Guidehouse

Business Custom Impact Evaluation Report

Energy Efficiency Plan: Program Year 2024 (1/1/2024-12/31/2024)

Prepared for:

Nicor Gas Company

FINAL

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1. Introduction

This report presents the results of the impact evaluation of the Nicor Gas 2024 Business Custom programs. It presents a summary of the energy impacts for the total program and broken out by relevant measure and program structure details. The appendices present the impact analysis methodology and inputs to the TRC. Program year 2024 covers January 1, 2024 through December 31, 2024.

2. Program Description

The Business Custom Program provides Nicor Gas commercial and industrial (C&I) customers with rebate incentives for the installation of cost-effective natural gas energy efficiency improvements that are not eligible for a prescriptive rebate under the Nicor Gas Business Energy Efficiency Rebate Program. The program targets large C&I private and public sector customers with more complex facilities that will benefit most from a custom offering during new equipment purchases and industrial process improvements. The program provides engineering studies to assist customers in understanding their efficiency opportunities by quantifying the estimated project costs, energy savings, and forecasted incentives.

The program staff work with both trade allies and decision-makers at facilities to identify and quantify energy efficiency opportunities. Interested customers must first submit a pre-approval application to the program which includes detailed calculations, specifications for the project and usage history. Program staff review the customer's initial reported savings and screen projects using an internal cost-benefit test. The Custom Program requires that a project's initial application be pre-approved prior to the start of the project. Prior to issuing an approval notice, pre-installation inspections are performed on almost all projects, especially for complex and high impact measures. After project completion, the customer submits a final application and receives the project rebate from the Custom Program.

The Custom Program evaluation also included reviews and analysis for the 2024 Nicor Gas Non-Joint Retro-Commissioning (NG-RCx) offering. This program assists participants with low-cost and no cost tune-ups and adjustments which are customized for the operating systems, building controls, energy management systems and HVAC systems of existing buildings.

The Custom program had 85 participants in 2024 and completed 93 projects as shown in Table 1. There were five participants completed eight NG-RCx projects and claimed savings.

Table 1. 2024 Volumetric Findings Detail

Participation	Private	Public	Total
Business Custom			
Participants *	47	38	85
Installed Projects †	53	40	93
Measure Types Installed ‡	22	17	34
Nicor Gas RCx			
Participants *	4	1	5
Installed Projects †	7	1	8
Measure Types Installed ‡	5	1	6
Program 2024 Total			

Participation	Private	Public	Total
Participants *	51	39	90
Installed Projects †	60	41	101
Measure Types Installed ‡	26	17	38

* Participants are defined as unique account names

† Installed Projects are defined as unique project IDs.

‡ Measure Types are defined as unique measure names. The measure type total quantities may not equal to the sum of the individual measure type quantities due to same measure types claimed in different sectors and paths.

Source: Nicor Gas tracking data and evaluation team analysis.

3. Program Savings Detail

Table 2 summarizes the energy savings the Business Custom Program achieved by Business Custom and NG-RCx paths in 2024.

Table 2. 2024 Annual Energy Savings Summary

Program Category	Program Path	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Private, Non-Disadvantaged Communities	Custom	2,350,178	93%	2,174,619	0.84	1,826,680
	NG-RCx	597,820	95%	569,177	0.84	478,108
Private, Non-DAC Subtotal		**2,947,998**	**93%**	**2,743,796**	**0.84**	**2,304,788**
Public, Non-Disadvantaged Communities	Custom	364,638	90%	329,159	0.84	276,494
	NG-RCx	5,692	94%	5,351	0.84	4,495
Public, Non-DAC Subtotal		**370,330**	**90%**	**334,510**	**0.84**	**280,988**
Public, Disadvantaged Communities	Custom	51,597	93%	47,813	1.00	47,813
Public, DAC Subtotal		**51,597**	**93%**	**47,813**	**1.00**	**47,813**
Total or Weighted Average		**3,369,925**	**93%**	**3,126,119**		**2,633,590**

* Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.
† NTG, Net to Gross is the deemed value available on the SAG website: https://www.ilsag.info/evaluator-ntg-recommendations-for-2024/. Based on SAG Policy, participants in disadvantaged communities (DAC) based on their census tract and with consumption under 35,000 Therms are assigned a NTG of 1.00.
Source: Evaluation team analysis.

4. Program Savings by Measure

The Custom Program categorizes measures based on savings into two groups of less than or greater than 7,500 therm savings, as shown in Table 3.

Table 3. 2024 Annual Energy Savings by Category

Program Category	Program Path	Savings Category	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Private, Non-Disadvantaged Communities	Custom	Custom > 7,500 therms	2,229,435	93%	2,062,668	0.84	1,732,641
		Custom 2,500-7,500 therms	120,743	93%	111,951	0.84	94,039
	NG-RCx	Custom > 7,500 therms	382,747	96%	365,982	0.84	307,425
		Custom 2,500-7,500 therms	215,073	94%	203,195	0.84	170,684
Private, Non-DAC Subtotal			***2,947,998***	**93%**	***2,743,796***	**0.84**	***2,304,788***
Public, Non-Disadvantaged Communities	Custom	Custom > 7,500 therms	276,489	89%	246,709	0.84	207,235
		Custom 2,500-7,500 therms	88,149	94%	82,451	0.84	69,258
	NG-RCx	Custom 2,500-7,500 therms	5,692	94%	5,351	0.84	4,495
Public, Non-DAC Subtotal			***370,330***	**90%**	***334,510***	**0.84**	***280,988***
Public, Disadvantaged Communities	Custom	Custom > 7,500 therms	34,565	92%	31,821	1.00	31,821
		Custom 2,500-7,500 therms	17,032	94%	15,993	1.00	15,993
Public, DAC Subtotal			***51,597***	**93%**	***47,813***	***1.00***	***47,813***
Total or Weighted Average			**3,369,925**	**93%**	**3,126,119**		**2,633,590**

* Realization Rate (RR) is the ratio of verified gross savings to ex ante gross savings, based on evaluation research findings.
† NTG, Net to Gross is the deemed value available on the SAG website: https://www.ilsag.info/evaluator-ntg-recommendations-for-2024/.

Based on SAG Policy, participants in disadvantaged communities (DAC) based on their census tract and with consumption under 35,000 Therms are assigned a NTG of 1.00.
Source: Evaluation team analysis.

The business custom program includes 38 measures as shown in the following table. The RTO, Dryer, Damper Control Replacement, Boiler Replacement, and Burner Upgrade measures contributed the most savings.

Large energy saving projects include Regenerative Thermal Oxidizer (RTO), Boiler Replacement, Controls Upgrade, and Air Handling Unit (AHU). More details of the 2023 Custom Program savings by measure are provided in Table 4.

Table 4. 2024 Annual Energy Savings by Measure

Measure	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
RTO	728,366	100%	728,366	0.84	611,827
Dryer	401,369	98%	393,314	0.84	330,384
Damper Control Replacement	382,747	96%	365,982	0.84	307,425
Boiler Replacement	358,441	87%	312,075	0.84	262,143
Burner Upgrade	348,316	91%	315,865	0.84	265,326
Controls Upgrade	204,233	86%	174,852	0.84	146,876
Atomizing Furnace & Coil Heater	91,907	81%	74,163	0.84	62,297
HVAC Upgrade	84,982	92%	78,508	0.91	71,486
Furnace Rebuild	83,272	83%	69,027	0.84	57,983
AHUs	76,648	82%	63,113	0.84	53,015
Cooler Doors	67,199	92%	61,863	0.84	51,965
Steam Ejectors	66,592	82%	54,714	0.84	45,960
AHU Controls Upgrade	52,768	92%	48,689	0.84	40,899
Roof	42,546	81%	34,416	0.84	28,910
Steam Trap Jackets	41,491	81%	33,481	0.84	28,124
Boiler Controls	34,841	92%	32,075	0.84	26,943
Steam Reduction	28,910	100%	28,910	0.84	24,284
Dryer Tune Up	28,421	100%	28,421	0.84	23,874

Measure	Ex Ante Gross Savings (Therms)	Verified Gross RR*	Verified Gross Savings (Therms)	NTG†	Verified Net Savings (Therms)
Boiler Upgrade	26,895	92%	24,760	0.84	20,798
Compressor Heat Recovery	24,178	92%	22,258	0.84	18,697
Steam Boiler Replacement	23,453	92%	21,591	0.84	18,136
Tank Insulation and RO System	22,183	92%	20,422	0.84	17,154
Condensing Boilers and Water Heaters	21,083	93%	19,636	0.84	16,494
VRF	19,823	92%	18,249	0.84	15,329
EMS Controls Upgrade	17,181	92%	15,817	0.84	13,286
Ventilators	17,036	95%	16,162	0.88	14,238
Insulation	14,488	92%	13,338	0.84	11,204
Economizer	13,232	92%	12,181	0.84	10,232
Oven Upgrade	7,135	92%	6,568	0.84	5,518
Steam to VRF	6,706	92%	6,174	0.84	5,186
ARUs	6,368	92%	5,862	0.84	4,924
Water Heater	6,092	93%	5,651	0.84	4,747
RTU	5,165	92%	4,755	0.84	3,994
Window Replacement	4,971	92%	4,576	1.00	4,576
VFD	4,864	92%	4,478	1.00	4,478
Modulating Steam Valve	2,625	96%	2,531	0.84	2,126
Heat Plant Blankets	2,150	96%	2,073	0.84	1,741
Rooftop Heat Pumps	1,248	96%	1,203	0.84	1,011
Total or Weighted Average	**3,369,925**	**93%**	**3,126,119**		**2,633,590**

Note: This table is the population savings, including all custom and RCx measures. The RRs applied in this table are the strata level RRs (not the individual sampled project RRs).
† NTG, Net to Gross is the deemed value available on the SAG website: https://www.ilsag.info/evaluator-ntg-recommendations-for-2024/. Based on SAG Policy, participants in disadvantaged communities (DAC) based on their census tract and with consumption under 35,000 Therms are assigned a NTG of 1.00.
Source: Evaluation team analysis.

5. Impact Analysis Findings and Recommendations

5.1 Impact Parameter Estimates

Table 5 shows the unit therm savings and realization rate findings by measure from our review. The realization rate is the ratio of the verified savings to the ex ante savings. Following the table, we provide findings and recommendations, including discussion of all measures with realization rates above or below 100%. Appendix A provides a description of the impact analysis methodology.

Table 5. Verified Gross Savings Parameters

Measure	Unit Basis	Ex Ante Gross (therms/unit)	Verified Gross (therms/unit)	Realization Rate	Data Source(s)
Custom Measures	Project	Vary	Vary	92%	Project File Review*, Monthly Billing Data, Illinois TRM v12.0†, Site Specific Verification‡
Nicor Gas-RCx Measures	Project	Vary	Vary	95%	Project File Review*, Monthly Billing Data, Illinois TRM v12.0†, Site Specific Verification‡

* Program Tracking Data (PTD) provided by Nicor Gas, extract dated January 30, 2025.
† State of Illinois Technical Reference Manual version 12.0 from http://www.ilsag.info/technical-reference-manual.html.
‡ Project files and monthly billing data provided by Nicor Gas. Where conducted, on-site or telephone interview data collected by Guidehouse.

5.2 Findings and Recommendations

The evaluation team found the largest deviations from ex ante savings are in Damper Control Replacement, Boiler Replacement, Burner Upgrade, and Controls Upgrade measures. The evaluation team sampled and reviewed projects in two waves as these were completed during the Program Year 2024 (PY2024) and provided findings to Nicor Gas using summary results trackers. Key findings and recommendations are summarized below.

Finding 1. For Combined Heat and Power Damper Replacement project NGRCx-23-04, the evaluator conducted utility data analysis since the ex ante savings were expected to be above 10% of the facility's usage. Weather data was used in the first version of the analysis but deemed inaccurate due to a low R-square value. The utility analysis was updated, based on gas consumption data and resulted in a gross realization rate (RR) of 96%.

Recommendation 1. For projects with savings expecting to exceed the threshold of 10% of the building annual gas consumption, the evaluation team recommends that the implementation team conduct a utility billing data analysis to true up the savings achieved at the utility meter. When conducting this analysis, utilize available data

through the most recent billing period to allow maximum coverage of the post installation period.

Finding 2. For project NG-22-36, a portion of the reported savings came from reduced humidity. When switching from steam injection humidification to ultrasonic mister, the water is still evaporated and adds latent load to the airstream, which is heated by natural gas. Therefore, this portion of savings was removed from the final savings in the verified calculation which resulted in a RR of 58%. Installing an ultrasonic mister is not a commonly seen measure in the custom program where the implementation team and the evaluation team need to align on the calculation methodology to improve the accuracy of the reported savings.

Recommendation 2a. For ultrasonic mister measures, no savings should be claimed for reduced humidity.

Recommendation 2b. The Nicor Custom Parallel Path Evaluation Protocol recommends that uncommon and complex custom measures not often seen in the custom program and for projects with savings above 75,000 Therm per year or above 10% of the building annual consumption should have a parallel path evaluation. Guidehouse recommends conducting a parallel path review for projects like NG-22-36.

Finding 3. For project NGRCx-24-09, the implementation team used a top-down methodology to estimate the pounds of steam reduction in the ex ante calculation. The calculated result exceeded the possible reduction identified using the bottom-up approach and was adjusted in the verified savings analysis. Also, the ex ante calculation did not account for the steam pressure being maintained by a regulator. With verified savings corrections made to address these findings, the project RR is 82%.

Recommendation 3. With available project info and data, consider trueing up the key inputs using both top-down and bottom-up approaches for a better understanding of the system operation.

Finding 4. Project NG-24-18 is a furnace rebuilt project with savings calculated using gas consumption and production data analysis. The evaluation team reviewed the production data post implementation and found the production level was lower than what the implementer used in the ex ante analysis. This lower production level led to reduced verified savings with an RR of 83%. This is a common finding that during evaluation when there is additional data available from the most recent period, the inclusion of such data usually results in an impact to the ex ante savings. This impact can be in either direction, to increase or decrease savings compared to the ex ante analysis.

Recommendation 4. When conducting trend data and utility data analysis, include data collected through most recent time period to better cover the post installation operation. If data collected during certain periods should not be included in the analysis, document the reason and specific dates in the calculator.

Finding 5. For project NG-24-10, ex ante calculation suggests the installed boiler burners are high turndown burners and applied a high turndown burner savings factor to calculate savings;

while during evaluation, Guidehouse confirmed the installed boiler burners are 4:1 turndown. In addition, evaluation found the different measures installed under the project scope share the same baseline and the measure interactions were not accounted for in the ex ante analysis. The evaluation adjusted the individual measures' baselines to be sequential to account for interaction, i.e. the first measure's baseline is the project baseline, the second measure's theoretical baseline is the first measure's post installation case. These two revisions resulted in a RR of 82%.

Recommendation 5. When there are multiple measures installed under the same projects, they should be considered sequentially to account for the measure interaction, i.e., measure 1 post installation operation should be the theoretical baseline of measure 2, and measure 2 baseline should not be the actual project baseline before any measure installation. This approach helps eliminate double claiming energy savings when the measures installed at the participating site are for the same systems and interact with each other.

Finding 6. Project NG-23-54 is for a Compressor Heat Recovery project, and trended power data is used in the ex ante saving calculations. The trended power are up to 35% higher than Compressed Air and Gas Institute (CAGI) listed maximum power for this air compressor. To account for this finding, the evaluation scaled down trended power data to be in a range that can match with the CAGI listed maximum power.

Recommendation 6. For compressed air system projects with trended data to support the savings, review the parameters listed in the compressor sheet at CAGI website. For identified outliers in this process, document the adjustments made to account for the outliers in the calculation file for future reference.

Finding 7. Project NG-23-08 is a burner retrofit. The evaluation team found the different firing rate operations were not assigned to the correct weights. The evaluation reduced the low fire %runtime from 57% to 38% and increased the mid-fire %runtime from 40% to 58%. Also, the ex ante annual baseline usage and the firing rates do not match the usage shown in the facility's utility data, therefore, evaluation updated the baseline usage used in the calculation. The RR for this project is 33%.

Recommendation 7. When conducting baseline consumption calculations, compare the baseline usage to the actual utility billing data and tweak the inputs and parameters when necessary to ensure the alignment.

Finding 8. The evaluation team found the key inputs and parameters in the ex ante savings were not in alignment with data in the project documentation. E.g., for project NG-23-47, balance point temperature was updated from an ex ante input of 65F to 62.5F which was based on daily utility data analysis; for project NG-24-15, the installed burner turndown ratio was updated from an ex ante input of 8:1 to 9:1 based firing rates recorded in combustion reports.

Recommendation 8. Continue to enhance the engineering review quality control process for projects to ensure the key inputs and assumptions are consistent with project installation and system operation and are supported by reference documentation.

Appendix A. Impact Analysis Methodology

During PY2024 evaluation for the Business Custom program, the program implementor provided documentation of project applications, savings, and supplemental documents. The evaluation team verified project eligibility and savings based on engineering review, billing data review, and site-specific verification of a sample of projects in the programs. The evaluation team designed the sample sizes to provide a 90/10 confidence and relative precision level for program-level gross savings verification.

Projects were randomly selected at the tracking record level using the population gross therm savings determined from program tracking data. Strata were defined by project size, based on gross energy savings boundaries that placed about one-third of program-level savings into each stratum. The Nicor Gas-RCx projects were handled separately during the evaluation sampling process to be individual strata. The bottom 2% of savings were placed in stratum 4 and not included in the final sample draw. The RR of the sampled custom projects was applied to stratum 4 and stratum RCx 4. Table A-1 shows a profile of the sample selection.

Table A-1. Profile of Gross Impact Sample for Custom Projects

		Population Summary		Sample Summary		
Program	Sampling Strata	Number of Projects (N)	Ex Ante Gross Savings (Therms)	N	Ex Ante Gross Savings (Therms)	Sampled % of Population (% Therms)
Business Custom	1	2	1,088,013	2	1,088,013	100%
	2	12	738,749	3	201,565	27%
	3	56	884,274	11	169,793	19%
	4	23	55,377	-	-	0%
NG-RCx	RCx1	1	382,747	1	382,747	100%
	RCx2	1	66,592	1	66,592	100%
	RCx3	5	148,481	1	28,421	19%
	RCx4	1	5,692	-	-	0%
TOTAL		**101**	**3,369,925**	**19**	**1,937,131**	**57%**

Source: Evaluation team analysis.

Table A-2 presents the strata-level verified gross realization rates and statistical precision values at 90% confidence for the Custom Program.

Table A-2. 2024 Gross Therm Realization Rates and Relative Precision at 90% Confidence

Program Sector	Sampling Strata	Relative Precision + or - %	Mean RR	Standard Error
Business Custom and NG-RCx	1	0%	100%	0.00
	2	31%	81%	0.08
	3	6%	92%	0.03
	4	-	-	-
	RCx1	0%	96%	0.00
	RCx2	0%	82%	0.00
	RCx3	0%	100%	0.00
	RCx4	-	-	-
Custom Total RR (90/10)		4%	93%	0.02

Source: Evaluation team analysis

Engineering Review of Project Files

For each selected project, an in-depth application review is performed to assess the engineering methods, parameters and assumptions used to generate all ex ante impact estimates. For each measure in the sampled project, engineers estimated verified gross savings based on their review of documentation and engineering analysis.

To support this review, the implementation contractor provided project documentation in electronic format for each sampled project. Documentation included scanned files of hardcopy application forms and supporting documentation from the applicant (invoices, measure specification sheets, and vendor proposals), pre-inspection reports and photos, post inspection reports and photos, and calculation spreadsheets.

On-Site Data Collection

Onsite surveys were completed for two of the 19 custom and NG-RCx projects sampled. Utility billing data was provided by Nicor Gas and analyzed for four of the 19 sampled projects.

Impact Analysis Supplemental Information

Table A-3 provides a summary of the Custom Program sample selection and verification approach. Table A-4 provides a summary of verification results for the selected samples.

Table A-3. 2024 Sample Gross Therm Realization Rates

Project ID	Program Sector	Ex Ante Gross Savings (Therms)	Strata	Verification Approach	Measure
NG-24-86	Private	728,366	1	File Review	RTO
NG-23-37	Private	359,647	1	File Review	Dryer
NGPS-23-42	Public	68,865	2	File Review	Boiler Replacement
NG-24-18	Private	67,159	2	File Review	Furnace Rebuild
NG-22-36	Private	65,541	2	File Review	AHUs
NG-24-10	Private	37,227	3	File Review	Boiler Replacement
NG-23-47	Private	28,197	3	File Review	Burner Upgrade
NG-23-54	Private	24,178	3	File Review	Compressor Heat Recovery
NG-21-15	Private	17,462	3	File Review, Site Visit	Boiler Upgrade
NGPS-23-06	Public	15,221	3	File Review, Utility Data Analysis	AHU Controls Upgrade
NG-23-21	Private	13,232	3	File Review	Economizer
NG-23-09	Private	11,107	3	File Review	AHUs
NG-23-45	Private	8,479	3	File Review	Burner Upgrade
NG-24-15	Private	5,388	3	File Review	Burner Upgrade
NG-23-08	Private	5,121	3	File Review, Utility Data Analysis	Burner Upgrade
NGPS-23-63	Public	4,181	3	File Review, Utility Data Analysis	Boiler Replacement
NGRCx-23-04	Private	382,747	RCx1	File Review, Site Visit, Utility Data Analysis	Damper Control Replacement
NGRCx-24-09	Private	66,592	RCx2	File Review	Steam Ejectors
NGRCx-23-03	Private	28,421	RCx3	File Review	Dryer Tune Up

Source: Evaluation team analysis

Table A-4. 2024 Sample Summary of Adjustments

Project ID	Program Sector	Measure	Gross Realization Rate	Summary of Adjustment
NG-24-86	Private	RTO	100%	-
NG-23-37	Private	Dryer	100%	-
NGPS-23-42	Public	Boiler Replacement	100%	-
NG-24-18	Private	Furnace Rebuild	83%	Included additional production data in the analysis.
NG-22-36	Private	AHUs	58%	Gas savings for steam injection humidification to ultrasonic mister are updated to 0 since the water is still evaporated and the overall load is not reduced.
NG-24-10	Private	Boiler Replacement	82%	Installed boiler burners are 4:1 and not high-turndown burners. Adjusted savings to account for measures interaction.
NG-23-47	Private	Burner Upgrade	99%	Adjusted balance point temperature to 62.5F to match daily dashboard value in the calculation tool.
NG-23-54	Private	Compressor Heat Recovery	87%	Scaled down trended power to match max power listed in CAGI.
NG-21-15	Private	Boiler Upgrade	100%	-
NGPS-23-06	Public	AHU Controls Upgrade	100%	-
NG-23-21	Private	Economizer	100%	-
NG-23-09	Private	AHUs	100%	-
NG-23-45	Private	Burner Upgrade	100%	-
NG-24-15	Private	Burner Upgrade	103%	Updated the new burner turndown ratio to 9:1
NG-23-08	Private	Burner Upgrade	33%	Revised to account for firing rate in the weighting to avoid low load operations being given higher weight than warranted.

Project ID	Program Sector	Measure	Gross Realization Rate	Summary of Adjustment
				Adjusted firing rate and annual usage to match available utility data.
NGPS-23-63	Public	Boiler Replacement	100%	-
NGRCx-23-04	Private	Damper Control Replacement	96%	Utility data analysis results are used for final savings.
NGRCx-24-09	Private	Steam Ejectors	82%	Adjusted hours of operation using bottom-up instead of top-down which results in less steam reduction lbs. Adjusted steam pressure to account for regulators.
NGRCx-23-03	Private	Dryer Tune Up	100%	-

Source: Evaluation team analysis

Appendix B. Program Specific Inputs for the Illinois TRC

Table B-1 shows the Total Resource Cost (TRC) cost-effectiveness analysis inputs available at the time of producing this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to the evaluation team later. Guidehouse will include annual and lifetime water savings and greenhouse gas reductions in the end of year summary report.

Table B-1. Verified Cost Effectiveness Inputs

Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Custom	AHU Controls Upgrade	FALSE	Project	3	15.0	NO	47,076	43,338	36,404
Custom	AHUs	FALSE	Project	2	15.0	NO	76,648	63,113	53,015
Custom	ARUs	FALSE	Project	1	15.0	NO	6,368	5,862	4,924
Custom	Atomizing Furnace & Coil Heater	FALSE	Project	1	16.5	NO	91,907	74,163	62,297
Custom	Boiler Controls	FALSE	Project	2	25.0	NO	34,841	32,075	26,943
Custom	Boiler Replacement	FALSE	Project	15	25.0	NO	358,441	312,075	262,143
Custom	Boiler Upgrade	FALSE	Project	2	25.0	NO	26,895	24,760	20,798
Custom	Burner Upgrade	FALSE	Project	12	20.0	NO	257,166	224,715	188,760
Custom	Compressor Heat Recovery	FALSE	Project	1	15.0	NO	24,178	22,258	18,697
Custom	Condensing Boilers and Water Heaters	FALSE	Project	5	25.0	NO	21,083	19,636	16,494
Custom	Controls Upgrade	FALSE	Project	9	15.0	NO	204,233	174,852	146,876
Custom	Cooler Doors	FALSE	Project	3	15.0	NO	67,199	61,863	51,965
Custom	Dryer	FALSE	Project	2	20.0	NO	401,369	393,314	330,384
Custom	Economizer	FALSE	Project	1	15.0	NO	13,232	12,181	10,232
Custom	EMS Controls Upgrade	FALSE	Project	1	15.0	NO	17,181	15,817	13,286
Custom	Furnace Rebuild	FALSE	Project	2	16.5	NO	83,272	69,027	57,983
Custom	Heat Plant Blankets	FALSE	Project	1	15.0	NO	2,150	2,073	1,741
Custom	HVAC Upgrade	FALSE	Project	4	15.0	NO	47,510	43,885	36,863
Custom	Insulation	FALSE	Project	1	15.0	NO	14,488	13,338	11,204
Custom	Modulating Steam Valve	FALSE	Project	1	15.0	NO	2,625	2,531	2,126
Custom	Oven Upgrade	FALSE	Project	1	12.0	NO	7,135	6,568	5,518
Custom	Roof	FALSE	Project	2	20.0	NO	42,546	34,416	28,910

Program Path	Savings Category	DAC Project*	Units	Quantity	Effective Useful Life	Early Replacement Flag	Ex Ante Gross Savings (Therms)	Verified Gross Savings (Therms)	Verified Net Savings (Therms)
Custom	Rooftop Heat Pumps	FALSE	Project	1	16.0	NO	1,248	1,203	1,011
Custom	RTO	FALSE	Project	1	20.0	NO	728,366	728,366	611,827
Custom	RTU	FALSE	Project	1	15.0	NO	5,165	4,755	3,994
Custom	Steam Boiler Replacement	FALSE	Project	1	25.0	NO	23,453	21,591	18,136
Custom	Steam to VRF	FALSE	Project	1	16.0	NO	6,706	6,174	5,186
Custom	Steam Trap Jackets	FALSE	Project	1	15.0	NO	41,491	33,481	28,124
Custom	Tank Insulation and RO System	FALSE	Project	2	15.0	NO	22,183	20,422	17,154
Custom	Ventilators	FALSE	Project	3	15.0	NO	12,746	12,026	10,102
Custom	VRF	FALSE	Project	1	16.0	NO	19,823	18,249	15,329
Custom	Water Heater	FALSE	Project	3	15.0	NO	6,092	5,651	4,747
Custom	HVAC Upgrade	TRUE	Project	3	15.0	NO	37,472	34,623	34,623
Custom	Ventilators	TRUE	Project	1	15.0	NO	4,290	4,136	4,136
Custom	VFD	TRUE	Project	1	15.0	NO	4,864	4,478	4,478
Custom	Window Replacement	TRUE	Project	1	40.0	NO	4,971	4,576	4,576
NG-RCx	AHU Controls Upgrade	FALSE	Project	1	15.0	NO	5,692	5,351	4,495
NG-RCx	Burner Upgrade	FALSE	Project	3	20.0	NO	91,150	91,150	76,566
NG-RCx	Damper Control Replacement	FALSE	Project	1	20.0	NO	382,747	365,982	307,425
NG-RCx	Dryer Tune Up	FALSE	Project	1	2.0	NO	28,421	28,421	23,874
NG-RCx	Steam Ejectors	FALSE	Project	1	15.0	NO	66,592	54,714	45,960
NG-RCx	Steam Reduction	FALSE	Project	1	15.0	NO	28,910	28,910	24,284
Total or Weighted Average					**19.2**		**3,369,925**	**3,126,119**	**2,633,590**

Source: Evaluation team analysis.