



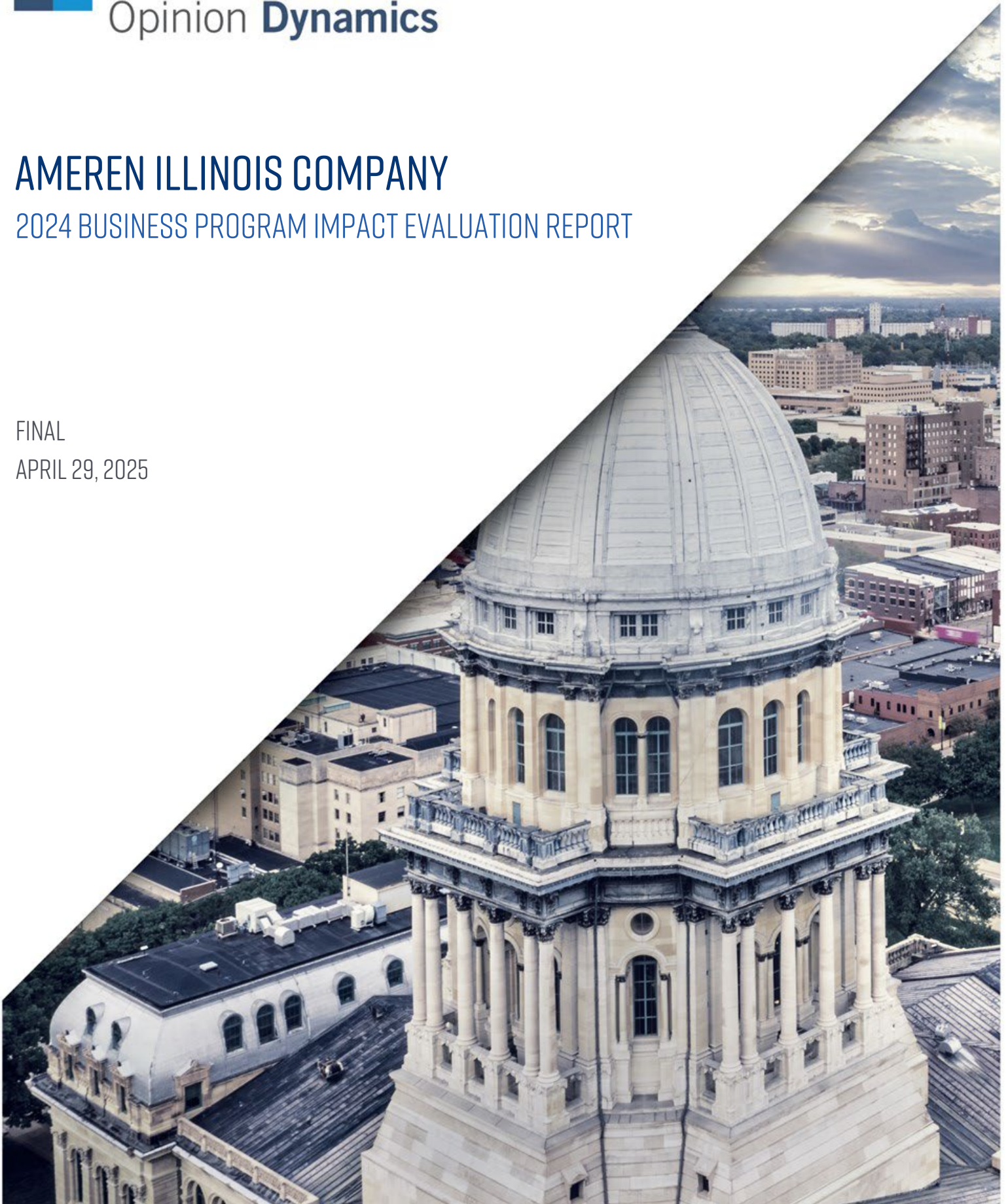
Opinion **Dynamics**

AMEREN ILLINOIS COMPANY

2024 BUSINESS PROGRAM IMPACT EVALUATION REPORT

FINAL

APRIL 29, 2025



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I. EXECUTIVE SUMMARY

This report presents the impact evaluation results for Ameren Illinois Company's (AIC) 2024 Business Program. The Business Program is part of AIC's overall portfolio of residential and nonresidential energy efficiency programs implemented during 2024. The overarching objective of the 2024 Business Program impact evaluation is to determine gross and net electric energy, electric demand, and fossil fuel impacts associated with the Program.

I.1 PROGRAM OVERVIEW

The Business Program is the largest component of AIC's portfolio and is made up of several initiatives (further broken down into channels) that the evaluation team assessed as part of the 2024 evaluation:¹

- Standard Initiative
 - Core channel
 - Online Store channel
 - Building Operator Certification (BOC) Training channel
- Custom Initiative
 - Custom Incentives channel
 - New Construction Lighting channel
- Retro-Commissioning (RCx) Initiative
 - Core channel (RCx Core)
 - Virtual Commissioning™ channel (VCx)
 - Virtual Strategic Energy Management (Virtual SEM) channel
- Streetlighting Initiative
 - Municipality-Owned Streetlighting (MOSL) channel
 - Utility-Owned Streetlighting (UOSL) channel
- Small Business Initiative
 - Small Business Direct Install (SBDI) channel
 - Small Business Energy Performance (SBEP) channel
- Midstream Initiative
 - Lighting channel
 - HVAC channel
 - Food Service channel
- Luminaire-Level Lighting Control (LLLC) Market Transformation (MT) Pilot²

¹ In addition to the channels described here, the Program operates a number of channels that provide customer services but do not directly produce energy savings (such as the Metering and Monitoring channel of the Custom Initiative), or that were operated in 2024 but did not lead to any completed projects (such as the Retro-Commissioning Lite channel of the Retro-Commissioning Initiative).

² The evaluation findings for the LLLC Pilot are presented under separate cover. See Appendix E.

The initiatives are designed to achieve energy savings from nonresidential customers in accordance with AIC’s plan filing. The Small Business and Standard Initiatives are key drivers of Business Program energy savings; they primarily provide customers with energy assessments, prescriptive rebates, and installation services. The Custom and RCx Initiatives provide information, technical support, and financial assistance for custom energy efficiency projects. The Midstream Initiative incentivizes equipment wholesalers and distributors to reduce prices at the point of sale and is becoming an increasing point of emphasis for the program. Lastly, the Streetlighting Initiative seeks to increase the adoption of energy-efficient streetlights throughout AIC’s territory.

1.2 POLICY BACKGROUND

This is the third calendar year of AIC’s sixth Electric and Gas Energy Efficiency and Demand Response Plan, covering calendar years 2022–2025 (Plan 6). AIC’s Plan 6 portfolio is governed by components of Illinois state law (220 ILCS 5/8-103B [Section 8-103B] and 220 ILCS 5/8-104 [Section 8-104]) that direct large, regulated utilities to offer electric and gas energy efficiency programs. Section 8-103B and Section 8-104 were recently substantively revised through the passage of Illinois Public Act 102-0662 (the Climate and Equitable Jobs Act, or CEJA) in September 2021.

Section 8-103B and Section 8-104 define key policy points relevant to evaluating the 2024 AIC Business Program. These are summarized below as context for this evaluation report.

- **Cumulative Persisting Annual Savings (CPAS):** Since 2018, electric energy savings goals for Illinois utilities have been primarily defined based on persisting savings as a percentage of sales. Therefore, annual evaluations of AIC’s electric energy efficiency programs must present both annual and persisting savings over the life of delivered measures. As a result, AIC and its program implementer have sought to deliver programs that achieve savings that persist for longer periods of time.
- **Weighted Average Measure Life (WAML):** Section 8-103B allows AIC to create a regulatory asset from all of its expenditures incurred under Section 8-103B. AIC can then amortize and recover the total expenditures of this regulatory asset “over a period that is equal to the weighted average of the measure lives implemented for that year that are reflected in the regulatory asset.”³ Therefore, annual evaluations of AIC’s electric energy efficiency programs must present a WAML in accordance with the calculation guidelines in the Illinois Stakeholder Advisory Group’s (SAG) WAML Report and the Illinois Energy Efficiency Policy Manual.⁴
- **Applicable Annual Incremental Goal (AAIG):** Section 8-103B allows AIC to earn a rate of return on their electric energy efficiency spending if they create a regulatory asset, as discussed above. The rate of return that is earned can be adjusted either up or down as a function of AIC’s performance relative to its AAIG. The AAIG is defined as the difference between the cumulative persisting electric savings goal for the year being evaluated and the cumulative persisting electric savings goal for the previous year. AIC must achieve sufficient savings through its programs to replace savings from measures at the end of their measure life before progress can be counted toward the AAIG. Therefore, annual evaluations of AIC’s electric energy efficiency programs must assess AIC’s performance against its AAIG.
- **(b-25) Savings Conversion:** Subsection (b-25) of Section 8-103B allows electric utilities to “convert” savings achieved of other fuels, including natural gas, to electric savings for the purposes of goal attainment in certain cases. The total amount of savings allowed to be converted is capped at a maximum of 10% of the utility’s

³ Illinois Energy Efficiency Stakeholder Advisory Group. *Weighted Average Measure Life Report*. 2018. Accessed at: https://www.ilsag.info/wp-content/uploads/SAG_files/SAG_Reports/SAG_WAML_Report_Final_2-20-18.pdf.

⁴ Ibid.

applicable annual total savings requirement.^{5,6} The 2024 AIC Integrated Impact Evaluation Report presents the savings AIC claimed in 2024 via (b-25) conversions; this report presents actual savings achieved for all fuels.

- **Large Customer Opt-Outs:** In 2018, the Future Energy Jobs Act (FEJA) excluded large electric customers from participating in AIC’s Business Program.⁷ CEJA removed this exclusion starting in the 2022 program year; however, large electric customers can still opt out of the programs. Large electric customers who opt out of the Program must submit an American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) level 2 or higher audit report to the utility. This report should identify all cost-effective energy efficiency project opportunities that could be invested in over the next 10 years. Additionally, customers must provide a detailed plan outlining how they intend to reallocate the funds they would have paid into the utility's energy efficiency programs toward their internal energy efficiency efforts. Opt-outs are only valid for a given plan cycle; large electric customers must request to opt out of future cycles. In 2020, large gas customers became ineligible to participate in AIC’s Business Program; they remain excluded.⁸

1.3 PROGRAM SAVINGS

In the following sections, the evaluation team presents annual savings (annualized 2024 energy savings) and CPAS for AIC's Business Program. As discussed in greater detail in the 2024 AIC Integrated Impact Evaluation Report, AIC’s performance compared to its AAIG is determined based on both types of savings.

1.3.1 ANNUAL SAVINGS

The 2024 Business Program achieved 216,468 MWh, 26.84 MW, and 2,908,908 therms in verified net savings. These savings include (b-25) conversions of fuels not provided by AIC, which are detailed further in the 2024 AIC Integrated Impact Evaluation Report. Table 1, Table 2, and Table 3 present ex ante gross, verified gross, and verified net electric energy, electric demand, and gas savings, by initiative and channel, for the 2024 Business Program.

Table 1. 2024 Business Program Electric Energy Annual Savings Summary

Initiative/Channel	Ex Ante Gross MWh	Gross Realization Rate	Verified Gross MWh	Net-to-Gross Ratio (NTGR)	Verified Net MWh
Standard - Core	64,643	97%	62,829	0.906	56,907
Standard - OS	2,465	99%	2,440	0.963	2,350
Standard - BOC	1,137	88%	1,003	N/A	1,003
Custom - Custom Incentives	39,928	91%	36,191	0.814	29,466
Custom - New Construction Lighting	1,474	94%	1,391	0.791	1,100
RCx - Core	1,841	100%	1,832	0.945	1,730
RCx - VCx	4,571	108%	4,956	0.937	4,642
RCx - Virtual SEM	803	103%	831	1.000	831
Streetlighting - MOSL	50	100%	50	1.000	50
Streetlighting - UOSL	12,516	100%	12,516	1.000	12,516

⁵ The annual total savings requirement is the AAIG plus the additional savings that need to be acquired on an annual basis to replace any savings from measures at the end of their measure life before progress can be counted toward AAIG.

⁶ Note that prior to the passage of CEJA, the (b-25) savings conversion was capped at 10% of AAIG, rather than the annual total savings requirement.

⁷ Large electric customers are defined as nonresidential electric customers with electric demand of over 10 MW.

⁸ Large gas customers are defined as nonresidential natural gas customers with annual usage of 4,000,000 therms or more across all AIC service points, or 8,000,000 therms or more across all Illinois service points.

Initiative/Channel	Ex Ante Gross MWh	Gross Realization Rate	Verified Gross MWh	Net-to-Gross Ratio (NTGR)	Verified Net MWh
Small Business - SBDI	35,027	100%	35,017	0.917	32,099
Small Business - SBEP	332	69%	229	1.000	229
Midstream - Lighting	28,461	101%	28,672	0.981	28,129
Midstream - HVAC	405	100%	405	0.704	285
Midstream - Food Service	575	92%	529	0.863	456
Midstream - Lighting Carryover ^a	N/A	N/A	3,543	0.913	3,235
LLLC Pilot	N/A	N/A	0	N/A	0
<i>Business Program Subtotal</i>	<i>194,226</i>	<i>99%</i>	<i>192,428</i>	<i>0.910</i>	<i>175,030</i>
Business (b)-25 Conversions					41,438
Business Program Total					216,468

^a Carryover savings are those achieved through installation of measures during 2024 that were distributed or rebated in prior program years. For clarity, we break out carryover savings separately throughout this report.

Table 2. 2024 Business Program Electric Demand Annual Savings Summary

Initiative/Channel	Ex Ante Gross MW	Gross Realization Rate	Verified Gross MW	NTGR	Verified Net MW
Standard - Core	11.82	99%	11.64	0.908	10.57
Standard - OS	0.52	100%	0.52	0.918	0.48
Standard - BOC	0.12	88%	0.11	N/A	0.11
Custom - Custom Incentives	4.04	93%	3.77	0.827	3.12
Custom - New Construction Lighting	0.28	99%	0.28	0.792	0.22
RCx - Core	0.05	79%	0.04	0.945	0.04
RCx - VCx	0.00	N/A	0.00	N/A	0.00
RCx - Virtual SEM	0.00	N/A	0.00	N/A	0.00
Streetlighting - MOSL	0.00	N/A	0.00	N/A	0.00
Streetlighting - UOSL	0.00	N/A	0.00	N/A	0.00
Small Business - SBDI	5.75	99%	5.71	0.918	5.25
Small Business - SBEP	0.11	96%	0.11	1.000	0.11
Midstream - Lighting	6.74	92%	6.17	0.981	6.06
Midstream - HVAC	0.10	107%	0.10	0.697	0.07
Midstream - Food Service	0.08	59%	0.05	0.854	0.04
Midstream - Lighting Carryover ^a	N/A	N/A	0.84	0.913	0.77
LLLC Pilot	N/A	N/A	0.00	N/A	0.00
Business Program Total	30.46	96%	29.35	0.914	26.84

^a Carryover savings are those achieved through installation of measures during 2024 that were distributed or rebated in prior program years. For clarity, we break out carryover savings separately throughout this report.

Table 3. 2024 Business Program Gas Annual Savings Summary

Initiative/Channel	Ex Ante Gross Therms	Gross Realization Rate	Verified Gross Therms	NTGR	Verified Net Therms
Standard - Core	1,555,181	100%	1,560,657	0.718	1,119,881
Standard - OS	107,812	100%	107,812	0.910	98,062
Standard - BOC	16,100	86%	13,800	N/A	13,800
Custom - Custom Incentives	1,454,451	132%	1,916,044	0.834	1,577,836
Custom - New Construction Lighting	0	N/A	0	N/A	0
RCx - Core	0	N/A	0	N/A	0
RCx - VCx	0	N/A	0	N/A	0
RCx - Virtual SEM	0	N/A	0	N/A	0
Streetlighting - MOSL	0	N/A	0	N/A	0
Streetlighting - UOSL	0	N/A	0	N/A	0
Small Business - SBDI	0	N/A	0	N/A	0
Small Business - SBEP	18,280	106%	19,319	1.000	19,319
Midstream - Lighting	0	N/A	0	N/A	0
Midstream - HVAC	7,469	95%	7,129	0.864	6,156
Midstream - Food Service	54,799	114%	62,568	0.866	54,170
Midstream - Lighting Carryover ^a	0	N/A	0	N/A	0
LLLC Pilot	N/A	N/A	0	N/A	0
Business Program Total	3,214,092	115%	3,686,724	0.789	2,908,908

^a Carryover savings are those achieved through installation of measures during 2024 that were distributed or rebated in prior program years. For clarity, we break out carryover savings separately throughout this report.

1.3.2 CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 4 summarizes CPAS and WAML for the 2024 Business Program at the initiative level. For additional detail related to CPAS and measure life, please see the individual initiative subsections in Section 3 and Appendix C of this report, which present CPAS achieved in each future year. The overall WAML for the 2024 Business Program is 16.8 years.

Table 4. 2024 Business Program CPAS and WAML

Initiative/Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
Standard - Core	12.9	62,829	0.906	56,907	56,907	56,890	56,719	...	55,817	...	728,986
Standard - Online Store	10.7	2,440	0.963	2,350	2,350	2,350	2,350	...	2,350	...	25,122
Standard - BOC	13.0	1,003	1.000	1,003	1,003	1,003	1,003	...	582	...	9,248
Custom - Custom Incentives	18.5	36,191	0.814	29,466	29,466	29,466	29,466	...	28,895	...	544,754
Custom - New Construction Lighting	12.8	1,391	0.791	1,100	1,100	1,100	1,100	...	1,100	...	14,035
Retro-Commissioning - Core	8.6	1,832	0.945	1,730	1,730	1,730	1,730	...	1,730	...	14,880
Retro-Commissioning - Virtual Commissioning	7.3	4,956	0.937	4,642	4,642	4,642	4,642	...	4,642	...	33,887
Retro-Commissioning - Virtual SEM	7.0	831	1.000	831	831	831	831	...	831	...	5,814
Streetlighting - MOSL	20.0	50	1.000	50	50	50	50	...	50	...	1,009
Streetlighting - UOSL	20.0	12,516	1.000	12,516	12,516	12,516	11,816	...	11,816	...	238,425
Small Business - SBDI	13.6	35,017	0.917	32,099	32,099	32,045	31,062	...	29,193	...	418,125
Small Business - SBEP	20.1	229	1.000	229	229	229	229	...	229	...	4,491
Midstream - Lighting	14.9	28,672	0.981	28,129	28,129	28,129	28,129	...	28,120	...	419,315
Midstream - HVAC	12.9	405	0.704	285	285	285	280	...	249	...	3,600
Midstream - Food Service	13.5	529	0.863	456	456	456	456	...	456	...	6,142
Midstream - Carryover	14.6	3,543	0.913	3,235	3,235	3,235	3,235	...	3,190	...	46,989
Business (b-25) Conversions	25.0	50,289	0.824	41,438	41,438	41,438	41,438	...	41,438	...	1,035,959
2024 Business Program CPAS		242,723	0.892	216,468	216,468	216,396	214,537	...	210,690	...	3,550,889
Expiring 2024 Business Program CPAS				0	0	72	1,858	...	1,453	...	
Expired 2024 Business Program CPAS				0	0	72	1,931	...	5,778	...	
WAML	16.8										

2. EVALUATION APPROACH

The following section of the report describes the evaluation approach taken for the 2024 Business Program impact evaluation. As part of the evaluation process, the evaluation team applied versions of the Illinois Energy Efficiency Policy Manual and the Illinois Technical Reference Manual (IL-TRM) applicable to the 2024 program year (Version 3.0 [V3.0]⁹ and Version 12.0 [V12.0], respectively) wherever relevant.¹⁰ Appendix A of this report provides more detailed, initiative-specific methodology where appropriate.

2.1 RESEARCH OBJECTIVES AND EVALUATION APPROACH

The overarching research objectives for the impact evaluation of AIC’s 2024 Business Program are as follows:

- Estimate the gross energy, demand, and gas impacts from the Program
- Estimate the net energy, demand, and gas impacts from the Program

We met these objectives by conducting the impact evaluation activities listed in Table 5. In addition, we reviewed initiative materials and interviewed initiative managers.

Table 5. 2024 Business Program Impact Evaluation Activities

Initiative	Gross Impacts				Net Impacts
	IL-TRM Application Review	Engineering Desk Reviews	On-Site Measurement and Verification (M&V)	Consumption Analysis	Application of SAG-Approved NTGRs
Standard	✓	✓			✓
Custom		✓	✓	✓ ^a	✓
RCx		✓	✓	✓	✓
Streetlighting	✓				✓
Small Business	✓				✓
Midstream	✓				✓

^a The evaluation team used site-specific regression analyses to estimate verified savings for some Custom Initiative projects.

The following sections provide further detail on the approaches to estimating verified gross and net savings.

2.2 VERIFIED GROSS IMPACT ANALYSIS APPROACH

2.2.1 APPLICATION OF IL-TRM V12.0

To determine verified gross impacts associated with the Standard, Small Business, Streetlighting, and Midstream Initiatives, we reviewed the contents of the tracking database to identify database errors and duplicate records and to ensure that the implementer correctly applied savings algorithms and assumptions stated in the IL-TRM V12.0 and the IL-TRM V12.0 errata document. In particular, we applied the algorithms and assumptions from the IL-TRM V12.0 while

⁹ Policy Manual Version 3.0 is effective as of January 1, 2024.

¹⁰ In future years, the evaluation team will apply updated versions of these manuals to the evaluation of this Program as required by law, Illinois Commerce Commission orders, and changes to the manuals themselves.

using project-specific data from the initiative tracking databases where appropriate. We verified measure installations by analyzing initiative tracking databases and reviewing supporting project documentation as part of this process.

We resolved discrepancies found in the databases and documented details related to any gross savings adjustments in the initiative-specific sections of this report. Further, in accordance with Illinois policy, the evaluation team omitted gas penalties from savings presented in the body of this report. Appendix B presents details on gas penalties for cost-effectiveness purposes.

2.2.2 CARRYOVER SAVINGS

In addition to savings achieved by AIC's Business Program through measures delivered during the 2024 program year, AIC claims carryover savings in 2024 from lighting measures distributed by the Business Program in prior years but not installed until 2024. In 2024, AIC claimed Business Program carryover savings from measures incentivized through the Midstream Initiative's Lighting channel in 2022 and 2023.

Carryover savings are estimated primarily based on assumptions outlined in the IL-TRM V12.0, which recommends application of assumptions from the IL-TRM V10.0 and IL-TRM V10.0 errata measures memo.¹¹ We reported previously on AIC's 2024 carryover savings as part of an earlier memo.¹² Carryover savings are not reported as part of individual initiative subsections in Section 3.

2.2.3 APPLICATION OF CUSTOM IMPACT METHODS

The Custom and RCx Initiatives are not suitable for gross impact analysis using the IL-TRM. These initiatives require custom energy savings calculations to determine some or all of the gross impacts. Further details on custom impact methods applied for these initiatives are presented in Appendix A.

2.3 VERIFIED NET IMPACT ANALYSIS APPROACH

To determine verified net savings for the 2024 Business Program, we applied SAG-approved NTGRs to verified gross savings. The two exceptions are: (1) the BOC Training channel within the Standard Initiative, for which the savings algorithms in IL-TRM V12.0 directly estimate net savings, and (2) projects eligible under the Disadvantaged Areas Net-to-Gross Policy described in the following section. Details on all other SAG-approved NTGRs are presented in Appendix A.

2.3.1 DISADVANTAGED AREAS NET-TO-GROSS POLICY

Section 7.4 of the Illinois Policy Manual Version 3.0 outlines the NTGR for Disadvantaged Areas policy.¹³ The policy recognizes that free ridership among certain types of customers in economically disadvantaged areas is likely very low; therefore, it directs the application of a NTGR of 1.000 for eligible customers, superseding the SAG-approved NTGRs that would otherwise be applied.

¹¹ Due to changes made to lighting measures in IL-TRM V11.0, the IL-TRM V10.0 and IL-TRM V10.0 errata memo is the final reference source for key lighting assumptions necessary for remaining carryover from certain lighting measures sold prior to 2023.

¹² Opinion Dynamics. *Ameren Illinois Company Lighting Carryover Savings Claimable in 2024*. Accessed at <https://www.ilsag.info/wp-content/uploads/AIC-2024-Lighting-Carryover-Savings-Memo-FINAL-2025-01-21.pdf>.

¹³ *Illinois Energy Efficiency Policy Manual V3.0*, Section 7.4. Accessed at https://www.ilsag.info/wp-content/uploads/IL_EE_Policy_Manual_Version_3.0_Final_11-3-2023.pdf.

For AIC’s Business Program, the policy applies to all program activity involving the following customer segments:

- Business customers in disadvantaged neighborhoods¹⁴ with DS-2 and/or GDS-2 rate classes; and
- Any general delivery service municipal, public school, and local government customers in a disadvantaged municipality.¹⁵

As a result, the reported NTGRs at the initiative- and measure-level vary from the SAG-approved NTGRs throughout this report. Further details on our approach to applying the policy and a list of disadvantaged neighborhoods are available in Opinion Dynamics’ July 17, 2024, presentation to the Illinois SAG.¹⁶

2.4 SOURCES AND MITIGATION OF ERROR

The evaluation team took steps to mitigate potential sources of error throughout the planning and implementation of the 2024 evaluation. In particular, we took the following actions to address potential sources of error:

- **Analysis Error**
 - **Prescriptive Gross Impact Calculations:** We calculated gross impacts by applying IL-TRM V12.0 calculations to the participant data in the tracking database. A separate team member reviewed all calculations to verify their accuracy and minimize data analysis errors.
 - **Custom Gross Impact Calculations:** We determined custom gross impacts using desk reviews and data collected during on-site M&V. To minimize data analysis errors, we had a separate team member review all calculations to verify that calculations were performed accurately.
 - **Net Impact Calculations:** We derived net impacts by applying SAG-approved NTGRs to estimated gross impacts. A separate team member reviewed all calculations to verify their accuracy and minimize analytical errors.
- **Sampling Error**
 - **Custom Initiative Impact Sample:** The evaluation team completed an impact review for 44 of 134 Custom Initiative projects achieving savings in 2024, drawing three waves of stratified samples separately for Custom Incentives projects claiming electric and gas savings and a fourth for New Construction Lighting projects. For gross impact results, at the 90% confidence level, we achieved a relative precision of 13.7% for electric energy savings, 41.4% for electric demand savings, and 13.0% for gas savings. Further detail on our methodology for Custom Initiative sampling is provided in Appendix A.
- **Non-Sampling Error**
 - **Measurement Error:** To minimize data collection error during on-site M&V, the evaluation team used trained engineers and technicians familiar with the equipment covered by the Custom Initiative and the methods used to calculate the gross impacts.

For the VCx and Virtual SEM channels, we also addressed the following types of errors:

- **Errors Due to Presence of Non-Routine Events:** Non-routine events (NREs) refer to changes in facility energy consumption resulting from facility-related changes unrelated to the interventions recommended through the channel. NREs can make it difficult to accurately measure savings using meter-based approaches, including those we used for VCx and Virtual SEM. The evaluation team accounted for NREs in our modeling approach by removing

¹⁴ Areas identified as “income-eligible households” by Illinois Solar for All.

¹⁵ Municipalities where at least fifty percent (50%) of the municipality is identified as income-eligible through Illinois Solar for All.

¹⁶ Opinion Dynamics. *Overview of Disadvantaged Areas Net-to-Gross Tracking for Ameren Illinois*. July 17, 2024. Accessed at: https://www.ilsag.info/wp-content/uploads/SAG-NTGR-for-Disadvantaged-Areas-Presentation_ODC_2024-07-17.pdf.

data for the affected period and/or extending the baseline back in time accordingly, consistent with International Performance Measurement and Verification Protocol (IPMVP) Non-Routine Adjustment Options 1 and 3, respectively.¹⁷

- **Model Specification Error:** In this type of error, variables that predict model outcomes are left out when they should be included, which can produce biased estimates. The models used to estimate ex ante impacts in 2024 excluded weather interaction terms despite the weather-sensitive nature of the interventions, such as HVAC scheduling adjustments. The evaluation team addressed this type of error by modifying the facility-level models in cases where the inclusion of weather interactions improved model fit before producing verified savings.
- **Measurement Error:** In the context of the VCx and Virtual SEM channels, measurement error can occur in two ways: (1) when utility electric meters do not accurately record the true energy consumption of a facility, and (2) when the defined post-period coincides with ongoing program implementation. In practice, little can be done in an evaluation context to mitigate errors from utility meters. However, we know from experience that this type of error is expected to be small and not significantly affect savings estimates. When appropriate and data permitting, the evaluation team re-defined model post-periods to exclude any periods of ongoing program implementation and only considered post-period data after all measures had been implemented.
- **Prediction Error:** Prediction error occurs when the model does not perfectly predict future energy consumption. We did not receive a full year of post-period data for all VCx and Virtual SEM projects in 2024. This introduces uncertainty because the models could not train on a full range of temperature data after the intervention was initiated. This could increase the prediction error for temperatures that are outside the range of the training data. We addressed this by carefully examining model fit diagnostics.
- **Multicollinearity:** This type of modeling error can bias the model results and produce very large variances. We addressed this issue by carefully considering model specifications and data to ensure that there were no multicollinearity issues.

Finally, note that the calculations in some of the tables in this report cannot be exactly reproduced due to rounding.

¹⁷ Webster, Lia. *IPMVP Application Guide on Non-Routine Events and Adjustments*. Efficiency Valuation Organization (EVO). 2020. Opinion Dynamics

3. INITIATIVE-LEVEL RESULTS

3.1 STANDARD INITIATIVE

3.1.1 INITIATIVE DESCRIPTION

The Standard Initiative offers fixed incentives to AIC private and public sector business customers for installing prescriptive energy efficiency measures. The Initiative primarily focuses on lighting retrofits, lighting controls, motors, HVAC equipment, steam traps, and specialty applications such as agricultural and refrigeration measures. AIC also incentivizes building operators in their service territory to attend BOC Training through the Standard Initiative.

For the purposes of this report, the Initiative offerings are grouped into three channels:

- **Standard Core channel:** The Standard Core channel consists of a collection of downstream incentives targeted at various energy-intensive end uses. Incentive requests exceeding \$10,000 require pre-approval by AIC staff. For projects that do not exceed this cap, customers can apply for incentives after purchasing and installing qualifying equipment.
- **Online Store channel:** The Online Store channel is an e-commerce marketplace where AIC business customers can purchase energy-efficient equipment at a reduced price.
- **Building Operator Certification (BOC) Training:** BOC Training is a nationally recognized certification program that educates building operators on equipment operations, common low-cost operational improvements, performance benchmarking, and building commissioning.

Overall, the implementation team set a goal of achieving 49,712 MWh and 1,050,123 therms of savings through the Standard Initiative in 2024.

3.1.2 INITIATIVE ANNUAL SAVINGS SUMMARY

Table 6 presents the Standard Initiative savings achieved in 2024. The 2024 Standard Initiative achieved 60,260 MWh, 11.16 MW, and 1,231,742 therms in verified net savings. The Initiative also produced 2,650 therms in verified net gas savings in 2024 that are not directly claimable by AIC because the customers do not receive gas service from AIC; these savings are detailed further in Appendix B.

Table 6. 2024 Standard Initiative Annual Savings

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	68,244	12.47	1,679,093
Gross Realization Rate	97%	98%	100%
Verified Gross Savings	66,272	12.28	1,682,268
NTGR	0.909	0.909	0.732
Verified Net Savings	60,260	11.16	1,231,742

3.1.3 STANDARD CORE CHANNEL

The following sections present the impact evaluation results for the 2024 Standard Core channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The Standard Core channel offers traditional downstream incentives for lighting, variable frequency drives, HVAC equipment, refrigeration/grocery store equipment, commercial kitchen equipment, steam trap repair/replacements, green nozzles, and other measures. The channel separates these into a series of distinct offerings, detailed below.

- Standard Lighting for Business (SLB)
- Variable Frequency Drives (VFDs)
- Specialty Equipment (SE)
- Heating, Ventilating, and Air Conditioning (HVAC)
- Green Nozzles (GNs)
- Steam Trap Repair/Replacement (STRR)

Summary of Key Implementation Changes

Initiative staff instituted the following design and implementation changes to the Standard Core channel in 2024:

- Several measures were removed from the list of eligible measures:
 - Steam boilers were removed from the HVAC offering.
 - Packaged Terminal Air Conditioners (PTAC) and Packaged Terminal Heat Pumps (PTHP) were moved from the Standard HVAC offering to the Midstream HVAC channel.
 - Interior and exterior downlights were removed from the SLB offering.
- The implementation team added a weatherization application, including incentives for air sealing, above-ground wall insulation, duct sealing, duct insulation, and covers and gap sealers for room air conditioners (RACs).
- Exterior networked lighting controls, including LLCs, were added to the list of eligible SLB measures, and the per-fixture incentive cap for interior and exterior networked lighting controls was reduced.
- The implementation team increased the incentives for several measures, including VFDs, anti-sweat heater controls, ECMs for coolers and freezers, advanced rooftop controls, demand-controlled ventilation, unitary condensing furnaces, ozone laundry, and guest room energy management
- A new end-of-year incentive bonus was implemented for electric projects. This bonus provided an additional 20% incentive for new and existing projects forecasted to close near the end of the year, incentivizing the customers to complete the projects sooner to ensure the savings could be claimed in 2024.
- Marketing efforts transitioned to a more segmented approach, targeting specific customer segments with customized communication and newsletters, including public sector customers, small commercial facilities, and industrial/manufacturing facilities.

PARTICIPATION SUMMARY

Table 7 presents a summary of participation in the 2024 Standard Core channel by offering. We present these data separated by public and private sector projects to provide context as to the primary drivers of participation. AIC customers completed 745 unique projects through the channel, encompassing 67,488 incentivized measures. The SLB offering continued to dominate channel activity, accounting for 55% of total projects completed in 2024. The HVAC and SE offerings accounted for the next largest share of completed projects at 17% and 14%, respectively.

Table 7. 2024 Standard Core Channel Participation Summary by Measure Category

Offering	Total Projects	Measure Quantity	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Therms
Private Sector^a					
SLB	343	53,404	42,166	8.66	0
VFDs	32	165	12,760	1.90	0
SE	101	1,381	2,925	0.26	296,075
HVAC	63	114	997	0.08	276,270
STRR	39	3,351	6	0.00	274,606
<i>Private Sector Subtotal</i>	<i>578</i>	<i>58,415</i>	<i>58,854</i>	<i>10.90</i>	<i>846,950</i>
Public Sector					
SLB	66	7,280	3,081	0.51	0
VFDs	16	29	1,412	0.31	0
HVAC	66	888	1,286	0.10	257,458
STRR	19	876	10	0.00	450,773
<i>Public Sector Subtotal</i>	<i>167</i>	<i>9,073</i>	<i>5,789</i>	<i>0.92</i>	<i>708,231</i>
Total	745	67,488	64,643	11.82	1,555,181

Note: The ex ante gas savings in this table reflect only AIC claimable gas savings. One project completed through the Standard Core channel produced non-AIC gas savings and, as such, was not included. More information on the savings from this project is presented in Appendix B.

^a The project counts, measure counts, and ex ante savings values presented in the Private Sector subsection of this table include State and Federal facilities, as these facility types are not included in the list of customer types covered in the public sector minimum funding requirements in subsection (c) of 220 ILCS 5/8-103B and subsection (e) of 220 ILCS 5/8-104.

Figure 1 shows the distribution of Standard Core projects by facility type. As shown, manufacturing/industrial, education, and retail were the most common facility types treated through the Standard Core channel in 2024.

Figure 1. 2024 Standard Core Channel Participation by Facility Type

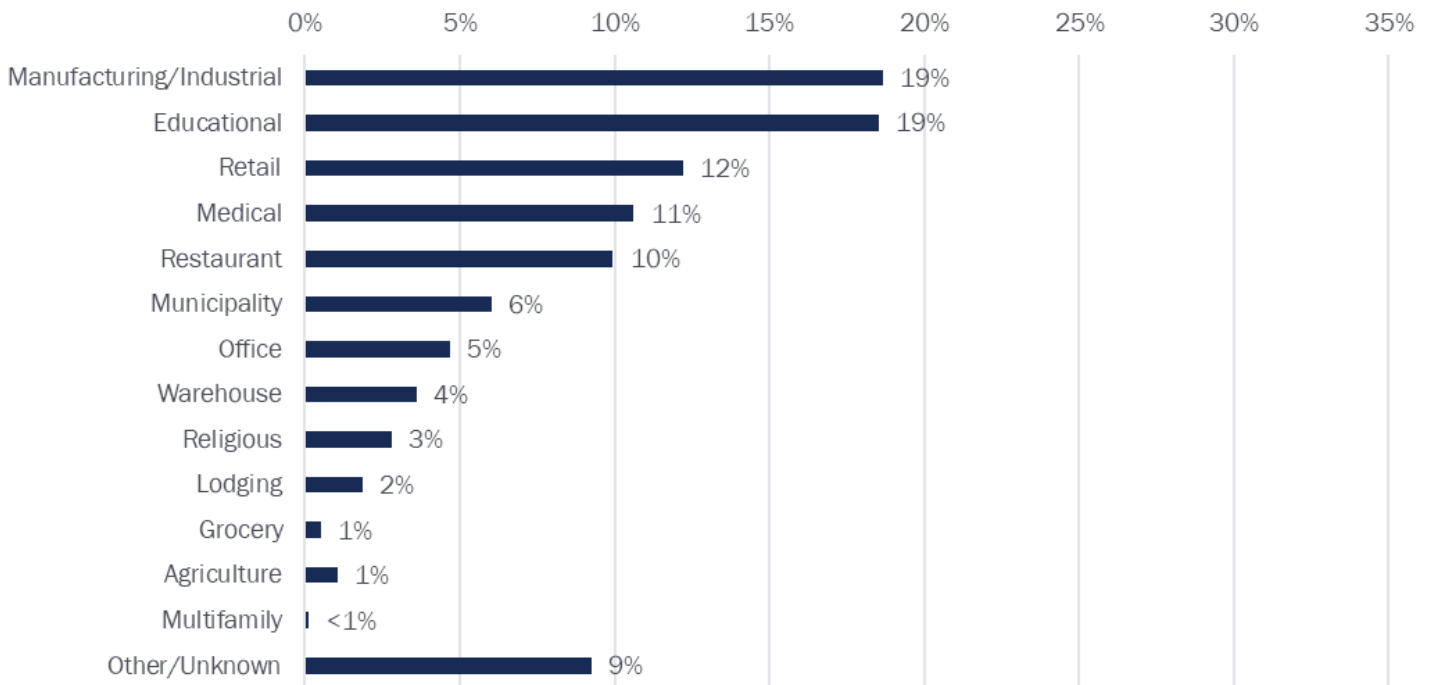


Table 8 presents information on Program Ally participation in the channel.¹⁸ In total, 165 program allies participated in 2024, a 13% increase compared to the 146 Program Allies in 2023. Notably, 21% of Standard Core projects were completed by customers without the assistance of a Program Ally. The majority of these projects were SE projects (42%) or SLB projects (38%). Table 8 presents participation information on the Program Allies that were most active in each channel offering in 2024.

Table 8. 2024 Standard Core Channel Program Ally Participation Summary

Program Ally	Projects	Share of Total
SLB (n=409)		
Ally 1	52	13%
Ally 2	35	9%
Ally 3	18	4%
Ally 4	12	3%
Ally 5	12	3%
HVAC (n=129)		
Ally 6	19	15%
Ally 7	14	11%
Ally 8	6	5%
Ally 9	5	4%

¹⁸ A Program Ally is a contractor or vendor that is enrolled in AIC's Program Ally Network, which is a network of companies qualified to deliver services through AIC's initiatives.

Program Ally	Projects	Share of Total
SE (n=101)		
Ally 10	12	12%
Ally 11	5	5%
Ally 12	3	3%
Ally 13	3	3%
STRR (n=58)		
Ally 6	45	78%
Ally 14	3	5%
Ally 15	2	3%
Ally 9	2	3%
VFDs (n=48)		
Ally 16	4	8%
Ally 17	3	6%

SAVINGS DETAIL

Table 9 presents the ex ante, verified gross, and verified net electric energy savings achieved through the Standard Core channel in 2024. The channel achieved a 97% gross realization rate for electric energy. The Standard Core channel experienced more than a doubling of verified net electric energy savings in 2024 compared to 2023, led by the SLB and VFD offerings. In line with historical contributions, the SLB offering represented the majority of verified net energy savings at 72%. While the SLB offering had a 45% increase in participation in 2024, the offering also achieved more savings per project in 2024 (100 MWh/project) than in 2023 (53 MWh/project), which drove the 135% increase in savings for the offering. The VFDs offering accounted for 20% of verified net electric energy savings in 2024 and achieved a 159% increase in savings compared to 2023, largely due to a 129% increase in participation. The other three offerings saw modest changes in contributions compared to 2023: (1) the SE offering experienced a 10% decrease in verified net savings compared to 2023 and contributed 5% towards the channel's total savings in 2024; (2) HVAC experienced a less than 1% drop in savings compared to 2023 and contributed 3% to total channel savings; and (3) STRR increased by 11% and contributed less than 1% to the channel total.

Table 9. 2024 Standard Core Channel Electric Energy Savings by Measure

Offering	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
SLB	45,247	100%	45,248	0.907	41,051
VFD	14,046	88%	12,311	0.912	11,231
SE	2,925	100%	2,916	0.929	2,710
HVAC	2,408	97%	2,338	0.814	1,904
STRR	16	101%	16	0.742	12
Total	64,643	97%	62,829	0.906	56,907

Table 10 presents the ex ante, verified gross, and verified net electric demand savings achieved through the Standard Core channel in 2024. The channel achieved a 99% gross realization rate for demand savings. SLB (79%) and VFDs (18%) accounted for 96% of the channel's verified net demand savings. Overall, the Standard Core channel experienced a 166% increase in verified net demand savings in 2024 compared to 2023. The primary driver of the increased demand savings was a 209% increase in verified net demand savings per project for the SLB offering in 2024.

Table 10. 2024 Standard Core Channel Electric Demand Savings by Measure

Offering	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
SLB	9.17	100%	9.17	0.907	8.31
VFD	2.22	93%	2.06	0.915	1.88
SE	0.26	100%	0.26	0.935	0.24
HVAC	0.18	90%	0.16	0.831	0.13
Total	11.82	99%	11.64	0.908	10.57

Table 11 presents the ex ante, verified gross, and verified net gas savings achieved through the Standard Core channel in 2024. The channel achieved a 100% realization rate for gas savings. Overall, the Standard Core channel experienced a 13% decrease in verified net gas savings in 2024 compared to 2023. The STRR offering (47% of channel verified net gas savings) saw a 10% increase in savings compared to 2023 and the HVAC offering (31% of channel verified net gas savings) saw a 160% increase. While SE (22% of channel verified net gas savings) saw a 62% decrease in verified net gas savings from 2023, the 2024 savings still represent a 198% increase over 2022 totals and a steady increase in the overall contributions to channel savings dating back to 2019.

Table 11. 2024 Standard Core Channel Gas Savings by Measure

Offering	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
SE	296,075	99%	293,659	0.853	250,422
HVAC	533,728	101%	540,622	0.634	342,825
STRR	725,379	100%	726,375	0.725	526,633
Total	1,555,181	100%	1,560,657	0.718	1,119,881

Note: The savings presented in this table only reflect those directly claimable by AIC. One additional project produced non-AIC gas savings. More information on these savings are presented in Appendix B.

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **VFDs** (22% of ex ante electric energy savings and 19% of demand savings): The gross realization rates for VFDs are 88% for electric energy and 93% for demand savings.
 - The evaluation team limits savings for VFDs installed on process pumps and process fans to 42% and 67% of the baseline energy usage, respectively.¹⁹ The implementation team did not apply the 67% limit to the baseline energy usage for three VFDs installed on process fans. This discrepancy accounts for nearly all of the differences between ex ante and verified savings for the VFD offering and resulted in a decrease in verified electric energy and demand savings.
- **HVAC** (4% of ex ante electric energy savings, 2% of demand savings, and 34% of gas savings): The gross realization rates for HVAC are 97% for electric energy, 90% for demand, and 101% for gas savings.
 - The primary driver of the HVAC electric energy and demand realization rates was the VFD for HVAC supply and return fans measure. The evaluation team observed two discrepancies. The first was a seemingly anomalous issue with one project where the ex ante savings did not match what the evaluation team calculated when applying the implementation team’s algorithms programmed in the Ameren Leidos Energy Efficiency Tracker (ALEET). The replicated ex ante savings matched the verified savings calculated by the evaluation team. The

¹⁹ The 67% cap for process fans is prescribed in IL-TRM V12.0 Section 4.8.13. The 42% cap for process pumps comes from a 2010 memorandum titled “Recommendations for Verifying Savings for non-HVAC VFDs.” More details on the evaluation team’s gross impact methodology for these measures is provided in the Appendix A.

discrepancies for this project resulted in decreased verified electric energy and demand savings. The second discrepancy was observed between the new and existing control strategies listed in the Initiative tracking data compared to the signed project application. For three measures, an existing control strategy of “no control or bypass damper” was listed in the Initiative tracking data, while “outlet control valve” was listed in the application. The evaluation team applied the discharge damper control strategy for those measures. For two measures, the Initiative tracking data did not include the new control strategy, while the signed application listed temperature sensor as the new control strategy. To be conservative, the evaluation team applied assumptions for VFDs with low/no duct static pressure control in the verified savings calculations, given that the TRM does not define assumptions for VFDs with temperature sensors. These differences resulted in decreased verified electric energy and demand savings.

- For the three high efficiency boiler projects (n=5 measures), the implementation team applied the baseline efficiency rating for boilers with capacities over 2.5 MMBtu from IL-TRM V12.0. The evaluation team applied the value from the IL-TRM V12.0 errata, which updated baseline efficiencies for units of that capacity. This resulted in an overall increase in verified gas savings.

3.1.4 ONLINE STORE CHANNEL

The following sections present the impact evaluation results for the 2024 Online Store channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The Online Store channel within the Standard Initiative provides a convenient e-commerce alternative to purchase energy-efficient technologies (e.g., LEDs, advanced thermostats, and advanced power strips). The Online Store channel is also a resource for educating private and public sector customers about the benefits of energy-efficient products and is available to all AIC business customers.

PARTICIPATION SUMMARY

Table 12 presents a summary of participation through the Online Store channel in 2024. In total, the channel incentivized the purchase of 6,108 units of efficient equipment.

Table 12. 2024 Online Store Channel Participation Summary by Measure

Measure Category	Measure Quantity	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Therms
Private Sector				
Advanced Thermostats	1,457	1,870	0.50	106,788
LED Bulbs and Fixtures	188	137	0.01	0
Advanced Power Strips – Tier 1	1,587	126	0.00	0
Lighting Controls	10	7	0.01	0
Smart Sockets	166	3	0.00	0
<i>Private Sector Subtotal</i>	<i>3,408</i>	<i>2,143</i>	<i>0.51</i>	<i>106,788</i>
Public Sector^a				
Advanced Thermostats	24	43	0.01	1,024
LED Bulbs and Fixtures	75	66	<0.01	0
Advanced Power Strips – Tier 1	2,585	206	0.00	0
Lighting Controls	15	8	0.01	0

Measure Category	Measure Quantity	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Therms
Smart Sockets	1	<1	0.00	0
<i>Public Sector Subtotal</i>	2,700	322	0.02	1,024
Total	6,108	2,465	0.52	107,812

^a The project counts, measure counts, and ex ante savings values presented in the Private Sector subsection of this table include State and Federal facilities, as these facility types are not included in the list of customer types covered in the public sector minimum funding requirements in subsection (c) of 220 ILCS 5/8-103B and subsection (e) of 220 ILCS 5/8-104.

SAVINGS DETAIL

Table 13 presents the ex ante, verified gross, and verified net electric energy savings achieved through the Online Store channel in 2024. The channel achieved a 99% electric energy realization rate. Overall, the channel experienced a 1% increase in verified net electric energy savings compared to 2023. Notable changes at the measure level include a 472% increase in verified net electric energy savings from advanced power strips and a 50% decrease in savings from LEDs compared to 2023.

Table 13. 2024 Online Store Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Advanced Thermostats	1,913	100%	1,913	0.908	1,737
Advanced Power Strips – Tier 1	332	100%	332	1.161	385
LED Bulbs and Fixtures	203	88%	178	1.161	207
Lighting Controls	14	100%	14	1.161	17
Smart Sockets	3	95%	3	1.161	3
Total	2,465	99%	2,440	0.963	2,350

Table 14 presents the ex ante, verified gross, and verified net electric demand savings achieved through the Online Store channel in 2024. The channel achieved a 100% realization rate for demand savings. Channel verified net demand savings decreased by 2% in 2024 compared to 2023, primarily driven by a 4% decrease in demand savings from advanced thermostats.

Table 14. 2024 Online Store Channel Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Advanced Thermostats	0.51	100%	0.51	0.910	0.46
LED Bulbs and Fixtures	0.01	100%	0.01	1.161	0.01
Lighting Controls	0.01	100%	0.01	1.161	0.01
Total	0.52	100%	0.52	0.918	0.48

Table 15 presents the ex ante, verified gross, and verified net gas savings achieved through the Online Store channel in 2024. The channel achieved a 100% realization rate for gas savings. Overall, the channel experienced an 18% decrease in verified net gas savings compared to 2023. This decrease in savings aligns with an 11% decrease in the number of advanced thermostats incentivized in 2024 compared to 2023.

Table 15. 2024 Online Store Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Advanced Thermostats	107,812	100%	107,812	0.910	98,062
Total	107,812	100%	107,812	0.910	98,062

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **LED Bulbs and Fixtures (8% of ex ante energy savings, 1% of demand savings):** The gross realization rates for LED Bulbs and Fixtures are 88% for electric energy savings and 100% for demand savings.
 - For 11 wall pack records, the evaluation team applied a baseline wattage consistent with IL-TRM V12.0 based on the lumen value included in the equipment specifications. All 11 records were the same model of wall pack (L80-WPT-50-120/277-D-PC), which outputs 8,000 lumens. We applied a baseline wattage of 198.8W in the verified savings calculations per the IL-TRM V12.0. The implementation team applied a baseline wattage of 284.1W, which is appropriate for lumen output values of 10,000 or higher. This discrepancy in baseline wattage assumptions resulted in lower verified electric energy savings.
- **Smart Sockets (<1% of ex ante energy savings):** The gross realization rate for Smart Sockets is 95% for electric energy savings.
 - The evaluation team awarded zero electric energy savings in the verified analysis for nine records because the customers associated with the projects are not AIC electric customers. This resulted in lower verified electric energy savings.

3.1.5 BUILDING OPERATOR CERTIFICATION

The following sections present the impact evaluation results for the 2024 BOC Training channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

AIC offers the BOC Training channel to building operators in their service territory. BOC is a nationally recognized course and certification training developed by the Northwest Energy Efficiency Council (NEEC). It includes classroom training, project assignments to be completed at the participant’s facility, and in-class tests at the end of each day. Graduates who pass the Certification Exam earn the BOC Certification and become a certified Building Operator. While participants do not need to be AIC customers to enroll in the course, AIC provides full tuition reimbursements to customers in their service territory upon course completion to incentivize participation.

The BOC training consists of two levels. The Level I course focuses on energy-efficient building operations, and the Level II course focuses on preparing building operators to evaluate their facility’s performance and optimize operations. Table 16 includes a list of topics covered in each of the course levels.

Table 16. BOC Training Topics by Level

Topics	Level I	Level II
1001 – Energy-Efficient Operation of Building HVAC Systems	✓	
1002 – Measuring and Benchmarking Energy Performance	✓	
1003 – Efficient Lighting Fundamentals	✓	
1004 – HVAC Controls Fundamentals	✓	
1005 – Indoor Environmental Quality	✓	
1006 – Common Opportunities for Low-Cost Operational Improvements	✓	
2001 – Building Scoping for Operational Improvements		✓
2002 – Optimizing HVAC Controls for Energy Efficiency		✓
2003 – Introduction to Building Commissioning		✓
2004 – Water Efficiency for Building Operators		✓
2005 – Presentations of Final Projects		✓

Note: In addition to the topics listed in this table, both the Level I and Level II courses include one supplemental class. The topics covered in this supplemental class vary.

PARTICIPATION SUMMARY

Table 17 summarizes participation in the 2024 BOC Training channel by segment. Overall, nine AIC customers participated in the training. All trainees enrolled in Level I of the training.

Table 17. 2024 BOC Training Channel Participation Summary by Segment

Participant Number	BOC Level	Segment
2401318	I	Municipality
2401319	I	Municipality
2401320	I	School/College
2401321	I	School/College
2401322	I	Manufacturing/Industrial
2401324	I	Medical
2401326	I	Medical
2401327	I	Medical
2401329	I	Medical

SAVINGS DETAIL

Table 18 presents the ex ante, verified gross, and verified net electric energy savings achieved through the BOC Training channel in 2024. The gross realization rate for electric energy savings is 88%. Overall, the channel produced 33% more verified net electric energy savings in 2024 compared to 2023.

Table 18. 2024 BOC Training Channel Electric Energy Savings by Measure

Participant Number	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
2401320	137	100%	137	N/A	137
2401321	137	100%	137	N/A	137

Participant Number	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
2401322	137	100%	137	N/A	137
2401324	137	100%	137	N/A	137
2401326	137	100%	137	N/A	137
2401327	137	100%	137	N/A	137
2401329	137	3%	3	N/A	3
2401319	110	100%	110	N/A	110
2401318	67	100%	67	N/A	67
Total	1,137	88%	1,003	N/A	1,003

Table 19 presents the ex ante, verified gross, and verified net electric demand savings achieved through the BOC Training channel in 2024. The gross realization rate for electric demand savings is 88%. Overall, the channel produced 38% more verified net electric demand savings in 2024 compared to 2023.

Table 19. 2024 BOC Training Channel Electric Demand Savings by Measure

Participant Number	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
2401320	0.02	100%	0.02	N/A	0.02
2401321	0.02	100%	0.02	N/A	0.02
2401322	0.02	100%	0.02	N/A	0.02
2401324	0.02	100%	0.02	N/A	0.02
2401326	0.02	100%	0.02	N/A	0.02
2401327	0.02	100%	0.02	N/A	0.02
2401329	0.02	3%	<0.01	N/A	<0.01
2401319	0.01	100%	0.01	N/A	0.01
2401318	0.01	100%	0.01	N/A	0.01
Total	0.12	88%	0.11	N/A	0.11

Table 20 presents the ex ante, verified gross, and verified net gas savings achieved through the BOC Training channel in 2024. The gross realization rate for electric energy savings is 86%. Overall, the channel produced 48% more verified net electric energy savings in 2024 compared to 2023.

Table 20. 2024 BOC Training Channel Gas Savings by Measure

Participant Number	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
2401320	2,300	100%	2,300	N/A	2,300
2401321	2,300	100%	2,300	N/A	2,300
2401322	2,300	100%	2,300	N/A	2,300
2401324	2,300	100%	2,300	N/A	2,300
2401326	2,300	100%	2,300	N/A	2,300
2401327	2,300	100%	2,300	N/A	2,300
2401329	2,300	0%	0	N/A	0
Total	16,100	86%	13,800	N/A	13,800

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **BOC Training:** The realization rates for the 2024 BOC Training cohort are 88% for electric energy savings, 88% for demand savings, and 86% for natural gas savings.
- **2401329:** For trainee 2401329, the evaluation team could not verify the ex ante square footage listed in the program tracking data. Specifically, the square footage details in the backup documentation differed from the square footage value in the tracking data and from that applied in the ex ante savings calculations. The evaluation team applied the square footage from the backup documentation in the verified calculations, which resulted in a realization rate of 3% for electric energy and demand savings. In addition, the facility listed in the backup documentation does not receive AIC gas service. Therefore, the evaluation team did not calculate verified gas savings for the trainee, resulting in a 0% realization rate for gas savings.

3.1.6 CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 21 through Table 24 present CPAS and WAML for the 2024 Standard Initiative by channel. The tables also include a summary of the measure-specific and total verified gross savings for the Initiative and respective channels, as well as CPAS in each year from 2024–2027.²⁰ The WAML for the Standard Initiative is 12.8 years, and the WAML for the Standard Core, Online Store, and BOC Training channels are 12.9 years, 10.7 years, and 13.0 years, respectively.

Table 21. 2024 Standard Initiative CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
Standard Core	12.9	62,829	0.906	56,907	56,907	56,890	56,719	...	55,817	...	728,986
Online Store	10.7	2,440	0.963	2,350	2,350	2,350	2,350	...	2,350	...	25,122
BOC	13.0	1,003	1.000	1,003	1,003	1,003	1,003	...	582	...	9,248
2024 CPAS		66,272	0.909	60,260	60,260	60,242	60,072	...	58,749	...	763,356
Expiring 2024 CPAS				0	0	18	171	...	603	...	
Expired 2024 CPAS				0	0	18	188	...	1,511	...	
WAML	12.8										

Table 22. 2024 Standard Core Channel CPAS and WAML

Offering	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
SLB	12.1	45,248	0.907	41,051	41,051	41,033	40,870	...	40,160	...	494,102
VFD	15.0	12,311	0.912	11,231	11,231	11,231	11,231	...	11,231	...	168,462
SE	14.1	2,916	0.929	2,710	2,710	2,710	2,710	...	2,567	...	38,278
HVAC	15.0	2,338	0.814	1,904	1,904	1,904	1,896	...	1,859	...	28,074
STRR	6.0	16	0.742	12	12	12	12	...	0	...	70
2024 CPAS		62,829	0.906	56,907	56,907	56,890	56,719	...	55,817	...	728,986
Expiring 2024 CPAS				0	0	18	171	...	603	...	
Expired 2024 CPAS				0	0	18	188	...	1,090	...	
WAML	12.9										

²⁰ For further detail, including achieved CPAS in years not presented in this table, please see the 2024 AIC CPAS and AAIG Workbook.

Table 23. 2024 Online Store Channel CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
Advanced Thermostats	11.0	1,913	0.908	1,737	1,737	1,737	1,737	...	1,737	...	19,109
Advanced Power Strips – Tier 1	7.0	332	1.161	385	3845	385	385	...	385	...	3,124
LED Bulbs and Fixtures	15.1	178	1.161	207	207	207	207	...	207	...	2,392
Lighting Controls	10.0	14	1.161	17	17	17	17	...	17	...	168
Smart Sockets	7.0	3	1.161	3	3	3	3	...	3	...	223
2024 CPAS		2,440	0.963	2,350	2,350	2,350	2,350	...	2,350	...	25,122
Expiring 2024 CPAS				0	0	0	0	...	0	...	
Expired 2024 CPAS				0	0	0	0	...	0	...	
WAML	10.7										

Table 24. 2024 BOC Training CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
BOC	13.0	1,003	N/A	1,003	1,003	1,003	1,003	...	582	...	9,248
2024 CPAS		1,003	N/A	1,003	1,003	1,003	1,003	...	582	...	9,248
Expiring 2024 CPAS				0	0	0	0	...	0	...	
Expired 2024 CPAS				0	0	0	0	...	421	...	
WAML	13.0										

3.1.7 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this evaluation, the evaluation team offers the following key findings and recommendations for the Standard Initiative moving forward:

STANDARD CORE CHANNEL

- **Key Finding #1:** Several pieces of information are needed to support savings calculations that are either not currently collected by the implementation team or are not included in the Initiative tracking data. Some pieces of information are more critical than others when quantifying savings. In particular, parameters where the TRM algorithms require equipment or project-specific information (i.e., the TRM does not provide a default assumption) are of utmost importance. For example, the case length for adding doors to refrigerated displays is partially collected by the implementation team but is not included in the Initiative tracking data, and the TRM does not provide a default value.
- **Recommendation:** We recommend that the implementation team review these data gaps and attempt to introduce the missing fields into the Initiative tracking database as soon as possible. Through our impact analysis, the evaluation team has identified the parameters from the IL-TRM algorithms that require actual values and can share those with the implementation team. If some data are too difficult to collect or impose a burden on applicants, then the implementation team should work with the evaluation team to discern reasonable default assumptions and propose updates to the TRM through the regular update process.

ONLINE STORE CHANNEL

- **Key Finding #1:** The primary source of discrepancy between the ex ante verified saving estimates were differences between the baseline wattages assigned by the implementation and evaluation teams for LED records.
- **Recommendation:** We recommend the implementation team review the baseline wattage assumptions programmed in ALEET, particularly for the wall packs, to ensure they align with the IL-TRM.

BUILDING OPERATOR CERTIFICATION

- **Key Finding #1:** The evaluation team observed significant improvements to the data tracking and documentation for the BOC Training channel. Specifically, the participant information documentation and comments included in ALEET specifying the facilities associated with each savings claim were improvements compared to previous evaluation years. However, further refinements can be made to reduce evaluation risk. Specifically, the evaluation team found that one of the participants was duplicated in the backup documentation, while another was missing. In addition, the evaluation team identified one case where the information listed for one of the participants in the backup documentation did not align with the square footage used to calculate the ex ante savings for the participant or the comment included in ALEET regarding the facility associated with the savings claim.
- **Recommendation:** We recommend that the implementation team continue refining the data tracking and documentation processes for the channel in future years to ensure that all participants and their associated facility information are correctly listed.

3.2 CUSTOM INITIATIVE

3.2.1 INITIATIVE DESCRIPTION

The Custom Initiative offers incentives to AIC business customers for energy efficiency projects involving equipment not covered through AIC’s prescriptive initiatives. The Initiative also provides an avenue for piloting novel measures before incorporating them into the Standard Initiative. Business customers often represent the highest potential for energy savings, but these savings frequently result from highly specialized equipment designed for particular industries or types of facilities. The Custom Initiative allows customers to propose additional measures and tailor projects to their facility and equipment needs.

The Custom Initiative is delivered to customers through several different channels. The Custom Incentives and New Construction Lighting channels produce all the electric energy, electric demand, and gas savings claimed through the Initiative; these channels are described in more detail in Sections 0 and 3.2.5, respectively. In addition to these two channels, AIC also operates several smaller efforts through the Custom Initiative, including Staffing Grants, Metering and Monitoring, Strategic Energy Management (SEM), Building Energy Assessments (BEA), Feasibility Studies, Agricultural Energy Audits, and New Construction Design channels. These channels engage AIC’s business customers more deeply regarding energy efficiency and do not have direct savings claims associated with them.

Overall, the implementation team set a goal of achieving 37,067 MWh and 793,093 therms of savings through the Custom Initiative.

3.2.2 PARTICIPATION SUMMARY

Table 25 presents a summary of the number of projects completed through each Custom Initiative channel, as well as a breakdown of how channel participation was distributed among private and public sector customers.

Table 25. 2024 Custom Initiative Participation Summary by Channel

Measure Category	Total Projects	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Therms
Private Sector				
Custom Incentives	73	19,766	2.86	1,046,161
New Construction Lighting	21	1,448	0.27	0
Staffing Grant	42	0	0	0
Feasibility Study	17	0	0	0
Metering & Monitoring	7	0	0	0
Strategic Energy Management	6	0	0	0
New Construction Design	2	0	0	0
<i>Private Sector Subtotal</i>	<i>162</i>	<i>21,215</i>	<i>3.13</i>	<i>1,046,161</i>

Measure Category	Total Projects	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Therms
Public Sector^a				
Custom Incentives	51	20,162	1.18	408,290
New Construction Lighting	3	25	0.01	0
Staffing Grant	49	0	0	0
Feasibility Study	1	0	0	0
Metering & Monitoring	1	0	0	0
<i>Public Sector Subtotal</i>	95	20,187	1.19	408,290
Total	257	41,402	4.32	1,454,451

Note: The ex ante gas savings in this table only reflect AIC claimable gas savings. Five projects completed through the Custom Initiative produced non-AIC gas savings and, as such, were not included. More information on the savings from these projects is presented in Appendix B.

^a The project counts, measure counts, and ex ante savings values presented in the Private Sector subsection of this table include State and Federal facilities, as these facility types are not included in the list of customer types covered in the public sector minimum funding requirements in subsection (c) of 220 ILCS 5/8-103B and subsection (e) of 220 ILCS 5/8-104.

Table 26 presents a summary of participation in the Custom Incentives and New Construction Lighting channels by facility type. Educational, manufacturing/industrial, and municipal facilities accounted for 66% of Initiative projects.

Table 26. 2024 Custom Initiative Projects by Facility Type

Facility Type	Share of Custom Incentives Projects	Share of New Construction Lighting Projects	Share of Total Projects
Manufacturing/Industrial	32%	8%	28%
Educational	30%	17%	28%
Municipality	10%	4%	9%
Medical	5%	4%	5%
Religious	5%	0%	4%
Office	4%	13%	5%
Warehouse	2%	21%	4%
Retail	2%	17%	5%
Restaurant	2%	4%	3%
Multifamily	2%	0%	2%
Grocery	1%	8%	2%
Lodging	1%	0%	1%
Agricultural	1%	0%	1%
Other/Unknown	2%	4%	3%

In total, 47 Program Allies participated in the Custom Initiative in 2024, with 36 completing projects through the Custom Incentives channel and 14 completing projects through the New Construction Lighting channel.²¹ Notably, 35% of Custom Incentives projects and 8% of New Construction Lighting projects were completed without the assistance of an enrolled Program Ally.

²¹ Three allies completed projects through both Custom Incentives and New Construction Lighting.

3.2.3 INITIATIVE ANNUAL SAVINGS SUMMARY

Table 27 presents the Custom Initiative annual savings achieved in 2024. The 2024 Custom Initiative achieved 30,566 MWh, 3.34 MW, and 1,597,520 therms in verified net savings. The Initiative also produced 1,876,342 therms in verified net gas savings in 2024 that are not directly claimable by AIC because the customers do not receive gas service from AIC. These savings are detailed further in Appendix B.

Table 27. 2024 Custom Initiative Annual Savings

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	41,402	4.32	1,454,451
Gross Realization Rate	91%	94%	132%
Verified Gross Savings	37,582	4.05	1,916,044
NTGR	0.813	0.825	0.834
Verified Net Savings	30,566	3.34	1,597,520

3.2.4 CUSTOM INCENTIVES CHANNEL

The following sections present the impact evaluation results for the 2024 Custom Incentives channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The Custom Incentives channel provides incentives for electric and gas measures not incentivized through other AIC offerings. Some examples of common Custom Incentives measures include compressed air improvements, energy management systems (EMS), and industrial process measures, including heat recovery, process heat, and improvements to steam systems.

Summary of Key Implementation Changes

Initiative staff instituted the following design and implementation changes to Custom Incentives in 2024:

- Electric and gas incentives were updated such that electric savings exceeding 3,125,000 kWh received a per-unit incentive of \$0.06/kWh, and gas savings exceeding 100,000 therms received a per-unit incentive of \$0.50/therm.
- Implementation staff hosted a Compressed Air Challenge Fundamentals Course with industrial customers. The training focused on compressed air systems energy optimization and was part of a continuing education effort to assist customers with identifying participation opportunities.

SAVINGS DETAIL

For the Custom Incentives channel, we verified participation and gross impacts through desk reviews and on-site M&V of a sample of projects, as described in Appendix A. Site-specific M&V was conducted for Custom Incentives projects in three distinct waves, with samples independently developed for each wave by fuel type (electric or gas). We used a stratified combined ratio estimator to develop a realization rate for each wave by savings type (presented later in this chapter).²²

²² Cochran, William G. *Sampling Techniques*. John Wiley & Sons, 1977.

Site-Specific Results

Table 28 presents the gross savings analysis results for 34 Custom Incentives projects we reviewed in 2024. Realization rates for individual projects ranged from 23% to 167% for electric energy and 0% to 213% for gas. In addition, Table 29 presents the gross savings analysis results for four fuel-switching projects we reviewed. More details for 12 selected project reviews are provided in the Appendix D supplement to this report.

Table 28. 2024 Custom Incentives Channel Gross Impact Results for Sample Projects

Project ID	Sample			Ex Ante Gross Savings			Gross Realization Rate			Verified Gross Savings		
	Wave	Fuel	Stratum	MWh	MW	Therms	MWh	MW	Therms	MWh	MW	Therms
2400007	1	Both	1; 1	50	0.00	6,500	167%	N/A	135%	84	0.01	8,766
2301010	2	Electric	2	173	0.13	—	156%	137%	—	270	0.17	—
2400006	1	Both	1; 1	69	0.02	7,221	138%	114%	72%	96	0.02	5,176
2300092	2	Electric	3	775	0.09	—	116%	116%	—	898	0.10	—
2301814	1	Both	1; 1	77	0.00	1,888	112%	N/A	114%	86	0.00	2,151
2300044	3	Electric	3	1,038	0.16	—	100%	100%	—	1,038	0.16	—
2301013	2	Electric	1	77	0.01	—	100%	100%	—	77	0.01	—
2200024	3	Electric	2	574	0.07	—	100%	213%	—	574	0.15	—
2301840	3	Electric	1	8	<0.01	—	100%	100%	—	8	0.00	—
2200065	3	Both	4; 4	3,547	0.42	1,577,311	100%	100%	213%	3,547	0.42	3,359,897
2200089	1	Both	1; 1	51	0.02	714	100%	100%	100%	51	0.02	714
2300006	1	Both	1; 1	197	0.05	-364	100%	100%	100%	197	0.05	-364
2400131	2	Both	3; 1	308	0.05	14,096	100%	44%	100%	308	0.02	14,096
2301683	2	Both	3; 1	469	<0.01	56,790	100%	N/A	100%	469	0.00	56,790
2301001	2	Electric	2	194	0.06	—	96%	100%	—	186	0.06	—
2200088	1	Both	1; 1	162	0.05	3,722	91%	92%	100%	148	0.05	3,722
2300733	1	Electric	1	5	<0.01	—	74%	42%	—	4	0.00	—
2200025	2	Electric	3	919	0.22	—	84%	17%	—	770	0.04	—
2401214	3	Electric	1	101	0.01	—	70%	70%	—	71	0.01	—
2300987	3	Electric	3	795	0.18	—	72%	62%	—	572	0.11	—
2300804	1	Electric	1	449	0.09	—	45%	25%	—	201	0.02	—
2401573	3	Electric	2	322	0.04	—	23%	27%	—	74	0.01	—
2400085	2	Gas	1	—	—	771	—	—	186%	—	—	1,437
2300164	3	Gas	2	—	—	40,025	—	—	100%	—	—	40,033
2101290	2	Gas	1	—	—	4,111	—	—	100%	—	—	4,111

Project ID	Sample			Ex Ante Gross Savings			Gross Realization Rate			Verified Gross Savings		
	Wave	Fuel	Stratum	MWh	MW	Therms	MWh	MW	Therms	MWh	MW	Therms
2000440	1	Gas	1	—	—	14,438	—	—	84%	—	—	12,128
2300834	3	Gas	3	—	—	104,703	—	—	76%	—	—	80,037
2400148	2	Gas	1	—	—	49,068	—	—	61%	—	—	30,010
2400800	3	Gas	3	—	—	165,248	—	—	56%	—	—	92,814
2301496	1	Gas	1	—	—	3,724	—	—	79%	—	—	2,938
2400146	3	Gas	3	—	—	399,763	—	—	44%	—	—	174,702
2400071	3	Gas	3	—	—	79,413	—	—	38%	—	—	30,049
2300101	1	Gas	1	—	—	21,773	—	—	24%	—	—	5,288
2400065	3	Gas	1	—	—	9,524	—	—	0%	—	—	0

Note: The customers that completed projects 2301683, 2400131, and 2200065 are not AIC gas customers. Therefore, these savings are not directly claimable by AIC towards its Section 8-104 gas energy efficiency goals. However, we present the savings in this table because these gas savings did inform the ratio estimator used to develop Initiative-level savings. Additionally, AIC chose to claim the gas savings achieved through these projects as electric savings via (b-25) conversions. More information on these savings can be found in Appendix B.

As part of our Wave 3 sampling activities, Leidos identified four fuel-switching projects in the population of completed projects. We separated these projects into their own sample due to their unique characteristics and completed reviews of each project. Table 29 presents the results of our gross savings analysis for these projects. Per the guidance in IL-TRM V12.0, the evaluation team determined the verified savings for these fuel-switching projects by estimating the change in site MMBtus (million British thermal units [Btus]) produced through the projects. As such, we present a single MMBtu realization rate for these projects instead of specific electric energy and gas realization rates. We then allocated the MMBtu savings for each project across electric energy and gas savings to count savings towards goal attainment in line with IL-TRM guidance.

Table 29. 2024 Custom Incentives Channel Gross Impact Results for Sampled Fuel Switching Projects

Project ID	Ex Ante Gross Savings				MMBtu Realization Rate	Verified Gross Savings			
	MWh	MW	Therms	MMBtu		MWh	MW	Therms	MMBtu
2300481	26	0.02	0	88	587%	151	<0.01	0	515
2301666	20	0.01	1,474	215	223%	44	<0.01	3,287	480
2300012	9,667	0.00	0	32,983	112%	10,825	-0.29	0	36,936
2400008	498	<0.01	16,117	3,310	83%	412	<0.01	13,330	2,737

Given that each Custom Incentives project is unique regarding the measures involved and the methods the evaluation team used to estimate savings, we cannot present a full summary of the sources of discrepancy between the ex ante and verified gross savings estimates for the channel. However, we did make specific findings regarding consistent differences in the approach taken by the evaluation and implementation teams to estimate savings. These findings are provided below. For project-specific details, please see Appendix D to this report and the separate backup documentation provided by the evaluation team. Overarching findings and recommendations for the Custom Initiative are presented in Section 3.2.7.

HVAC and HVAC Controls Projects

- For HVAC Controls projects, the most common and impactful adjustments the evaluation team made were to operating condition assumptions affecting gas savings. For several projects, the evaluation team found that the customer operated the equipment differently from what was characterized in the backup documentation and reflected in the ex ante savings calculations. The evaluation team recommends that the implementation team verify equipment operating conditions following installation and commissioning to ensure they are accurately reflected in ex ante savings calculations.
- The most common adjustment made to the demand savings for HVAC controls projects was to consider the TRM definition of peak hours rather than dividing the energy savings by the hours of use. The evaluation team has observed a marked improvement in considering peak hours in ex ante demand savings calculations in recent years and we encourage the implementation team to continue to use energy savings during peak hours to determine demand savings.

HVAC Replacement Projects

- For one project, a newly installed ground source heat pump system was expected to completely offset the heating load of an existing gas boiler. The implementation team used IL-TRM V12.0 section 4.4.44 for ground source heat pumps to calculate the savings for the project but did not account for new gas-fired make-up air units installed with the project. The evaluation team estimated the project savings using a regression model and found increased gas consumption following the completion of the project, suggesting that the gas usage shifted from the boiler to the make-up air units. The evaluation team recommends the implementation team ensure that ex ante savings calculations encompass all equipment installed as part of, or affected by, the project, and where feasible, validate calculated savings against meter data.

Compressed Air Projects

- The implementation team used performance curve assumptions for two projects that were not representative of the installed equipment. One used a Compressed Air and Gas Institute (CAGI) datasheet with an incorrect operating pressure, and another used a curve of unknown origin. The evaluation team recommends ensuring the correct CAGI datasheet is used or documenting the source if alternate performance data is used. For equipment that does not have a CAGI datasheet or that operates at non-standard conditions, the evaluation team recommends creating a curve using metered power and flow data. The evaluation team encourages the implementation team to continue sending these projects for early review and to ensure that relevant early review recommendations are implemented.

Combined Heat and Power Projects

- The evaluation team reviewed one combined heat and power (CHP) project completed in 2024 and found that while the ex ante calculations were reasonable from an engineering perspective, the calculations and savings allocation did not conform with the IL-TRM CHP methodology. To reduce evaluation risk going forward, the evaluation team recommends that implementation team conform with the TRM approach or provide justification for using other approaches.

Overall Results

We used a stratified combined ratio estimation technique to estimate gross realization rates for each wave by fuel type.^{23,24} These realization rates are presented in Table 30.

Table 30. 2024 Custom Incentives Channel Realization Rates by Wave and Fuel Type

Wave	Energy Savings (MWh)	Demand Savings (MW)	Gas Savings (Therms)
1	82%	73%	68%
2	101%	71%	85%
3	81%	111%	137%
Fuel Switching (FS)	112%	-1,156%	95%

We produced verified gross savings estimates for the Custom Incentives channel by applying these gross realization rates to the population of projects in each wave. Table 31, Table 32, and Table 33 present the annual ex ante, verified gross and net electric energy, electric demand, and gas savings for each wave. Overall, Custom Incentives channel projects accounted for 96% of Custom Initiative verified net MWh savings, 93% of Initiative verified net MW savings, and 100% of Initiative verified net gas savings. The evaluation team achieved a relative precision of 13.1% for channel gross electric energy savings, 40.6% for gross electric demand savings, and 12.7% for gas savings at the 90% confidence level. Further details on our methodology for Custom Initiative sampling are provided in Appendix A.

Table 31. 2024 Custom Incentives Channel Electric Energy Savings by Wave

Wave	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
1	1,061	82%	867	0.814	706
2	3,561	101%	3,612	0.799	2,886
3	25,097	81%	20,280	0.824	16,720
FS	10,210	112%	11,432	0.801	9,154
Total	39,928	91%	36,191	0.814	29,466

Table 32. 2024 Custom Incentives Channel Electric Demand Savings by Wave

Wave	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
1	0.22	73%	0.17	0.805	0.13
2	0.76	71%	0.54	0.827	0.44
3	3.03	111%	3.36	0.822	2.76
FS	0.03	-1156%	-0.29	0.751	-0.22
Total	4.04	93%	3.77	0.827	3.12

²³ Cochran, William Gemmill. *Sampling Techniques*. John Wiley & Sons, 1977.

²⁴ Levy, Paul S., and Stanley Lemeshow. *Sampling of Populations: Methods and Applications*. John Wiley & Sons, 2008.

Table 33. 2024 Custom Incentives Channel Gas Savings by Wave

Wave	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
1	59,615	68%	40,519	0.865	35,038
2	53,950	85%	46,002	0.838	38,535
3	1,323,294	137%	1,812,907	0.832	1,507,575
FS	17,591	94%	16,617	0.985	16,372
Total	1,454,451	132%	1,916,044	0.834	1,597,520

Note: The savings presented in this table only reflect those directly claimable by AIC. Five additional projects produced non-AIC gas savings. More information on these savings are presented in Appendix B.

3.2.5 NEW CONSTRUCTION LIGHTING CHANNEL

The following sections present the impact evaluation results for the 2024 New Construction Lighting channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The New Construction Lighting channel offers incentives for lighting measures in new construction projects. For these New Construction Lighting projects, a tool is provided to help customers design efficient lighting for any facility size. Additionally, the simple application is used to incentivize the installation of lighting that is more efficient than Illinois energy code requirements.

SAVINGS DETAIL

For the New Construction Lighting channel, we verified initiative participation and gross impacts through desk reviews and on-site M&V of a sample of projects, as described in Appendix A. Site-specific M&V was conducted for New Construction Lighting channel projects in a single wave at the close of the program year.

Site-Specific Results

Table 34 presents the gross savings analysis results for the six New Construction Lighting projects we reviewed in 2024. Realization rates for individual projects ranged from 3% to 100%.

Table 34. 2024 New Construction Lighting Channel Gross Impact Results for Sampled Projects

Project ID	Sample Stratum	Ex Ante Gross Savings		Gross Realization Rate		Verified Gross Savings	
		MWh	MW	MWh	MW	MWh	MW
2400607	2	67	0.04	100%	100%	67	0.04
2400063	1	3	0.00	100%	99%	3	<0.01
2400026	4	767	0.09	99%	105%	758	0.10
2400047	3	105	0.04	93%	96%	97	0.04
2400076	3	267	0.02	80%	85%	214	0.01
2400060	1	1	<0.01	3%	37%	<1	<0.01

We reviewed the sampled 2024 New Construction Lighting projects to identify consistent differences in the savings estimation approach taken by the evaluation and implementation teams. These findings are provided below to contextualize the impact evaluation results for the channel.

The evaluation team found that the drivers of the New Construction Lighting channel's realization rates included adjustments to equipment wattages, building area measurements, and facility type assignments which impact the assumptions from IL-TRM that are applied in savings calculations, such as lighting power density. Regarding the wattage discrepancies, the evaluation team recommends that the implementation team use the Design Lights Consortium (DLC) website to confirm the fixture wattages applied in ex ante savings calculations for fixtures that do not utilize switchable drivers. The DLC testing protocols ensure consistency in reported wattages across lighting products and manufacturers.

Overall Results

We used a stratified combined ratio estimation technique to estimate gross realization rates for each savings type.^{25,26} These realization rates are presented in Table 35.

Table 35. 2024 New Construction Lighting Channel Realization Rates

Wave	Electric Energy Savings (MWh)	Electric Demand Savings (MW)
New Construction Lighting	94%	99%

We produced verified gross savings estimates for the New Construction Lighting channel by applying these gross realization rates to the population of projects. Table 36 and Table 37 present the ex ante, verified gross, and verified net electric energy and electric demand savings for the New Construction Lighting channel in 2024. Overall, New Construction Lighting projects accounted for 4% of Custom Initiative verified net MWh savings and 7% of Custom Initiative verified net MW savings. The evaluation team achieved a relative precision of 1.9% for channel electric energy and demand savings at the 90% confidence level. Further details on our methodology for Custom Initiative sampling are provided in Appendix A.

Table 36. 2024 New Construction Lighting Channel Electric Energy Savings

Wave	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
New Construction Lighting	1,474	94%	1,391	0.791	1,100

Table 37. 2024 New Construction Lighting Channel Electric Demand Savings

Wave	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
New Construction Lighting	0.28	99%	0.28	0.792	0.22

²⁵ Cochran, William Gemmill. *Sampling Techniques*. John Wiley & Sons, 1977.

²⁶ Levy, Paul S., and Stanley Lemeshow. *Sampling of Populations: Methods and Applications*. John Wiley & Sons, 2008.

3.2.6 CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 38 presents CPAS and WAML for the 2024 Custom Initiative by channel. The table also includes a summary of the total verified gross savings for the Initiative and channels, as well as CPAS in each year from 2024 to 2027.²⁷ The WAML for the Custom Initiative is 18.3 years, and the WAML for the Custom Incentives and New Construction Lighting channels are 18.5 years and 12.8 years, respectively.

Table 38. 2024 Custom Initiative CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)						Lifetime Savings (MWh)	
				2024	2025	2026	2027	...	2030		...
Custom Incentives	18.5	36,191	0.814	29,466	29,466	29,466	29,466	...	28,895	...	544,754
New Construction Lighting	12.8	1,391	0.791	1,100	1,100	1,100	1,100	...	1,100	...	14,035
2024 CPAS		37,582	0.813	30,566	30,566	30,566	30,566	...	29,995	...	558,789
Expiring 2024 CPAS				0	0	0	0	...	0	...	
Expired 2024 CPAS				0	0	0	0	...	572	...	
WAML	18.3										

²⁷ For further detail, including achieved CPAS in years not presented in this table, please see the 2024 AIC CPAS and AAIG Workbook.

3.2.7 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this evaluation, the evaluation team offers the following key findings and recommendations for the Custom Initiative moving forward:

CUSTOM INCENTIVES CHANNEL

- **Finding #1:** Several fuel-switching projects were completed in 2024. The evaluation team separated these projects into their own sample frame to account for the unique characteristics of these projects.
 - **Recommendation:** We recommend that the implementation and evaluation teams continue to coordinate on potential fuel-switching projects prior to the next evaluation to ensure these projects are accounted for properly during the evaluation team's sampling activities, and to discuss how to appropriately estimate savings for these types of projects. In addition, the implementation and evaluation teams should collaborate to ensure discussions are brought to the Illinois Technical Advisory Committee, as applicable, and that any updates that may be needed to the IL-TRM are submitted for review as part of the V14.0 development process.
- **Finding #2:** For several projects, we observed differences between the expected performance and scheduling of equipment and controls, and the actual performance and operation. While these discrepancies can result in increased savings in some cases and reduced savings in others, they consistently represent an evaluation risk.
 - **Recommendation:** We recommend that the implementation team follow-up with customers two or three months after a project is completed to gather information about any changes the customer has made since completing the project, such as changes to occupancy schedules or control setpoints. We also recommend that post-installation metering activities are conducted at that time to confirm operating conditions and equipment performance metrics. For process-related projects, it may only take two to three weeks of metering to gather sufficient data, while HVAC projects may require several months of metering to capture seasonal variation. While the evaluation team recognizes these steps may not always be feasible, they would reduce evaluation risk. In addition, if savings should be observable at the meter level, the evaluation team recommends the implementation team review utility billing data from before and after the project to validate the magnitude of the ex ante savings.
- **Finding #3:** The evaluation team continued to perform early reviews of larger or more complex Custom Initiative projects in 2024. Early reviews produce key findings and recommendations relating to potential risk to the estimated savings for a project. Some recommendations are minor, such as corrections to formulas, while others are more challenging to address, such as installing metering equipment to verify baseline operating characteristics. As observed in 2023, projects where the implementation team addressed the findings and recommendations presented in the early review typically achieved realization rates near 100%; while projects where recommendations from the early review were not fully addressed achieved lower realization rates.
 - **Recommendation:** We recommend continuing to address early review findings and recommendations whenever possible, and for the more challenging recommendations, working with the evaluation team to prioritize recommendations and data needs ahead of the annual impact evaluation.
- **Finding #4:** The most common correction the evaluation team made to demand savings was to account for the peak period as defined in the IL-TRM.
 - **Recommendation:** While the evaluation team has observed a marked improvement in the incorporation of peak hours into ex ante demand savings calculations in recent years, the team encourages the implementation team to continue to use energy savings during peak hours to determine demand savings.

- **Finding #5:** The implementation team accepted vendor energy models from external proprietary interfaces with DOE-2 modeling software to calculate the savings for several HVAC projects.
 - **Recommendation:** The evaluation team recommends requiring vendors and participants to submit energy modeling files in specific standardized formatting as part of the application process. The key modeling files are the baseline and proposed input data files, which are .IDF file extensions for EnergyPlus and .INP file extensions for DOE-2. These are not always the primary modelling files depending on the front-end simulation software (e.g., Trane 3D, DesignBuilder), but these files can typically be exported from the software, providing a uniform and non-proprietary set of files for documentation and evaluation. In conjunction with a detailed review of the modeling files, this will reaffirm the project scope, ensure claimed savings are reasonable and well-documented, and reduce evaluation risk.

NEW CONSTRUCTION LIGHTING CHANNEL

- **Finding #1:** The evaluation team identified several types of discrepancies in the ex ante savings for NCL projects. These discrepancies included the total floor area impacted by the incentivized lighting, building type, efficient lighting wattages, and eligible fixtures. While some discrepancies led to large differences between the ex ante and verified savings estimates, none of the discrepancies were systemic in nature.
 - **Recommendation:** Recognizing that projects may change over time, we recommend taking additional QA/QC steps to ensure the final ex ante savings reflect the final scope of the project. This will reduce the evaluation risk for the NCL channel moving forward.
- **Finding #2:** The backup documentation for most of the NCL projects reviewed by the evaluation team included hard-coded values for inputs and ex ante savings. In past years, the backup documentation has included a standardized lighting application with traceable calculations.
 - **Recommendation:** The evaluation team recommends that the implementation team return to using the standardized application or include other backup documentation containing the detailed ex ante savings calculations. This will streamline evaluation activities and communication and reduce evaluation risk for the NCL channel in future years.

3.3 RETRO-COMMISSIONING INITIATIVE

3.3.1 INITIATIVE DESCRIPTION

The RCx Initiative helps AIC business customers evaluate their existing mechanical equipment, energy management, and industrial compressed air systems to identify no-cost and low-cost efficiency measures to optimize existing energy-using systems.

Over time, deferred maintenance and changing operating directives and practices can lead to inefficient operation of building systems. Retro-commissioning is a process that examines current equipment operations relative to the needs of equipment owners and those served by the equipment and then determines opportunities for increasing equipment efficiency through maintenance, system tune-ups, scheduling, and optimization of operations. Most of the identified improvement opportunities require little, if any, capital funds to implement.

Major market barriers to RCx include a lack of awareness of improvement opportunities and the cost of the detailed engineering studies required to identify these opportunities. Additionally, customer apathy can inhibit the implementation of recommendations, even when no cost is involved. To address these barriers, the RCx Initiative

subsidizes Retro-Commissioning Service Provider (RSP) studies and publicizes the benefits of retro-commissioning to foster a market for the services, with utility-registered RSPs providing the marketing outreach.

The RCx Initiative is grouped into three offerings: the RCx Core channel, the VCx channel, and the Virtual SEM channel. Details on the services provided through the RCx Core, VCx, and Virtual SEM channels are provided in Section 3.3.3, Section 3.3.4, and Section 3.3.5, respectively.

Overall, the implementation team set a goal of achieving 6,039 MWh and 20,605 therms of savings through the RCx Initiative in 2024.

3.3.2 INITIATIVE ANNUAL SAVINGS SUMMARY

Table 39 presents the Retro-Commissioning Initiative annual savings achieved in 2024. The 2024 Retro-Commissioning Initiative achieved 7,203 MWh and 0.04 MW in verified net savings.

Table 39. 2024 Retro-Commissioning Initiative Annual Savings

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	7,214	0.05	0
Gross Realization Rate	106%	79%	N/A
Verified Gross Savings	7,618	0.04	0
NTGR	0.945	0.945	N/A
Verified Net Savings	7,203	0.04	0

3.3.3 RETRO-COMMISSIONING CORE CHANNEL

The following sections present the impact evaluation results for the 2024 RCx Core channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The RCx Core channel includes three sets of offerings, each targeted at different customer segments:

- Industrial Refrigeration Retro-Commissioning:** The Industrial Refrigeration offering provides incentives to defray the cost of a retro-commissioning study of industrial refrigeration equipment, leading to the implementation of low- and no-cost energy efficiency measures for existing industrial refrigeration systems. Typical measures include optimizing condensing pressure, suction pressure, evaporator fan controls, evaporator defrost settings, and compressor sequencing.
- Large Facilities Retro-Commissioning:** The Large Facilities offering has historically targeted two separate types of facilities: healthcare and large commercial facilities (primarily office buildings). Healthcare facilities represent a major opportunity for energy savings in AIC's service territory and have historically driven this offering. Most savings achieved through this offering are from adjusting EMS settings to optimize the operation of HVAC systems, as well as other HVAC and lighting optimization activities.

Large Facilities retro-commissioning projects undergo a screening phase that examines the feasibility of retro-commissioning at the facility. If the RSP determines that the site has good savings potential, the customer is eligible to apply to the Initiative. RSPs commit resources to this deliverable, which may or may not result in a viable retro-commissioning project. To defray potential financial risk to RSPs and encourage them to market the Initiative

more aggressively, AIC pays a screening stipend of 5%–10% of the retro-commissioning study cost to the RSP for complex projects. This stipend does not require a commitment to implement a project and does not necessarily mean that energy savings will be achieved in future years.

- **Retro-Commissioning Lite:** This offering is an option for smaller facilities that do not qualify for the Large Facilities channel.

Table 40 includes a summary of incentives provided through each offering.

Table 40. 2024 Retro-Commissioning Core Channel Incentive Structure

Offering	Survey Incentive	Customer Implementation Incentive	Incentive Requirements
Industrial Refrigeration	<ul style="list-style-type: none"> ▪ 95% of survey cost 	<ul style="list-style-type: none"> ▪ \$0.04/kWh saved 	<ul style="list-style-type: none"> ▪ Payback period of 0–2 years ▪ Measure must be completed before the incentive is paid
Large Facilities	<ul style="list-style-type: none"> ▪ 95% of survey cost for facilities where AIC provides both electric and gas service; 50% for facilities where AIC provides only one fuel source ▪ 5%–10% of survey cost as a “stipend” to RSPs for complex projects 	<ul style="list-style-type: none"> ▪ \$0.04/kWh saved ▪ \$0.15/therm saved 	<ul style="list-style-type: none"> ▪ Payback period of 0–2 years ▪ Measure must be completed before the incentive is paid ▪ Measures do not need to be completed for the stipend to be paid
Lite	<ul style="list-style-type: none"> ▪ 100% of survey cost, capped at \$20,000; 50% for facilities where AIC provides only one fuel source 	<ul style="list-style-type: none"> ▪ \$0.04/kWh saved ▪ \$0.15/therm saved 	<ul style="list-style-type: none"> ▪ Payback period of 0–2 years ▪ Measure must be completed before the incentive is paid

PARTICIPATION SUMMARY

Table 41 presents RCx Core channel participation during 2024. Four projects were completed through the Large Facilities offering, all by private sector customers. The RCx Core channel has existed since the inception of the AIC portfolio in 2008. Historically, the channel has maintained consistent but relatively low participation. However, no projects were completed in 2023. Activity in 2024 reflects a return to levels seen from 2020 to 2022.

Table 41. 2024 Retro-Commissioning Core Channel Participation Summary

Offering	Project Number	Ex Ante Gross Savings	
		MWh	% of Total
Large Facilities	2300290	652	35%
Large Facilities	2000048	458	25%
Large Facilities	2000017	439	24%
Large Facilities	2200874	291	16%
Total	4	1,841	100%

SAVINGS DETAIL

Table 42 presents the ex ante, verified gross, and verified net electric energy savings achieved through the RCx Core channel in 2024.

Table 42. 2024 RCx Core Channel Electric Energy Savings by Measure

Project ID	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
2300290	652	104%	680	0.945	642
2000048	458	100%	458	0.945	432
2000017	439	92%	403	0.945	381
2200874	291	100%	290	0.945	275
Total	1,841	100%	1,832	0.945	1,730

Table 43 presents the ex ante, verified gross, and verified net electric demand savings achieved through the RCx Core channel in 2024.

Table 43. 2024 RCx Core Channel Electric Demand Savings by Measure

Project ID	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
2300290	0.02	87%	0.02	0.945	0.02
2200874	0.03	74%	0.02	0.945	0.02
Total	0.05	79%	0.04	0.945	0.04

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **Project 2300290** (35% of ex ante electric energy and 36% of ex ante demand savings): The gross realization rates for project 2300290 are 104% for electric energy savings and 87% for demand savings.
 - The evaluation team adjusted the maximum fan speeds to 92.2% for all evaporators in the verified savings calculations based on observations during the on-site visit. This adjustment increased verified electric energy savings. It also affected the savings estimates for the VFD settings on the evaporator fans. While setting the baseline fan speed to 92.2% in the verified calculations led to a decrease in verified electric energy savings for that specific adjustment, the overall impact of all changes resulted in increased verified electric energy savings.
- **Project 2000017** (24% of ex ante electric energy savings): The gross realization rate for project 2000017 is 92% for electric energy savings.
 - The evaluation team updated the schedules for the rooftop units (RTUs) based on findings during the desk review and on-site visit, resulting in increased verified electric energy savings.
 - The scheduling revisions mentioned above impacted the savings estimates associated with the discharge air temperature reset programming implemented as part of the project, resulting in lower verified electric energy savings.
 - The evaluation team eliminated savings associated with static pressure resets programmed for two RTUs based on observations during the on-site visit, resulting in lower verified electric energy savings.
 - The evaluation team revised the economizer set points in the verified savings calculations based on the desk review and on-site visit findings, resulting in lower verified electric energy savings.
- **Project 2200874** (16% of ex ante electric energy and 64% of ex ante demand savings): The gross realization rates for project 2200874 are 100% for electric energy savings and 74% for demand savings.
 - The evaluation team determined that two of the implemented measures did not impact energy usage during the peak hours defined in the IL-TRM and, therefore, did not calculate verified demand savings for these measures.

3.3.4 VIRTUAL COMMISSIONING CHANNEL

The following sections present the impact evaluation results for the 2024 VCx channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

Virtual Commissioning is an approach that remotely targets the traditionally hard-to-reach customer segment of small and medium business (SMB) customers, as well as public sector customers, to support low- and no-cost energy-saving measures. The VCx approach leverages Advanced Metering Infrastructure (AMI) data to support targeted insights for these customers through the design, implementation, and evaluation phases of the channel.

The implementation team uses internal software to complete an initial analysis of AMI data for AIC's SMB and public sector customers to identify prospective participants. They then use the outcomes of this analysis to identify opportunities for low- and no-cost energy-saving improvements at prospective participants' facilities remotely. These opportunities commonly include modifications to HVAC system settings and lighting scheduling adjustments.

Energy advisors from the implementation team then contact potential participants to share the analysis results, confirm the energy-saving opportunities, and verify facility characteristics. After participants implement the recommended changes, the implementation team develops individual facility-level regression models using the participants' pre- and post-participation energy consumption to estimate savings. The models must meet certain criteria for robustness for savings to be claimed.²⁸

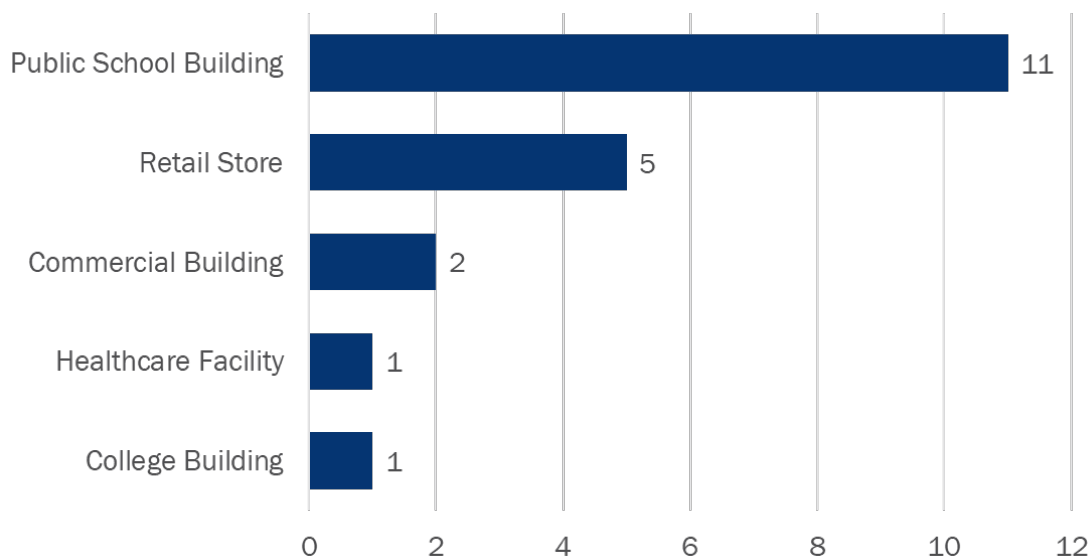
PARTICIPATION SUMMARY

The VCx channel served 20 participants (i.e., unique sites) across 14 unique organizations in 2024.²⁹ This represents a 35% decrease in participating sites compared to 2023; however, we did not find a commensurate decrease in verified electric energy savings. VCx participants commonly adjusted their lighting system scheduling, HVAC system setpoints, and HVAC equipment and/or HVAC system scheduling. In 2024, the most common facility types served through the VCx channel were education and retail (Figure 2).

²⁸ These criteria are specified in AIC's Virtual Commissioning M&V Plan authored by Power TakeOff and are as follows: the normalized savings uncertainty must be below 50% at 68% confidence; the absolute value of normalized mean bias error (NMBE) must be below 0.5%; and the coefficient of variation of root mean square error [CV(RMSE)] must be below 25%. CV(RMSE) and NMBE are both metrics of how well a regression model explains or fits the data.

²⁹ We identified unique organizations by using unique contacts in the program tracking database.

Figure 2. 2024 Virtual Commissioning Participation by Facility Type



SAVINGS DETAIL

Table 44 presents the ex ante, verified gross, and verified net electric energy savings achieved through the VCx channel in 2024. The 2024 VCx channel achieved 4,642 MWh in verified net electric energy savings after adjusting for cross-participation and free ridership. When comparing the implementation and evaluation teams' estimated savings, the gross realization rate was 108%. AIC did not claim demand savings or gas savings from VCx in 2024. Savings are only presented at the channel level, as VCx is a single-measure channel.

Table 44. 2024 Virtual Commissioning Channel Annual Savings

	Electric Energy Savings (MWh)
Ex Ante Gross Savings	4,571
Gross Realization Rate	108%
Verified Gross Savings	4,956
NTGR	0.937
Verified Net Savings	4,642

The main source of discrepancy between the ex ante and verified savings estimates was that the evaluation team included weather interaction terms in eight relevant models, whereas the implementation team did not. The evaluation team included weather interaction terms in the models when: (1) interventions were weather sensitive; (2) there were at least nine months of post-period data; and (3) the inclusion of weather added explanatory value to the model, per Analysis of Variance (ANOVA) tests. In addition, to minimize the need for cross-participation adjustments, we curtailed the post-period to one year for two projects.

3.3.5 VIRTUAL STRATEGIC ENERGY MANAGEMENT CHANNEL

The following sections present the impact evaluation results for the 2024 Virtual SEM channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

AIC launched Virtual SEM as a pilot in 2023 and continued its operation in 2024. Virtual SEM is designed in accordance with the Consortium for Energy Efficiency’s minimum elements for effective SEM and seeks to educate participants and enable them to manage their facility’s energy usage holistically. The implementation team targets customers previously engaged through the VCx channel that withdrew before implementation. Once participants enroll in the channel, the implementation team conducts an energy audit of the facility to identify all available low- and no-cost operational, maintenance, and behavioral improvement opportunities. They then work with the facility staff to develop an energy improvement plan. Participants receive the training, tools, and resources they need to develop and implement their continuous energy improvement plan.

PARTICIPATION SUMMARY

Four participants completed energy-saving improvements through the Virtual SEM channel in 2024. These participants improved the operation of the HVAC systems at public schools, public libraries, and county buildings. In 2024, public school buildings were the most common facility type served through the Virtual SEM channel (n=2).

SAVINGS DETAIL

Table 45 presents the ex ante, verified gross, and verified net electric energy savings achieved through the Virtual SEM channel in 2024. The 2024 Virtual SEM channel achieved 831 MWh in verified net electric energy savings after adjusting for cross-participation. The gross realization rate, when comparing the implementation and evaluation teams’ estimated savings, was 103%. AIC did not claim demand savings or gas savings from Virtual SEM in 2024. Savings are only presented at the channel level, as Virtual SEM is a single-measure channel.

Table 45. 2024 Virtual Strategic Energy Management Channel Annual Savings

	Electric Energy Savings (MWh)
Ex Ante Gross Savings	803
Gross Realization Rate	103%
Verified Gross Savings	831
NTGR	1.000
Verified Net Savings	831

We identified two main sources of discrepancy between the ex ante verified savings estimates. The evaluation team included weather interaction terms in two relevant models, whereas the implementation team did not. The evaluation team included weather interaction terms in the models when: (1) interventions were weather sensitive; (2) there were at least nine months of post-period data; and (3) the inclusion of weather added explanatory value to the model, per ANOVA tests. In addition, for one project, the evaluation team set the post-period start date based on the date of the last intervention, while the implementation team used the first. This difference resulted in a 'ramp-up' phase in the ex ante post-period, during which interventions were implemented over several months. By excluding this ramp-up phase, the evaluation team ensured the post-period only reflected when all interventions were in place, allowing for a more accurate estimate of total savings produced through the Virtual SEM project.

3.3.6 CUMULATIVE ANNUAL PERSISTING SAVINGS

Table 46 presents CPAS and WAML for the 2024 Retro-Commissioning Initiative by channel. The table summarizes the total verified gross savings for the Initiative and channels as well as CPAS in each year from 2024 to 2027.³⁰ The WAML for the Retro-Commissioning Initiative is 7.6 years, and the WAML for the RCx Core, VCx, and Virtual SEM channels are 8.6 years, 7.3 years, and 7.0 years, respectively.

Table 46. 2024 Retro-Commissioning Initiative CPAS and WAML

Channel	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
RCx Core	8.6	1,832	0.945	1,730	1,730	1,730	1,730	...	1,730	...	14,880
VCx	7.3	4,956	0.937	4,642	4,642	4,642	4,642	...	4,642	...	33,887
Virtual SEM	7.0	831	1.000	831	831	831	831	...	831	...	5,814
2024 CPAS		7,618	0.945	7,203	7,203	7,203	7,203	...	7,203	...	54,581
Expiring 2024 CPAS				0	0	0	0	...	0	...	
Expired 2024 CPAS				0	0	0	0	...	0	...	
WAML	7.6										

³⁰ For further detail, including achieved CPAS in years not presented in this table, please see the 2024 AIC CPAS and AAIG Workbook.
Opinion Dynamics

3.3.7 CONCLUSIONS AND RECOMMENDATIONS

Based on the evaluation results, the evaluation team offers the following key findings and recommendations for the Retro-Commissioning Initiative:

RETRO-COMMISSIONING CORE CHANNEL

- **Finding #1:** The implementation team estimated ex ante electric demand savings for one of the projects by dividing the ex ante electric energy savings by 8,760 hours. This approach assumes that the energy savings produced by that project have a 100% coincidence factor with the peak hours defined in the IL-TRM.
- **Recommendation:** We recommend that the implementation team review their approach to estimating ex ante demand savings for Large Facility RCx projects and limit savings claims to measures likely to impact the facility's energy usage during the peak hours defined in the IL-TRM.

VIRTUAL COMMISSIONING CHANNEL

- **Finding #1:** In 2023, the evaluation team noted that the implementation team did not include weather interaction terms in their ex ante models for projects that included weather-sensitive interventions. The implementation team expressed that including these terms in the ex ante models was not practical from an implementation perspective due to the need to provide timely savings estimates to participating facilities. The evaluation team acknowledges these considerations but continued to apply weather interactions in the 2024 verified models for projects that met the following criteria: (1) interventions were weather sensitive; (2) the post-period contained more than nine months of data covering all four seasons in a typical weather year; and, 3) inclusion of weather interactions added explanatory value to the model.
- **Recommendation:** The evaluation team recognizes the implementation team's desire to provide timely savings estimates to participating facilities and that the application of simplified models enables quick feedback due to the reduced post-period data requirements. However, if the implementation team wishes to reduce evaluation risk, we recommend applying the more robust model specifications when estimating ex ante savings for projects, including weather-sensitive interventions, whenever sufficient data are available.

VIRTUAL STRATEGIC ENERGY MANAGEMENT CHANNEL

- **Finding #1:** Based on a review of the implementation logs, it is clear that each Virtual SEM project includes a broad set of interventions. The interventions are often implemented in multiple stages and over a long period of time. Individually, each intervention is expected to produce different magnitudes of energy savings, accumulating over time as each intervention is implemented. In this context, defining an appropriate post-period is challenging but crucial. For example, the interventions included in project a1CT0000000MUnR2AW were implemented from May through October. However, the reporting date was set in May, which meant the ex ante post-period included a five-month period in which conditions at the site were still changing. Removing this period from the verified analysis and setting the post-period to begin after the last intervention led to an unadjusted gross realization rate of 140%.
- **Recommendation:** The evaluation team recognizes the trade-offs the implementation team faces between capturing savings of all interventions and providing timely savings estimates to participants and AIC. However, to fully capture savings from all Virtual SEM interventions, the evaluation team recommends removing implementation ramp-up periods from the analysis, and starting the post-period after the last intervention is completed.

3.4 STREETLIGHTING INITIATIVE

3.4.1 INITIATIVE DESCRIPTION

The AIC Streetlighting Initiative, launched in 2018, encourages the replacement of streetlighting using high-pressure sodium (HPS) and mercury vapor (MV) lighting with energy-efficient LED technology. High-intensity discharge lighting, specifically HPS, is still the standard technology used for streetlighting in the United States. The implementation team targets streetlighting upgrades through the Municipality-Owned Streetlighting (MOSL) and Utility-Owned Streetlighting (UOSL) channels, described in more detail in subsequent sections.

Overall, the implementation team set a goal of achieving 14,130 MWh of savings through the Streetlighting Initiative in 2024.

3.4.2 INITIATIVE ANNUAL SAVINGS SUMMARY

Table 47 presents the Streetlighting Initiative annual savings achieved in 2024. The 2024 Streetlighting Initiative achieved 12,556 MWh in verified net savings. Streetlighting with standard operating hours does not produce any demand savings. Therefore, AIC did not claim any demand savings for the Initiative, and the evaluation team did not calculate any verified demand savings.

Table 47. 2024 Streetlighting Initiative Annual Savings

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	12,566	0	0
Gross Realization Rate	100%	N/A	N/A
Verified Gross Savings	12,566	0	0
NTGR	1.000	N/A	N/A
Verified Net Savings	12,556	0	0

3.4.3 MUNICIPALITY-OWNED STREETLIGHTING CHANNEL

The following sections present the impact evaluation results for the 2024 MOSL channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

Through the MOSL channel, AIC targets municipal customers who own their streetlighting fixtures. Incentives are provided to encourage these customers to replace existing streetlights (typically HPS and MV) with LED streetlights.

SAVINGS DETAIL

In total, the channel incentivized the installation of 69 measures in one municipality. Table 48 presents the ex ante, verified gross, and verified net electric energy savings achieved through the MOSL channel in 2024. We did not observe any discrepancies between the ex ante and verified savings calculations for the MOSL channel in 2024.

Table 48. 2024 Municipality-Owned Streetlighting Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
MOSL (HPS Baseline)	50	100%	50	1.000	50
Total	50	100%	50	1.000	50

3.4.4 UTILITY-OWNED STREETLIGHTING CHANNEL

The following sections present the impact evaluation results for the 2024 UOSL channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

Through the UOSL channel, AIC targets municipal customers with AIC-owned streetlighting fixtures. Early replacement of functioning HPS and MV streetlights with LED streetlights is available to customers through the Initiative for a per-fixture fee. The channel incentivizes customers to request early replacement of these fixtures and provides an incentive to decrease the per-fixture cost of the replacement for customers. In addition, through this channel, AIC claims savings from the ongoing replacement of existing AIC-owned HPS streetlighting with LED streetlights upon burnout (ROB).

SAVINGS DETAIL

In total, the channel incentivized the installation of 18,007 measures across 164 projects. Table 49 presents the ex ante, verified gross, and verified net electric energy savings achieved through the UOSL channel in 2024. We did not observe any discrepancies between the ex ante and verified savings calculations for the UOSL channel in 2024.

Table 49. 2024 Utility-Owned Streetlighting Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
UOSL (HPS Baseline, AIC ROB)	8,732	100%	8,732	1.000	8,732
UOSL (HPS Baseline)	2,338	100%	2,338	1.000	2,338
UOSL (MV Baseline)	1,446	100%	1,446	1.000	1,446
Total	12,516	100%	12,516	1.000	12,516

3.4.5 CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 50 through Table 52 present CPAS and WAML for the 2024 Streetlighting Initiative by channel. The tables also include a summary of the measure-specific and total verified gross savings for the Initiative and respective channels, as well as CPAS in each year for 2024–2027.³¹ The WAML for the Streetlighting Initiative is 20.0 years.

Table 50. 2024 Streetlighting Initiative CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
MOSL	20.0	12,516	1.000	12,516	12,516	12,516	11,816	...	11,816	...	238,425
UOSL	20.0	50	1.000	50	50	50	50	...	50	...	1,009
2024 CPAS		12,566	1.000	12,556	12,556	12,556	11,867	...	11,867	...	239,434
Expiring 2024 CPAS				0	0	0	700	...	0	...	
Expired 2024 CPAS				0	0	0	700	...	700	...	
WAML	20.0										

Table 51. 2024 Municipality-Owned Streetlighting Channel CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
MOSL (HPS Baseline)	20.0	50	1.000	50	50	50	50	...	50	...	1,009
2024 CPAS		50	1.00	50	50	50	50	...	50	...	1,009
Expiring 2024 CPAS				0	0	0	0	...	0	...	
Expired 2024 CPAS				0	0	0	0	...	0	...	
WAML	20.0										

³¹ For further detail, including CPAS in years not presented in this table, please see the 2024 AIC CPAS and AAIG Workbook.

Table 52. 2024 Utility-Owned Streetlighting Channel CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
UOSL (HPS Baseline, AIC ROB)	20.0	8,732	1.000	8,732	8,732	8,732	8,732	...	8,732	...	174,633
UOSL (HPS Baseline)	20.0	2,338	1.000	2,338	2,338	2,338	2,338	...	2,338	...	46,768
UOSL (MV Baseline)	20.0	1,446	1.000	1,446	1,446	1,446	746	...	746	...	17,025
2024 CPAS		12,516	1.000	12,516	12,516	12,516	11,816	...	11,816	...	238,425
Expiring 2024 CPAS				0	0	0	700	...	0	...	
Expired 2024 CPAS				0	0	0	700	...	700	...	
WAML	20.0										

3.4.6 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this evaluation, the evaluation team offers the following key finding for the Streetlighting Initiative:

- **Finding #1:** The evaluation team observed that all ex ante savings calculations were performed correctly, and the implementation team provided the necessary backup documentation to support the verification of these savings. As such, the realization rate for the Initiative is 100%.

3.5 SMALL BUSINESS INITIATIVE

3.5.1 INITIATIVE DESCRIPTION

The primary objective of the Small Business Initiative is to deliver energy savings to small commercial and industrial customers by increasing access to energy-efficient products through financial and technical support. The Initiative targets private and public facilities through two channels that work in tandem to provide a comprehensive suite of offerings:

- **Small Business Direct Install (SBDI) channel:** The SBDI channel is available to all small nonresidential facilities in AIC's service territory and focuses on rapidly deployable lighting and refrigeration measures. The SBDI channel is the primary driver of the Small Business Initiative electric savings.
- **Small Business Energy Performance (SBEP) channel:** The SBEP channel targets facilities located in economically disadvantaged areas. This channel focuses on building envelope upgrades, HVAC improvements, and other non-SBDI measures supported by participating Program Allies.

Both channels leverage a network of Program Allies to coordinate and install the incentivized measures in participating facilities. These Program Allies specialize in serving small businesses, nonprofit organizations, schools, and local governments. Many projects are fully funded through channel incentives and require no out-of-pocket contribution from the customer. The low-touch, high-impact measures incentivized through the SBDI channel, combined with the customized, deeper retrofits incentivized through the SBEP channel, offer customers in this segment an opportunity to comprehensively upgrade their facilities.

Overall, the implementation team set a goal of achieving 42,494 MWh and 70,367 therms of savings through the Small Business Initiative in 2024.

3.5.2 INITIATIVE ANNUAL SAVINGS SUMMARY

Table 53 presents the Small Business Initiative annual savings achieved in 2024. The 2024 Small Business Initiative achieved 32,328 MWh, 5.36 MW, and 19,319 therms in verified net savings. The Initiative also produced 2,325 therms in verified net gas savings in 2024 that are not directly claimable by AIC because the customers do not receive gas service from AIC. These savings are detailed further in Appendix B.

Table 53. 2024 Small Business Initiative Annual Savings

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	35,359	5.86	18,280
Gross Realization Rate	100%	99%	106%
Verified Gross Savings	35,246	5.82	19,319
NTGR	0.917	0.920	1.000
Verified Net Savings	32,328	5.36	19,319

3.5.3 SMALL BUSINESS DIRECT INSTALL CHANNEL

The following sections present the impact evaluation results for the 2024 SBDI channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The SBDI channel provides small nonresidential customers with electric energy savings opportunities by offering a free energy assessment and a streamlined process for installing incentivized measures. Eligible customers receive an on-site assessment and report outlining recommended measures, estimated project costs, estimated energy savings, and estimated bill savings. The customer then selects the package of measures they wish to have installed. All measures must be installed by qualified Program Allies, and incentives are paid directly to Program Allies, enabling a streamlined transaction at the time of installation with zero or minimal out-of-pocket costs for customers.

Program Allies conduct most of the customer outreach activities for the channel, either through their own marketing efforts or direct conversations with prospective participants. Initiative staff support the allies through co-branding marketing materials, hosting community events and webinars, targeted customer outreach through email/mailed campaigns, partnerships with local chambers of commerce and other community-based organizations, and maintaining a Small Business landing page on the AIC Energy Efficiency website. The Business Program Energy Advisors contribute to recruitment efforts by conducting ad hoc outreach, including visiting organizations in their region that have not participated in the Initiative.

Small Business Initiative staff continue to partner with AIC Market Development Initiative staff to identify diverse contractors and train them to participate in the SBDI channel. Initiative staff provide allies with training and documentation for best practices for completing projects. In addition, Initiative staff engage Program Allies on their workforce development needs to help them expand their services and overall business through job placements, scholarships, seasonal employment, and training.

Summary of Key Implementation Changes

Initiative staff instituted the following design and implementation changes to the SBDI channel in 2024:

- The implementation team dedicated specific resources to Program Ally management and implemented a strategy to re-engage Program Allies who had not completed a project in 2024.
- In partnership with AIC’s Market Development Initiative, implementation staff introduced co-payment assistance for customers located in economically disadvantaged areas to reduce customer out-of-pocket costs. The implementation team also increased incentive levels for SBDI for all customers to encourage participation and limit customer upfront costs.

PARTICIPATION SUMMARY

Table 54 presents a summary of participation in the SBDI channel in 2024. We present these data separated by public and private sector customers to provide context as to the primary drivers of participation. AIC customers completed 1,285 unique projects through the channel, encompassing 137,640 incentivized measures. LED bulbs and fixtures continued to dominate channel activity, accounting for 88% of total measures incentivized in 2024. Lighting controls and fluorescent delamping accounted for the next largest share of incentivized measures at 11% and 1%, respectively.

Table 54. 2024 Small Business Direct Install Channel Participation Summary by Measure

Measure Category	Unique Projects	Measure Quantity	Ex Ante Gross MWh	Ex Ante Gross MW
Private Sector				
LED Bulbs & Fixtures	1,119	100,145	28,169	4.40
Lighting Controls	199	11,848	2,604	0.55
ECMs for Walk-in and Reach-in Coolers/Freezers	20	475	568	0.06
Fluorescent Delamping	22	819	107	0.02
Evaporator Fan Control for ECMs	15	51	47	0.01
LED Exit Signs	41	189	38	0.01
Automatic Door Closer for Walk-in Coolers and Freezers	6	6	14	0.00
<i>Private Sector Subtotal</i>	<i>1,134</i>	<i>113,533</i>	<i>31,548</i>	<i>5.05</i>
Public Sector^a				
LED Bulbs & Fixtures	144	21,243	3,082	0.60
Lighting Controls	37	2,750	388	0.10
LED Exit Signs	12	114	9	<0.01
<i>Public Sector Subtotal</i>	<i>151</i>	<i>24,107</i>	<i>3,479</i>	<i>0.70</i>
Total	1,285	137,640	35,027	5.75

^a The project counts, measure counts, and ex ante savings values presented in the Private Sector subsection of this table include State and Federal facilities, as these facility types are not included in the list of customer types covered in the public sector minimum funding requirements in subsection (c) of 220 ILCS 5/8-103B and subsection (e) of 220 ILCS 5/8-104.

Figure 3 shows the distribution of SBDI projects by facility type. In 2024, retail, office, and religious facilities were the most common facility types treated through the channel.

Figure 3. 2024 Small Business Direct Install Participation by Facility Type

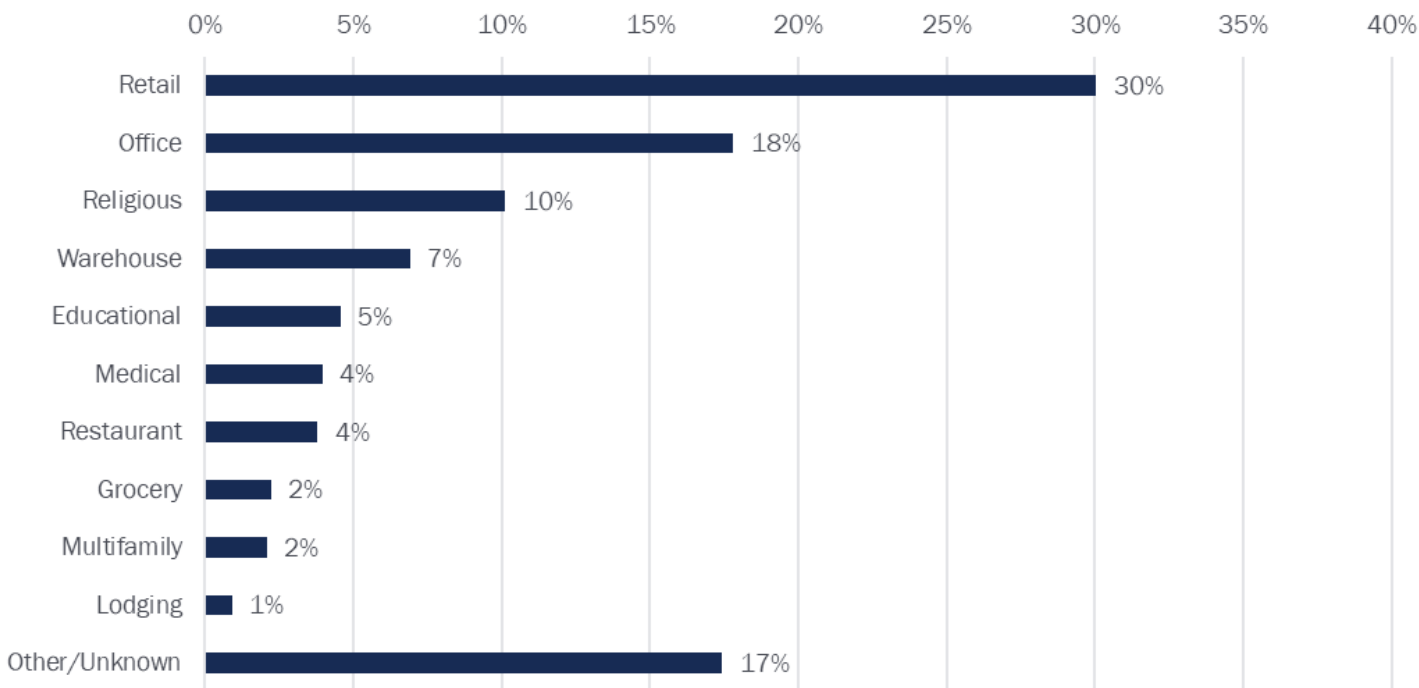


Table 55 presents information on Program Ally participation in the channel. In total, 94 Program Allies participated in the channel in 2024, a 14% decrease compared to the 107 program allies that participated in 2023. Table 55 presents information on the five program allies most active in the channel in 2024.

Table 55. 2024 Small Business Direct Install Channel Program Ally Participation Summary

Program Ally	Projects	Share of Total (n=1,285)
Ally 18	234	18%
Ally 19	146	11%
Ally 20	127	10%
Ally 21	72	6%
Ally 22	64	5%

SAVINGS DETAIL

Table 56 presents the ex ante, verified gross, and verified net electric energy savings achieved through the SBDI channel in 2024. The SBDI channel achieved a 100% realization rate for gross electric energy savings. The channel's performance is primarily driven by lighting measures, with 89% of the verified net electric energy savings for the channel produced through the installation of LED bulbs and fixtures and 8% produced through the installation of lighting controls. Electronically commutated motors (ECMs) for walk-in and reach-in coolers and freezers were the next largest contributor to electric energy savings at 2% of verified net electric energy savings. Overall, the channel experienced a 42% decrease in verified net electric energy savings compared to 2023.

Table 56. 2024 Small Business Direct Install Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
LED Bulbs and Fixtures	31,252	100%	31,239	0.918	28,680
Lighting Controls	2,992	100%	2,994	0.906	2,714
ECMs for Coolers/Freezers	568	100%	568	0.897	509
Fluorescent Delamping	107	100%	107	0.913	98
Evaporator Fan Control for ECMs	47	100%	47	0.904	43
Exit Signs	47	100%	47	0.911	43
Automatic Door Closer	14	100%	14	0.891	13
Total	35,027	100%	35,017	0.917	32,099

Table 57 presents the ex ante, verified gross, and verified net electric demand savings achieved through the SBDI channel in 2024. The SBDI channel achieved a 99% realization rate for gross demand savings. LED bulbs and fixtures produced 88% of the channel’s verified net demand savings, followed by lighting controls and ECMs for walk-in and reach-in coolers and freezers (10% and 1% of savings, respectively). Overall, the channel experienced a 39% decrease in verified net demand savings compared to 2023.

Table 57. 2024 Small Business Direct Install Channel Demand Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
LED Bulbs and Fixtures	5.00	100%	5.00	0.920	4.60
Lighting Controls	0.65	94%	0.61	0.906	0.55
ECMs for Coolers/Freezers	0.06	100%	0.06	0.897	0.06
Fluorescent Delamping	0.02	100%	0.02	0.912	0.02
Evaporator Fan Control for ECMs	0.01	100%	0.01	0.911	<0.01
Exit Signs	0.01	100%	0.01	0.904	0.01
Automatic Door Closer	<0.01	100%	<0.01	0.891	<0.01
Total	5.75	99%	5.71	0.918	5.25

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **LED Bulbs and Fixtures** (89% of ex ante energy savings and 87% of demand savings): The gross realization rates for LED Bulbs and Fixtures are 100% for electric energy savings and 100% for demand savings.
 - For thirty records, the implementation team applied the coincidence factor for an uncooled building in the ex ante calculations instead of the garage building type listed in the tracking data. The evaluation team applied the coincidence factor for garages in the verified calculations, resulting in higher verified demand savings.
 - For three records, the implementation team applied the interactive effect factor for electrically heated facilities (IFkWh) and the waste heat factor for electric energy (WHFe) for an uncooled building instead of a garage. The evaluation team applied all parameters for the garage building type in the verified calculations, resulting in higher verified electric energy savings.
 - For one record, the building type listed in the tracking data was “Office – Low Rise” with cooling. However, the ex ante savings reflected the application of the WHFe for an uncooled building. The evaluation team applied all parameters consistent with the building type listed in the tracking data (a cooled Office – Low Rise), resulting in higher verified energy savings.

- For one record, the implementation team inadvertently did not claim savings due to database programming, which drops ex ante electric energy savings claims for customers that do not have an AIC electric rate code listed in the data. However, the evaluation team verified that the customer associated with this record does receive electric service from AIC and, therefore, calculated verified savings for this measure, resulting in higher verified electric energy savings.
- **Lighting Controls** (9% of ex ante energy savings and 11% of demand savings): The gross realization rates for Lighting Controls are 100% for electric energy savings and 94% for demand savings.
- For forty-five records, the implementation team applied the coincidence factor for the building type listed in the tracking data instead of the uncooled building type. Based on the buildings' uncooled status, as indicated in the tracking data, the evaluation team applied all parameters for an uncooled building in the verified calculations, resulting in lower verified demand savings.
- For sixteen records, the implementation team applied the IFkWh for the building type listed in the tracking data as opposed to the uncooled building type. Based on the uncooled status of the buildings, as indicated in the tracking data, the evaluation team applied all parameters for an uncooled building in the verified calculations, resulting in higher verified electric energy savings.

3.5.4 SMALL BUSINESS ENERGY PERFORMANCE CHANNEL

The following sections present the impact evaluation results for the 2024 SBEP channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The SBEP channel targeted nonresidential customers in economically disadvantaged areas, including schools, municipal buildings, and other nonprofit organizations. The eligible measures included building envelope upgrades, HVAC improvements, and other non-SBDI measures. In 2024, most completed projects comprised air-sealing facility building envelopes. Similar to the SBDI channel, the services delivered through the SBEP channel are provided at zero or minimal out-of-pocket cost to the customer, qualified Program Allies must install all measures, and incentives are paid directly to the Program Allies to enable a streamlined transaction at the time of installation. A key focus of channel staff continues to be building out the Program Ally base for the channel, particularly by adding contractors who can provide the HVAC and weatherization services offered through the program.

Summary of Key Implementation Changes

Initiative staff instituted the following design and implementation changes to the SBEP channel in 2024:

- The implementation team added wall insulation to the list of eligible measures in 2024.
- Due to restrictions in the gas budget, Initiative staff focused outreach and project development efforts toward the end of the year on all-electric customers, including former participants known to have electric resistance heating.

PARTICIPATION SUMMARY

Table 58 presents a summary of participation in the SBEP channel in 2024. We present these data separated by public and private sector customers to provide context as to the primary drivers of participation. AIC customers completed 29 unique projects through the channel, with commercial and industrial (C&I) air sealing dominating channel activity.

Table 58. 2024 Small Business Energy Performance Channel Participation Summary by Measure

Measure Category	Unique Projects	Measure Quantity	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Private Sector					
C&I Air Sealing	12	234	210	0.04	5,177
Wall Insulation	1	2,560	4	<0.01	0
Covers and Gap Sealers for Room Air Conditioners	4	10	0	0.00	176
<i>Private Sector Subtotal</i>	12	245	215	0.04	5,353
Public Sector^a					
C&I Air Sealing	15	8,341	117	0.07	10,766
Covers and Gap Sealers for Room ACs	1	2	0	0.00	21
High Efficiency Boilers	2	2	0	0.00	2,139
<i>Public Sector Subtotal</i>	17	8,345	117	0.07	12,927
Total	29	8,590	332	0.11	18,280

Note: The ex ante therm savings presented in this table only reflect AIC claimable gas savings. Four projects completed through the SBEP channel produced non-AIC gas savings. More information on the savings from these projects is presented in Appendix B.

^a The project counts, measure counts, and ex ante savings values presented in the Private Sector subsection of this table include State and Federal facilities, as these facility types are not included in the list of customer types covered in the public sector minimum funding requirements in subsection (c) of 220 ILCS 5/8-103B and subsection (e) of 220 ILCS 5/8-104.

Figure 4 shows the distribution of SBEP projects by facility type. Educational facilities accounted for 41% of projects completed through the channel.

Figure 4. 2024 Small Business Energy Performance Participation by Facility Type

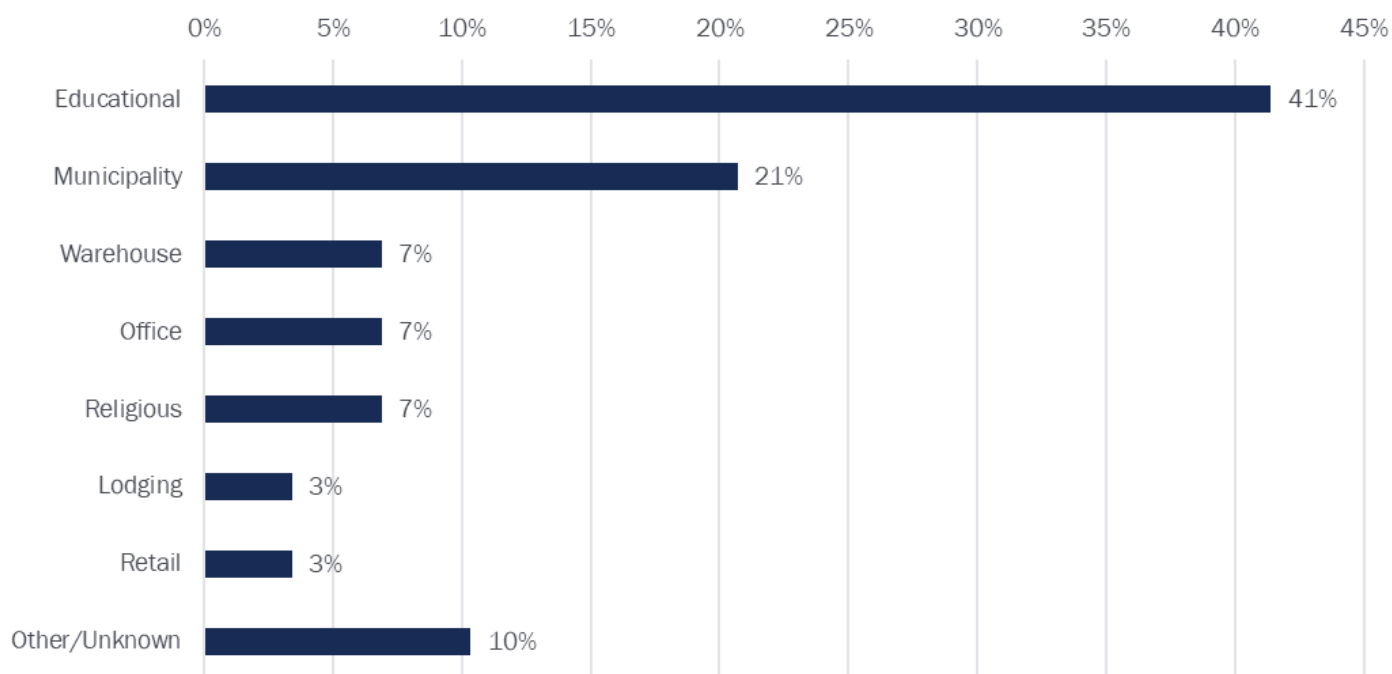


Table 59 presents information on Program Ally participation in the channel. Five Program Allies participated in the channel in 2024, an increase from four in 2023. In total, these allies completed 29 projects compared to the 59 completed in 2023. In 2023, Ally 23 completed 71% of all SBEP projects; in 2024, they completed 41%. Ally 24 increased their share of projects from 3% in 2023 to 31% in 2024.

Table 59. 2024 Small Business Energy Performance Channel Program Ally Participation Summary

Program Ally	Projects	Share of Total (n=29)
Ally 23	12	41%
Ally 24	9	31%
Ally 6	2	7%

SAVINGS DETAIL

Table 60 presents the ex ante, verified gross, and verified net electric energy savings achieved through the SBEP channel in 2024. The SBEP channel achieved a 67% realization rate for gross electric energy savings. The channel's performance is primarily driven by C&I air sealing measures, accounting for 98% of the verified net electric energy savings for the channel. Commercial wall insulation accounted for 2% of verified net electric energy savings. Overall, the channel experienced a 21% decrease in verified net electric energy savings compared to 2023.

Table 60. 2024 Small Business Energy Performance Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
C&I Air Sealing	327	69%	225	1.000	225
Commercial Wall Insulation	4	100%	4	1.000	4
Total	332	69%	229	1.000	229

Table 61 presents the ex ante, verified gross, and verified net electric demand savings achieved through the SBEP channel in 2024. The SBEP channel achieved a 92% realization rate for gross demand savings. C&I air sealing produced 91% of the channel verified net demand savings, while commercial wall insulation produced 9% of channel verified net demand savings. Overall, the channel experienced a 21% decrease in verified net demand savings compared to 2023.

Table 61. 2024 Small Business Energy Performance Channel Demand Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
C&I Air Sealing	0.11	96%	0.11	1.000	0.11
Commercial Wall Insulation	<0.01	83%	<0.01	1.000	<0.01
Total	0.11	96%	0.11	1.000	0.11

Table 62 presents the ex ante, verified gross, and verified net gas savings achieved through the SBEP channel in 2024. The SBEP channel achieved a 106% realization rate for gas savings. C&I air sealing produced 83% of channel verified net gas savings. High efficiency boilers accounted for 17% of verified net gas savings and covers and gap sealers for RACs produced less than 1%. Overall, the channel experienced a 19% decrease in verified net gas savings compared to 2023.

Table 62. 2024 Small Business Energy Performance Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
C&I Air Sealing	15,944	100%	15,944	1.000	15,944
High Efficiency Boiler	2,139	154%	3,304	1.000	3,304
Covers and Gap Sealers for RACs	197	36%	72	1.000	72
Total	18,280	106%	19,319	1.000	19,319

Note: The savings presented in this table only reflect those directly claimable by AIC. Four additional projects produced non-AIC gas savings. More information on these savings are presented in Appendix B.

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **C&I Air Sealing** (99% of ex ante electric energy savings, 99% of demand savings, and 87% of gas savings): The gross realization rates for C&I Air Sealing are 67% for electric energy savings, 92% for demand savings, and 100% for gas savings.
 - For four records, the implementation team divided the electric heating term of the electric energy savings calculation by 1,000 to convert from watts to kilowatts instead of dividing by 3,412 to convert from BTU to kWh as defined in the IL-TRM algorithms for facilities that are electrically heated. The evaluation team applied the 3,412 BTU to kWh conversion factor in the verified calculations in accordance with the IL-TRM, resulting in lower verified electric energy savings.
 - For one record, the implementation team applied a heating efficiency of 2.73 for a facility heated by a heat pump. Based on the backup documentation for this project, the evaluation team determined that the facility was heated by a post-2017, five-ton heat pump. Therefore, the evaluation team applied a heating efficiency of 2.40 in the verified calculation in accordance with the IL-TRM assumption for a heat pump of this capacity and equipment age, resulting in higher verified electric energy savings.
 - For forty-two records, the implementation team divided by the coincidence factor in the ex ante demand savings calculation instead of multiplying by the coincidence factor. The evaluation team multiplied by the coincidence factor in accordance with TRM algorithms, resulting in lower verified demand savings.
 - For seven records, the implementation team did not claim any demand savings despite a portion of the associated facility being cooled. Four of these facilities were 100% cooled. The evaluation team added a factor to the verified demand savings calculation to account for the percentage of the facility that was cooled, per the backup documentation, resulting in higher verified demand savings.
- **Commercial Wall Insulation** (1% of ex ante electric energy savings and 1% of demand savings): The gross realization rates for Commercial Wall Insulation are 100% for electric energy savings and 83% for demand savings.
 - For one record, the implementation team divided by the coincidence factor in the ex ante demand savings calculation instead of multiplying by the coincidence factor. The evaluation team multiplied by the coincidence factor in accordance with TRM algorithms, resulting in lower verified demand savings.
- **High Efficiency Boiler** (12% of ex ante natural gas savings): The gross realization rate for High Efficiency Boilers is 154% for gas savings.

- For all records, the implementation team applied an installed boiler thermal efficiency of 97% in the ex ante calculations, while the backup documentation shows a thermal efficiency of 96.5%. The evaluation team applied the installed boiler thermal efficiency of 96.5% in the verified calculations, resulting in lower verified natural gas savings.
- For all records, the implementation team applied the equivalent full load hours for heating in existing buildings based on the “Unknown/Misc.” building type provided in the tracking data. The backup documentation indicates that the measures were installed in fire stations. The evaluation team applied the equivalent full load hours for heating in existing buildings specific to an “Emergency Services” facility, resulting in higher verified natural gas savings.
- **Covers and Gap Sealers for Room Air Conditioners** (1% of ex ante natural gas savings): The gross realization rate for Covers and Gap Sealers for RACs is 36% for gas savings.
 - For all records, the implementation team accounted for the quantity of installed measures twice in the ex ante savings calculation: once in the calculation of the flow rate of air infiltration and again in the final calculation of the natural gas savings. The evaluation team removed one of the quantity factors in the verified savings calculations, resulting in lower verified natural gas savings.

3.5.5 CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 63 through Table 65 present CPAS and WAML for the 2024 Small Business Initiative by channel. The tables also include a summary of measure-specific and total verified gross savings for the Initiative and channels, as well as CPAS in each year from 2024 to 2027.³² The WAML for the Small Business Initiative is 13.7 years, and the WAML for the SBDI and SBEP channels are 13.6 years and 20.1 years, respectively.

Table 63. 2024 Small Business Initiative CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
SBDI	13.6	35,017	0.917	32,099	32,099	32,045	31,062	...	29,193	...	418,125
SBEP	20.1	229	1.000	229	229	229	229	...	229	...	4,601
2024 CPAS		35,246	0.917	32,328	32,328	32,274	31,291	...	29,422	...	422,726
Expiring 2024 CPAS				0	0	54	983	...	845	...	
Expired 2024 CPAS				0	0	54	1,037	...	2,906	...	
WAML	13.7										

Table 64. 2024 Small Business Direct Install Channel CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
LED Bulbs and Fixtures	13.5	31,239	0.918	28,680	28,680	28,625	27,643	...	25,816	...	368,064
Lighting Controls	14.9	2,994	0.906	2,714	2,714	2,714	2,714	...	2,714	...	40,473
ECMs for Coolers/Freezers	15.0	568	0.897	509	509	509	509	...	509	...	7,641
Fluorescent Delamping	11.0	107	0.913	98	98	98	98	...	98	...	1,075
Evaporator Fan Control for ECMs	13.0	47	0.904	43	43	43	43	...	43	...	554
Exit Signs	5.0	47	0.911	43	43	43	43	...	0	...	214
Automatic Door Closer	8.0	14	0.891	13	13	13	13	...	13	...	103
2024 CPAS		35,017	0.917	32,099	32,099	32,045	31,062	...	29,193	...	418,125
Expiring 2024 CPAS				0	0	54	983	...	845	...	
Expired 2024 CPAS				0	0	54	1,037	...	2,906	...	
WAML	13.6										

³² For further detail, including achieved CPAS in years not presented in this table, please see the 2024 AIC CPAS and AAIG Workbook.

Table 65. 2024 Small Business Energy Performance Channel CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)								Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...		
C&I Air Sealing	20.0	225	1.000	225	225	225	225	...	225	...	4,491	
Commercial Wall Insulation	25.0	4	1.000	4	4	4	4	...	4	...	110	
2024 CPAS		229	1.000	229	229	229	229	...	229	...	4,601	
Expiring 2024 CPAS				0	0	0	0	...	0	...		
Expired 2024 CPAS				0	0	0	0	...	0	...		
WAML	20.1											

3.5.6 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this evaluation, the evaluation team offers the following key findings and recommendations for the Small Business Initiative moving forward:

SMALL BUSINESS DIRECT INSTALL CHANNEL

- **Finding #1:** The reference table in Section 4.5 of the IL-TRM V12.0 deems specific parameter values for lighting measures installed in uncooled spaces, independent of the building type. Additionally, for garage space types, the IL-TRM Glossary (Volume 1, Section 3.6) defines garages as “unconditioned spaces.” In some cases, the implementation team is inconsistent when applying parameter values, such as waste heat factor and coincidence factors, for lighting projects designated as occurring in garages or uncooled spaces.
- **Recommendation:** We recommend using the IL-TRM V12.0 to confirm the correct building conditions and lighting locations are being applied for each unique measure. The evaluation team recommends first applying parameters for exterior space types to any record labeled as exterior lighting. Second, we recommend applying the parameters for the garage space type for all records where the tracking data lists the facility as a garage, including cases where the tracking data also specified the space as uncooled. Third, we recommend applying the parameters for an uncooled building when a building is listed as uncooled in the tracking data and not also labeled as installed in an exterior space or garage. Lastly, for measures installed in cooled interior spaces, we recommend applying the parameters for the building type listed in the tracking data.
- **Finding #2:** The reference table in Section 4.5 of the IL-TRM V12.0 specifies building sub-types for two building types frequently applied by the implementation team: “Office – High Rise” and “Multi-Family Common Areas.” Within the “Office – High Rise” building type, the IL-TRM includes several subtypes, such as “CAV no Econ,” “CAV Econ,” “VAV Econ,” and “FCU.” Within the “Multi-Family Common Areas” building type, the IL-TRM includes several subtypes, such as “MF - High Rise - Common” and “MF - Mid Rise - Common.” The evaluation team was able to derive which subtypes the implementation team applied in the ex ante calculations, but being more explicit with the building type information provided in the tracking data will eliminate potential evaluation risk in future years.
- **Recommendation:** To ensure that the proper building-specific assumptions are being applied in all lighting calculations, we recommend that the implementation team match the verbiage used in the tracking data with the building types and subtypes listed in the reference table in Section 4.5 of the IL-TRM V12.0.

SMALL BUSINESS ENERGY PERFORMANCE CHANNEL

- **Finding #1:** C&I air sealing accounted for 99% of the ex ante energy savings, 99% of demand savings, and 87% of gas savings claimed through the SBEP channel. However, the realization rate for electric energy savings was 67% due to an error in the ex ante calculations for the electric heating savings term. The ex ante calculations included a conversion factor of 1,000 (to convert from watts to kilowatts) in the denominator of the electric heating savings term instead of 3,412 (to convert from BTUs to kilowatt-hours). This resulted in significant overestimates of electric energy savings for this measure in electrically heated buildings. In addition, for some records, the Initiative tracking data included limited information on the parameters applied in ex ante savings calculations. For example, the change in infiltration flow rate for each measure installed, the efficiency of electric and/or fossil fuel heating systems, the efficiency of cooling systems, the percentage of facility square footage that was heated, and the percentage of facility square footage which was cooled were not included in the tracking data.
- **Recommendation:** We recommend that the implementation team reviews the algorithms and assumptions programmed in ALEET for C&I air sealing to ensure that the appropriate conversion factor is applied in the electric heating savings term in the future. We also recommend including additional details on the parameters

applied in the ex ante savings via either the Initiative tracking data or continued access to the equipment catalog extract for the channel.

- **Finding #2:** The implementation team mistakenly divided by the coincidence factor in their demand savings calculations for many of the C&I air sealing and wall insulation measures, which resulted in an overestimation of the ex ante demand savings for these measures.
 - **Recommendation:** We recommend that the implementation team review the algorithms programmed in ALEET for these measures to ensure the coincidence factor field is applied appropriately.
- **Finding #3:** The implementation team mistakenly multiplied by the quantity of installed units twice in their ex ante gas savings calculations for covers and gap sealers: once in the calculation of the flow rate of infiltration and again in the final calculation of the total gas savings. This error led to significant overestimates of the gas savings and a 36% realization rate for this measure.
 - **Recommendation:** We recommend that the implementation team review the algorithms programmed in ALEET for this measure to ensure the quantity field is applied appropriately.

3.6 MIDSTREAM INITIATIVE

3.6.1 INITIATIVE DESCRIPTION

The Midstream Initiative incentivizes distributors and wholesalers to reduce prices for efficient equipment at the point of sale. The Initiative includes three channels: Midstream Lighting, Midstream HVAC, and Midstream Food Service. The goal is to increase the adoption of high efficiency equipment without requiring the end customer to submit an incentive application. Public sector and nonprofit customers can receive an additional incentive to cover the cost of installation services if they hire a qualified Program Ally to install equipment purchased through the HVAC and Lighting channels.

Overall, the implementation team set a goal of achieving 25,258 MWh and 99,868 therms of savings through the Midstream Initiative in 2024.

3.6.2 INITIATIVE ANNUAL SAVINGS SUMMARY

Table 66 presents the Midstream Initiative annual savings achieved in 2024. The 2024 Midstream Initiative achieved 28,871 MWh, 6.17 MW, and 60,326 therms in verified net savings.

Table 66. 2024 Midstream Initiative Annual Savings

	Electric Energy Savings (MWh)	Electric Demand Savings (MW)	Gas Savings (Therms)
Ex Ante Gross Savings	29,441	6.92	62,268
Gross Realization Rate	101%	91%	112%
Verified Gross Savings	29,606	6.33	69,697
NTGR	0.975	0.975	0.866
Verified Net Savings	28,871	6.17	60,326

3.6.3 LIGHTING CHANNEL

The following sections present the impact evaluation results for the 2024 Midstream Lighting channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The Midstream Lighting channel provides incentives to participating lighting equipment distributors to reduce the final sale price of equipment for end customers and to encourage distributors to promote higher efficiency equipment. AIC has offered midstream incentives for efficient nonresidential lighting since the 2014–2015 cycle. Initiative staff provide incentives for the sale of linear LED tubes, pin-based bulbs, mogul-based LED lamps, wall packs, and LED exit signs. By providing incentives to distributors, Initiative staff aim to increase the adoption of high efficiency lighting without requiring customers to submit an incentive application.

Distributors are required to pass the full incentive on to the purchaser through a point-of-sale discount. However, participating distributors are eligible to receive bonuses based on their channel activity. To receive incentives, distributors collect equipment and end customer information from contractors and submit the information via an online Midstream Lighting portal hosted and managed by Leidos.³³ Only sales to AIC end customers are eligible to receive channel incentives. Implementation partner Energy Sciences reviews all incoming transaction data for completeness, accuracy, and eligibility. Once a transaction is approved, the incentive is paid to the distributor.

AIC provides cobranded marketing materials to participating distributors, as well as educational materials and training on channel participation requirements. Leidos partners with CMC Energy Services to manage the network of participating distributors. CMC provides each distributor with an account manager that helps them troubleshoot issues and increase their channel activity. AIC and Leidos continually recruit new distributors, focusing on reaching those in economically disadvantaged areas.

PARTICIPATION SUMMARY

Table 67 presents a summary of participation in the Midstream Lighting channel in 2024. We present these data separated by public and private sector customers to provide context as to the primary drivers of participation. AIC customers purchased 446,310 units of efficient lighting through the channel, representing a 21% increase compared to 2023. Linear LEDs dominated channel activity, accounting for 97% of all incentivized measures.

Table 67. 2024 Midstream Lighting Channel Participation Summary by Measure

Measure Category	Quantity	Ex Ante Gross MWh	Ex Ante Gross MW
Private Sector^a			
Linear LEDs	242,844	12,185	2.91
Moguls	3,167	2,368	0.57
Wall Packs	2,037	1,486	0.33
Four-Pin LEDs	400	17	<0.01
Exit Signs	49	2	<0.01
<i>Private Sector Subtotal</i>	248,497	16,059	3.80

³³ Not all distributors have transitioned to using the portal yet. These distributors submit the necessary information via email.

Measure Category	Quantity	Ex Ante Gross MWh	Ex Ante Gross MW
Public Sector			
Linear LEDs	188,922	9,003	2.15
Moguls	5,198	2,374	0.57
Wall Packs	1,227	889	0.19
Four-Pin LEDs	2,332	129	0.03
Exit Signs	134	6	<0.01
<i>Public Sector Subtotal</i>	<i>197,813</i>	<i>12,402</i>	<i>2.94</i>
Total	446,310	28,461	6.74

^a The project counts, measure counts, and ex ante savings values presented in the Private Sector subsection of this table include State and Federal facilities, as these facility types are not included in the list of customer types covered in the public sector minimum funding requirements in subsection (c) of 220 ILCS 5/8-103B and subsection (e) of 220 ILCS 5/8-104.

Table 68 presents information on distributor participation in the channel. In total, 42 distributors participated in the channel in 2024 compared to 41 in 2023. In total, these distributors completed 729 projects. Table 68 presents information on the ten distributors most active in the channel in 2024.

Table 68. 2024 Midstream Lighting Channel Participating Distributor Summary

Distributor	Projects	Share of Total (n=729)
Ally 1	282	39%
Ally 4	57	8%
Ally 25	36	5%
Ally 26	36	5%
Ally 27	33	5%
Ally 2	30	4%
Ally 28	25	3%
Ally 29	19	3%
Ally 30	17	2%
Ally 31	15	2%

Note: The project counts included in this table are based on project numbers as they are tracked in the Initiative tracking data. For the Midstream Lighting channel, project numbers correspond to invoices; some invoices include a single customer purchase, while others can include several. Therefore, project numbers are used as a proxy for channel activity but may not reflect the true distribution of channel activity among distributors.

SAVINGS DETAIL

Table 69 presents the ex ante, verified gross, and verified net electric energy savings achieved through the Midstream Lighting channel in 2024. The channel provided incentives for the same measures in 2024 as in 2023. Overall, the channel achieved a realization rate of 101% for electric energy savings. Linear LEDs were the primary driver of electric energy savings, producing 74% of the channel's verified net electric energy savings, up from 57% in 2023. The verified net savings produced by Mogul LEDs, which accounted for 16% of total verified net electric energy savings in 2024, dropped by 56% compared to 2023. Wall packs accounted for 10% of verified net energy savings in 2024 compared to 5% in 2023. Pin-base bulbs accounted for 1% of verified net electric energy savings in 2024 compared to less than 1% in 2023, and exit signs accounted for less than 1% of savings in 2024, consistent with 2023. Overall, the channel saw a 4% increase in verified net electric energy savings compared to 2023.

Table 69. 2024 Midstream Lighting Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Linear LEDs	21,188	100%	21,160	0.980	20,738
Moguls	4,743	96%	4,557	0.986	4,491
Wall Packs	2,376	117%	2,790	0.984	2,747
Four-Pin LEDs	146	107%	157	0.923	145
Exit Signs	8	103%	9	0.974	8
Total	28,461	101%	28,672	0.981	28,129

Table 70 presents the ex ante, verified gross, and verified net electric demand savings achieved through the Midstream Lighting channel in 2024. The channel achieved a realization rate of 92% for electric demand savings. Overall, the channel saw a 1% decrease in verified net demand savings compared to 2023.

Table 70. 2024 Midstream Lighting Channel Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Linear LEDs	5.06	100%	5.05	0.980	4.95
Moguls	1.13	96%	1.09	0.986	1.07
Wall Packs	0.51	0%	0.00	N/A	0.00
Four-Pin LEDs	0.03	100%	0.03	0.923	0.03
Exit Signs	<0.01	102%	<0.01	0.974	<0.01
Total	6.74	92%	6.17	0.981	6.06

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **Moguls** (17% of ex ante electric energy and demand savings): The gross realization rate for Moguls is 96% for both electric energy and demand savings.
 - For one record, the implementation team applied an unknown quantity to derive the ex ante savings. The evaluation team applied the quantity provided in the tracking data (-16), resulting in negative verified electric energy and demand savings. The evaluation team suspects that this negative quantity was meant to account for the return of previously incentivized equipment by a customer and that the correction to the quantity field in the tracking data was not appropriately propagated to the ex ante savings. This discrepancy resulted in a decrease in verified electric energy and demand savings.
- **Wall Packs** (8% of ex ante electric energy savings and demand savings): The gross realization rate for Wall Packs is 117% for electric energy savings and 0% for demand savings.
 - For all records, the implementation team applied the unknown building/space type coincidence factor (CF) of 0.67, whereas the evaluation team applied the exterior space CF (0.0), resulting in zero verified demand savings.
 - For 264 records, the implementation team applied hours of use (HOU) assumptions for an interior location, whereas the evaluation team used the HOU for the “Exterior – Dusk to Dawn” space type (4,303 hours), resulting in higher verified electric energy savings.
 - For 82 records, the lumens for the incentivized fixture were not included in the tracking data. The evaluation team used the average baseline wattage assumptions from the known lumen ranges included in the IL-TRM

(5k–10k, 10k–15k, and 15k–30k) to derive a baseline wattage for Wall Packs with a lumen range of 5k–30k. This resulted in overall higher verified electric energy savings.

- For three records, the efficient wattage was not included in the tracking data. The evaluation team derived an average efficient wattage from the known lumen ranges in the IL-TRM (5k–10k, 10k–15k, and 15k–30k) to derive an efficient wattage for Wall Packs with a lumen range of 5k–30k. This resulted in lower verified electric energy savings.
- **Four-Pin LEDs** (1% of ex ante electric energy savings and demand savings): The gross realization rate for four-pin LEDs is 107% for electric energy savings and 100% for demand savings.
 - For all records, the implementation team used the HOU associated with fixtures (3,379 hours), whereas the evaluation team used the HOU associated with LED bulbs (3,612 hours), resulting in higher verified electric energy savings.
 - For three records, the implementation team applied the TLED ISR of 83.1%, whereas the evaluation team applied the LED bulb ISR of 97.9%, resulting in higher verified electric energy and demand savings.
- **Exit Signs** (<1% of ex ante electric energy savings and demand savings): The gross realization rate for Exit Signs is 102% for electric energy savings and 101% for demand savings.
 - For two records, the implementation team applied assumptions for LED fixtures (e.g., ISR, CF, and HOU) in the ex ante savings calculations, whereas the evaluation team applied assumptions consistent with IL-TRM V12.0 for exit signs, resulting in slightly higher verified electric energy and demand savings.

3.6.4 HVAC CHANNEL

The following sections present the impact evaluation results for the 2024 Midstream HVAC channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The Midstream HVAC channel provides incentives to participating HVAC equipment distributors to reduce the final sale price of equipment for end customers and to encourage distributors to promote higher efficiency HVAC and water heating equipment. By providing incentives to distributors, channel staff aim to increase the adoption of high efficiency HVAC and water heating equipment without requiring customers to submit an incentive application. The measures currently incentivized through the channel include ducted and ductless air source heat pumps, central air conditioners, heat pump water heaters (HPWHs), smart thermostats, and notched V-belts. Distributors are permitted to keep up to approximately 10% of the incentive to support their internal data tracking and incentive submission processes, as well as their marketing, education, and outreach efforts.³⁴

AIC provides cobranded marketing materials to participating distributors, as well as educational materials and training on channel participation requirements and eligible equipment specifications. Leidos partners with CMC Energy Services to manage the network of participating distributors. CMC provides each distributor with an account manager that helps them troubleshoot issues and increase their channel activity. The distributors are encouraged to disseminate the provided marketing and educational materials to contractors and to host their own equipment showcases, events, and training sessions to increase contractor engagement with the channel. Any contractor in AIC's service territory is eligible to engage with the channel; however, those who enroll as Program Allies are listed on AIC's website and receive

³⁴ The percentage that distributors can keep varies by measure.

cobranding marketing materials and channel-related communications from AIC. AIC and Leidos continually recruit new distributors and contractors, focusing on reaching those in economically disadvantaged areas.

To receive incentives, distributors collect equipment and end customer information from contractors and submit the information via an online Midstream HVAC portal that is hosted and managed by Leidos. Only sales to AIC end customers are eligible to receive channel incentives. Implementation partner Energy Sciences reviews all incoming transaction data for completeness, accuracy, and eligibility. Once a transaction is approved, the incentive is paid to the distributor. Given the dynamics of the HVAC market and the requirement that distributors verify end customer eligibility, incentivized sales typically occur in one of two ways:

- **Scenario 1:** A contractor purchases equipment for a specific end customer and provides the customer's information to the distributor at the time of purchase. In this scenario, the distributor can typically confirm the customer's eligibility on the spot and sell the equipment to the contractor at a discounted price. Distributors submit the transaction information via the web portal and recoup the incentive.
- **Scenario 2:** A contractor purchases equipment for stock and not for a specific end customer. In this scenario, the distributor sells the equipment to the contractor at full price. Once the contractor sells that equipment to an eligible end customer, they can provide the necessary end customer information to the distributor, who can issue a credit to the contractor and submit the information via the web portal for approval.

In both scenarios, the intent is that the incentive is passed through as savings to the end customer through a lower purchase price with the contractor.

Summary of Key Implementation Changes

Initiative staff instituted the following design and implementation changes to the Midstream HVAC channel in 2024:

- Distributors were required to pass through approximately 90% of the incentive payment at the point of purchase; the previous pass-through requirement was 75%.
- Ductless air source heat pumps (DMSHPs), PTHPs, and PTACs were added to the list of eligible measures.
- The implementation team created separate incentive tiers for heat pumps that met program SEER and heating seasonal performance factor (HSPF) eligibility and those that only met the SEER requirements. The tiered approach provides higher incentives for equipment that meets both sets of criteria while also providing some incentive for equipment that only meets the SEER requirement.
- Initiative staff partnered with the ENERGY STAR® Manufacturers Action Council (ESMAC) on a HPWH campaign to offer training on HPWH technology and educate distributors and contractors about the offerings available through the channel.³⁵
- Implementation staff met with an advisory group and held distributor roundtable meetings to discuss barriers and improvement opportunities, with the goal of bettering serving program partners.

³⁵ The ENERGY STAR® name and mark are registered trademarks owned by the US EPA.

PARTICIPATION SUMMARY

Table 71 presents a summary of participation in the Midstream HVAC channel in 2024. We present these data separated by public and private sector customers to provide context as to the primary drivers of participation. AIC customers purchased 445 units of efficient HVAC equipment through the channel, representing a 138% increase compared to 2023. Ductless heat pumps dominated channel activity, accounting for 31% of all incentivized measures.

Table 71. 2024 Midstream HVAC Channel Participation Summary by Measure

Measure Category	Measure Quantity	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Private Sector^a				
Ductless Heat Pumps	106	132	0.03	0
Small Commercial Thermostats	65	98	0.02	7,469
Notched V-Belts for HVAC Systems	97	45	0.01	0
Single-Package and Split System Unitary Air Conditioners	39	37	0.02	0
Air and Water Source Heat Pumps	25	32	0.01	0
Heat Pump Water Heaters	7	24	<0.01	0
<i>Private Sector Subtotal</i>	339	368	0.09	7,469
Public Sector				
Ductless Heat Pumps	30	36	0.01	0
<i>Public Sector Subtotal</i>	30	36	0.01	0
Total	369	405	0.10	7,469

^a The project counts, measure counts, and ex ante savings values presented in the Private Sector subsection of this table include State and Federal facilities, as these facility types are not included in the list of customer types covered in the public sector minimum funding requirements in subsection (c) of 220 ILCS 5/8-103B and subsection (e) of 220 ILCS 5/8-104.

Table 72 presents information on distributor participation in the channel. In total, 31 distributors participated in the channel in 2024, a 48% increase compared to 21 distributors in 2023. In total, these distributors completed 285 projects. Table 72 presents information on the ten distributors most active in the channel in 2024.

Table 72. 2024 Midstream HVAC Channel Participating Distributor Summary

Distributor	Projects	Share of Total (n=285)
Ally 32	48	17%
Ally 33	36	13%
Ally 34	22	8%
Ally 35	21	7%
Ally 36	21	7%
Ally 37	15	5%
Ally 38	13	5%
Ally 39	11	4%
Ally 40	11	4%
Ally 41	10	4%
Ally 42	10	4%

SAVINGS DETAIL

Table 73 presents the ex ante, verified gross, and verified net electric energy savings achieved through the Midstream HVAC channel in 2024. The channel achieved a gross realization rate of 100% for electric energy savings. The channel continued to provide incentives for the same measures as in 2023. Additionally, it introduced unitary DMSHPs, which accounted for 40% of verified net electric energy savings, representing the largest contributor to channel electric energy savings. Advanced thermostats accounted for 26% of verified net electric energy savings, down from 59% in 2023 and continuing an 80% decline in savings since 2022. The primary driver of the decrease in verified net electric energy savings from advanced thermostats was a 46% drop in the number of incentivized measures compared to 2023. Unitary ACs contributed 10% to the channel's verified net electric energy savings, equaling their contribution in 2023, with a 47% increase in total verified net savings compared to 2023. Notched V-belts (13% of channel verified net electric energy savings) saw a 6,367% increase in verified net electric energy savings compared to 2023 due in part to a twelve-fold increase in measure uptake. Unitary air source heat pumps (ASHPs) and HPWHs contributed 7% and 5% to the channel's verified net electric energy savings, down from 21% and 9%, respectively, in 2023. Overall, the verified net electric energy savings achieved through the channel increased by 52% compared to 2023.

Table 73. 2024 Midstream HVAC Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Unitary DMSHP	169	99%	168	0.674	113
Advanced Thermostat	98	99%	96	0.762	74
Notched V-Belt	45	100%	45	0.800	36
Unitary AC	37	114%	43	0.651	28
Unitary ASHP	32	84%	27	0.708	19
Heat Pump Water Heater	24	110%	26	0.600	16
Total	405	100%	405	0.704	285

Table 74 presents the ex ante, verified gross, and verified net electric demand savings achieved through the Midstream HVAC channel in 2024. The Midstream HVAC channel achieved a gross realization rate of 107% for electric demand savings. Overall, the channel saw a 46% increase in verified net demand savings compared to 2023.

Table 74. 2024 Midstream HVAC Channel Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Unitary DMSHP	0.04	100%	0.04	0.683	0.03
Advanced Thermostat	0.02	105%	0.02	0.740	0.02
Notched V-Belt	0.01	102%	<0.01	0.800	<0.01
Unitary AC	0.02	101%	0.02	0.641	0.01
Unitary ASHP	0.01	171%	0.01	0.726	0.01
Heat Pump Water Heater	<0.01	125%	<0.01	0.600	<0.01
Total	0.10	107%	0.10	0.697	0.07

Table 75 presents the ex ante, verified gross, and verified net gas savings achieved through the Midstream HVAC channel in 2024. The channel achieved a realization rate of 95% for gas savings. Advanced thermostats are the only measure contributing to gas savings in the channel. Overall, the channel produced 49% fewer verified net gas savings compared to 2023.

Table 75. 2024 Midstream HVAC Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Advanced Thermostat	7,469	95%	7,129	0.864	6,156
Total	7,469	95%	7,129	0.864	6,156

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **Advanced Thermostats** (24% of ex ante energy savings, 23% of demand savings, and 100% of gas savings): The gross realization rates for Advanced Thermostats are 99% for electric energy, 105% for demand, and 95% for gas savings.

 - The implementation team applied a calculated EER2 value of 11.46 in the ex ante savings calculations based on the TRM-specified SEER2 default of 12.4 for midstream programs. The evaluation team applied the TRM default EER2 value of 10.9, which is specified for midstream programs. This discrepancy affected all advanced thermostat measures, resulting in increased verified electric demand savings.
 - The evaluation team identified a discrepancy in the gas savings for three records, but the specific cause could not be determined. A thorough review of the implementation team's calculations and assumptions confirmed alignment with IL-TRM V12.0 and the verified analysis. These records had realization rates of 100% in an interim analysis conducted by the evaluation team; however, the ex ante savings values changed in the year-end data, resulting in decreased verified gas savings for these records.
- **Notched V-Belts** (11% of ex ante energy savings and 7% of demand savings): The gross realization rates for Notched V-Belts are 100% for electric energy and 100% for demand savings.

 - The implementation team applied deemed assumptions for controlled horsepower (hp) and motor efficiency in the ex ante savings calculations for notched AX and BX V-belts. For AX V-belts, the implementation team assumed a three-hp motor at the NEMA premium efficiency of 89.5%, and for BX V-belts, they assumed a 7.5-hp 91.7% efficient NEMA premium motor. The IL-TRM V12.0 algorithm requires actual motor horsepower for the fans where the V-belts are installed but does not provide guidance for midstream programs when actual values are unknown. The evaluation team reviewed manufacturer specifications and the implementation team's supporting documentation for notched AX and BX V-belts, which provided minimum sheave dimensions for the belts, which were further correlated to a minimum motor horsepower. Based on this review, the evaluation team determined the implementation team's assumptions to be reasonable and applied the same assumptions in the verified analysis.
- **Unitary ACs** (9% of ex ante energy savings and 20% of demand savings): The gross realization rates for Unitary ACs are 114% for electric energy and 101% for demand savings.

 - The implementation team applied the IL-TRM V12.0 baseline of 14.3 SEER2 for units less than 65,000 btu/h in cooling capacity, which is listed within an abbreviated table of the Code of Federal Regulations (CFR) mechanical efficiency standards. However, the evaluation team found that the TRM table incorrectly lists the SEER2 standards for heat pumps in the "Small Commercial Package Air-Conditioning and Heating Equipment (Air-Cooled, 3-Phase, Split-System) of <65,000 Btu/h cooling capacity" category. The correct baseline efficiency for an air conditioning-only unit meeting the category conditions is 13.4 SEER2. The evaluation team applied the 13.4 SEER2 value, resulting in increased verified electric energy savings.
 - The implementation team calculated the baseline and efficient EER2 values used in the ex ante savings calculations from the corresponding SEER2 value, an option presented in the IL-TRM V12.0. The evaluation team applied the Initiative tracking data value for the efficient EER2 and calculated the baseline EER2 from the CFR SEER2 baseline. The difference between the ex ante and verified baseline EER2 is a constant 4%, while the

difference for the efficient EER2 ranged from -7% to 12%. This resulted in an increase in electric demand savings for some measures and a decrease for others, leading to an overall increase in verified demand savings.

- **Unitary ASHPs** (8% of ex ante energy savings and 7% of demand savings): The gross realization rates for Unitary ASHPs are 84% for electric energy and 171% for demand savings.
 - For all records, the implementation team applied the cooling capacity of the ASHP in place of the heating capacity in their calculation of the *Heating Load* term. The evaluation team aligned with the IL-TRM V12.0 algorithm, which multiplies the ASHP's heating capacity with the annual heating season effective full load hours. This difference between the ex ante and verified savings calculations resulted in decreased verified electric energy savings.
 - For all records, the implementation team calculated baseline and efficient EER2 values from the corresponding SEER2 value. However, the evaluation team found a mistake in the formula, which flipped a subtraction operation to addition. This resulted in elevated baseline (20.1 EER2) and efficient (21.6 to 28.5 EER2) EER2 values. In addition, the IL-TRM V12.0 specifies a baseline EER2 of 9.4, which the evaluation team used in the verified savings calculations. If the SEER2-to-EER2 conversion formula used by the implementation team had been applied correctly, the ex ante baseline EER2 assumption would have been 27% higher than the value specified in the IL-TRM. Additionally, it is unclear from the IL-TRM whether applying a calculated baseline EER2 is allowable over the assumption specified in the TRM. Overall, these discrepancies resulted in increased verified electric demand savings.
- **Heat Pump Water Heaters** (6% of ex ante energy savings and 3% of demand savings): The gross realization rates for HPWHs are 110% for electric energy and 125% for demand savings.
 - The implementation team assumed that all installations occurred at sites where an ASHP is the primary HVAC system, resulting in the use of a *COPheat* of 1.92 in the ex ante savings calculations. This assumption results in the calculation of negative electric heating impacts due to the HPWH's cool air output in a conditioned space. The evaluation team assumed that all installations occurred at businesses with a natural gas furnace as the primary heating system due to the prevalence of natural gas furnaces throughout the service territory. This resulted in replacing an electric heating penalty with a gas heating penalty, increasing verified electric energy savings.
 - In 2023, the evaluation team identified an error in the implementation team's ex ante electric energy savings calculation, which subtracted both the Waste Heat Cooling and Waste Heat Heating impacts from the total electric energy savings, while the IL-TRM algorithm only stated to subtract the Waste Heat Heating impacts and to add the Waste Heat Cooling impacts. In 2024, the ex ante calculation for electric energy savings appears to have been corrected to address this issue. However, the demand savings still appear to be calculated using electric energy savings that reflect the incorrect formula applied in 2023, resulting in increased verified electric demand savings for the channel.

3.6.5 FOOD SERVICE CHANNEL

The following sections present the impact evaluation results for the 2024 Midstream Food Service channel. Additional details on the impact analysis methodology are provided in Appendix A.

CHANNEL DESCRIPTION

The Midstream Food Service channel is a statewide offering that provides incentives to participating food service equipment distributors to reduce the final sale price of equipment for end customers and to encourage distributors to

promote higher efficiency equipment. By providing incentives to distributors, channel staff aim to increase the adoption of high efficiency food service equipment without requiring customers to submit an incentive application. Distributors are permitted to keep a portion of equipment incentives to support their internal data tracking and incentive submission processes, as well as their marketing, education, and outreach efforts. The channel targets both national and local food service equipment suppliers to participate in the channel. The incentives are intended to be passed through as savings to the end customer through a lower purchase price, either directly from the participating distributor or through a contractor.

Frontier Energy implements the channel and is primarily responsible for setting incentive levels, establishing eligibility criteria, and paying out the incentives to distributors. They coordinate with Leidos to share transaction data to estimate savings and track AIC-specific channel activity.

Summary of Key Implementation Changes

Initiative staff instituted the following design and implementation changes to the Midstream Food Service channel in 2024:

- The transaction submittal process was streamlined to enable customers to be paid faster.
- Implementation staff introduced a bonus program to incentivize distributors with outstanding incentive claims to submit them more promptly.

PARTICIPATION SUMMARY

Table 76 presents a summary of participation in the Midstream Food Service Channel in 2024. We present these data separated by public and private sector customers to provide context as to the primary drivers of participation. AIC customers purchased 251 units of efficient food service equipment through the channel, representing an 8% increase compared to 233 units in 2023. Solid and glass door refrigerators & freezers dominated channel activity, accounting for 57% of all incentivized measures in 2024.

Table 76. 2024 Midstream Food Service Channel Participation Summary by Measure

Measure Category	Measure Quantity	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Private Sector^a				
Fryers	38	149	0.01	38,306
Dishwashers	9	92	0.01	588
Solid and Glass Door Refrigerators & Freezers	119	75	0.01	0
Combination Ovens	7	60	0.03	0
Steam Cookers	3	31	0.01	3,491
Broilers	2	24	0.01	3,348
Griddles	5	20	<0.01	609
Convection Ovens	9	17	<0.01	383
Ice Makers	17	16	<0.01	0
Conveyor Ovens	2	0	0.00	3,893
<i>Private Sector Subtotal</i>	<i>211</i>	<i>485</i>	<i>0.08</i>	<i>50,617</i>
Public Sector				
Dishwashers	4	61	<0.01	0
Solid and Glass Door Refrigerators & Freezers	24	17	<0.01	0
Steam Cookers	1	169	0.00	1,751

Measure Category	Measure Quantity	Ex Ante Gross MWh	Ex Ante Gross MW	Ex Ante Gross Therms
Griddles	3	8	<0.01	1,892
Convection Ovens	4	1	<0.01	538
Ice Makers	3	2	<0.01	0
Hot Food Holding Cabinets	1	1	<0.01	0
<i>Public Sector Subtotal</i>	40	90	0.01	4,182
Total	251	575	0.08	54,799

^a The project counts, measure counts, and ex ante savings values presented in the Private Sector subsection of this table include State and Federal facilities, as these facility types are not included in the list of customer types covered in the public sector minimum funding requirements in subsection (c) of 220 ILCS 5/8-103B and subsection (e) of 220 ILCS 5/8-104.

SAVINGS DETAIL

Table 77 presents the ex ante, verified gross, and verified net electric energy savings achieved through the Midstream Food Service channel in 2024. The channel provided incentives for many of the same measures as in 2023 and added ENERGY STAR hot food holding cabinets and conveyor ovens. The channel achieved a realization rate of 92% for electric energy savings. Channel energy savings were primarily driven by dishwashers, which produced 29% of the channel’s verified net electric energy savings, up from 6% in 2023. Overall, the channel saw a 4% decrease in verified net savings compared to 2023, partly due to a reduction in the number of steam cookers and conveyor broilers incentivized through the channel. The verified net savings produced by steam cookers dropped by 90% in 2024 compared to 2023, and conveyor broilers saw a 74% drop compared to 2023. Seven measures saw an increase in their contribution to verified net energy savings in 2024 compared to 2023. Dishwashers accounted for 29% of verified net energy savings in 2024 compared to 6% in 2023, while fryers (19%, up from 9%), refrigerators and freezers (18%, up from 9%), combination ovens (12%, up from 1%), griddles (5%, up from <1%), convection ovens (4%, up from <1%) and ice machines (3%, up from 2%) also increased in their share of total verified electric energy savings in 2024 compared to 2023.

Table 77. 2024 Midstream Food Service Channel Electric Energy Savings by Measure

Measure Category	Ex Ante Gross Savings (MWh)	Gross Realization Rate	Verified Gross Savings (MWh)	NTGR	Verified Net Savings (MWh)
Dishwashers	154	100%	154	0.857	131
Fryers	149	63%	94	0.912	86
Refrigerators and Freezers	92	100%	92	0.879	81
Combination Ovens	60	105%	63	0.857	54
Steam Cookers	31	101%	31	0.802	25
Griddles	28	98%	27	0.902	24
Automatic Conveyor Broilers	24	103%	25	0.800	20
Convection Ovens	19	125%	24	0.829	20
Ice Machines	18	101%	18	0.800	15
Hot Food Holding Cabinets	1	100%	1	0.800	1
Total	575	92%	529	0.863	456

Table 78 presents the ex ante, verified gross, and verified net electric demand savings achieved through the Midstream Food Service channel in 2024. The channel achieved a realization rate of 59% for electric demand savings. Refrigerators and freezers drove channel demand savings, accounting for 20% of total savings. Overall, the channel experienced a 43% decrease in verified net electric demand savings compared to 2023.

Table 78. 2024 Midstream Food Service Channel Electric Demand Savings by Measure

Measure Category	Ex Ante Gross Savings (MW)	Gross Realization Rate	Verified Gross Savings (MW)	NTGR	Verified Net Savings (MW)
Dishwashers	0.01	100%	0.01	0.857	0.01
Fryers	0.01	64%	0.01	0.912	0.01
Refrigerators and Freezers	0.01	100%	0.01	0.879	0.01
Combination Ovens	0.03	18%	0.01	0.857	0.01
Steam Cookers	0.01	100%	0.01	0.800	<0.01
Griddles	<0.01	98%	<0.01	0.902	<0.01
Automatic Conveyor Broilers	0.01	81%	<0.01	0.800	<0.01
Convection Ovens	<0.01	74%	<0.01	0.829	<0.01
Ice Machines	<0.01	89%	<0.01	0.800	<0.01
Hot Food Holding Cabinets	<0.01	16%	<0.01	0.800	<0.01
Total	0.08	59%	0.05	0.854	0.04

Table 79 presents the ex ante, verified gross, and verified net gas savings achieved through the Midstream Food Service channel in 2024. The channel achieved a realization rate of 114% for gas savings. Overall, the channel experienced an 85% increase in verified net gas savings compared to 2023.

Table 79. 2024 Midstream Food Service Channel Gas Savings by Measure

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Dishwashers	588	100%	588	0.800	470
Fryers	38,306	102%	39,082	0.846	33,059
Steam Cookers	5,242	98%	5,160	0.912	4,705
Griddles	2,501	98%	2,452	0.951	2,333
Automatic Conveyor Broilers	3,348	99%	3,322	0.800	2,657
Convection Ovens	922	205%	1,891	0.800	1,513
Conveyor Ovens	3,893	259%	10,074	0.936	9,432
Total	54,799	114%	62,568	0.866	54,170

We discuss significant discrepancies between ex ante claims and the verified analysis below.

- **Fryers** (26% of ex ante energy savings, 12% of demand savings, and 70% of gas savings): The gross realization rates for Fryers are 63% for electric energy, 64% for demand, and 102% for gas savings.
 - The implementation team applied the same value for $\text{PreheatEnergy}_{\text{Base}}$ and $\text{PreheatEnergy}_{\text{ESTAR}}$ in the ex ante savings calculations. The evaluation team applied $\text{PreheatEnergy}_{\text{Base}}$ and $\text{PreheatEnergy}_{\text{ESTAR}}$ assumptions in accordance with IL-TRM V12.0, resulting in higher verified gas savings.
 - The implementation team appears to be using Idle Energy Rate values in units of kW/h instead of W/h for the efficient equipment. The evaluation team converted these efficient Idle Energy Rate values to W/h in the verified savings calculations, resulting in lower verified electric energy and demand savings.
- **Combination Ovens** (10% of ex ante energy savings and 40% of demand savings): The gross realization rates for Combination Ovens are 105% for energy savings and 18% for demand savings.

- The evaluation team used the IL-TRM V12.0 algorithms and assumptions to estimate the verified savings, using inputs from the tracking data where possible. Based on a review of ALEET, the implementation team appears to be using the algorithms from the IL-TRM V12.0 and applying the efficient inputs correctly. However, the reported ex ante demand savings value differs from what is calculated using those algorithms and assumptions, resulting in lower demand savings.
- For all records, the implementation team applied an electric steam efficiency value for the efficient equipment that is not provided in the tracking data and does not align with IL-TRM V12.0 assumptions. The evaluation team applied the IL-TRM default assumption for the electric steam efficiency of the efficient equipment, which resulted in higher verified electric energy and demand savings. However, the effect on verified demand savings does not supersede the discrepancy mentioned in the previous bullet.
- **Steam Cookers** (5% of ex ante energy savings, 7% of demand savings, and 10% of gas savings): The gross realization rates for Steam Cookers are 101% for energy savings, 100% for demand savings, and 98% for gas savings.
 - The implementation team used the assumptions and inputs defined in IL-TRM V12.0 for “Steam Generation” units to calculate the ex ante savings. Based on the model numbers of the efficient equipment, the evaluation team used the “Boilerless” assumptions and inputs according to the IL-TRM in the verified calculations, resulting in higher verified electric energy savings.
 - For two records, the implementation team applied the IL-TRM V12.0 assumption for average daily hours of operation for an “unknown” building type in the ex ante savings calculations. The evaluation team applied the assumption for a “Fast Food Limited Menu” location based on the interpretation that it is the closest available option in the IL-TRM to the medical facility building type listed in the tracking data. This resulted in lower verified electric energy and gas savings.
 - For one record, the implementation team did not apply the element count from the tracking data to calculate ex ante savings. The evaluation team applied the element count in the verified calculations, resulting in higher verified electric energy and demand savings.
- **Griddles** (5% of ex ante energy savings, 3% of demand savings, and 5% of gas savings): The gross realization rates for Griddles are 98% for energy, demand savings, and gas savings.
 - The discrepancies between the ex ante and verified savings appear to be due to the application of rounded values in the ex ante savings calculations, resulting in lower verified electric energy, demand, and gas savings.
- **Automatic Conveyor Broilers** (4% of ex ante electric energy savings and 6% of demand and gas savings): The gross realizations rates for Automatic Conveyer Broilers are 103% for electric energy savings, 81% for demand savings, and 99% for gas savings.
 - For both measures, the implementation team appears to have applied a CF in the ex ante calculations that differs from the assumption programmed in ALEET, or an unspecified adjustment factor, resulting in increased ex ante demand savings. The evaluation team used the CF value and demand savings algorithm defined in the IL-TRM in the verified calculation. The assumptions and algorithms programmed in ALEET align with the evaluation team’s approach, but the ex ante savings in the tracking data do not. This discrepancy results in lower verified demand savings.
 - For one measure, the implementation team uses a value identical to the deemed cooking energy rate for the preheat energy. The evaluation team used the deemed preheat energy value from the IL-TRM V12.0, resulting in higher verified electric energy and gas savings.
 - For one measure, the implementation team used the deemed cooking energy from the IL-TRM V12.0 in the ex ante calculations. The evaluation team used the cooking energy provided in the program data in the verified calculations, resulting in lower verified gas savings.

- **Convection Ovens** (3% of ex ante electric energy savings, 4% of demand, and 2% of gas savings): The gross realization rates for Convection Ovens are 184% for electric energy savings, 108% for demand savings, and 206% for gas savings.
 - For eight electric records, the implementation team appears to have either applied a CF value in the ex ante calculations that differs from the assumption programmed in ALEET or an unspecified adjustment factor. The evaluation team used the demand savings algorithm defined in IL-TRM V12.0 and CF values based on the facility type information in the tracking data to estimate the verified demand savings. The assumptions and algorithms programmed in ALEET align with the evaluation team's approach, but the ex ante savings in the tracking data do not. This discrepancy results in lower verified demand savings.
 - The evaluation team believes a data transfer or ingestion issue occurred for five gas convection oven records, which resulted in the over-reporting of ex ante gas savings for some records. The evaluation team estimated verified savings using inputs from the tracking data, where possible, and default assumptions from the IL-TRM V12.0. These discrepancies resulted in lower verified gas savings; however, applying element counts in the verified savings resulted in an overall increase in verified gas savings. The evaluation team reviewed backup documentation on ALEET for these records and found that the ex ante savings values included in that documentation were in the same range as the verified estimates.
 - For three electric records, the implementation team did not use the element count to calculate ex ante savings. The evaluation team used the element count to calculate savings, resulting in higher verified electric energy and demand savings. However, the effect on demand savings does not supersede the previously mentioned discrepancies.
 - For one electric record, the implementation team applied the default efficient idle time assumption from IL-TRM V12.0 in the ex ante savings calculations. The evaluation team applied the IL-TRM V12.0 algorithm to calculate efficient idle time using the efficient production capacity provided in the tracking data, resulting in lower verified electric energy and demand savings.
- **Ice Machines** (3% of ex ante electric energy savings and 5% of demand savings): The gross realization rates for Ice Machines are 101% for electric energy savings and 89% for demand savings.
 - The implementation team appears to have applied the same algorithms and assumptions as the evaluation team to estimate the demand savings for all records. However, the evaluation team calculated lower verified demand savings. The source of the discrepancy is unclear, based on the evaluation team's review of the tracking data and ALEET.
 - For one record, the evaluation team applied the assumptions from the IL-TRM V12.0 based on the harvest rate listed in the tracking data. The implementation team appears to have applied assumptions inconsistent with the incentivized equipment's harvest rate, resulting in higher verified electric energy savings.
- **Hot Food Holding Cabinets** (<1% of ex ante electric energy savings and 1% of demand savings): The gross realization rates for the Hot Food Holding Cabinets are 100% for energy savings and 17% for demand savings.
 - The evaluation team believes there was a data entry error for the ex ante demand savings. The evaluation team applied the IL-TRM V12.0 algorithm with the volume provided in the tracking data to calculate the verified demand savings. The assumptions and algorithms programmed in ALEET align with the evaluation team's approach, but the ex ante savings listed in the tracking data are significantly higher. This discrepancy results in lower verified demand savings.
- **Gas Conveyor Ovens** (7% of ex ante gas savings): The gross realization rate for Gas Conveyor Ovens is 259% for gas savings.
 - The implementation team did not apply the element count when calculating the ex ante savings. The evaluation team incorporated the element counts when calculating savings, resulting in higher verified gas savings.

3.6.6 CUMULATIVE PERSISTING ANNUAL SAVINGS

Table 80 through Table 83 present CPAS and WAML for the 2024 Midstream Initiative by channel. The tables also include a summary of the measure-specific and total verified gross savings for the Initiative and respective channels, as well as CPAS in each year from 2024–2027.³⁶ The WAML for the Midstream Initiative is 14.9 years, and the WAML for the Lighting, HVAC, and Food Service channels are 14.9 years, 12.9 years, and 12.8 years, respectively.

Table 80. 2024 Midstream Initiative CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
Lighting	14.9	28,672	0.981	28,129	28,129	28,129	28,129	...	28,120	...	419,315
HVAC	12.9	405	0.704	285	285	285	280	...	249	...	3,600
Food Service	13.5	529	0.863	456	456	456	456	...	456	...	6,142
2024 CPAS		29,606	0.975	28,871	28,871	28,871	28,865	...	28,826	...	429,057
Expiring 2024 CPAS				0	0	0	6	...	0	...	
Expired 2024 CPAS				0	0	0	6	...	45	...	
WAML	14.9										

Table 81. 2024 Midstream Lighting Channel CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
Linear LEDs	14.8	21,160	0.980	20,738	20,738	20,738	20,738	...	20,738	...	306,865
Moguls	14.8	4,557	0.986	4,491	4,491	4,491	4,491	...	4,491	...	66,460
Wall Packs	16.0	2,790	0.984	2,747	2,747	2,747	2,747	...	2,747	...	43,947
4-Pin LEDs	13.8	157	0.923	145	145	145	145	...	145	...	2,000
Exit Signs	5.0	9	0.974	8	8	8	8	...	0	...	42
2024 CPAS		28,672	0.981	28,129	28,129	28,129	28,129	...	28,120	...	419,315
Expiring 2024 CPAS				0	0	0	0	...	0	...	
Expired 2024 CPAS				0	0	0	0	...	8	...	
WAML	14.9										

³⁶ For further detail, including achieved CPAS in years not presented in this table, please see the 2024 AIC CPAS and AAIG Workbook.

Table 82. 2024 Midstream HVAC Channel CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
Unitary DMSHP	15.0	168	0.674	113	113	113	113	...	113	...	1,696
Advanced Thermostat	11.0	96	0.762	74	74	74	74	...	74	...	809
Notched V-Belt	3.8	45	0.800	36	36	36	30	...	0	...	139
Unitary AC	15.0	43	0.651	28	28	28	28	...	28	...	418
Unitary ASHP	16.0	27	0.708	19	19	19	19	...	19	...	305
Heat Pump Water Heater	15.0	26	0.600	16	16	16	16	...	16	...	233
2024 CPAS		405	0.704	285	285	285	280	...	249	...	3,600
Expiring 2024 CPAS				0	0	0	6	...	0	...	
Expired 2024 CPAS				0	0	0	6	...	36	...	
WAML	12.9										

Table 83. 2024 Midstream Food Service Channel CPAS and WAML

Measure	Measure Life	Annual Verified Gross Savings (MWh)	NTGR	CPAS – Verified Net Savings (MWh)							Lifetime Savings (MWh)
				2024	2025	2026	2027	...	2030	...	
Dishwashers	17.4	154	0.857	131	131	131	131	...	131	...	2,286
Fryers	12.0	94	0.912	86	86	86	86	...	86	...	1,032
Refrigerators and Freezers	12.0	92	0.879	81	81	81	81	...	81	...	967
Combination Ovens	12.0	63	0.857	54	54	54	54	...	54	...	649
Steam Cookers	12.0	31	0.802	25	25	25	25	...	25	...	302
Griddles	12.0	27	0.902	24	24	24	24	...	24	...	293
Automatic Conveyor Broilers	12.0	25	0.800	20	20	20	20	...	20	...	237
Convection Ovens	12.0	24	0.829	20	20	20	20	...	20	...	234
Ice Machines	9.0	18	0.800	15	15	15	15	...	15	...	131
Hot Food Holding Cabinets	12.0	1	0.800	1	1	1	1	...	1	...	12
2024 CPAS		529	0.863	456	456	456	456	...	456	...	6,142
Expiring 2024 CPAS				0	0	0	0	...	0	...	
Expired 2024 CPAS				0	0	0	0	...	0	...	
WAML	13.5										

3.6.7 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this evaluation, the evaluation team offers the following key findings and recommendations for the Midstream Initiative moving forward:

LIGHTING CHANNEL

- **Finding #1:** For wall packs, the implementation team applied HOU and CF assumptions for interior spaces rather than the HOU and CF associated with exterior spaces. Since the fixtures are installed in an exterior location, the evaluation team applied hours of use and coincidence factor assumptions in accordance with the IL-TRM V12.0 values for an “Exterior – dusk to dawn” space type.
- **Recommendation:** We recommend that the implementation team review the savings algorithms and default assumptions in their internal tracking systems to ensure this measure is characterized appropriately. These changes will improve channel realization rates.
- **Finding #2:** For all four-pin base LEDs, the implementation team estimated ex ante savings using a fixture HOU assumption. After researching the specific equipment model numbers for the incentivized equipment and reviewing the available measure characteristics in the Initiative tracking data, the evaluation believes that savings for four-pin base LEDs should be estimated using HOU and ISR assumptions from the IL-TRM V12.0 for LED lamps because the only products found in our research to use four-pin bases were specialty LED lamps, such as directional BR30s.
- **Recommendation:** We recommend that the Leidos team review their current characterization of pin-base bulbs and that the implementation and evaluation teams meet to discuss how to appropriately estimate savings for these measures if the implementation team disagrees with how the evaluation team characterized these measures. If the implementation team agrees with our characterization, we recommend they update their savings algorithms and assumptions accordingly. Lastly, if this equipment continues to be incentivized in greater quantities in future years, we recommend submitting updates to the TRM to include specific provisions for four-pin base LEDs.

HVAC CHANNEL

- **Finding #1:** The implementation team effectively estimated savings for the HVAC channel in 2024, exemplified by the 95% or greater realization rates achieved within the channel for all savings categories. However, the evaluation team identified several systematic discrepancies that, while having a minimal impact on savings, can be easily corrected through a review of internal initiative tracking systems.
- **Recommendation:** We recommend that the implementation team review the discrepancies noted in this report and attempt to rectify them through their data tracking system, ALEET, or the IL-TRM update process.

FOOD SERVICE CHANNEL

- **Finding #1:** The evaluation team identified several discrepancies in the ex ante savings calculations stemming from the misapplication of deemed values and inputs from IL-TRM V12.0. For example, the implementation team appeared to use Idle efficient energy rate values in units of kW/h instead of W/h to estimate ex ante savings for fryers. .
- **Recommendation:** The evaluation team suggests reviewing the algorithms and deemed values in ALEET to ensure that savings calculations and other assumptions align with the IL-TRM.

- **Finding #2:** Other discrepancies were driven by gaps in the Initiative tracking data. For several measures, the tracking data did not include specific equipment characteristics that are needed to apply the appropriate assumptions from the IL-TRM. For example, the tracking data were missing information for the steamed cooking efficiency of the efficient units for combination oven records, which resulted in discrepancies between the ex ante and verified savings calculations because the evaluation applied the IL-TRM default value. In other cases, key fields included in the tracking data were only partially populated. Within a given measure, some records had values in these fields, and others did not, resulting in the evaluation team applying IL-TRM defaults in cases where data were missing. For example, the Initiative tracking data for electric convection ovens only contains information on the efficient equipment's production capacity for one out of eight records.
- **Recommendation:** The evaluation team understands that the midstream implementation model limits how much data can be collected and tracked. However, we recommend that the implementation team collect data on equipment characteristics wherever possible and include this information in the Initiative tracking data to reduce the evaluation risk around these measures.

APPENDIX A. IMPACT ANALYSIS METHODOLOGY

STANDARD INITIATIVE

GROSS IMPACT METHODOLOGY

The evaluation team calculated verified savings for the Standard Initiative by applying savings algorithms from the IL-TRM V12.0. The team leveraged information from the Initiative tracking data, such as primary heating and cooling type, LED wattage, LED lamp type, and project location (for weather-dependent variables), to inform savings assumptions. For variables outside these parameters, the evaluation team relied on defaults from the IL-TRM V12.0. Table 84 lists the measures in the Standard Initiative, their corresponding IL-TRM section, and whether or not TRM errata applied to the measure in the 2024 evaluation.

Table 84. Standard Initiative Evaluated Measures

IL-TRM Measure Name	IL-TRM Measure Code	Errata Applied?
Small Commercial Thermostats	4.4.48	No errata present for this measure
LED Bulbs and Fixtures	4.5.4	No errata present for this measure
Lighting Controls	4.5.10	No errata present for this measure
Advanced Power Strip – Tier 1 Commercial	4.8.7	No errata present for this measure
Smart Sockets	4.8.22	No errata present for this measure
Commercial LED Grow Lights	4.1.11	Errata applied
Water Heater	4.3.1	Errata applied
Ozone Laundry	4.3.6	No errata present for this measure
Tank Insulation	4.3.12	No errata present for this measure
Space Heating Boiler Tune-up	4.4.2	No errata present for this measure
Process Boiler Tune-up	4.4.3	No errata present for this measure
Electric Chiller	4.4.6	No errata present for this measure
Guest Room Energy Management (PTAC & PTHP)	4.4.8	No errata present for this measure
High Efficiency Boiler	4.4.10	Errata applied
High Efficiency Furnace	4.4.11	No errata present for this measure
Infrared Heaters	4.4.12	No errata present for this measure
Package Terminal Air Conditioner (PTAC) and Package Terminal Heat Pump (PTHP)	4.4.13	No errata present for this measure
Steam Trap Replacement or Repair	4.4.16	No errata present for this measure
Variable Speed Drives for HVAC Pumps and Cooling Tower Fans	4.4.17	No errata present for this measure
Unitary HVAC Condensing Furnace	4.4.37	No errata present for this measure
Steam Trap Monitoring System	4.4.58	No errata present for this measure
Automatic Door Closer for Walk-In Coolers and Freezers	4.6.1	No errata present for this measure
ECMs for Walk-in and Reach-in Coolers / Freezers	4.6.4	No errata present for this measure
Evaporator Fan Control for Electrically Commutated Motors	4.6.6	No errata present for this measure
Add Doors to Open Refrigerated Display Cases	4.6.13	No errata present for this measure
VSD Air Compressor	4.7.1	No errata present for this measure
Compressed Air Low Pressure Drop Filters	4.7.2	No errata present for this measure
Compressed Air No-Loss Condensate Drains	4.7.3	No errata present for this measure

IL-TRM Measure Name	IL-TRM Measure Code	Errata Applied?
Compressed Air Storage Receiver Tank	4.7.10	No errata present for this measure
Reduce Compressed Air Setpoint	4.7.11	No errata present for this measure
High Frequency Battery Chargers	4.8.9	Errata applied
Variable Speed Drives for Process Fans	4.8.13	No errata present for this measure
Commercial Weather Stripping	4.8.16	No errata present for this measure
Lithium Ion Forklift Batteries	4.8.23	No errata present for this measure
Building Operator Certification	4.8.24	No errata present for this measure

NON-TRM MEASURES AND ASSUMPTIONS

Variable-Speed Drives for Process Pumps

Process VFDs are available through the Standard Core channel's VFD offering and include installations for both process fans and process pumps. The IL-TRM V12.0 Volume 2 includes a VFD measure for process fans but does not provide an approach for calculating gross impacts for VFDs on process pumps. For the VFDs controlling process pumps, the evaluation team applied a mix of methods to evaluate verified savings, including the use of IL-TRM V12.0 Section 4.8.13 algorithms and assumptions in coordination with a 2010 memorandum that provides guidance on capping savings at a percentage of estimated base energy consumption.³⁷ The following discussion details the evaluation team's methods for evaluating verified savings.

The evaluation team adopted the IL-TRM V12.0 Section 4.8.13 algorithms for calculating the base energy consumption of processes before the installation of VFDs. The algorithms for calculating verified energy and demand savings are provided below in Equation 1 through Equation 3. The deemed assumptions applied by the evaluation team in these algorithms are provided in Table 85.

Equation 1. Base Annual Electric Energy Usage

$$kWh_{base} = \left[\left(0.746 \times HP \times \frac{LF}{\eta_{motor}} \right) \times RHRS_{Base} \times \sum_{0\%}^{100\%} (\%FF \times PLR_{Base}) \right]$$

Equation 2. VFD Electric Energy Savings for Process Pumps

$$Energy (kWh) = kWh_{base} \times ESF$$

Equation 3. VFD Electric Demand Savings for Process Pumps

$$Demand (kW) = \left[\left(0.746 \times HP \times \frac{LF}{\eta_{motor}} \right) \times PLR_{Base,FFpeak} \right] \times ESF$$

³⁷ The memorandum titled "Recommendations for Verifying Savings for non-HVAC VFDs" was submitted in response to program administrator comments regarding the PY2 evaluation methods for non-HVAC VFDs.

Table 85. Deemed Inputs for VFD Calculations

Algorithm Variable	Description	Value	Source
kWh _{base}	Base energy consumption of the existing motor prior to installation of the VFD	Calculated	IL-TRM V12.0
HP	Nominal horsepower of controlled motor	Actual value	Initiative tracking database
Motor LF	Motor load factor	75%	2010 memorandum ^b
Σ (%FF × PLR)	Flow Fraction and Part Load Ratio (PLR) factor: assumes “No Control or Bypass Damper”	1	IL-TRM V12.0
n _{motor}	Installed nominal/nameplate motor efficiency, based on horsepower ^a	NEMA Standard	Extracted from IL-TRM V12.0 Table of NEMA Motor Efficiencies
RHRS _{base}	Annual operating hours of base motor	Actual value	Initiative tracking database
ESF (pump)	Energy Savings Factor for pump applications	42%	2010 memorandum ^b

^a Default motor type is a National Electrical Manufacturers Association (NEMA) Premium Efficiency, Open Drip Proof, 4-pole/1800 RPM fan motor.

^b Recommendations for Verifying Savings for non-HVAC VFDs provides details on load factor and ESF assumptions.

Energy and demand savings are capped by the energy savings factor (ESF) of 42% for pump applications. The evaluation team compares the verified electric energy and demand savings against the claimed savings to ensure savings are capped. If the proportion of claimed savings to kWh_{base} is greater than the savings limit, then the savings limit is applied to the kWh_{base}. If the proportion is less than the claimed savings, the claimed savings are accepted as verified savings.

The evaluation team will continue to apply the method outlined above to calculate verified savings for VFDs installed on process pumps until the IL-TRM provides guidance for this application of VFDs.

Measure Lives and Cumulative Persisting Annual Savings

For prescriptive measures, the evaluation team applied measure lives and mid-life adjustments from the IL-TRM V12.0.

NET IMPACT METHODOLOGY

The evaluation team applied SAG-approved 2024 NTGRs to the verified gross savings to calculate verified net savings.

Table 86. 2024 SAG-Approved Standard Initiative NTGRs

Channel	Measure	Electric NTGR	Gas NTGR
Online Store	Advanced Thermostats	0.880	0.880
Online Store	All Other Measures	1.161	0.800
SLB	All Measures	0.902	N/A
HVAC	All Non-Advanced Thermostat Measures	0.759	0.483
VFD	All Measures	0.908	N/A
SE	All Measures	0.924	0.732
STRR	All Measures	0.684	0.665

CUSTOM INITIATIVE

GROSS IMPACT METHODOLOGY – CUSTOM INCENTIVES CHANNEL

The evaluation team’s gross impact analysis for the Custom Incentives channel used desk reviews and on-site M&V to determine verified gross impacts. Overall, the evaluation team reviewed 38 Custom Incentives channel projects.

The evaluation team completed desk reviews and (in most cases) on-site M&V to provide increased accuracy for the 38 sampled projects to determine gross impact results. Desk reviews were used to compare the inputs provided in the application to the assumptions used in the analysis, verify consistency in savings estimates throughout the project file, and provide insight into the validity of the ex ante savings. The team accomplished this by reviewing the project documentation and calculations for consistency, accuracy, and correct application of engineering principles.

SAMPLING APPROACH

We selected the sample of 2024 projects for evaluation in three waves, drawing each sample from the population of completed Custom Incentives channel projects. As part of this process, we selected projects independently by fuel type and by wave to satisfy random sampling requirements.

We chose a sample of 38 projects using a stratified random sample design targeting 10% relative precision at a 90% level of confidence for each fuel across all the sample waves. We used the Dalenius-Hodges method to determine strata boundaries,³⁸ and the Neyman allocation to determine the optimal allocation of the available projects to the strata.³⁹

The sample included 22 projects chosen for the Custom Incentives electric sample and 21 projects chosen for the gas sample.⁴⁰ We also sampled four projects the implementation team identified as having fuel-switching impacts. The evaluation team classified these fuel-switching projects into a separate sample and reviewed a census of projects. The 38 total project reviews accounted for 52% of the total ex ante gross Custom Incentives electric energy savings and 82% of the total ex ante gross gas savings. Table 87, Table 88, and Table 89 present details around the sample of electric, gas, and fuel-switching projects chosen for the 2024 evaluation.

³⁸ Dalenius, Tore, and Joseph L. Hodges. “Minimum Variance Stratification.” *Journal of the American Statistical Association* 54, no. 285 (1959): 88–101. <https://doi.org/10.2307/2282141>.

³⁹ Neyman, Jerzy. “On the Two Different Aspects of the Representative Method: The Method of Stratified Sampling and the Method of Purposive Selection.” *Journal of the Royal Statistical Society* 97, no. 4 (1934): 558–625. <https://doi.org/10.2307/2342192>.

⁴⁰ Nine projects were sampled as part of both the electric and gas samples.

Table 87. Custom Incentives Channel Sampling Approach for Projects with Electric Savings

Wave	Sampling Stratum	Savings Range	Population of Projects		Completed Reviews	
			Project Count	Ex Ante MWh	Project Count	Ex Ante MWh
1	1	Census	8	1,061	8	1,061
	<i>Subtotal</i>		8	1,061	8	1,061
2	1	< 127 MWh	6	411	1	77
	2	> 127 MWh & < 251 MWh	2	367	2	367
	3	> 251 MWh	5	2,783	4	2,472
	<i>Subtotal</i>		13	3,561	7	2,916
3	1	< 239 MWh	40	3,342	2	108
	2	> 239 MWh & < 682 MWh	25	10,483	2	897
	3	> 682 MWh & < 3,546 MWh	7	7,725	2	1,834
	4	> 3,546 MWh	1	3,547	1	3,547
	<i>Subtotal</i>		73	25,097	7	6,385
Total			94	29,718	22	10,362

Table 88. Custom Incentives Channel Sampling Approach for Projects with Gas Savings

Wave	Sampling Stratum	Savings Range	Population of Projects		Completed Reviews	
			Project Count	Ex Ante Therms	Project Count	Ex Ante Therms
1	1	Census	9	59,615	9	59,615
	<i>Subtotal</i>		9	59,615	9	59,615
2	1	Census	5	124,837	5	124,837
	<i>Subtotal</i>		5	124,837	5	124,837
3	1	<15,856 therms	15	94,133	1	9,524
	2	>15,856 & <59,719 therms	13	343,224	1	40,025
	3	> 59,719 & < 1,577,310 therms	5	926,035	4	749,127
	4	> 1,577,310 therms	1	1,577,311	1	1,577,311
	<i>Subtotal</i>		34	2,940,703	7	2,375,986
Total			48	3,125,155	21	2,560,439

Note: The therm savings presented in this table include savings for three non-AIC gas customers. These savings are not directly claimable by AIC. However, we present the savings in this table because they informed the ratio estimator used to develop Initiative-level savings. Additionally, AIC chose to convert the therm savings achieved through this project to electric savings under subsection b-25.

Table 89. Custom Incentives Channel Sampling Approach for Fuel-Switching Projects

Wave	Savings Range	Population of Projects			Completed Reviews		
		Project Count	Ex Ante MWh	Ex Ante Therms	Project Count	Ex Ante MWh	Ex Ante Therms
FS	Census	4	10,210	17,591	4	10,210	17,591

To estimate the channel's verified savings, the evaluation team used the combined ratio adjustment method.^{41,42} As described in Equation 4, we calculated the gross realization rate based on the desk reviews and on-site M&V for a

⁴¹ Cochran, William Gemmill. *Sampling Techniques*. John Wiley & Sons, 1977.

⁴² Levy, Paul S., and Stanley Lemeshow. *Sampling of Populations: Methods and Applications*. John Wiley & Sons, 2008.

stratified random sample of projects. For each wave and fuel, we then applied the ratio of the verified gross savings to the ex ante gross savings (the realization rate) to adjust the ex ante gross savings for the population of all 2024 Custom Incentives channel projects (N=1111).⁴³

Equation 4. Ratio Adjustment Method

$$I_{EP} = \frac{I_{EPS}}{I_{EAS}} \times I_{EA}$$

Where:

I_{EP} = the verified population energy and demand impacts

I_{EA} = the ex ante population energy and demand impacts

I_{EPS} = the verified sample energy and demand impacts

I_{EAS} = the ex ante sample energy and demand impacts

Precision Calculations

We calculated the precision for our gross impact results by pooling the results from all waves of project reviews.⁴⁴ To calculate relative precision, the team first determined the variance in the sample and then calculated the standard error and confidence interval. We used Equation 5 through Equation 8 to support these calculations.

Equation 5. Stratified Ratio Estimator

$$\text{Stratified Ratio Estimator} = \frac{\sum_{i=1}^n w_i y_i}{\sum_{i=1}^n w_i x_i}$$

Equation 6. Standard Error

$$\text{Standard Error} = \frac{1}{\bar{X}} \sqrt{\sum_{i=1}^n w_i (w_i - 1) e_i^2}$$

Equation 7. Confidence Interval

$$90\% \text{ Confidence Interval} = 1.645 \times \text{Standard Error}$$

Equation 8. Relative Precision

$$\text{Relative Precision} = \frac{90\% \text{ Confidence Interval}}{\text{Stratified Ratio Estimator}}$$

⁴³ The population number represents the population of completed 2024 projects which produced electric energy or gas savings.

⁴⁴ The error bound of the total savings is estimated by calculating the square root of the sum of the squared error bounds of each wave or group of projects. These calculations are consistent with the California Evaluation Framework.

Where:

w = case weights for each stratum h (N_h/n_h)

y = verified savings

x = ex ante savings

$e = y_i - b x_i$

$$\hat{X} = \sum_{i=1}^n w_i x_i$$

MEASURE LIVES AND CUMULATIVE PERSISTING ANNUAL SAVINGS

In accordance with methods presented and discussed in the IL-TRM V12.0 Attachment B,⁴⁵ the evaluation team reviewed the ex ante measure life assumptions provided by the implementation team for sampled Custom Incentives channel projects in 2024 and revised these assumptions where necessary. We then calculated an adjustment to ex ante measure lives in a manner similar to that of calculating a gross savings realization rate and applied that adjustment to the population of ex ante measure lives. Table 90 provides a summary of Custom Incentives channel project measure lives that were adjusted after evaluation. All other ex ante measure lives in our sample were determined to have been applied appropriately.

Table 90. Custom Incentives Channel Measure Life Adjustments Due to Evaluation

Project Number	Enduse	Measure Life		Rationale for Adjustment
		Ex Ante	Verified	
2101290	Custom Miscellaneous	17.4	20.6	The evaluation team applied the IL-TRM V12.0 Attachment B recommendation for nonresidential new construction gas measures. The implementation team applied the assumption for electric measures.
2301666	Custom HVAC	16.0	25.0	The evaluation team applied the measure life assumption from IL-TRM V12.0 section 4.4.44 for commercial ground source and ground water source heat pumps. The implementation team applied the assumption from section 4.4.9 for air and water source heat pump systems.

GROSS IMPACT METHODOLOGY – NEW CONSTRUCTION LIGHTING CHANNEL

The evaluation team’s gross impact analysis for the New Construction Lighting channel used desk reviews and on-site M&V to determine verified gross impacts. Overall, the evaluation team reviewed six New Construction Lighting projects.

The evaluation team completed desk reviews for the six sampled projects to determine gross impact results. Desk reviews were used to compare the inputs provided in the application to the assumptions used in the analysis, verify consistency in savings estimates throughout the project file, and provide insight into the validity of the ex ante electric energy savings. The team accomplished this by reviewing the project documentation and calculations for consistency, accuracy, and correct application of engineering principles.

⁴⁵ Illinois Statewide Technical Reference Manual V12.0 – Attachment B: Effective Useful Life for Custom Measure Guidelines.
Opinion Dynamics

SAMPLING APPROACH

We chose the sample of six New Construction Lighting projects using a stratified random sample design targeting 10% relative precision at a 90% level of confidence. For the stratification, we used the Dalenius-Hodges method to determine strata boundaries and the Neyman allocation to determine the optimal allocation of the available projects to the strata.

The six projects we reviewed accounted for 82% of the total channel ex ante gross electric energy savings. Table 91 presents details around the sample of projects chosen for the 2024 evaluation.

Table 91. Sampling Approach for New Construction Lighting Projects with Electric Savings

Wave	Sampling Stratum	Savings Range	Population		Completed Reviews Column	
			Project Count	Ex Ante MWh	Project Count	Ex Ante MWh
NCL	1	< 29 MWh	16	146	2	4
	2	> 29 MWh & < 86 MWh	4	188	1	67
	3	> 86 MWh & < 767 MWh	2	372	2	372
	4	> 767 MWh	1	767	1	767
Total			23	1,474	6	1,210

To estimate the channel's verified savings, the evaluation team used the combined ratio adjustment method. As described in Equation 9, we calculated the gross realization rate based on the desk reviews for a stratified random sample of projects. We then applied the ratio of the verified gross savings to the ex ante gross savings (the realization rate) to adjust the ex ante gross savings for the population of New Construction Lighting projects with savings (N=23).

Equation 9. Ratio Adjustment Method

$$I_{EP} = \frac{I_{EPS}}{I_{EAS}} \times I_{EA}$$

Where:

I_{EP} = the verified population energy and demand impacts

I_{EA} = the ex ante population energy and demand impacts

I_{EPS} = the verified sample energy and demand impacts

I_{EAS} = the ex ante sample energy and demand impacts

Precision Calculations

To calculate relative precision, the team first determined the variance in the sample and then calculated the standard error and confidence interval. We used Equation 10 through Equation 13 to support these calculations.

Equation 10. Stratified Ratio Estimator

$$\text{Stratified Ratio Estimator} = \frac{\sum_{i=1}^n w_i y_i}{\sum_{i=1}^n w_i x_i}$$

Equation 11. Standard Error

$$\text{Standard Error} = \frac{1}{\hat{X}} \sqrt{\sum_{i=1}^n w_i (w_i - 1) e_i^2}$$

Equation 12. Confidence Interval

$$90\% \text{ Confidence Interval} = 1.645 \times \text{Standard Error}$$

Equation 13. Relative Precision

$$\text{Relative Precision} = \frac{90\% \text{ Confidence Interval}}{\text{Stratified Ratio Estimator}}$$

Where:

w = case weights for each stratum h (N_h/n_h)

y = verified savings

x = ex ante savings

$e = y_i - b x_i$

$$\hat{X} = \sum_{i=1}^n w_i x_i$$

MEASURE LIVES AND CUMULATIVE PERSISTING ANNUAL SAVINGS

In accordance with methods presented and discussed in the IL-TRM V12.0 Attachment B,⁴⁶ the evaluation team reviewed the ex ante measure life assumptions provided by the implementation team for sampled New Construction Lighting channel projects in 2024. Table 92 provides a summary of NCL channel project measure lives adjusted after evaluation. All other ex ante measure lives in our sample were determined to have been applied appropriately.

Table 92. New Construction Lighting Channel Measure Life Adjustments Due to Evaluation

Project Number	Ex Ante Measure Life	Verified Measure Life	Rationale for Adjustment
2400063	12.2	15.0	The evaluation team applied the EUL from IL-TRM V12.0 section 4.5.7.
2400607	5.8	15.0	The evaluation team applied the EUL from IL-TRM V12.0 section 4.5.7.
2400076	5.8	15.0	The evaluation team applied the EUL from IL-TRM V12.0 section 4.5.7.

NET IMPACT METHODOLOGY

The evaluation team applied SAG-approved 2024 NTGRs to the verified gross savings to calculate verified net savings.

⁴⁶ Illinois Statewide Technical Reference Manual V12.0 – Attachment B: Effective Useful Life for Custom Measure Guidelines.
Opinion Dynamics

Table 93. 2024 SAG-Approved Custom Initiative NTGRs

Channel	Electric NTGR	Gas NTGR
All Measures	0.791	0.824

RETRO-COMMISSIONING INITIATIVE

GROSS IMPACT METHODOLOGY – RCX CORE CHANNEL

The evaluation team examined RCx Core impacts to estimate a gross realization rate between the ex ante and verified gross savings. The evaluation team conducted engineering desk reviews and on-site visits for a census of projects to determine verified gross savings.

The engineering desk reviews consisted of a thorough examination of all available project documentation, including project reports, communications, equipment submittals, calculations, and any other project-specific data that were available to our team. The evaluation team also conducted on-site visits to verify measure status and collect supplemental data as needed.

We reviewed all completed projects; therefore, there is no sampling error regarding the impact evaluation results.

MEASURE LIVES AND CUMULATIVE PERSISTING ANNUAL SAVINGS

In accordance with the methodology presented and discussed in the IL-TRM V12.0 Attachment B, the evaluation team reviewed the ex ante measure life assumptions provided by the implementation team for Retro-Commissioning Initiative projects in 2024. The evaluation team did not make any adjustments to the project measure lives.

GROSS IMPACT METHODOLOGY – VIRTUAL COMMISSIONING CHANNEL

The evaluation team evaluated gross savings from VCx channel activities in 2024 by replicating and verifying Power TakeOff’s facility-level modeling approach. Our approach, which leans heavily on the IPMVP Option C guidelines, focused on verifying Power TakeOff’s methods. We were able to take this approach because Power TakeOff agreed to adopt the evaluation team’s methodological recommendations from the 2021 AIC Virtual Commissioning impact evaluation, which enabled both Power TakeOff and the evaluation team to agree on a common methodology to estimate savings for 2022 and beyond. In 2024, after replicating Power TakeOff’s models, the evaluation team adjusted the facility-level models for eight projects to account for the exclusion of weather interaction terms.

As part of the verification process, the evaluation team assessed Power TakeOff’s data cleaning and processing methods, model specifications and evaluation process, and process for calculating electric energy savings. In addition to verifying the savings associated with VCx, the evaluation team independently verified whether the individual project modeling results met the channel’s guidelines for model fitness criteria. All projects that Power TakeOff claimed as part of the 2024 VCx channel met model robustness criteria.

Lastly, the evaluation team reviewed and verified cross-participation adjustments Power TakeOff made to the ex ante savings estimates. Cross-participation adjustments are necessary to avoid double-counting savings produced through other AIC initiatives. Power TakeOff identified six sites that participated in the VCx channel and also participated in other AIC initiatives. The modeling-based approach to estimating savings for the VCx channel produces facility-level savings estimates, which include savings produced through other program interventions. Therefore, savings achieved through

program activity incentivized and claimed through other AIC initiatives need to be removed from the savings estimates for VCx. The evaluation team modified the cross-participation adjustments made for three projects. More information on these modifications is provided in the Uplift from Other AIC Initiatives section.

DATA REVIEW AND CLEANING

The evaluation team compared the raw and processed AMI data provided by Power TakeOff for a subset of projects to independently verify the data cleaning process that Power TakeOff used to estimate their models. The evaluation team utilized Power TakeOff’s processed data for modeling and reviewed this data for completeness.

MODELING APPROACH

The evaluation team verified the electric savings results Power TakeOff claimed for VCx by validating their site-level model specifications and replicating Power TakeOff’s results. To calculate annualized savings, we first developed regression-based baseline energy usage models and incorporated Typical Meteorological Year (TMYx) data to estimate normalized gross annual savings.

We developed the baseline model by fitting a regression model to pre- and post-intervention data. Power TakeOff selected an hourly or a daily regression model, depending on the project. Hourly models were estimated for 14 facilities, and daily models were estimated for 6 facilities. Model specifications also differed depending on whether there was an NRE.

Power TakeOff included weather interactions for seven projects in their 2024 ex ante models. The evaluation team added weather interactions to the model specifications of eight additional projects that had (1) weather-sensitive interventions (i.e., HVAC set point or scheduling adjustments), (2) at least nine months of post-period data, and (3) the combined effect of the interacted terms was statistically significant, per ANOVA tests. In addition to the weather interactions, the evaluation team reduced the post-period to one year to limit the need for cross-participation corrections for two projects. The remaining model specifications were kept the same.

TIME-BASED REGRESSION MODEL

Equation 14 through Equation 16 below describe the four model specifications utilized in our evaluation.

Equation 14. Regression Model Considering Time Interactions

$$E(i) = \sum_{j=1}^k \beta_j Time(i) + \alpha_j Change(i) + H(i) + C(i) + \left(\sum_{j=1}^k \beta_j Time(i) \times \alpha_j Change(i) \right)$$

Equation 15. Regression Model Considering Time and Weather Interactions

$$E(i) = \sum_{j=1}^k \beta_j Time(i) + \alpha_j Change(i) + H(i) + C(i) + \left(\sum_{j=1}^k \beta_j Time(i) \times \alpha_j (Change(i)) \right) + \left((H(i) + C(i)) \times \alpha_j Change(i) \right)$$

Equation 16. Regression Model Considering Time, Weather, and NRE Interactions

$$E(i) = \sum_{j=1}^k \beta_j Time(i) + \alpha_j Change(i) + H(i) + C(i) + NRE(i) + \left(\sum_{j=1}^k \beta_j Time(i) \times \alpha_j (Change(i)) \right) \\ + \left(\sum_{j=1}^k \beta_j Time(i) \times NRE(i) \right) + \left((H(i) + C(i)) \times \alpha_j Change(i) \right)$$

Across these three specifications, two time-based models were run.

Where daily consumption data were present, the time used in j was the day of the week, k represents 1 through 7 for the days in a week. $H(i)$ represents the heating component while $C(i)$ reflects the cooling component. $H(i)$ is defined as:

$$H(i) = h_1 T_1(i) + h_2 T_2(i) + h_3 T_3(i) + h_4 T_4(i)$$

Where:

$$T_1(i) = \sum_{i=1}^{24} \min(\max(55 - Temp(i), 0), 10)$$

$$T_2(i) = \sum_{i=1}^{24} \min(\max(45 - Temp(i), 0), 10)$$

$$T_3(i) = \sum_{i=1}^{24} \min(\max(35 - Temp(i), 0), 15)$$

$$T_4(i) = \sum_{i=1}^{24} \max(20 - Temp(i), 0)$$

$Temp(i)$ is temperature in degrees Fahrenheit for hour i .

$C(i)$ is defined as:

$$C(i) = c_1 P_1(i) + c_2 P_2(i) + c_3 P_3(i) + c_4 P_4(i)$$

Where:

$$P_1(i) = \sum_{i=1}^{24} \min(\max(Temp(i) - 55, 0), 10)$$

$$P_2(i) = \sum_{i=1}^{24} \min(\max(Temp(i) - 65, 0), 10)$$

$$P_3(i) = \sum_{i=1}^{24} \min(\max(Temp(i) - 75, 0), 15)$$

$$P_4(i) = \sum_{i=1}^{24} \max(\text{Temp}(i) - 90, 0)$$

Where hourly data were present, the time period j used was the hour of the week, and k represents the hours in a week (1 of 168). $H(i)$ represents the heating component while $C(i)$ reflects the cooling component. $H(i)$ is defined as:

$$H(i) = h_1T_1(i) + h_2T_2(i) + h_3T_3(i) + h_4T_4(i)$$

Where:

$$T_1(i) = \min(\max(55 - \text{Temp}(i), 0), 10)$$

$$T_2(i) = \min(\max(45 - \text{Temp}(i), 0), 10)$$

$$T_3(i) = \min(\max(35 - \text{Temp}(i), 0), 15)$$

$$T_4(i) = \max(20 - \text{Temp}(i), 0)$$

$\text{Temp}(i)$ is temperature in degrees Fahrenheit for hour i .

$C(i)$ is defined as:

$$C(i) = c_1P_1(i) + c_2P_2(i) + c_3P_3(i) + c_4P_4(i)$$

Where:

$$P_1(i) = \min(\max(\text{Temp}(i) - 55, 0), 10)$$

$$P_2(i) = \min(\max(\text{Temp}(i) - 65, 0), 10)$$

$$P_3(i) = \min(\max(\text{Temp}(i) - 75, 0), 15)$$

$$P_4(i) = \max(\text{Temp}(i) - 90, 0)$$

$\text{Time}(i)$ is an indicator variable set to one if i is the j^{th} hour of the week or day of the week and zero otherwise.

$\text{Change}(i)$ is the treatment variable, set to one if hour i occurs during the reporting period and zero otherwise.

$\text{NRE}(i)$ is a flag for all nonroutine event periods. There can be multiple NRE periods per model; each NRE is treated separately and will add a new set of NRE terms and interactions if applicable.

NORMALIZED GROSS ANNUAL SAVINGS

To verify gross annual savings resulting from the VCx channel, the evaluation team first estimated the hourly model for 14 facilities and the daily model for six facilities using actual weather data. Next, we calculated each facility's annual predicted baseline and reporting period electricity consumption using estimated regression coefficients and TMYx weather data. Finally, we computed the annual savings by calculating the difference between the annual predicted baseline and reporting period electricity consumption.

For each facility where Power TakeOff estimated the hourly regression model specified in Equation 14 through Equation 16, the evaluation team calculated hourly predicted baseline period electricity consumption based on Equation 17. Equation 17 contains the maximum terms that would be used to calculate the baseline. Models corresponding to facilities that do not have an NRE (i.e., Equation 14, Equation 15, and Equation 16) did not include the NRE terms. The following equations show how we calculated the gross annual savings in detail.

Equation 17. Hourly Predicted Baseline Period Electricity Consumption

$$E_B(i) = \sum_{j=1}^{7 \times 24} \hat{\beta}_j HOW_j(i) + \hat{H}(i) + \hat{C}(i) + NRA(i) + \left(\sum_{j=1}^{7 \times 24} \beta_j HOW_j(i) \times NRA(i) \right) + \left((\hat{H}(i) + \hat{C}(i)) \times NRE(i) \right)$$

In Equation 17, $E_B(i)$ is predicted baseline period electricity consumption for hour i . $\hat{\beta}_j$ is the estimated coefficient on the j^{th} hour/day of the week indicator variable as defined in Equation 14 through Equation 16, $\hat{H}(i)$ and $\hat{C}(i)$ specified below are estimated heating and cooling components evaluated using TMY3 weather data and regression coefficients.

$$\begin{aligned} \hat{H}(i) &= \hat{h}_1 T_1(i) + \hat{h}_2 T_2(i) + \hat{h}_3 T_3(i) + \hat{h}_4 T_4(i) \\ \hat{C}(i) &= \hat{c}_1 P_1(i) + \hat{c}_2 P_2(i) + \hat{c}_3 P_3(i) + \hat{c}_4 P_4(i) \end{aligned}$$

We calculated hourly reporting period electricity consumption based on Equation 18. Equation 18 contains the maximum terms that would be used to calculate the reporting period. Models that do not interact the *Change* variable with weather (Equation 14) will not include that interaction. Models that do not interact the hour of the week (*HOW*) variable with the *Change* variable (Equation 16) will not include that interaction.

Equation 18. Hourly Predicted Reporting Period Electricity Consumption

$$\begin{aligned} E_R(i) &= \sum_{j=1}^{7 \times 24} \hat{\beta}_j HOW_j(i) + \hat{H}(i) + \hat{C}(i) + \alpha_j Change(i) + \left(\sum_{j=1}^{7 \times 24} \beta_j HOW_j(i) \times \alpha_j (Change(i)) \right) \\ &+ \left((\hat{H}(i) + \hat{C}(i)) \times \alpha_j Change(i) \right) \end{aligned}$$

In Equation 18, $E_R(i)$ is predicted reporting period electricity consumption for hour i . $\hat{\alpha}_j$ is the estimated coefficient on the interaction term between the treatment variable and the j^{th} hour of the week indicator variable as defined for the hourly model versions of Equation 14 through Equation 16.

Annual savings were calculated as follows:

$$\sum_{i \in TMY} E_B(i) - \sum_{i \in TMY} E_R(i)$$

Where each sum was across all the hours in the TMY.

Similarly, for each facility where Power TakeOff estimated the daily regression model specified in Equation 14 through Equation 16, the evaluation team calculated daily predicted baseline and reporting period electricity consumption based on Equation 19 and Equation 20. We calculated annual savings using the formula defined above, but the sum included all the days in the TMY. Equation 19 contains the maximum terms that would be used to calculate the daily baseline. Models that do not include an NRE (Equation 14, Equation 15 and Equation 16) will not include NRE terms. Equation 20 contains the maximum terms that would be used to calculate the reporting period. Models that do not interact the *Change* variable with weather (Equation 14) will not include that interaction. Models that do not interact the day of week (*W*) variable with the *Change* variable (Equation 16) will not include that interaction.

Equation 19. Daily Predicted Baseline Period Electricity Consumption

$$E_B(i) = \sum_{j=1}^7 \hat{\beta}_j W_j(i) + \hat{H}(i) + \hat{C}(i) + NRE(i) + \left(\sum_{j=1}^7 \beta_j W_j(i) * NRE(i) \right) + \left((\hat{H}(i) + \hat{C}(i)) * NRE(i) \right)$$

Equation 20. Daily Predicted Reporting Period Electricity Consumption

$$E_R(i) = \sum_{j=1}^7 \hat{\beta}_j W_j(i) + \hat{H}(i) + \hat{C}(i) + \alpha_j \text{Change}(i) + \left(\sum_{j=1}^7 \beta_j W_j(i) * \alpha_j (\text{Change}(i)) \right) + \left((\hat{H}(i) + \hat{C}(i)) * \alpha_j \text{Change}(i) \right)$$

As before, annual savings were calculated as follows:

$$\sum_{i \in TMY} E_B(i) - \sum_{i \in TMY} E_R(i)$$

Where each sum was over all the hours in the TMY.

NON-ROUTINE EVENTS

Power TakeOff identified NRE at four participating sites in 2024. The details of these NRE are provided in Table 94. Both the implementation and the evaluation teams handled these NREs following the IPMVP NRE guidelines by dropping data for the affected period and extending the baseline back in time accordingly.

Table 94. NRE Details

Project ID	NRE Description	IPMVP Method
a1CT0000000KFL02AO	Missing data or period of atypically low usage	1
a1CT0000000KFKp2AO	School closure for summer break	3
a1CT0000000KFKu2AO	Brief period of atypically high usage	1
a1CT0000000hhAA2AY	Unknown drop in usage not associated with VCx recommendations	3

MODEL FITNESS CRITERIA

To claim project savings as part of the channel, the model for each project must meet the following goodness-of-fit criteria:

- Absolute Value of Normalized Mean Bias Error (NMBE) < 0.5%
- Coefficient of Variation of Root Mean Square Error CV(RMSE) < 25%
- Savings Uncertainty < 50% at 68% confidence

These goodness-of-fit metrics were calculated consistent with industry best practices.⁴⁷ All of the projects met the savings uncertainty criteria.

DETAILED PROJECT SAVINGS

Table 95 presents the results of the gross savings analysis (unadjusted for cross-participation) for the 20 VCx projects completed in 2024. Electric energy savings realization rates for individual projects range from 81% to 106%. All projects met model uncertainty thresholds in 2024.

⁴⁷ *Uncertainty Assessment for IPMVP*. Efficiency Valuation Organization (EVO), 2019. Opinion Dynamics

Table 95. 2024 Virtual Commissioning Annual Savings by Project

Project ID	Ex Ante Gross kWh	Verified Gross kWh	Gross Realization Rate
a1CT0000000hh9v2AA	24,170	24,170	100%
a1CT0000000hhAA2AY	70,908	70,908	100%
a1CT0000000KFKh2AO	37,093	37,093	100%
a1CT0000000KFKi2AO ^a	66,711	68,547	103%
a1CT0000000KFKI2AO ^b	1,178,245	1,122,634	95%
a1CT0000000KFKm2AO ^a	35,398	36,261	102%
a1CT0000000KFKn2AO ^a	271,452	285,676	105%
a1CT0000000KFKo2AO ^a	53,602	56,721	106%
a1CT0000000KFKp2AO ^a	109,017	102,317	94%
a1CT0000000KFKq2AO	284,183	284,183	100%
a1CT0000000KFKr2AO	75,683	76,530	101%
a1CT0000000KFKs2AO	410,957	410,957	100%
a1CT0000000KFKu2AO ^a	125,575	121,559	97%
a1CT0000000KFKy2AO ^{a,b}	2,712,288	2,203,733	81%
a1CT0000000KFKz2AO	21,797	21,797	100%
a1CT0000000KFL02AO	55,893	56,061	100%
a1CT0000000KFMs2AO	37,049	37,049	100%
a1CT0000000KFMt2AO	74,858	74,858	100%
a1CT0000000rTos2AE	33,624	33,624	100%
a1CT0000000rTpe2AE ^a	109,063	95,256	87%

^a Evaluation team model included weather interactions.

^b Evaluation team reduced the post-period to one year to limit cross-participation adjustments as much as possible.

Table 96 shows the model goodness-of-fit metrics that Power TakeOff and the evaluation team produced for the 20 VCx projects.

Table 96. 2024 Virtual Commissioning Model Goodness-of-Fit Metrics by Project

Project ID	Adjusted R ²		CV(RMSE)		NMBE		Savings Uncertainty	
	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff
a1CT0000000hh9v2AA	0.87	0.87	16.41%	16.41%	0.00%	0.00%	3.54%	6.94%
a1CT0000000hhAA2AY	0.93	0.93	9.91%	9.91%	0.00%	0.00%	2.09%	2.83%
a1CT0000000KFKh2AO	0.73	0.73	21.90%	21.90%	0.00%	0.00%	1.22%	9.71%
a1CT0000000KFKi2AO ^a	0.82	0.81	20.71%	21.32%	0.00%	0.00%	12.19%	21.79%
a1CT0000000KFKI2AO ^b	0.71	0.73	21.44%	21.65%	0.00%	0.00%	0.80%	2.32%
a1CT0000000KFKm2AO ^a	0.79	0.79	21.40%	21.45%	0.00%	0.00%	7.88%	23.23%
a1CT0000000KFKn2AO ^a	0.83	0.80	13.07%	14.49%	0.00%	0.00%	8.75%	12.88%
a1CT0000000KFKo2AO ^a	0.82	0.81	15.34%	15.59%	0.00%	0.00%	11.80%	15.76%
a1CT0000000KFKp2AO ^a	0.66	0.63	23.63%	24.70%	0.00%	0.00%	18.80%	17.46%
a1CT0000000KFKq2AO	0.88	0.88	21.25%	21.25%	0.00%	0.00%	2.47%	4.08%
a1CT0000000KFKr2AO	0.67	0.69	15.23%	14.94%	0.00%	0.00%	22.03%	23.36%

Project ID	Adjusted R ²		CV(RMSE)		NMBE		Savings Uncertainty	
	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff
a1CT0000000KFKs2AO	0.91	0.91	13.70%	13.70%	0.00%	0.00%	1.13%	2.12%
a1CT0000000KFKu2AO ^a	0.72	0.72	21.71%	22.17%	0.00%	0.00%	20.44%	25.02%
a1CT0000000KFKy2AO ^{a,b}	0.82	0.82	10.60%	10.68%	0.00%	0.00%	1.96%	4.74%
a1CT0000000KFKz2AO	0.82	0.82	20.10%	20.10%	0.00%	0.00%	3.01%	5.93%
a1CT0000000KFL02AO	0.63	0.63	15.38%	15.39%	0.00%	0.00%	2.44%	5.66%
a1CT0000000KFMs2AO	0.85	0.85	16.62%	16.62%	0.00%	0.00%	1.98%	5.14%
a1CT0000000KFMt2AO	0.86	0.86	16.60%	16.60%	0.00%	0.00%	1.77%	3.84%
a1CT0000000rTos2AE	0.88	0.88	15.23%	15.23%	0.00%	0.00%	2.49%	4.93%
a1CT0000000rTpe2AE ^a	0.61	0.59	23.65%	24.06%	0.00%	0.00%	4.33%	13.45%

^a Evaluation team model included weather interactions.

^b Evaluation team reduced the post-period to one year to limit cross-participation adjustments as much as possible.

UPLIFT FROM OTHER AIC INITIATIVES

The savings analysis for the VCx channel considers energy savings that resulted from energy-efficient actions taken through other AIC Business Program initiatives. The implementation team identified six sites that completed projects through other AIC Business Program initiatives after participating in the VCx offering in 2024. They adjusted the ex ante savings estimates to exclude savings generated from these other AIC initiatives. The evaluation team modified the cross-participation adjustments made for three projects.

For two of these sites, the evaluation team reduced the post-period applied in the analysis to one year of data, limiting the cross-participation adjustments needed. For both sites, at least some of the cross-participation accounted for by the implementation team occurred more than a year after the participation date for the site. By modifying the post-period, the evaluation team eliminated the need to adjust the savings estimates for cross-participation for one of the sites (a1CT0000000KFKI2AO). For the second site (a1CT0000000KFKy2AO), the modification to the post-period reduced the amount of cross-participation savings that needed to be accounted for compared to the adjustment made by the implementation team. For the third site (a1CT0000000KFKu2AO), the difference between the cross-participation adjustment applied by the implementation and evaluation teams was because the implementation team adjusted their savings using ex ante savings estimates for the cross-participation project, and the evaluation team adjusted using the verified savings for the project.

The evaluation team accounted for cross-program participation by subtracting verified gross savings for each project completed through another AIC initiative from the verified gross electric savings from the VCx channel at the corresponding site. Table 97 summarizes the projects completed through other AIC Initiatives and the associated verified gross electric energy savings.

Table 97. Summary of Projects Completed Through Other AIC Initiatives

Project ID	Source of Cross-Program Participation	Verified Gross Savings (kWh)	Verified Gross Savings from Cross-Program Participation (kWh)	Verified Gross Savings Adjusted for Cross-Program Participation (kWh)
a1CT0000000KFKn2AO	Standard HVAC	285,676	146,759	138,917
a1CT0000000KFKq2AO	SBEP	284,183	22,940	261,243
a1CT0000000KFKy2AO	Standard Lighting	2,203,733	33,546	2,170,187
a1CT0000000KFKp2AO	SBEP	102,317	5,494	96,823

Project ID	Source of Cross-Program Participation	Verified Gross Savings (kWh)	Verified Gross Savings from Cross-Program Participation (kWh)	Verified Gross Savings Adjusted for Cross-Program Participation (kWh)
a1CT0000000KFKu2AO	SBEP, Standard Lighting	121,559	55,548	66,011

MEASURE LIVES AND CUMULATIVE PERSISTING ANNUAL SAVINGS

The evaluation team applied an EUL of 7.3 for VCx based on guidance in Attachment B of IL-TRM V12.0, Volume 4.⁴⁸

GROSS IMPACT METHODOLOGY – VIRTUAL STRATEGIC ENERGY MANAGEMENT CHANNEL

The evaluation team evaluated the gross savings resulting from Virtual SEM in 2024 by replicating and verifying Power TakeOff’s facility-level modeling approach. Our approach, which leans heavily on the IPMVP Option C guidelines, focused on verifying Power TakeOff’s methods. In 2024, after replicating Power TakeOff’s models, the evaluation team adjusted the facility-level models for two projects to account for the exclusion of weather interaction terms.

As part of the verification process, the evaluation team assessed Power TakeOff’s data cleaning and processing methods, model specification and evaluation process, and process for calculating electric energy savings. In addition to verifying the savings associated with Virtual SEM, the evaluation team independently verified whether the individual project modeling results met the channel’s guidelines for model robustness. All the projects that Power TakeOff claimed as part of the 2024 Virtual SEM channel met model robustness criteria.

Lastly, the evaluation team reviewed and verified the cross-participation adjustments Power TakeOff made to the ex ante savings estimates. These cross-participation adjustments are necessary to avoid double-counting savings produced through other AIC initiatives. Power TakeOff identified one site that participated in the Virtual SEM channel as well as other AIC initiatives. The modeling-based approach to estimating savings for the Virtual SEM channel produces facility-level savings estimates, which envelop savings produced through other program interventions. Therefore, savings achieved through program activity incentivized and claimed through other AIC initiatives need to be removed from the savings estimates for Virtual SEM. The evaluation team’s cross-participation adjustments aligned with the implementation team’s adjustments for Virtual SEM. The Uplift From Other AIC Initiatives section provides more information on these cross-participation adjustments.

DATA REVIEW AND CLEANING

Opinion Dynamics compared the raw and processed AMI data provided by Power TakeOff for the individual projects to independently verify the data cleaning process that Power TakeOff used to estimate their model. The evaluation team utilized Power TakeOff’s processed data for modeling and reviewed this data for completeness.

MODELING APPROACH

The evaluation team verified the electric energy savings results that Power TakeOff claimed for Virtual SEM by validating their site-level model specifications and replicating Power TakeOff’s results. To calculate annualized savings, we first developed a regression-based baseline energy usage model. We then used the baseline models, together with TMYx data, to estimate normalized gross annual savings.

⁴⁸ Illinois Statewide Technical Resource Manual – Volume 4: Cross-Cutting Measures and Attachments. Accessed at: https://www.ilsag.info/wp-content/uploads/IL-TRM_Effective_010124_v12.0_Vol_4_X-Cutting_Measures_and_Attach_09222023_FINAL.pdf.

Following Power TakeOff's process, we developed the baseline models by fitting a regression model to pre- and post-intervention data. Power TakeOff selected daily regression models.

The evaluation team added weather interactions to two model specifications since the projects had weather-sensitive interventions (e.g., HVAC set point or scheduling adjustments), at least nine months of post-period data, and the combined effect of the interacted terms was statistically significant.

TIME-BASED REGRESSION MODEL

Equation 21 describes the model specification utilized in our evaluation.

Equation 21. Regression Model Considering Weather Interactions and Time Interactions

$$E(i) = \sum_{j=1}^k \beta_j \text{Time}(i) + \alpha_j \text{Change}(i) + H(i) + C(i) + \left((H(i) + C(i)) \times \alpha_j \text{Change}(i) \right) + \left(\sum_{j=1}^k \beta_j \text{Time}(i) \times \alpha_j \text{Change}(i) \right)$$

Since daily consumption data were present, the time used in j was the day of the week, k represents 1 through 7 for the days in a week. $H(i)$ represents the heating component while $C(i)$ reflects the cooling component. $H(i)$ is defined as:

$$H(i) = h_1 T_1(i) + h_2 T_2(i) + h_3 T_3(i) + h_4 T_4(i)$$

Where:

$$T_1(i) = \sum_{i=1}^{24} \min(\max(55 - \text{Temp}(i), 0), 10)$$

$$T_2(i) = \sum_{i=1}^{24} \min(\max(45 - \text{Temp}(i), 0), 10)$$

$$T_3(i) = \sum_{i=1}^{24} \min(\max(35 - \text{Temp}(i), 0), 15)$$

$$T_4(i) = \sum_{i=1}^{24} \max(20 - \text{Temp}(i), 0)$$

$\text{Temp}(i)$ is temperature in degrees Fahrenheit for hour i .

$C(i)$ is defined as:

$$C(i) = c_1 P_1(i) + c_2 P_2(i) + c_3 P_3(i) + c_4 P_4(i)$$

Where

$$P_1(i) = \sum_{i=1}^{24} \min(\max(Temp(i) - 55, 0), 10)$$

$$P_2(i) = \sum_{i=1}^{24} \min(\max(Temp(i) - 65, 0), 10)$$

$$P_3(i) = \sum_{i=1}^{24} \min(\max(Temp(i) - 75, 0), 15)$$

$$P_4(i) = \sum_{i=1}^{24} \max(Temp(i) - 90, 0)$$

$Time(i)$ is an indicator variable set to one if i is the j^{th} day of the week and zero otherwise.

$Change(i)$ is the treatment variable, set to one if day i occurs during the reporting period and zero otherwise.

NORMALIZED GROSS ANNUAL SAVINGS

To verify gross annual savings resulting from the Virtual SEM channel, the evaluation team first estimated the daily models for the individual facilities using actual weather data. Next, we calculated the annual predicted baseline and reporting period electricity consumption for the facility using estimated regression coefficients and TMYx weather data. Finally, we computed the annual savings by calculating the difference between the annual predicted baseline and reporting period electricity consumption.

For each facility where Power TakeOff estimated the daily regression model specified in Equation 21, the evaluation team calculated daily predicted baseline and reporting period electricity consumption based on Equation 22 and Equation 23. We calculated annual savings using the formula defined above, but the sum included all the days in the TMY. The following equations detail how we calculated the gross annual savings.

Equation 22. Daily Predicted Baseline Period Electricity Consumption

$$E_B(i) = \sum_{j=1}^7 \hat{\beta}_j W_j(i) + \hat{H}(i) + \hat{C}(i)$$

Equation 23. Daily Predicted Reporting Period Electricity Consumption

$$E_R(i) = \sum_{j=1}^7 \hat{\beta}_j W_j(i) + \hat{H}(i) + \hat{C}(i) + \alpha_j Change(i) + \left(\sum_{j=1}^7 \beta_j W_j(i) * \alpha_j (Change(i)) \right) + \left((\hat{H}(i) + \hat{C}(i)) * \alpha_j Change(i) \right)$$

Annual savings were calculated as follows:

$$\sum_{i \in TMY} E_B(i) - \sum_{i \in TMY} E_R(i)$$

Where each sum was over all the hours in the TMY.

NON-ROUTINE EVENTS

Power TakeOff did not identify any NREs that occurred at the participating sites in 2024.

MODEL FITNESS CRITERIA

To claim project savings as part of the channel, the model for the project must meet the following goodness-of-fit criteria:

- Absolute Value of Normalized Mean Bias Error (NMBE) < 0.5%
- Coefficient of Variation of Root Mean Square Error CV(RMSE) < 25%
- Savings Uncertainty < 50% at 68% confidence

These goodness-of-fit metrics were calculated consistent with industry best practices.⁴⁹ The project met the savings uncertainty criteria.

DETAILED PROJECT SAVINGS

Table 98 presents the results of the gross savings analysis (unadjusted for cross-participation) for the four Virtual SEM projects completed in 2024. Electric energy savings realization rates for individual projects range from 70% to 140%. All projects met model uncertainty thresholds in 2024.

Table 98. 2024 Virtual SEM Annual Savings by Project

Project ID	Ex Ante Gross kWh	Verified Gross kWh	Gross Realization Rate
a1CT0000000MUnR2AW ^a	223,921	312,746	140%
a1CT000000010gv52AA ^b	29,867	20,879	70%
a1CT000000010gvk2AA	106,388	106,389	100%
a1CT000000010gvO2AQ ^b	541,228	488,828	90%

^a Evaluation team reduced the post-period to one year to limit cross-participation adjustments as much as possible.

^b Evaluation team model included weather interactions.

Table 99 shows the model goodness-of-fit metrics that Power TakeOff and the evaluation team produced for the four Virtual SEM projects.

Table 99. 2024 Virtual SEM Model Goodness-of-Fit Metrics by Project

Project ID	Adjusted R ²		CV(RMSE)		NMBE		Savings Uncertainty	
	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff
a1CT0000000MUnR2AW ^a	0.75	0.70	17.74%	19.40%	0.00%	0.00%	8.72%	16.57%
a1CT000000010gv52AA ^b	0.91	0.90	19.08%	19.90%	0.00%	0.00%	7.86%	6.21%
a1CT000000010gvk2AA	0.80	0.80	21.64%	21.64%	0.00%	0.00%	5.70%	8.54%

⁴⁹ *Uncertainty Assessment for IPMVP*. Efficiency Valuation Organization (EVO). 2019.

Project ID	Adjusted R ²		CV(RMSE)		NMBE		Savings Uncertainty	
	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff	Opinion Dynamics	Power TakeOff
a1CT00000010gvO2AQ ^b	0.65	0.64	19.56%	19.93%	0.00%	0.00%	17.99%	26.80%

^a Evaluation team reduced the post-period to one year to limit cross-participation adjustments as much as possible.

^b Evaluation team model included weather interactions.

UPLIFT FROM OTHER AIC INITIATIVES

The savings analysis for the Virtual SEM channel considers energy savings that resulted from energy-efficient actions taken through other AIC Business Program initiatives. The evaluation team identified one Virtual SEM participant that completed projects through other AIC Business Program initiatives after participating in the Virtual SEM offering in 2024 and adjusted the ex ante savings estimates to exclude savings produced through the other AIC initiatives. The evaluation team’s cross-participation adjustments matched those made by the implementation team.

The evaluation team accounted for cross-program participation by subtracting verified gross savings for each project completed through another AIC initiative from the verified gross electric savings from the Virtual SEM channel at the corresponding site. Table 100 summarizes the projects completed through other AIC Initiatives and the associated verified gross electric energy savings.

Table 100. Summary of Projects Completed through Other AIC Initiatives

Project ID	Source of Cross-Program Participation	Verified Gross Savings (kWh)	Verified Gross Savings from Cross-Program Participation (kWh)	Verified Gross Savings Adjusted for Cross-Program Participation (kWh)
a1CT0000000MUnR2AW	Standard Lighting	312,746	98,297	214,450

MEASURE LIVES AND CUMULATIVE PERSISTING ANNUAL SAVINGS

The evaluation team applied an EUL of 7.0 for Virtual SEM based on guidance in Attachment B of IL-TRM V12.0, Volume 4.⁵⁰

NET IMPACT METHODOLOGY

The evaluation team applied SAG-approved 2024 NTGRs to the verified gross savings to calculate verified net savings. Table 101 outlines the SAG-approved NTGR values applied to the verified gross savings for RCx Core, VCx, and Virtual SEM.

Table 101. 2024 SAG-Approved Retro-Commissioning Initiative NTGRs

Channel	Electric NTGR
RCx Core	0.945
Virtual Commissioning	0.935
Virtual SEM	1.000

⁵⁰ Illinois Statewide Technical Resource Manual – Volume 4: Cross-Cutting Measures and Attachments. Accessed at: https://www.ilsag.info/wp-content/uploads/IL-TRM_Effective_010124_v12.0_Vol_4_X-Cutting_Measures_and_Attach_09222023_FINAL.pdf.

STREETLIGHTING INITIATIVE

GROSS IMPACT METHODOLOGY

The evaluation team calculated verified savings for the Streetlighting Initiative by applying savings algorithms from the IL-TRM V12.0. The team leveraged information from the Initiative tracking data such as fixture quantity, baseline fixture wattage and type, and LED wattage to inform savings assumptions. For variables outside these parameters, the evaluation team relied on defaults from the IL-TRM V12.0. Table 102 lists the measures in the Streetlighting Initiative, their corresponding IL-TRM section, and whether or not TRM errata applied to the measure in the 2024 evaluation.

Table 102. Streetlighting Initiative Evaluated Measures

IL-TRM Measure Name	IL-TRM Measure Code	Errata Applied?
LED Streetlighting	4.5.16	No errata present for this measure

MEASURE LIVES AND CUMULATIVE PERSISTING ANNUAL SAVINGS

We applied EULs and baseline adjustments per IL-TRM V12.0 to determine CPAS for this evaluation. The IL-TRM specifies an EUL of 20 years for an LED streetlight under standard operation and 10 years for an LED streetlight under continuous operation.⁵¹

In cases where LED streetlights replaced existing, functional MV fixtures, a baseline adjustment was made after the remaining useful life (RUL) of the MV fixture expired. Per IL-TRM V12.0, the RUL for MV streetlights under standard operation is assumed to be three years.

NET IMPACT METHODOLOGY

The evaluation team applied SAG-approved 2024 NTGRs to the verified gross savings to calculate verified net savings.

Table 103. 2024 SAG-Approved Streetlighting Initiative NTGRs

Channel	Measure	Electric NTGR	Gas NTGR
MOSL	All Measures	0.690	N/A
UOSL	All Measures	1.000	N/A

SMALL BUSINESS INITIATIVE

GROSS IMPACT METHODOLOGY

The evaluation team calculated verified savings for the Small Business Initiative by applying savings algorithms from the IL-TRM V12.0. The team leveraged information from the Initiative tracking data, such as primary heating and cooling type, LED wattage, LED lamp type, project location (e.g., weather-dependent variables), and building type, to inform savings assumptions. For variables outside these parameters, the evaluation team relied on defaults from the IL-TRM

⁵¹ All evaluated streetlights in 2024 were determined to be under standard operation.

V12.0. Table 104 lists the measures in the Small Business Initiative, their corresponding IL-TRM section, and whether or not TRM errata applied to the measure in the 2024 evaluation.

Table 104. Small Business Initiative Evaluated Measures

IL-TRM Measure Name	IL-TRM Measure Code	Errata Applied?
LED Bulbs and Fixtures	4.5.4	No errata present for this measure
Lighting Controls	4.5.10	No errata present for this measure
Fluorescent Delamping	4.5.2	No errata present for this measure
ECMs for Walk-In and Reach-In Coolers/Freezers	4.6.4	No errata present for this measure
Commercial LED Exit Signs	4.5.5	No errata present for this measure
Evaporator Fan Control for Electrically Commutated Motors	4.6.6	No errata present for this measure
Automatic Door Closer for Walk-In Coolers and Freezers	4.6.1	No errata present for this measure
C&I Air Sealing	4.8.27	No errata present for this measure
Covers and Gap Sealers for Room Air Conditioners	4.4.38	No errata present for this measure
High Efficiency Boiler	4.4.10	Errata applied
Commercial Wall Insulation	4.8.30	No errata present for this measure

MEASURE LIVES AND CUMULATIVE PERSISTING ANNUAL SAVINGS

For prescriptive measures, the evaluation team applied measure lives defined in IL-TRM V12.0.

NET IMPACT METHODOLOGY

The evaluation team applied SAG-approved 2024 NTGRs to the verified gross savings to calculate verified net savings.

Table 105. 2024 SAG-Approved Small Business Initiative NTGRs

Channel	Measure	Electric NTGR	Gas NTGR
SBDI	LED Bulbs and Fixtures	0.891	N/A
	Fluorescent Delamping	0.891	N/A
	Exit Signs	0.891	N/A
	Lighting Controls	0.891	N/A
	Evaporator Fan Control for ECMs	0.891	N/A
	ECMs for Coolers/Freezers	0.891	N/A
	Automatic Door Closer	0.891	N/A
SBEP	All measures	1.000	1.000

MIDSTREAM INITIATIVE

GROSS IMPACT METHODOLOGY

The evaluation team calculated verified savings for the Midstream Initiative by applying savings algorithms from the IL-TRM V12.0. The team leveraged information from the Initiative tracking data such as equipment capacity and efficiency, LED wattage, LED lamp type, and project location and facility type (e.g., for weather-dependent variables) to inform savings assumptions. For variables outside these parameters, the evaluation team relied on defaults from the IL-TRM V12.0. Table 106 lists the measures in the Midstream Initiative, their corresponding IL-TRM section, and whether or not TRM errata applied to the measure in the 2024 evaluation.

Table 106. Midstream Initiative Evaluated Measures

IL-TRM Measure Name	IL-TRM Measure Code	Errata Applied?
Water Heater	4.3.1	Errata applied
Air and Water Source Heat Pump Systems	4.4.9	No errata present for this measure
Single-Package and Split System Unitary Air Conditioners	4.4.15	No errata present for this measure
Notched V Belts for HVAC Systems	4.4.30	No errata present for this measure
Small Commercial Thermostats	4.4.48	No errata present for this measure
Ductless Heat Pumps	4.4.59	No errata present for this measure
Dishwashers	4.2.6	No errata present for this measure
Fryers	4.2.7	No errata present for this measure
Refrigerators and Freezers	4.2.2	No errata present for this measure
Combination Ovens	4.2.1	No errata present for this measure
Steam Cookers	4.2.3	Errata applied
Griddles	4.2.8	No errata present for this measure
Broilers	4.2.22	Errata applied
Convection Ovens	4.2.5	No errata present for this measure
Ice Machines	4.2.10	No errata present for this measure
Hot Food Holding Cabinets	4.2.9	No errata present for this measure
Conveyor Ovens	4.2.4	No errata present for this measure
LED Bulbs and Fixtures	4.5.4	No errata present for this measure
Commercial LED Exit Signs	4.5.5	No errata present for this measure

MEASURE LIVES AND CUMULATIVE PERSISTING ANNUAL SAVINGS

For prescriptive measures, the evaluation team applied measure lives defined in IL-TRM V12.0.

NET IMPACT METHODOLOGY

The evaluation team applied SAG-approved 2024 NTGRs to the verified gross savings to calculate verified net savings.

Table 107. 2024 SAG-Approved Midstream Initiative NTGRs

Channel	Measure	Electric NTGR	Gas NTGR
Midstream HVAC	Advanced Thermostat - Heating	0.800	0.800
Midstream HVAC	Advanced Thermostat - Cooling	0.600	N/A
Midstream HVAC	Unitary DMSHP	0.600	N/A
Midstream HVAC	Unitary AC	0.600	N/A
Midstream HVAC	Unitary ASHP	0.600	N/A
Midstream HVAC	Notched V-Belt	0.800	N/A
Midstream HVAC	Heat Pump Water Heater	0.600	N/A
Midstream Lighting	Specialty LED	0.918	N/A
Midstream Lighting	Mogul	0.918	N/A
Midstream Lighting	Exit Sign	0.918	N/A
Midstream Lighting	Wall Pack	0.918	N/A
Midstream Lighting	4-Pin LED	0.918	N/A
Midstream Lighting	Linear LED	0.918	N/A
Midstream Food Service	All measures	0.800	0.800

APPENDIX B. ADDITIONAL IMPACTS

INTRODUCTION

In this appendix, we provide additional quantified impacts from AIC's Business Program that are not presented in the body of the report. Three specific types of additional inputs are provided:

- Summaries of fossil fuel impacts achieved by the Business Program that cannot be directly claimed against AIC's goals but can be used in cost-effectiveness testing and to support savings conversions under Illinois law;
- Summaries of gas penalties that are not counted toward goal attainment but are required for cost-effectiveness analysis; and
- Summaries of water savings and secondary electric energy savings from water supply and wastewater treatment that are required for cost-effectiveness analysis.

ADDITIONAL FOSSIL FUEL IMPACTS

Some AIC customers receive natural gas service from other providers or use unregulated fuels such as propane to serve their energy needs. Measures provided by AIC to these customers through its existing programs may save units of these fuels in addition to energy sources provided by AIC. While these savings cannot be directly claimed against AIC's energy savings goals, where possible, we quantify these impacts in this appendix to support both cost-effectiveness testing and savings conversions under Illinois state law.

The Standard Core, Custom Incentives, and Small Business Energy Performance channels produced quantifiable non-AIC natural gas impacts in 2024.

GAS HEATING PENALTIES

Per the Policy Manual, AIC is not required to account for gas heating penalties resulting from the installation of energy efficiency measures designed to save electricity when considering savings for goal attainment purposes.^{52,53} Therefore, we exclude those effects from all savings reported throughout the body of this report. However, these effects must be evaluated and considered as part of cost-effectiveness testing and are therefore presented in this appendix.

In the following sections, the evaluation team focuses specifically on the following gas heating penalties:

- **Lighting Heating Penalties.** The inclusion of waste heat factors for lighting is based on the concept that heating loads are increased to supplement the reduction in waste heat that was once provided by the existing, less efficient lamp type. The evaluation team applied the IL-TRM waste heat factors to lamps based on heating fuel types provided in the tracking database to arrive at gross heating penalties. For cases where tracking data did not provide the heating type, the team assumed natural gas heating, per the IL-TRM.
- **Furnace Blower Motor Heating Penalties.** High efficiency fan motors operate at cooler temperatures than traditional furnace blower motors. The amount of heat that is released decreases due to cooler operating

⁵² Illinois Energy Efficiency Policy Manual. Section 7.7. Accessed at: https://www.ilsag.info/wp-content/uploads/IL_EE_Policy_Manual_Version_3.0_Final_11-3-2023.pdf.

⁵³ AIC is required to account for *electric* heating penalties resulting from the installation of energy efficiency measures designed to save electricity, and those effects are accounted for throughout this report.

conditions. Heating equipment must compensate for this heat loss during the heating season, which can increase HVAC heating loads. The team applied IL-TRM algorithms to calculate the associated heating penalty.

- **Heat Pump Water Heater Heating Penalties.** When HPWHs are installed in conditioned spaces, they move heat from the ambient air into water stored in a tank. During the heating season, this can result in an increase in HVAC heating loads. The team applied IL-TRM algorithms to calculate the associated heating penalty.

All gas heating penalties were calculated using algorithms from the IL-TRM V12.0 (with applicable errata applied).

SECONDARY ELECTRIC SAVINGS FOR WATER SUPPLY AND WASTEWATER TREATMENT

Some measures delivered through the Business Program produce water savings as well as energy savings. For applicable measures, the IL-TRM V12.0 includes an algorithm to calculate the secondary electric impacts of these water savings resulting from decreased electricity usage for water supply and wastewater treatment. As directly instructed in the IL-TRM, these savings may be included toward goal attainment but must be removed for cost-effectiveness calculations. Therefore, we present these savings separately in this appendix to provide transparency on the reduced savings that will be used when conducting testing for cost-effectiveness. All secondary electric savings were calculated using algorithms from the IL-TRM V12.0.

STANDARD INITIATIVE

ADDITIONAL FOSSIL FUEL IMPACTS

One project completed through the Standard Core channel produced non-AIC gas savings in 2024. The ex ante gross, verified gross, and verified net gas savings produced through the project are summarized in Table 108.

Table 108. 2024 Standard Core Channel non-AIC Natural Gas Savings

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
SE	2,650	100%	2,650	0.732	1,939
Total	2,650	100%	2,650	0.732	1,939

GAS HEATING PENALTIES

Table 109 presents gas penalties not reported in the body of the report for the Standard Initiative.

Table 109. 2024 Standard Initiative Gas Heating Penalties

Channel	Measure	Therms
Standard Core	LED Fixtures and Bulbs	-195,134
	Lighting Controls	-36,703
Online Store	LEDs	-475
	Lighting Controls	-236
Total Gas Penalties		-232,549

SECONDARY ELECTRIC SAVINGS FOR WATER SUPPLY AND WASTEWATER TREATMENT

Table 110 presents water savings and secondary electric savings for the Standard Initiative.

Table 110. 2024 Standard Initiative Secondary Electric and Water Savings by Measure

Measure Category	Verified Gross Water Savings (Gallons)	Conversion Factor	Verified Gross Secondary Electric Savings (kWh)
Ozone Laundry	1,108,004	5,010 kWh/million gal ^a	5,551
Steam Trap Replacement or Repair	6,018,338	2,571 kWh/million gal ^a	15,473
Steam Trap Monitoring System	69,991		180
Total	7,196,333		21,204

^aSource: IL-TRM V12.0

TOTAL IMPACTS FOR COST-EFFECTIVENESS

Table 111 presents a summary of the 2024 Standard Initiative verified gross impacts adjusted for the above effects.

Table 111. 2024 Standard Initiative Verified Gross Impacts for Cost-Effectiveness

	Electric Energy (kWh)	Gas (Therms)	Non-AIC Gas (Therms)	Water (Gallons)
Verified Gross Impacts for Goal Attainment	66,272,180	1,682,268	N/A	N/A
Gas Penalties	N/A	-232,549	N/A	N/A
Water Savings	N/A	N/A	N/A	7,196,333
Secondary Electric Savings	-21,204	N/A	N/A	N/A
Additional Fossil Fuel Impacts	N/A	N/A	2,650	N/A
Final Verified Gross Impacts for Cost-Effectiveness	66,250,976	1,449,719	2,650	7,196,333

Note: All electric demand savings used in cost-effectiveness testing align with those presented in Section 3.

CUSTOM INITIATIVE

ADDITIONAL FOSSIL FUEL IMPACTS

Five projects completed through the Custom Incentives channel of the Custom Initiative produced non-AIC gas savings in 2024. The ex ante gross, verified gross, and verified net gas savings produced through the projects are summarized in Table 112.

Table 112. 2024 Custom Initiative Non-AIC Natural Gas Savings

Channel	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
Custom Incentives	1,688,295	135%	2,276,285	0.824	1,876,342
Total	1,688,295	135%	2,276,285	0.824	1,876,342

GAS HEATING PENALTIES

No measures delivered through the Custom Initiative produced quantifiable gas heating penalties in 2024.

SECONDARY ELECTRIC SAVINGS FOR WATER SUPPLY AND WASTEWATER TREATMENT

No measures delivered through the Custom Initiative produced quantifiable secondary electric savings in 2024.

TOTAL IMPACTS FOR COST-EFFECTIVENESS

Table 113 presents a summary of the 2024 Custom Initiative verified gross impacts adjusted for the above effects.

Table 113. 2024 Custom Initiative Verified Gross Impacts for Cost-Effectiveness

	Electric Energy (kWh)	Gas (Therms)	Non-AIC Gas (Therms)	Water (Gallons)
Verified Gross Impacts for Goal Attainment	37,582,090	1,916,044	N/A	N/A
Gas Penalties	N/A	N/A	N/A	N/A
Water Savings	N/A	N/A	N/A	N/A
Secondary Electric Savings	N/A	N/A	N/A	N/A
Additional Fossil Fuel Impacts	-12,730,213	434,355	2,276,285	N/A
Final Verified Gross Impacts for Cost-Effectiveness	24,851,877	2,350,399	2,276,285	N/A

Note: All electric demand savings used in cost-effectiveness testing align with those presented in Section 3.

RETRO-COMMISSIONING INITIATIVE

ADDITIONAL FOSSIL FUEL IMPACTS

The Retro-Commissioning Initiative produced no additional fossil fuel impacts in 2024.

GAS HEATING PENALTIES

No measures delivered through the Retro-Commissioning Initiative produced quantifiable gas heating penalties in 2024.

SECONDARY ELECTRIC SAVINGS FOR WATER SUPPLY AND WASTEWATER TREATMENT

No measures delivered through the Retro-Commissioning Initiative produced quantifiable secondary electric savings in 2024.

TOTAL IMPACTS FOR COST-EFFECTIVENESS

Table 114 presents a summary of the 2024 Retro-Commissioning Initiative verified gross impacts adjusted for the above effects.

Table 114. 2024 Retro-Commissioning Initiative Verified Gross Impacts for Cost-Effectiveness

	Electric Energy (kWh)	Gas (Therms)	Non-AIC Gas (Therms)	Water (Gallons)
Verified Gross Impacts for Goal Attainment	7,618,120	0	N/A	N/A
Gas Penalties	N/A	N/A	N/A	N/A
Water Savings	N/A	N/A	0	0
Secondary Electric Savings	N/A	N/A	N/A	N/A
Additional Fossil Fuel Impacts	N/A	0	0	0
Final Verified Gross Impacts for Cost-Effectiveness	7,618,120	0	N/A	N/A

Note: All electric demand savings used in cost-effectiveness testing align with those presented in Section 3.

STREETLIGHTING INITIATIVE

ADDITIONAL FOSSIL FUEL IMPACTS

The Streetlighting Initiative produced no additional fossil fuel impacts in 2024.

GAS HEATING PENALTIES

Because all measures installed through the Streetlighting Initiative in 2024 are located in unconditioned space, no measures installed through the Initiative produced gas heating penalties.

SECONDARY ELECTRIC SAVINGS FOR WATER SUPPLY AND WASTEWATER TREATMENT

No measures delivered through the Streetlighting Initiative produced quantifiable secondary electric savings in 2024.

TOTAL IMPACTS FOR COST-EFFECTIVENESS

Table 115 presents a summary of the 2024 Streetlighting Initiative verified gross impacts adjusted for the above effects.

Table 115. 2024 Streetlighting Initiative Verified Gross Impacts for Cost-Effectiveness

	Electric Energy (kWh)	Gas (Therms)	Non-AIC Gas (Therms)	Water (Gallons)
Verified Gross Impacts for Goal Attainment	12,566	0	N/A	N/A
Gas Penalties	N/A	0	N/A	N/A
Water Savings	N/A	N/A	N/A	0
Secondary Electric Savings	0	N/A	N/A	N/A
Final Verified Gross Impacts for Cost-Effectiveness	12,566	0	0	0

Note: All electric demand savings used in cost-effectiveness testing align with those presented in Section 3.

SMALL BUSINESS INITIATIVE

ADDITIONAL FOSSIL FUEL IMPACTS

Four projects completed through the SBEP channel produced non-AIC gas savings in 2024. The ex ante gross, verified gross, and verified net gas savings produced through the projects are summarized in Table 116.

Table 116. 2024 Small Business Energy Performance Channel non-AIC Natural Gas Savings

Measure Category	Ex Ante Gross Savings (Therms)	Gross Realization Rate	Verified Gross Savings (Therms)	NTGR	Verified Net Savings (Therms)
C&I Air Sealing	2,325	100%	2,325	1.000	2,325
Total	2,325	100%	2,325	1.000	2,325

GAS HEATING PENALTIES

Table 117 presents gas penalties not reported in the body of the report for the Small Business Initiative.

Table 117. 2024 Small Business Initiative Gas Heating Penalties

Channel	Measure	Therms
SBDI	LED Bulbs and Fixtures	-329,979
	Lighting Controls	-38,907
	Fluorescent Delamping	-1,947
	Exit Signs	-617
Total Gas Penalties		-371,450

SECONDARY ELECTRIC SAVINGS FOR WATER SUPPLY AND WASTEWATER TREATMENT

No measures delivered through the Small Business Initiative produced quantifiable secondary electric savings in 2024.

TOTAL IMPACTS FOR COST-EFFECTIVENESS

Table 118 presents a summary of the 2024 Small Business Initiative verified gross impacts adjusted for the above effects.

Table 118. 2024 Small Business Initiative Verified Gross Impacts for Cost-Effectiveness

	Electric Energy (kWh)	Gas (Therms)	Non-AIC Gas (Therms)	Water (Gallons)
Verified Gross Impacts for Goal Attainment	35,245,936	19,319	N/A	N/A
Gas Penalties	N/A	-371,450	N/A	N/A
Water Savings	N/A	N/A	N/A	N/A
Secondary Electric Savings	0	N/A	N/A	N/A
Additional Fossil Fuel Impacts	N/A	N/A	2,325	N/A
Final Verified Gross Impacts for Cost-Effectiveness	35,245,936	-352,130	2,325	N/A

Note: All electric demand savings used in cost-effectiveness testing align with those presented in Section 3.

MIDSTREAM INITIATIVE

ADDITIONAL FOSSIL FUEL IMPACTS

The Midstream Initiative produced no additional fossil fuel impacts in 2024.

GAS HEATING PENALTIES

Table 119 presents gas penalties not reported in the body of the report for the Midstream Initiative.

Table 119. 2024 Midstream Initiative Gas Heating Penalties

Channel	Measure	Therms
Lighting	Linear LEDs	-293,892
	Moguls	-63,292
	4-Pin LEDs	-2,174
	Exit Signs	-121
HVAC	Heat Pump Water Heater	-196
Total Gas Penalties		-359,675

SECONDARY ELECTRIC SAVINGS FOR WATER SUPPLY AND WASTEWATER TREATMENT

Table 120 presents water savings and secondary electric savings for the Midstream Initiative.

Table 120. 2024 Midstream Initiative Secondary Electric and Water Savings by Measure

Channel	Measure Category	Verified Gross Water Savings (Gallons)	Conversion Factor	Verified Gross Secondary Electric Savings (kWh)
Food Service	Dishwashers	595,267	5,010 kWh/million gal ^a	2,982
Food Service	Steam Cookers	335,825	2,571 kWh/million gal ^a	863
Total Savings		931,092		3,846

^a Source: IL-TRM V12.0.

TOTAL IMPACTS FOR COST-EFFECTIVENESS

Table 121 presents a summary of the 2024 Midstream Initiative verified gross impacts adjusted for the above effects.

Table 121. 2024 Midstream Initiative Verified Gross Impacts for Cost-Effectiveness

	Electric Energy (kWh)	Gas (Therms)	Non-AIC Gas (Therms)	Water (Gallons)
Verified Gross Impacts for Goal Attainment	29,606,087	69,697	N/A	N/A
Gas Penalties	N/A	-359,675	N/A	N/A
Water Savings	N/A	N/A	N/A	931,092
Secondary Electric Savings	-3,846	N/A	N/A	N/A
Final Verified Gross Impacts for Cost-Effectiveness	29,602,241	-289,978	N/A	931,092

Note: All electric demand savings used in cost-effectiveness testing align with those presented in Section 3.

APPENDIX C. CUMULATIVE PERSISTING ANNUAL SAVINGS

This appendix presents detailed CPAS for the Business Program initiatives and channels. Due to many years of CPAS, tables are challenging to read; please reference the separately provided CPAS spreadsheet for additional details as needed.

Table 122 provides CPAS for the 2024 Business Program through 2075 at the initiative level. Lifetime savings for the 2024 Business Program through 2075 are 3,550,889 MWh.

Table 122. 2024 Business Program CPAS and WAML

Initiative	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)																									
				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Standard	12.8	66,272	0.909	60,260	60,260	60,242	60,072	59,622	59,352	58,749	57,665	52,799	52,519	49,985	41,005	29,136	27,770	27,340	4,206	295	295	295	295	295	295	154	154	0	
Custom	18.3	37,582	0.813	30,566	30,566	30,566	30,566	29,995	29,995	29,995	29,552	29,445	29,430	28,513	28,201	23,100	23,047	16,715	15,652	14,628	13,950	13,950	12,932	12,813	12,638	3,983	3,832	613	
Retro-Commissioning	7.6	7,618	0.945	7,203	7,203	7,203	7,203	7,203	7,203	7,203	3,123	1,038	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Streetlighting	20.0	12,566	1.000	12,566	12,566	12,566	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	0	0	0	0	
Small Business	13.7	35,246	0.917	32,328	32,328	32,274	31,291	30,699	30,266	29,422	28,838	28,715	28,303	27,664	24,982	20,266	18,609	18,339	7,466	229	229	229	229	229	4	4	4	4	
Midstream	14.9	29,606	0.975	28,871	28,871	28,871	28,865	28,835	28,826	28,826	28,826	28,812	28,805	28,731	28,421	28,398	23,162	2,835	69	69	69	69	69	0	0	0	0	0	
Midstream - Carryover	14.6	3,543	0.913	3,235	3,235	3,235	3,235	3,197	3,195	3,190	3,138	3,138	3,138	3,137	3,137	3,137	3,137	2,501	0	0	0	0	0	0	0	0	0	0	
Business (b-25) Conversions	25.0	50,289	0.824	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	41,438	
2024 Portfolio CPAS		242,723	0.892	216,468	216,468	216,396	214,537	213,427	212,142	210,690	204,890	197,374	195,521	192,326	179,673	162,466	154,320	147,694	84,526	69,550	68,527	67,848	67,848	54,670	54,550	54,376	45,580	45,429	613
Expiring 2024 Portfolio CPAS				0	0	72	1,858	1,111	1,284	1,453	5,800	7,516	1,853	3,195	12,654	17,207	8,146	6,626	63,168	14,976	1,023	678	0	13,179	119	174	8,796	151	44,815
Expired 2024 Portfolio CPAS				0	0	72	1,931	3,041	4,326	5,778	11,578	19,094	20,947	24,141	36,795	54,002	62,148	68,774	131,941	146,918	147,941	148,619	148,619	161,798	161,917	162,092	170,888	171,039	215,855

Initiative	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)																										
				2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	
Standard	12.8	66,272	0.909	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Custom	18.3	37,582	0.813	613	613	613	613	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	0	0	
Retro-Commissioning	7.6	7,618	0.945	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Streetlighting	20.0	12,566	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Small Business	13.7	35,246	0.917	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Midstream	14.9	29,606	0.975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Midstream - Carryover	14.6	3,543	0.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Business (b-25) Conversions	25.0	50,289	0.824	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2024 Portfolio CPAS		242,723	0.892	613	613	613	613	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	0	0	
Expiring 2024 Portfolio CPAS				0	0	0	0	587	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0
Expired 2024 Portfolio CPAS				215,855	215,855	215,855	215,855	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,442	216,468	216,468	
WAML	16.8																													

STANDARD INITIATIVE

Table 123 provides CPAS for the 2024 Standard Initiative through 2051. Lifetime savings for the Initiative are 763,356 MWh.

Table 123. 2024 Standard Initiative Program CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)													
				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Core	12.9	62,829	0.906	56,907	56,907	56,890	56,719	56,691	56,421	55,817	55,122	50,257	49,981	47,469	40,248	28,379	27,595
Online Store	10.7	2,440	0.963	2,350	2,350	2,350	2,350	2,350	2,350	2,350	1,961	1,960	1,956	1,934	175	175	175
BOC	13.0	1,003	1.000	1,003	1,003	1,003	1,003	582	582	582	582	582	582	582	582	582	0
2024 CPAS		66,272	0.909	60,260	60,260	60,242	60,072	59,622	59,352	58,749	57,665	52,799	52,519	49,985	41,005	29,136	27,770
Expiring 2024 CPAS				0	0	18	171	450	270	603	1,084	4,866	280	2,534	8,980	11,869	1,366
Expired 2024 CPAS				0	0	18	188	638	908	1,511	2,595	7,461	7,741	10,275	19,256	31,124	32,490

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)														
				2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	
Core	12.9	62,829	0.906	27,167	4,041	295	295	295	295	295	295	295	295	154	154	0	0	0
Online Store	10.7	2,440	0.963	173	165	0	0	0	0	0	0	0	0	0	0	0	0	0
BOC	13.0	1,003	1.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 CPAS		66,272	0.909	27,340	4,206	295	295	295	295	295	295	295	295	154	154	0	0	0
Expiring 2024 CPAS				431	23,134	3,910	0	0	0	0	0	0	141	0	154	0	0	
Expired 2024 CPAS				32,921	56,055	59,965	59,965	59,965	59,965	59,965	59,965	59,965	60,106	60,106	60,260	60,260	60,260	
WAML	12.8																	

CUSTOM INITIATIVE

Table 124 provides CPAS for the 2024 Custom Initiative through 2075. Lifetime savings for the Initiative are 558,789 MWh.

Table 124. 2024 Custom Initiative Program CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)																									
				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Custom Incentives	18.5	36,191	0.814	29,466	29,466	29,466	29,466	29,466	28,895	28,895	28,895	28,627	28,624	28,609	27,969	27,969	22,868	22,820	16,498	15,435	14,413	13,735	13,735	12,717	12,672	12,638	3,983	3,832	613
New Construction Lighting	12.8	1,391	0.791	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	926	821	821	543	232	232	227	216	216	216	214	214	214	141	0	0	0	
2024 CPAS		37,582	0.813	30,566	30,566	30,566	30,566	30,566	29,995	29,995	29,995	29,552	29,445	29,430	28,513	28,201	23,100	23,047	16,715	15,652	14,628	13,950	13,950	12,932	12,813	12,638	3,983	3,832	613
Expiring 2024 CPAS				0	0	0	0	0	572	0	0	442	107	15	918	312	5,101	52	6,332	1,063	1,023	678	0	1,018	119	174	8,655	151	3,219
Expired 2024 CPAS				0	0	0	0	0	572	572	572	1,014	1,121	1,136	2,054	2,366	7,467	7,519	13,851	14,915	15,938	16,616	16,616	17,634	17,754	17,928	26,583	26,734	29,953

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)																										
				2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	
Custom Incentives	18.5	36,191	0.814	613	613	613	613	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	0	0
New Construction Lighting	12.8	1,391	0.791	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 CPAS		37,582	0.813	613	613	613	613	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	0	0
Expiring 2024 CPAS				0	0	0	0	587	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0
Expired 2024 CPAS				29,953	29,953	29,953	29,953	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,540	30,566	30,566
WAML	18.3																													

RETRO-COMMISSIONING INITIATIVE

Table 125 provides CPAS for the 2024 Retro-Commissioning Initiative through 2032. Lifetime savings for the Initiative are 54,581 MWh.

Table 125. 2024 Retro-Commissioning Initiative Program CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)													
				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034			
Core	8.6	1,832	0.945	1,730	1,730	1,730	1,730	1,730	1,730	1,730	1,730	1,730	1,038	0	0		
Virtual Commissioning	7.3	4,956	0.937	4,642	4,642	4,642	4,642	4,642	4,642	4,642	4,642	1,393	0	0			
Virtual SEM	7.0	831	1.000	831	831	831	831	831	831	831	831	0	0	0			
2024 CPAS		7,618	0.945	7,203	7,203	7,203	7,203	7,203	7,203	7,203	7,203	3,123	1,038	0	0		
Expiring 2024 CPAS				0	0	0	0	0	0	0	0	4,080	2,085	1,038	0		
Expired 2024 CPAS				0	0	0	0	0	0	0	0	4,080	6,165	7,203	7,203		
WAML	7.6																

STREETLIGHTING INITIATIVE

Table 126 provides CPAS for the 2024 Streetlighting Initiative through 2045. Lifetime savings for the Initiative are 239,434 MWh.

Table 126. 2024 Streetlighting Initiative Program CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)																						
				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	
Municipality-Owned Streetlighting	20.0	50	1.000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	0	0	
Utility-Owned Streetlighting	20.0	12,516	1.000	12,516	12,516	12,516	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	11,816	0	0	
2024 CPAS		12,566	1.000	12,566	12,566	12,566	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	11,867	0	0	
Expiring 2024 CPAS				0	0	0	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,867	0	
Expired 2024 CPAS				0	0	0	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	700	12,566	12,566
WAML	20.0																									

SMALL BUSINESS INITIATIVE

Table 127 provides CPAS for the 2024 Small Business Initiative through 2049. Lifetime savings for the Initiative are 422,726 MWh.

Table 127. 2024 Small Business Initiative Program CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)												
				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
SBDI	13.6	35,017	0.917	32,099	32,099	32,045	31,062	30,470	30,038	29,193	28,609	28,486	28,074	27,435	24,753	20,037
SBEP	20.1	229	1.000	229	229	229	229	229	229	229	229	229	229	229	229	229
2024 CPAS		35,246	0.917	32,328	32,328	32,274	31,291	30,699	30,266	29,422	28,838	28,715	28,303	27,664	24,982	20,266
Expiring 2024 CPAS				0	0	54	983	592	432	845	583	123	413	639	2,682	4,716
Expired 2024 CPAS				0	0	54	1,037	1,629	2,061	2,906	3,490	3,612	4,025	4,664	7,346	12,062

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)												
				2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
SBDI	13.6	35,017	0.917	18,380	18,110	7,237	0	0	0	0	0	0	0	0	0	0
SBEP	20.1	229	1.000	229	229	229	229	229	229	229	4	4	4	4	4	0
2024 CPAS		35,246	0.917	18,609	18,339	7,466	229	229	229	229	4	4	4	4	4	0
Expiring 2024 CPAS				1,657	270	10,873	7,237	0	0	0	225	0	0	0	0	4
Expired 2024 CPAS				13,719	13,989	24,862	32,099	32,099	32,099	32,099	32,323	32,323	32,323	32,323	32,323	32,328
WAML	13.7															

MIDSTREAM INITIATIVE

Table 128 provides CPAS for the 2024 Midstream Initiative through 2045. Lifetime savings for the Initiative are 429,057 MWh.

Table 128. 2024 Midstream Initiative Program CPAS and WAML

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)										
				2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Lighting	14.9	28,672	0.981	28,129	28,129	28,129	28,129	28,129	28,120	28,120	28,120	28,120	28,120	28,120
HVAC	12.9	405	0.704	285	285	285	280	249	249	249	249	249	249	249
Food Service	13.5	529	0.863	456	456	456	456	456	456	456	456	456	442	435
2024 CPAS		29,606	0.975	28,871	28,871	28,871	28,865	28,835	28,826	28,826	28,826	28,826	28,812	28,805
Expiring 2024 CPAS				0	0	0	6	30	8	0	0	0	15	7
Expired 2024 CPAS				0	0	0	6	36	45	45	45	45	59	66

Channel	WAML	Annual Verified Gross Savings (MWh)	NTGR	CPAS - Verified Net Savings (MWh)										
				2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Lighting	14.9	28,672	0.981	28,120	28,120	28,098	22,861	2,747	0	0	0	0	0	0
HVAC	12.9	405	0.704	176	176	176	176	19	0	0	0	0	0	0
Food Service	13.5	529	0.863	435	125	125	125	69	69	69	69	69	69	0
2024 CPAS		29,606	0.975	28,731	28,421	28,398	23,162	2,835	69	69	69	69	69	0
Expiring 2024 CPAS				74	310	23	5,236	20,327	2,766	0	0	0	69	0
Expired 2024 CPAS				139	450	472	5,709	26,035	28,801	28,801	28,801	28,801	28,871	28,871
WAML	14.9													

APPENDIX D. CUSTOM INITIATIVE PROJECT REPORTS

This appendix is provided under a separate cover.

APPENDIX E. 2024 LLLC MT PILOT MARKET PROGRESS EVALUATION REPORT

This appendix is provided under a separate cover.



Opinion **Dynamics**

CONTACT:

Zach Ross
Director
zross@opiniondynamics.com

Tyler Sellner
Principal Consultant
tsellner@opiniondynamics.com



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SAN DIEGO
SAN FRANCISCO

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