3	Tank temperature deemed 125 °F, Take incoming water temperature deemed 50.7 °F. T Differential = 125 – 50.7 = 74.3 °F	IL TRM v12.0
Conversion Factor kWh	3412	Conversion factor from Btu to kWh	IL TRM v12.0
Conversion Factor therms	100,000	Conversion factor from Btu to therms	IL TRM v12.0

Compressed Air—VFD

The evaluation team used the following equations from Illinois TRM v12.0 vol. 2 Measure 4.7.1 to calculate electrical energy savings, summer coincidence peak demand savings, and therms savings associated with this installation of new VFD air compressors (or retrofit of existing air compressor) with VFD controls. Table 390 lists the assumptions and sources of each assumption for measure savings calculations.

$$kWh \text{ savings} = 0.9 * HP_{Compressor} * Hours * (CF_b - CF_e)$$

Table 390. *Ex Post* Variable Assumptions – Compressed Air VFD

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Hp compressor	<i>Varies</i>	Compressor motor nominal HP, from project specific equipment data	IL TRM v12.0
Conversion Factor kW	0.9	Nominal HP to full load kW conversion factor	IL TRM v12.0
Hours	5,702	Compressor total run hours of operation, depending on shift, given by TRM. If unknown, assume 5,702 (= approximately 3 shift 24/5)	IL TRM v12.0
CF _b	<i>Varies</i>	Baseline compressor factor, defaults given in TRM by size and type	IL TRM v12.0
CF _e	0.705 0.658	Efficient compressor factor. Depending on unit size. 0.705 for < 40 HP, 0.658 for 50-200 HP	IL TRM v12.0
CF	0.89	coincidence factor. Varies by number of shifts. Unknown, assume 0.89	IL TRM v12.0

Compressed Air—System Leak Repair

The evaluation team used the following equations from Indiana TRM Workbook v1.0 to calculate electrical energy savings, summer coincidence peak demand savings, and therms savings associated with compressed air system leak repairs. Table 391 below, lists the assumptions and source of each assumption for measure savings calculations.

$$kWh \text{ savings} = CFM \text{ Reduced} * kW(CFM) * HOU$$

$$kW \text{ reduction} = CFM \text{ Reduced} * kW(CFM) * CF$$

Table 391. *Ex Post* Variable Assumptions – Compressed Air System Leak Repair

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
CFM Reduced	<i>varies</i>	Verified reduced air consumption (CFM) resulting from repair work, cumulative of all leaks. Actual, verified by vendor or estimated CFM by leak size	IN TRM Workbook v1.0
kW (CFM)	<i>varies</i>	System power reduction per reduced air demand (kW/CFM) depending on the type of control: Reciprocating - On/off Control 0.184 Reciprocating - Load/Unload 0.136 Screw - Load/Unload 0.152	IN TRM Workbook v1.0

INPUT	EX POST VALUE	INPUT DEFINITION		SOURCE
		Screw - Inlet Modulation	0.055	
		Screw - Variable Displacement	0.153	
		Screw - VFD	0.178	
		Screw - Inlet Modulation w/ Unloading	0.055	
Hours	5,702	Compressed air system pressurized hours, based on shift type:		
		Indust. 1-shift (8/5)	2088	IN TRM Workbook v1.0
		Indust. 2-shift (16/5)	4176	
		Indust. 3-shift (24/5)	6264	
		Indust. 4-shift (24/7)	8760	
		If unknown, assume 5,702 (= approximately 3 shift 24/5)		
CF	71%	Coincidence Factor, dependent on Hours selection for shift type. 71% for 1-3 shifts, 100% for 4-shift (24/7 operation).		IN TRM Workbook v1.0

Appendix 13. Commercial & Industrial (C&I) Online Marketplace Program

Algorithms and Assumptions

This appendix contains the assumptions used in electric savings, demand reduction, and gas savings algorithms for the measures within the Commercial & Industrial (C&I) Online Marketplace (OLM) program. The evaluation team examined each assumption behind the algorithms to capture savings and compared it against the Indiana TRM Workbook v1.0 and the Illinois TRM v12.0, as well as other state and industry approaches.⁷⁴ Detailed information on the analysis and supporting assumptions for the C&I OLM program measures are included within this appendix. Table 392 lists the sources and assumptions of the *ex post* per-measure savings:

Table 392. C&I OLM Sampled Measures

MEASURE	EX POST SOURCE	PRIMARY DEVIATIONS FROM EX ANTE
Bathroom Aerator	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.	None with algorithm, same source referenced, quantity error made in <i>ex ante</i> measure calculation.
Kitchen Aerator	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.	None.
Pre-Rinse Spray Valve	Illinois TRM v12.0 Vol. 2. Measure 4.2.11.	None.
Low-Flow Showerhead	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.	GPM base variable, 2.67 GPM <i>ex ante</i> , 2.5 GPM <i>ex post</i> , same source referenced; 2.67 GPM is specified for direct install programs only, 2.5 GPM for general baseline use.
LED Desk Lamp	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.	Heat penalty calculation and fuel saturation application errors made in <i>ex ante</i> , same source referenced.
LED Exit Sign Retrofit	Illinois TRM V.12.0 Vol. 2, Measure 4.5.5.	Heat penalty calculation and fuel saturation application errors made in <i>ex ante</i> , same source referenced.
Smart Plug	Illinois TRM V.12.0 Vol. 2 Measure 4.8.22.	None.
Pipe Insulation Wrap	Illinois TRM v12.0 Vol. 2	None.
Hot Water Temperature Card	Illinois TRM v12.0 Vol. 3, Measure 5.4.6.	None.
Advanced Power Strip Tier 1	Illinois TRM v12.0 Vol. 2. Measure 4.8.7.	None.
Switch Gaskets	Illinois TRM v12.0 Vol. 3 Measure 5.6.1.	None.
Outlet Gaskets	Illinois TRM v12.0 Vol. 3 Measure 5.6.1.	None.

⁷⁴ Illinois Energy Efficiency Stakeholder Advisory Group. 2024 Illinois Statewide Technical Reference Manual for Energy Efficiency Version 12.0. Volume 2: Commercial and Industrial Measures. September 22, 2023.

Kitchen and Bathroom Faucet Aerators, Pre-Rinse Spray Valves

The evaluation team used the following equations from the Illinois TRM v12.0 to calculate electric energy, peak demand, and natural gas energy savings for low-flow kitchen and bathroom faucet aerators and pre-rinse spray valves. Table 393 lists the assumptions and source of each variable input and assumption for kitchen and bathroom faucet aerator measure savings calculations.

$$\Delta kWh = ISR * \%ElectricDHW * \frac{GPM_{base} - GPM_{low\ flow}}{GPM_{base}} * Usage * EPG\ electric$$

$$\Delta kW = (kWh/Hours) * CF$$

$$\Delta therms = ISR * \%GasDHW * \left(GPM_{base} - \frac{GPM_{low\ flow}}{GPM_{base}} \right) * Usage * EPG\ gas$$

Table 393. *Ex Post* Variable Assumption for Kitchen and Bathroom Faucet Aerators, Pre-Rinse Spray Valve

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
GPMbase (Kitchen)	2.2	GPM of baseline faucet aerator or valve. Kitchen aerator baseline.	Wisconsin TRM 2024 (to provide differentiation between base and efficient)
GPMbase (Bathroom)	1.39	GPM of baseline faucet aerator or valve. Bathroom aerator baseline.	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.
GPMbase (Pre-Rinse Valve)	1.23	GPM of baseline faucet aerator or valve. Pre-rinse valve baseline.	Illinois TRM v12.0 Vol. 2. Measure 4.2.11.
GPMlow-flow (Kitchen)	1.5	GPM of low-flow faucet aerator or valve. Kitchen aerator performance case.	Specification for product distributed
GPMlow-flow (Bathroom)	1.0	GPM of low-flow faucet aerator or valve. Bathroom aerator performance case.	Specification for product distributed
GPMlow-flow (Pre-Rinse Valve)	0.68	GPM of low-flow faucet aerator or valve, actual. Pre-rinse valve performance case.	Specification for product distributed
ISR (Bath)	34% 88%	ISR, estimated proportion installed. Office and Conservation Kits 34%, Water Saver Kits 88%.	2023 NIPSCO C&I OLM survey
ISR (Kitchen)	34% 42%	ISR, estimated proportion installed. Office and Conservation Kits 34%, Water Saver Kits 42%.	2023 NIPSCO C&I OLM survey
ISR (Pre Rinse)	33%	ISR, estimated proportion installed.	2023 NIPSCO C&I OLM survey
% Electric DHW	48%	DHW fuel saturation ratio, electric proportion.	2023 NIPSCO C&I OLM Population
% Gas DHW	52%	DHW fuel saturation ratio, gas proportion.	2023 NIPSCO C&I OLM Population
Usage (Kitchen)	2,500.	Usage of annual gallons mixed water per faucet per year. Used for all kitchen aerators, based on “other” space type.	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Usage (Bath)	5,000.	Usage of annual gallons mixed water per faucet per year. Used for all bath aerators, based on “other” space type.	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.
Usage (Pre-Rinse)	2,008.	Usage of annual gallons mixed water per faucet per year. Used for all pre-rinse valves, based on “small business” space type.	Illinois TRM v12.0 Vol. 2. Measure 4.2.11.
EPG Electric (Kitchen)	0.1054	kWh/gallon. Energy per gallon of mixed water used by faucet, incorporates specific weight of water, heat capacity of water, water inlet temperature, water outlet temperature, and thermal recovery efficiency of gas water heater.	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.
EPG Electric (Bath)	0.0879	kWh/gallon. Energy per gallon of mixed water used by faucet, incorporates specific weight of water, heat capacity of water, water inlet temperature, water outlet temperature, and thermal recovery efficiency of gas water heater.	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.
EPG Gas (Kitchen)	0.0053	Therms/gallon. Energy per gallon of mixed water used by faucet, incorporates specific weight of water, heat capacity of water, water inlet temperature, water outlet temperature, and thermal recovery efficiency of gas water heater.	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.
EPG Gas (Bathroom)	0.0044	Therms/gallon. Energy per gallon of mixed water used by faucet, incorporates specific weight of water, heat capacity of water, water inlet temperature, water outlet temperature, and thermal recovery efficiency of gas water heater.	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.
Hours/Yr (Bath, Kitchen)	41	Annual DHW recovery hours for faucet use, dependent on space type.	Illinois TRM v12.0 Vol. 2. Measure 4.3.2.
Hours/Day (Pre-Rinse)	1.3	Average hours of use per day.	Illinois TRM v12.0 Vol. 2. Measure 4.2.11.
CF (Bath, Kitchen)	0.0128	CF.	Illinois TRM v12.0 Vol. 2.

Low-Flow Showerhead

The evaluation team used the following equations from Illinois TRM v12.0 Vol. 2, Measure 4.3.3, to calculate the electric energy, peak demand, and natural gas energy savings for low-flow showerheads. Table 394 lists the input assumptions and source of each variable input and assumption for low-flow showerheads.

$$\Delta kWh = ISR * \%ElecDHW * ((GPM_{base} * L_{Base}) - (GPM_{Low} * L_{Low}) * NSPD * 365.25) * EPG Elec$$

$$\Delta kW = (kWh/Hours) * CF$$

$$\Delta therms = ISR * \%GasDHW * ((GPM_{base} * L_{Base}) - (GPM_{Low} * L_{Low}) * NSPD * 365.25) * EPG Gas$$

Table 394. *Ex Post* Variable Assumption for Low-Flow Showerhead

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
GPM _{base}	2.5	GPM of baseline showerhead, 2.5 GPM. <i>Ex ante</i> utilized 2.67 GPM, but the reference indicates that GPM is for direct install programs, and 2.5 GPM is appropriate for general baseline.	Illinois TRM v12.0 Vol. 2, Measure 4.3.3. p
GPM _{low-flow}	1.5	GPM of low-flow showerhead, actual.	Specification for product distributed
L _{Base}	8.2	Shower length in minutes with baseline showerhead, unchanged from performance.	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.
L _{Low}	8.2	Shower length in minutes with low-flow showerhead, unchanged from baseline.	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.
ISR	10%	ISR, proportion estimated installed.	2023 NIPSCO C&I OLM survey
% Electric DHW	48%	DHW fuel saturation ratio, electric proportion.	2023 NIPSCO C&I OLM Population
% Gas DHW	52%	DHW fuel saturation ratio, gas proportion.	2023 NIPSCO C&I OLM Population
NSPD	3	Estimated number of showers taken per day for one showerhead.	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.
365.25	365.25	Average days per year.	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.
Hours	270.61	Annual DHW recovery hours for showerhead use, dependent on space type. Calculated value = $((\text{GPM}_{\text{base}} * \text{L}_{\text{base}}) * \text{NSPD} * 365.25) * 0.608 / \text{GPH}$	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.
GPH	53.9	Gallons per hour recovery of electric water heater calculated for 89.3F temp rise (140-50.7), 98% recovery efficiency, and typical 12kW electric resistance storage tank.	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.
CF	0.0278	CF	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.
EPG Electric	0.125	kWh/gallon. Energy per gallon of mixed water used by showerhead, incorporates specific weight of water, heat capacity of water, water inlet temperature, water outlet temperature, and thermal recovery efficiency of electric HW.	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.
EPG Gas	0.006254	Therms/gallon. Energy per gallon of mixed water used by showerhead, incorporates specific weight of water, heat capacity of water, water inlet temperature, water outlet temperature, and thermal recovery efficiency of gas WH.	Illinois TRM v12.0 Vol. 2, Measure 4.3.3.

LED Lighting: LED Exit Sign Retrofit and LED Desk Lamp

The evaluation team used the following equations from the Illinois TRM v12 Vol. 2, Measure 4.5.4 and Measure 4.5.5, to calculate the electric energy and peak demand savings, as well as natural gas energy penalties, for all LED lighting products. Table 395 lists the input assumptions and source of each variable input and the assumption for LED lighting measures' savings calculations.

$$\Delta kWh = \Delta kWh_{Elec} + ((1 - FS_{Gas}) * \Delta kWh_{Heating Penalty})$$

$$\Delta kWh_{Elec} = \frac{(W_{base} - W_{LED}) * (ISR * Hours) * (WHF_e)}{1,000}$$

Heating penalty for electrically heated spaces:

$$\Delta kWh_{Heating Penalty} = \frac{(W_{base} - W_{LED}) * (ISR * Hours) * (-IFkWh)}{1,000}$$

Heating penalty for fossil fuel heated spaces, or if unknown:

$$\Delta therms = FS_{GAS} * \frac{(W_{base} - W_{LED}) * (ISR * Hours) * (-IFTherms)}{1,000}$$

Demand savings:

$$\Delta kW = \frac{(W_{base} - W_{LED}) * Coincidence Factor * ISR * (WHF_d)}{1,000}$$

Table 395. *Ex Post* Variable Assumptions for LED Lighting

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
FS _{Gas}	52%	Fuel saturation of gas/electric ratio of hot water heater. Population data demonstrates 52% gas and 48% electric.	2023 NIPSCO C&I OLM population data
W _{base} (Desk)	25.00	Wattage of the bulb/fixture being replaced.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.
W _{base} (Exit)	7.00	Wattage of the bulb/fixture being replaced.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.5.
W _{LED} (Desk)	3.50	Wattage of the LED bulb, actual.	Specification for product distributed
W _{LED} (Exit)	2.40	Wattage of the LED bulb, actual.	Specification for product distributed
Hours (Desk)	3,379	Average hours of use per year.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.
Hours (Exit)	8,766	Average hours of use per year (24/7).	Illinois TRM V.12.0 Vol. 2, Measure 4.5.5.
WHF _e Electric AC	1.08	WHF for energy to account for HVAC interactions with lighting.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
WHF _{d demand AC}	1.30	WHF for demand to account for HVAC interactions with lighting.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.
IFKWH _{ELEC HEAT}	0.154	WHF for energy to account for HVAC interactions with lighting.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.
IFTerms _{GAS HEAT}	0.015	WHF for demand to account for HVAC interactions with lighting.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.
365	365	Number of days per year.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.
1,000	1,000	Constant to convert watts to kW.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.
CF (Desk)	67%	Summer peak CF.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.4.
CF (Exit)	100%	Summer peak CF.	Illinois TRM V.12.0 Vol. 2, Measure 4.5.5.
ISR (Exit)	33%	ISR. Estimated proportion installed.	2022 NIPSCO C&I OLM customer survey
ISR (Desk)	69%	ISR. Estimated proportion installed.	2022 NIPSCO C&I OLM customer survey

Smart Plug

The team used the following deemed values shown Table 396 from the Illinois TRM v12.0 Vol. 2. to calculate energy savings for this product.

$$\begin{aligned}
 \Delta kWh = & \quad [((WBase * OnAdj) - WEff) * (hrswkday - hrswkday-open)] \\
 & + [((WBase * OnAdj) - WEff) * (hrswkend - hrswkend-open)] \\
 & / 1000 * weeks/year * ISR
 \end{aligned}$$

Table 396. *Ex Post* Variable Assumption for Smart Plug

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Wbase	9.40	Standby power or “on” power consumption of connected appliance. If unknown, e.g., via kits, assume 9.4 watts.	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.
OnAdj	1.00	Adjustment for wattages of appliances that are powered on during out of hours, 100% for appliances in standby mode or unknown.	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.
Weff	0.70	Standby power consumption of smart socket. If unknown, assume 0.7 watts.	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Hrs Wkday	106	Total weekly hours on weekdays (M-F).	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.
Hrs Wkend	62	Total weekly hours on weekends (S and S).	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.
Hrs Wkday – Open	48	Weekly hours business is open on weekdays.	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.
Hrs Wkend – Open	10	Weekly hours business is open on weekend.	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.
Weeks/Yr	52.2	Weeks per year.	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.
ISR	28%	ISR. Assumed for kits that include two smart sockets.	Illinois TRM v12.0 Vol. 2, Measure 4.8.22.

Pipe Insulation Wrap

The team used the following deemed values shown in Table 397 from Illinois TRM v12.0 Vol. 2 to calculate energy savings for this product.

Table 397. *Ex Post* Variable Assumption for Pipe Insulation

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
Feet	5	Total linear feet of pipe on which wrap is fully installed, actual. Product is 15 feet but wrapped approximately 5 linear feet of pipe covered.	Specification for product distributed
Therms/Unit	0.69	Deemed value of therms per year saved by linear foot of pipe wrap is fully installed on.	Illinois TRM v12.0 Vol. 2
% Gas DHW	52%	Fuel saturation of gas/electric ratio of hot water heater. Population data demonstrates 52% gas, 48% electric.	2023 NIPSCO C&I OLM Population
ISR	42%	ISR. Estimated proportion installed.	2023 NIPSCO C&I OLM survey

Hot Water Temperature Card

The team used the following deemed values shown in Table 398 from Illinois TRM v12.0 Vol. 3, Measure 5.4.6, Water Heat Temperature Setback measure, to calculate energy savings for this product.

Table 398. *Ex Post* Variable Assumption for Hot Water Temperature Card

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
kWh/Unit	2.12	Deemed value of kWh per year saved by installation of device.	Illinois TRM v12.0 Vol. 3, Measure 5.4.6

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
kW/Unit	0.0002	Deemed value of kW demand savings saved by installation of device.	Illinois TRM v12.0 Vol. 3, Measure 5.4.6
Therms/unit	0.13	Deemed value of therms per year saved by installation of device.	IL TRM v12.0 Vol. 3, Measure 5.4.6
% Gas DHW	52%	Fuel saturation of gas/electric ratio of hot water heater. Population data demonstrates 52% gas, 48% electric.	2023 NIPSCO C&I OLM Population
ISR	N/A	ISR. Estimated proportion installed. This value is not applied separately; it is built into the deemed savings values	Illinois TRM v12.0 Vol. 3, Measure 5.4.6

Advanced Power Strip Tier 1

The evaluation team used the following equations from the Illinois TRM v12.0 to calculate the electric energy and peak demand savings for advanced power strips (tier 1). Table 399 lists the assumptions and source of each variable input and assumption for measure savings calculations.

$$\Delta kWh = ((kWwkday * (hrswkday - hrswkdayopen)) + (kWwkend * (hrswkend - hrswkendopen))) * weeks/year * ISR$$

Table 399. *Ex Post* Variable Assumption for Advanced Power Strip Tier 1

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
kWwkday	0.0315	Standby power consumption in kW of connected electronics on weekdays off-hours. If unknown, assume 0.0315 kW.	Illinois TRM v12.0 Measure 4.8.7
kWwkend	0.00617	Standby power consumption in kW of connected electronics on weekend off-hours. If unknown, assume 0.00617 kW.	Illinois TRM v12.0 Measure 4.8.7
hrswkday	106	Total hours during the work week (Monday 7:30 a.m. to Friday 5:30 p.m.).	Illinois TRM v12.0 Measure 4.8.7
hrswkend	62	Total hours during the weekend (Friday 5:30 p.m. to Monday 7:30 a.m.).	Illinois TRM v12.0 Measure 4.8.7
hrswkdayopen	50	Hours that office is open during the work week. If unknown, assume 50 hours.	Illinois TRM v12.0 Measure 4.8.7
hrswkendopen	0	Hours that office is open during the weekend. If unknown, assume 0 hours.	Illinois TRM v12.0 Measure 4.8.7
weeks/year	52.2	Number of weeks per year.	Illinois TRM v12.0 Measure 4.8.7
ISR	82%	ISR, estimated fraction installed.	2023 NIPSCO C&I OLM survey

Switch and Outlet Gaskets

The team used the following deemed values shown in Table 400 from Illinois TRM v12.0 Vol. 3, Section 5.6.1 Res Air Sealing measure, to calculate energy savings for these products. Note that the application of the gaskets is specified as different in the measure names (under switch plates versus under outlet plates), but the measure savings follows the same energy savings algorithm, as per Illinois TRM v12.0 Vol. 3, Measure 5.6.1.

$\Delta kWh = (kWh_{cool} + kWh_{heat} * Electric\ Heat\ Saturation\ Rate) * ISR * QTY$

$\Delta kW = \Delta kW = (\Delta kWh_{cooling} / FLH_{cooling}) * CF$

$\Delta therms = therms/gasket * FS\ Gas * ISR * QTY$

Table 400. Ex Post Variable Assumption for Switch and Outlet Gaskets

INPUT	EX POST VALUE	INPUT DEFINITION	SOURCE
kWh Cool	1.2	Deemed value, kWh saved per unit installed in cooling conditions, for air conditioned spaces.	Illinois TRM v12.0 Vol. 3. Measure 5.6.1
kWh Heat	5.1	Deemed value, kWh saved per unit installed in heating conditions, for electrically heated spaces.	Illinois TRM v12.0 Vol. 3. Measure 5.6.1
Therms Per Unit	0.47	Deemed value, therms saved per unit installed in heating conditions, for gas heated spaces.	Illinois TRM v12.0 Vol. 3. Measure 5.6.1
FS GAS	89%	Fuel saturation of natural gas space heating type. 2023 NIPSCO C&I OLM population data.	2023 NIPSCO C&I OLM population data
ISR	38%	IISR. Estimated proportion installed.	2023 NIPSCO C&I OLM survey

2024 Cost Effectiveness Test Results

PREPARED FOR: NIPSCO

PREPARED BY: ILLUME Advising, an E Source Company and Cadmus

DATE: July 11, 2025

This memo discusses the cost-effectiveness for NIPSCO's portfolio of electric and gas energy efficiency programs for the 2024 program year. Using the methodology detailed in the *Indiana Evaluation Framework* and the *California Standard Practice Manual*, net savings impacts verified through evaluation activities were used to quantify the cost-effectiveness of the efficiency programs, using each of the following standard tests:

- The Total Resource Cost Test (TRC)
- The Program Administrator Cost Test (PACT), or Utility Cost Test (UCT)
- The Participant Cost Test (PCT)
- The Rate Impact Measure Test (RIM)

The definitions and descriptions of each test are provided below. The Societal Cost Test (SCT) is not included in the analysis because Indiana does not quantify environmental externalities that would differentiate this test from the TRC.

There are a few overall factors that affected cost-effectiveness in 2024, compared to prior years, which are worth noting:

- The avoided costs provided by NIPSCO have been updated since the last cost-effectiveness evaluation, resulting in slightly lower values for the electric portfolio, but higher values for the gas portfolio.
 - The value of peak electricity (capacity) decreased from \$121 per kW to \$81 per kW, while avoided Transmission & Distribution (T&D) costs increased from \$33 to \$51 per kW. While these shifts slightly offset each other, the net impact is roughly \$22 less per peak kW reductions achieved by the programs.
 - First-year avoided electric generation (kWh) was marginally higher in 2024 than in 2023 (\$0.034 in 2024 vs \$0.031 in 2023). However, overall electricity avoided costs escalated at a slower rate in 2024 compared to 2023, resulting in lower future year electricity (kWh) values overall.
 - By comparison, the value of avoided natural gas substantially rose, from \$0.19 per therm in 2023 to \$0.52 per therm in 2024. While gas escalation rates, like electricity rates, also decreased compared to 2023, the magnitude of the difference in first-year savings more than offset the relative reduction in future year values.
- The discount rates for both avoided electricity benefits and avoided gas benefits in the UCT and TRC tests marginally increased between years, decreasing the benefits generated in future years relative to the first year of the programs. This was more significant for the TRC than for the UCT. The PCT discount rate was unchanged from 2023.

PROGRAM AND PORTFOLIO COST-EFFECTIVENESS TEST RESULTS

Cadmus led the cost-effectiveness analysis using the inputs provided by NIPSCO and obtained through the evaluation, measurement, and verification (EM&V) process. The Cadmus team conducted the analysis using their cost effectiveness tool (EUROPA).

Table 1 (Electric) and Table 2 (Gas) summarize the results of each cost-effectiveness test by program and sector, as well as for the total portfolio. The differences of each test will be further explained in the next section.

The residential and C&I electric portfolios are cost-effective from each of the total resource, participant, and utility cost perspectives. The RIM test result is below 1.0, as is expected for energy efficiency program designs.

The following provides context for specific electric programs that did not pass either TRC or UCT:

- **Retail Products (TRC, UCT):** This program is impacted by relatively low net-to-gross ratios. Additionally, lighting, which was traditionally a cost-effective measure, represents a smaller portion of program savings as well as a shorter effective useful measure lives (EUL) than in previous years, limiting savings streams for that measure.
- **Appliance Recycling (TRC, UCT):** The Illinois TRM includes incremental measure costs (IMCs) for appliance recycling based on the value of a recycled appliance. These costs alone result in the program failing from a TRC perspective. The results also reflect the lower savings compared with administrative and incentive costs resulting from a slower ramp-up with the move to a new implementation vendor.
- **Behavioral / Income Qualified (IQ)-Behavioral (TRC, UCT):** This program has historically had cost-effective results slightly above 1.0; however, it did not pass either test in 2023 or 2024 due to higher implementation costs relative to savings.
- **MFDI (TRC, UCT):** This program produced slightly lower savings compared to direct install measure costs, unlike prior years where it passed the UCT.
- **Residential New Construction (UCT):** The discount rate and net-to-gross ratio was the primary driver of the lower UCT results for this program.
- **C&I SEM (TRC):** Overall program activity for C&I SEM was relatively low, affecting the TRC.

TABLE 1. COST-EFFECTIVENESS RESULTS FOR NIPSCO'S ELECTRIC EFFICIENCY PROGRAMS, 2024

PROGRAM	COST-EFFECTIVENESS			
	TRC	PCT*	UCT	RIM
Residential				
Home Rebates	1.54	1.68	2.57	0.78
Retail Products	0.87	5.09	0.70	0.28
Home Energy Analysis	2.25	1.72	1.60	0.72
Appliance Recycling	0.89	11.06	0.41	0.22
School Education	1.28	N/A	1.00	0.35
Multifamily Direct Install	0.85	N/A	0.71	0.30
IQ-Behavioral	0.92	N/A	0.92	0.30
Behavioral	0.91	N/A	0.91	0.30
New Construction	1.13	13.25	0.73	0.36
HomeLife Calculator	1.27	N/A	1.01	0.37
Income Qualified Weatherization	2.28	N/A	1.59	0.62
Residential Marketplace	1.21	1.56	1.74	0.64
Total Residential	1.25	6.47	1.06	0.40
Commercial and Industrial				
Custom	1.83	4.85	2.33	0.24
Prescriptive	2.05	3.18	4.70	0.37
Commercial New Construction	1.10	2.90	2.53	0.21
Small Business Direct Install	2.34	4.20	2.95	0.31
Commercial Marketplace	3.05	8.30	1.87	0.31
SEM	0.94	1.84	2.12	0.34
Total Commercial and Industrial	1.72	3.74	2.95	0.27
Total 2024 Electric Portfolio	1.61	3.96	2.21	0.29

*PCT is N/A for programs that do not require participant contributions, such as Behavioral, direct install, or kit programs.

The cost-effectiveness of the combined residential and C&I gas programs is similar to previous years, with a TRC of 2.06, meaning that the programs as a whole yield \$2.06 of benefits for each \$1 of cost. As was seen with the electric portfolio, all gas programs have RIM scores less than 1.0, as is expected for energy efficiency program designs. Below is additional context for gas programs that did not pass either TRC or UCT:

- **Residential New Construction (TRC, UCT):** This program tends to contribute relatively more electric than natural gas benefits relative to costs.
- **Behavioral/IQ-Behavioral (TRC, UCT):** These programs barely fail both the TRC and UCT, largely due to high implementation costs relative to savings.
- **Income Qualified Weatherization (UCT):** This program fails from the UCT perspective due to slightly smaller gas savings relative to delivery and admin costs.
- **Prescriptive (TRC):** This program is penalized from a TRC perspective due to significant incremental measure costs.
- **Small Business Direct Install (UCT):** This program fails the UCT due to substantial direct install measure and administrative costs, relative to gas savings. The program strongly passes the UCT from an electric perspective.

- **Commercial Marketplace (TRC, UCT):** This program's delivery cost against lower participation and savings resulted in the program failing the TRC and UCT.

TABLE 2. COST-EFFECTIVENESS RESULTS FOR NIPSCO'S GAS EFFICIENCY PROGRAMS, 2024

PROGRAM	COST-EFFECTIVENESS			
	TRC	PCT*	UCT	RIM
Residential				
Home Rebates	4.68	7.19	2.34	0.69
Home Energy Analysis	1.50	0.91	1.06	0.51
School Education	1.83	N/A	1.42	0.58
Multi-Family Direct Install	1.29	N/A	1.03	0.50
IQ-Behavioral	0.95	N/A	0.95	0.48
Behavioral	0.93	N/A	0.93	0.48
Residential New Construction	0.59	7.70	0.38	0.27
HomeLife Calculator	3.52	2.76	2.77	0.73
Income-Qualified Weatherization	1.27	N/A	0.86	0.46
Residential Marketplace	2.32	4.40	1.33	0.57
Total Residential	2.02	5.72	1.34	0.57
Commercial and Industrial				
Custom	3.08	2.57	3.01	0.73
Prescriptive	0.80	0.65	2.10	0.68
Commercial New Construction	3.11	4.46	2.05	0.50
Small Business Direct Install	0.42	0.48	0.42	0.30
Commercial Marketplace	0.80	1.49	0.67	0.42
SEM	-	-	-	-
Total Commercial and Industrial	2.13	1.99	2.18	0.61
Total 2024 Gas Portfolio	2.06	3.32	1.59	0.59

*PCT is N/A for programs that do not require participant contributions, such as Behavioral, direct install, or kit programs.

COST-EFFECTIVENESS TESTS

Cost-effectiveness screening, at its core, evaluates whether the net present value (NPV) of the benefits of energy efficiency programs outweigh the costs of the programs. Cost-effectiveness can be evaluated from a variety of different perspectives, including:

- Utility's or program administrator's perspective – using the Program Administrator Cost Test (UCT)
- Societal perspective – using the Total Resource Cost (TRC) Test
- Participant's perspective – using the Participant Cost Test (PCT)
- Nonparticipant's perspective – using the Rate Impact Measure Test (RIM)

Each test result is expressed as a ratio of the NPV of benefits divided by the NPV of costs. A value greater than 1.0 indicates that benefits exceed costs, and the program is cost-effective. The costs and benefits included in each test

are summarized in Table 3, which is abstracted from a guide to best practices in cost-effectiveness testing from the U.S. Environmental Protection Agency.¹

TABLE 3. COSTS AND BENEFITS BY TEST TYPE

COSTS AND BENEFITS	UCT	TRC	PCT	RIM
Avoided energy costs (fuel and operation and maintenance of power plants and transmission and distribution [T&D] lines)*	Benefit	Benefit		Benefit
Avoided capacity costs (constructing power plants, T&D lines, pipelines)*	Benefit	Benefit		Benefit
Other benefits (fossil fuel savings, water savings, equipment operation and maintenance)		Benefit	Benefit	
Participants' incremental cost (above baseline) of efficient equipment		Cost	Cost	
Program administration costs (staff, marketing)	Cost	Cost		Cost
Incentives and value of energy saving measures provided to customers at no cost (including direct install and kits)	Cost	Cost**	Benefit	Cost
Lost utility revenue / lower energy bills (due to lower sales)			Benefit	Cost

*Avoided energy and capacity costs are net of free rider impacts.

** Monetized incentive costs are not considered a TRC cost, but rather a transfer (benefit to customer, cost to utility). However, measure costs for direct install and kit programs are a program-related expense and captured as a cost in the TRC.

INPUTS TO COST-EFFECTIVENESS ANALYSIS

The sections below describe the various inputs that inform the cost-effectiveness test results in two categories: global inputs (which are globally applied to all programs and are not program specific), and program and measure inputs.

GLOBAL INPUTS

Global inputs instruct how to translate the energy savings into dollar benefits, and how to discount the value of future costs and benefits. Global inputs include the following:

DISCOUNT RATES

Because money today is worth more than money tomorrow, a discount rate is used to compare the present value of future costs and benefits. Most of the costs of energy efficiency are incurred up front, while the benefits accrue over time. Benefits are discounted more than costs, so that a lower discount rate will result in higher cost-effectiveness.

The discount rate can vary from test to test and jurisdiction to jurisdiction. For this analysis, the discount rate for the TRC is the yield on 30-year U.S. Treasury bonds; the discount rates used in the UCT are utility-specific weighted

¹ National Action Plan for Energy Efficiency. *Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy Makers*. Energy and Environmental Economics, Inc., and Regulatory Assistance Project. 2008. <https://www.epa.gov/sites/production/files/2015-08/documents/cost-effectiveness.pdf>

average costs of capital; and the discount rate used in the PCT is a typical credit card interest rate. The values used for discount rates were:

- 2.14% for TRC
- 6.53% for electric UCT and RIM
- 6.58% for gas UCT and RIM
- 15% for PCT.

AVOIDED ELECTRIC ENERGY COSTS

These are the variable costs associated with producing a marginal unit of electricity. The main component of this is typically the avoided fuel cost. NIPSCO provided year one costs and escalation factors to project into the future. Both values were revised from 2023 to 2024.

AVOIDED GENERATION CAPACITY COSTS

These are the costs of building new generation capacity that are avoided by reducing peak demand and thereby lowering the need to buy expensive power from the Midwest Independent Service Operator (MISO) during peak summer hours. For the other tests, NIPSCO provided year one costs and escalators to project into the future. Both values were revised from 2023 to 2024.

AVOIDED TRANSMISSION AND DISTRIBUTION (T&D) COSTS

This represents the value of the avoided or delayed expenditures to upgrade the T&D system to meet peak demand. This value was revised from 2023 to 2024.

AVOIDED GAS COSTS

This represents the variable costs associated with procuring and delivering a marginal unit of gas and is generally the commodity cost of gas. NIPSCO provided year one costs and escalation factors to project into the future. Both values were revised from 2023 to 2024.

ELECTRIC AND GAS LINE LOSSES

Line losses are the energy losses incurred as electricity or gas is delivered through the T&D system. If electric line losses are 5%, then for every 100 kWh saved at the customer meter, 105 kWh is saved in generation. NIPSCO provided the average line losses which were used in this analysis. For electricity, the analysis uses a line loss factor of 2.97% in the residential sector, 2.65% in the commercial and industrial sector, and 4.11% during peak times. For gas, the analysis uses a line loss factor of 0.88%. The gas line loss factor was the only factor revised from 2023 to 2024.

PROGRAM AND MEASURE INPUTS

Program and measure inputs are the costs, effective useful measure lives (EUL), savings, and net-to-gross (NTG) ratios used in calculating cost-effectiveness. These inputs come directly from the EM&V activities detailed in the 2024 DSM Portfolio Evaluation report, as well as NIPSCO's program design files provided by the program implementer (TRC), the Indiana Technical Reference Manual (TRM) workbook v1.0 (2024), and the Illinois TRM (v12.0). The following details the program-level inputs and sources of inputs.

- **Program administrative costs:** Program expenditures provided by NIPSCO
- **Measure incentive costs:** Program tracking data and program design files provided by TRC, confirmed by the program expenditures provided by NIPSCO
- **Measure incremental costs:** Program design files provided by TRC

- **Measure EUL:** Program design files provided by TRC, which primarily reference the Indiana TRM workbook v1.0 values
- **Verified savings:** Evaluation results using *ex post gross* values
- **NTG ratio:** Evaluation results, accounting for freeridership only (NTG ratio (%) = 100% - freeridership rate (%)).

DETAILED RESULTS

Table 4 through Table 11 show the discounted benefits, costs, net benefits, and benefit cost ratio for each test (UCT, TRC, PCT, and RIM).

TABLE 4. NET PRESENT VALUE OF ELECTRIC PROGRAM NET BENEFITS: UCT

PROGRAM	UCT		PRESENT VALUE OF NET BENEFITS
	TOTAL BENEFITS	TOTAL COSTS	
Residential			
Home Rebates	\$1,183,695.71	\$460,524.80	\$723,170.91
Retail Products	\$849,002.38	\$1,210,056.42	\$(361,054.04)
Home Energy Analysis	\$786,985.59	\$492,641.82	\$294,343.77
Appliance Recycling	\$122,156.46	\$297,875.78	\$(175,719.32)
School Education	\$1,584,792.76	\$1,588,823.11	\$(4,030.35)
Multifamily Direct Install	\$647,112.39	\$913,355.84	\$(266,243.44)
IQ-Behavioral	\$440,985.49	\$480,210.69	\$(39,225.20)
Behavioral	\$778,896.38	\$852,953.11	\$(74,056.73)
New Construction	\$159,866.39	\$219,240.70	\$(59,374.31)
HomeLife Calculator	\$363,141.41	\$359,159.89	\$3,981.51
Income Qualified Weatherization	\$815,569.10	\$512,299.18	\$303,269.92
Residential Marketplace	\$324,901.86	\$186,367.18	\$138,534.69
Total Residential	\$8,057,105.92	\$7,573,508.52	\$483,597.41
Commercial and Industrial			
Custom	\$13,658,321.61	\$5,867,538.37	\$7,790,783.24
Prescriptive	\$12,831,020.42	\$2,731,180.48	\$10,099,839.94
Commercial New Construction	\$6,086,489.25	\$2,405,796.11	\$3,680,693.14
Small Business Direct Install	\$2,134,314.42	\$723,977.32	\$1,410,337.10
Commercial Marketplace	\$139,032.21	\$74,183.19	\$64,849.01
SEM	\$26,552.19	\$12,551.09	\$14,001.11
Total Commercial and Industrial	\$34,875,730.10	\$11,815,226.56	\$23,060,503.54
Total 2024 Electric Portfolio	\$42,932,836.03	\$19,388,735.08	\$23,544,100.95

Note: Totals may not properly sum due to rounding

TABLE 5. NET PRESENT VALUE OF GAS PROGRAM BENEFITS: UCT

PROGRAM	UCT		PRESENT VALUE OF NET BENEFITS
	TOTAL BENEFITS	TOTAL COSTS	
Residential			
Home Rebates	\$3,946,433.77	\$1,689,453.40	\$2,256,980.37
Home Energy Analysis	\$759,211.43	\$717,375.94	\$41,835.49
School Education	\$636,911.08	\$448,467.30	\$188,443.79
Multi-Family Direct Install	\$207,917.39	\$201,457.34	\$6,460.05
IQ-Behavioral	\$254,654.68	\$269,441.99	\$(14,787.31)
Behavioral	\$520,150.55	\$561,650.85	\$(41,500.30)
Residential New Construction	\$336,438.57	\$890,052.07	\$(553,613.50)
HomeLife Calculator	\$209,876.00	\$75,698.07	\$134,177.94
Income-Qualified Weatherization	\$715,719.77	\$829,151.54	\$(113,431.78)
Residential Marketplace	\$268,149.85	\$201,215.99	\$66,933.85
Total Residential	\$7,855,463.09	\$5,883,964.49	\$1,971,498.60
Commercial and Industrial			
Custom	\$3,114,186.07	\$1,034,912.53	\$2,079,273.54
Prescriptive	\$618,761.29	\$294,455.54	\$324,305.75
Commercial New Construction	\$1,694,625.65	\$828,072.92	\$866,552.72
Small Business Direct Install	\$161,279.37	\$381,046.64	\$(219,767.27)
Commercial Marketplace	\$28,268.48	\$42,179.14	\$(13,910.66)
SEM	\$0.00	\$547.29	\$(547.29)
Total Commercial and Industrial	\$5,617,120.85	\$2,581,214.05	\$3,035,906.80
Total 2024 Gas Portfolio	\$13,472,583.93	\$8,465,178.53	\$5,007,405.40

Note: Totals may not properly sum due to rounding

TABLE 6. NET PRESENT VALUE OF ELECTRIC PROGRAM NET BENEFITS: TRC

PROGRAM	TRC		PRESENT VALUE OF NET BENEFITS
	TOTAL BENEFITS	TOTAL COSTS	
Residential			
Home Rebates	\$1,601,636.79	\$1,038,283.79	\$563,353.00
Retail Products	\$1,028,457.56	\$1,183,841.22	\$(155,383.65)
Home Energy Analysis	\$1,106,527.97	\$492,641.82	\$613,886.14
Appliance Recycling	\$138,099.32	\$155,740.90	\$(17,641.58)
School Education	\$2,033,558.18	\$1,588,823.11	\$444,735.06
Multifamily Direct Install	\$778,859.12	\$913,355.84	\$(134,496.72)
IQ-Behavioral	\$440,985.49	\$480,210.69	\$(39,225.20)
Behavioral	\$778,896.38	\$852,953.11	\$(74,056.73)
New Construction	\$248,446.58	\$219,240.70	\$29,205.88
HomeLife Calculator	\$454,866.17	\$359,159.89	\$95,706.27
Income Qualified Weatherization	\$1,167,689.24	\$512,299.18	\$655,390.06
Residential Marketplace	\$397,813.70	\$329,273.11	\$68,540.59
Total Residential	\$10,175,836.50	\$8,125,823.35	\$2,050,013.14
Commercial and Industrial			
Custom	\$17,943,381.78	\$9,789,002.85	\$8,154,378.92
Prescriptive	\$16,815,501.28	\$8,215,753.05	\$8,599,748.23
Commercial New Construction	\$8,157,217.24	\$7,441,122.91	\$716,094.32
Small Business Direct Install	\$2,739,903.75	\$1,169,763.62	\$1,570,140.13
Commercial Marketplace	\$171,288.75	\$56,158.88	\$115,129.87
SEM	\$33,411.30	\$35,507.07	\$(2,095.76)
Total Commercial and Industrial	\$45,860,704.10	\$26,707,308.39	\$19,153,395.72
Total 2024 Electric Portfolio	\$56,036,540.60	\$34,833,131.74	\$21,203,408.86

Note: Totals may not properly sum due to rounding

TABLE 7. NET PRESENT VALUE OF GAS PROGRAM BENEFITS: TRC

PROGRAM	TRC		PRESENT VALUE OF NET BENEFITS
	TOTAL BENEFITS	TOTAL COSTS	
Residential			
Home Rebates	\$5,725,452.52	\$1,223,212.79	\$4,502,239.73
Home Energy Analysis	\$1,077,759.10	\$717,375.94	\$360,383.17
School Education	\$822,201.20	\$448,467.30	\$373,733.91
Multi-Family Direct Install	\$260,289.16	\$201,457.34	\$58,831.82
IQ-Behavioral	\$254,654.68	\$269,441.99	\$(14,787.31)
Behavioral	\$520,150.55	\$561,650.85	\$(41,500.30)
Residential New Construction	\$525,037.42	\$890,052.07	\$(365,014.65)
HomeLife Calculator	\$266,321.15	\$75,698.07	\$190,623.08
Income-Qualified Weatherization	\$1,054,284.27	\$829,151.54	\$225,132.73
Residential Marketplace	\$331,680.36	\$142,740.93	\$188,939.43
Total Residential	\$10,837,830.42	\$5,359,248.82	\$5,478,581.60
Commercial and Industrial			
Custom	\$4,358,416.33	\$1,414,404.87	\$2,944,011.46
Prescriptive	\$827,423.23	\$1,036,154.28	\$(208,731.05)
Commercial New Construction	\$2,398,942.04	\$772,577.92	\$1,626,364.12
Small Business Direct Install	\$168,009.49	\$395,952.95	\$(227,943.45)
Commercial Marketplace	\$34,965.90	\$43,620.38	\$(8,654.48)
SEM	\$0.00	\$547.29	\$(547.29)
Total Commercial and Industrial	\$7,787,756.99	\$3,663,257.68	\$4,124,499.32
Total 2024 Gas Portfolio	\$18,625,587.41	\$9,022,506.49	\$9,603,080.92

Note: Totals may not properly sum due to rounding

TABLE 8. NET PRESENT VALUE OF ELECTRIC PROGRAM NET BENEFITS: PCT

PROGRAM	PCT		PRESENT VALUE OF NET BENEFITS
	TOTAL BENEFITS	TOTAL COSTS	
Residential			
Home Rebates	\$1,404,162.14	\$833,400.51	\$570,761.64
Retail Products	\$3,257,538.76	\$639,974.80	\$2,617,563.97
Home Energy Analysis	\$485,530.19	\$282,130.37	\$203,399.82
Appliance Recycling	\$542,288.78	\$49,045.68	\$493,243.10
School Education	\$2,094,705.86	\$-	\$2,094,705.86
Multifamily Direct Install	\$985,411.51	\$-	\$985,411.51
IQ-Behavioral	\$973,905.34	\$-	\$973,905.34
Behavioral	\$1,726,767.81	\$-	\$1,726,767.81
New Construction	\$413,172.75	\$31,171.76	\$382,000.99
HomeLife Calculator	\$451,701.33	\$-	\$451,701.33
Income Qualified Weatherization	\$517,196.44	\$-	\$517,196.44
Residential Marketplace	\$312,242.46	\$199,764.72	\$112,477.74
Total Residential	\$13,164,623.37	\$2,035,487.83	\$11,129,135.54
Commercial and Industrial			
Custom	\$39,290,456.06	\$8,106,797.44	\$31,183,658.62
Prescriptive	\$22,988,014.06	\$7,228,288.09	\$15,759,725.97
Commercial New Construction	\$19,328,445.09	\$6,671,706.34	\$12,656,738.75
Small Business Direct Install	\$4,171,310.67	\$994,072.66	\$3,177,238.01
Commercial Marketplace	\$332,148.05	\$40,017.84	\$292,130.21
SEM	\$50,971.11	\$27,737.98	\$23,233.13
Total Commercial and Industrial	\$86,161,345.04	\$23,068,620.34	\$63,092,724.69
Total 2024 Electric Portfolio	\$99,325,968.41	\$25,104,108.18	\$74,221,860.23

Note: Totals may not properly sum due to rounding

TABLE 9. NET PRESENT VALUE OF GAS PROGRAM BENEFITS: PCT

PROGRAM	PCT		PRESENT VALUE OF NET BENEFITS
	TOTAL BENEFITS	TOTAL COSTS	
Residential			
Home Rebates	\$5,235,084.67	\$728,486.14	\$4,506,598.53
Home Energy Analysis	\$536,064.76	\$588,009.76	\$(51,945.00)
School Education	\$438,379.01	\$-	\$438,379.01
Multi-Family Direct Install	\$153,539.80	\$-	\$153,539.80
IQ-Behavioral	\$258,301.53	\$-	\$258,301.53
Behavioral	\$527,599.50	\$-	\$527,599.50
Residential New Construction	\$873,383.47	\$113,490.91	\$759,892.56
HomeLife Calculator	\$150,911.42	\$54,664.30	\$96,247.12
Income-Qualified Weatherization	\$423,648.98	\$-	\$423,648.98
Residential Marketplace	\$351,898.30	\$79,976.64	\$271,921.66
Total Residential	\$8,948,811.43	\$1,564,627.75	\$7,384,183.68
Commercial and Industrial			
Custom	\$2,712,996.11	\$1,056,395.97	\$1,656,600.14
Prescriptive	\$609,028.80	\$941,309.29	\$(332,280.49)
Commercial New Construction	\$2,099,866.13	\$471,278.91	\$1,628,587.22
Small Business Direct Install	\$153,522.39	\$321,190.27	\$(167,667.89)
Commercial Marketplace	\$59,714.02	\$40,017.84	\$19,696.19
SEM	\$0.00	\$0.00	\$0.00
Total Commercial and Industrial	\$5,635,127.45	\$2,830,192.28	\$2,804,935.17
Total 2024 Gas Portfolio	\$14,583,938.87	\$4,394,820.03	\$10,189,118.85

Note: Totals may not properly sum due to rounding

TABLE 10. NET PRESENT VALUE OF ELECTRIC PROGRAM NET BENEFITS: RIM

PROGRAM	RIM		
	TOTAL BENEFITS	TOTAL COSTS	PRESENT VALUE OF NET BENEFITS
Residential			
Home Rebates	\$1,183,695.71	\$1,511,708.61	\$(328,012.89)
Retail Products	\$849,002.38	\$3,048,654.72	\$(2,199,652.34)
Home Energy Analysis	\$786,985.59	\$1,094,591.90	\$(307,606.30)
Appliance Recycling	\$122,156.46	\$550,697.49	\$(428,541.03)
School Education	\$1,584,792.76	\$4,468,440.38	\$(2,883,647.62)
Multifamily Direct Install	\$647,112.39	\$2,164,472.77	\$(1,517,360.38)
IQ-Behavioral	\$440,985.49	\$1,454,116.02	\$(1,013,130.54)
Behavioral	\$778,896.38	\$2,579,720.92	\$(1,800,824.54)
New Construction	\$159,866.39	\$442,769.76	\$(282,903.37)
HomeLife Calculator	\$363,141.41	\$976,228.89	\$(613,087.48)
Income Qualified Weatherization	\$815,569.10	\$1,316,261.15	\$(500,692.04)
Residential Marketplace	\$324,901.86	\$510,003.26	\$(185,101.39)
Total Residential	\$8,057,105.92	\$20,117,665.85	\$(12,060,559.93)
Commercial and Industrial			
Custom	\$13,658,321.61	\$57,650,575.43	\$(43,992,253.83)
Prescriptive	\$12,831,020.42	\$34,309,457.43	\$(21,478,437.01)
Commercial New Construction	\$6,086,489.25	\$29,294,095.37	\$(23,207,606.12)
Small Business Direct Install	\$2,134,314.42	\$6,796,005.71	\$(4,661,691.29)
Commercial Marketplace	\$139,032.21	\$446,951.52	\$(307,919.31)
SEM	\$26,552.19	\$77,580.58	\$(51,028.38)
Total Commercial and Industrial	\$34,875,730.10	\$128,574,666.05	\$(93,698,935.94)
Total 2024 Electric Portfolio	\$42,932,836.03	\$148,692,331.90	\$(105,759,495.87)

Note: Totals may not properly sum due to rounding

TABLE 11. NET PRESENT VALUE OF GAS PROGRAM BENEFITS: RIM

PROGRAM	RIM		
	TOTAL BENEFITS	TOTAL COSTS	PRESENT VALUE OF NET BENEFITS
Residential			
Home Rebates	\$3,946,433.77	\$5,692,403.09	\$(1,745,969.32)
Home Energy Analysis	\$759,211.43	\$1,487,459.85	\$(728,248.42)
School Education	\$636,911.08	\$1,094,499.43	\$(457,588.35)
Multi-Family Direct Install	\$207,917.39	\$412,352.27	\$(204,434.88)
IQ-Behavioral	\$254,654.68	\$527,743.52	\$(273,088.84)
Behavioral	\$520,150.55	\$1,089,250.35	\$(569,099.80)
Residential New Construction	\$336,438.57	\$1,231,308.69	\$(894,870.12)
HomeLife Calculator	\$209,876.00	\$288,579.65	\$(78,703.65)
Income-Qualified Weatherization	\$715,719.77	\$1,555,120.95	\$(839,401.19)
Residential Marketplace	\$268,149.85	\$473,205.95	\$(205,056.10)
Total Residential	\$7,855,463.09	\$13,851,923.74	\$(5,996,460.65)
Commercial and Industrial			
Custom	\$3,114,186.07	\$4,258,212.04	\$(1,144,025.98)
Prescriptive	\$618,761.29	\$910,576.15	\$(291,814.86)
Commercial New Construction	\$1,694,625.65	\$3,391,613.11	\$(1,696,987.46)
Small Business Direct Install	\$161,279.37	\$545,808.91	\$(384,529.55)
Commercial Marketplace	\$28,268.48	\$68,035.87	\$(39,767.39)
SEM	\$0.00	\$547.29	\$(547.29)
Total Commercial and Industrial	\$5,617,120.85	\$9,174,793.37	\$(3,557,672.53)
Total 2024 Gas Portfolio	\$13,472,583.93	\$23,026,717.11	\$(9,554,133.18)

Note: Totals may not properly sum due to rounding

CONCLUSIONS

Overall, NIPSCO's energy efficiency portfolio was cost-effective, creating \$28.5 million in total net benefits for NIPSCO, \$84.4 million in total net benefits for program participants, and \$30.8 million in total net benefits on a societal (TRC) basis. While the portfolios passed the TRC, UCT and PCT, several programs failed from either the TRC or UCT perspective, though many were close to passing. Finally, as expected based on previous years, the electric and gas RIM test is below 1.0.