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| Business Custom Impact Evaluation Report  Energy Efficiency Plan: Program Year 2024  (1/1/2024-12/31/2024) | | | | | | | |
| Prepared for:  Nicor Gas Company  DRAFT  April 24, 2025 | | | | | | | |
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# 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.

# 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 the following table. 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** |  |  |  |
| 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. 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.

# Program Savings Detail

Table 3 summarizes the energy savings the Business Custom Program achieved by Business Custom and NG-RCx paths in 2024.

Table 3. 2024 Annual Energy Savings Summary

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Program Category | Program Path | Ex Ante Gross Savings (Therms) | Verified Gross RR\* | Verified Gross Savings (Therms) | NTG† | 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 | 83% | 498,737 | 0.84 | 418,939 |
| ***Private, Non-DAC Subtotal*** |  | **2,947,998** | **91%** | **2,673,356** | **0.84** | **2,245,619** |
| Public, Non-Disadvantaged Communities | Custom | 364,638 | 90% | 329,159 | 0.84 | 276,494 |
| NG-RCx | 5,692 | 79% | 4,512 | 0.84 | 3,790 |
| ***Public, Non-DAC Subtotal*** |  | **370,330** | **90%** | **333,671** | **0.84** | **280,283** |
| 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** | | **3,369,925** | **91%** | **3,054,840** |  | **2,573,716** |

\* 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.

# 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 the following table.

Table 4-1. 2024 Annual Energy Savings by Measure

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | 77% | 295,542 | 0.84 | 248,256 |
| Custom 2,500-7,500 therms | 215,073 | 94% | 203,195 | 0.84 | 170,684 |
| ***Private, Non-DAC Subtotal*** |  |  | ***2,947,998*** | **91%** | ***2,673,356*** | **0.84** | ***2,245,619*** |
| 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 | 79% | 4,512 | 0.84 | 3,790 |
| ***Public, Non-DAC Subtotal*** |  |  | ***370,330*** | **90%** | ***333,671*** | **0.84** | ***280,283*** |
| 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** | | | **3,369,925** | **91%** | **3,054,840** |  | **2,573,716** |

\* 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 the following table.

Table 4-2. 2024 Annual Energy Savings by Measure

| Savings Category | 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 | 40,194 |
| Dryer | 401,369 | 98% | 393,314 | 0.84 | 53,015 |
| Damper Control Replacement | 382,747 | 77% | 295,542 | 0.84 | 4,924 |
| Boiler Replacement | 358,441 | 87% | 312,075 | 0.84 | 62,297 |
| Burner Upgrade | 348,316 | 91% | 315,865 | 0.84 | 26,943 |
| Controls Upgrade | 204,233 | 86% | 174,852 | 0.84 | 262,143 |
| Atomizing Furnace & Coil Heater | 91,907 | 81% | 74,163 | 0.84 | 20,798 |
| HVAC Upgrade | 84,982 | 92% | 78,508 | 0.84 | 265,326 |
| Furnace Rebuild | 83,272 | 83% | 69,027 | 0.84 | 18,697 |
| AHUs | 76,648 | 82% | 63,113 | 0.84 | 16,494 |
| Cooler Doors | 67,199 | 92% | 61,863 | 0.84 | 146,876 |
| Steam Ejectors | 66,592 | 82% | 54,714 | 0.84 | 51,965 |
| AHU Controls Upgrade | 52,768 | 91% | 47,850 | 0.84 | 248,256 |
| Roof | 42,546 | 81% | 34,416 | 0.84 | 330,384 |
| Steam Trap Jackets | 41,491 | 81% | 33,481 | 0.84 | 23,874 |
| Boiler Controls | 34,841 | 92% | 32,075 | 0.84 | 10,232 |
| Steam Reduction | 28,910 | 100% | 28,910 | 0.84 | 13,286 |
| Dryer Tune Up | 28,421 | 100% | 28,421 | 0.84 | 57,983 |
| Boiler Upgrade | 26,895 | 92% | 24,760 | 0.84 | 1,741 |
| Compressor Heat Recovery | 24,178 | 92% | 22,258 | 0.91 | 71,486 |
| Steam Boiler Replacement | 23,453 | 92% | 21,591 | 0.84 | 11,204 |
| Tank Insulation and RO System | 22,183 | 92% | 20,422 | 0.84 | 2,126 |
| Condensing Boilers and Water Heaters | 21,083 | 93% | 19,636 | 0.84 | 5,518 |
| VRF | 19,823 | 92% | 18,249 | 0.84 | 28,910 |
| EMS Controls Upgrade | 17,181 | 92% | 15,817 | 0.84 | 1,011 |
| Ventilators | 17,036 | 95% | 16,162 | 0.84 | 611,827 |
| Insulation | 14,488 | 92% | 13,338 | 0.84 | 3,994 |
| Economizer | 13,232 | 92% | 12,181 | 0.84 | 18,136 |
| Oven Upgrade | 7,135 | 92% | 6,568 | 0.84 | 45,960 |
| Steam to VRF | 6,706 | 92% | 6,174 | 0.84 | 24,284 |
| ARUs | 6,368 | 92% | 5,862 | 0.84 | 5,186 |
| Water Heater | 6,092 | 93% | 5,651 | 0.84 | 28,124 |
| RTU | 5,165 | 92% | 4,755 | 0.84 | 17,154 |
| Window Replacement | 4,971 | 92% | 4,576 | 0.88 | 14,238 |
| VFD | 4,864 | 92% | 4,478 | 1.00 | 4,478 |
| Modulating Steam Valve | 2,625 | 96% | 2,531 | 0.84 | 15,329 |
| Heat Plant Blankets | 2,150 | 96% | 2,073 | 0.84 | 4,747 |
| Rooftop Heat Pumps | 1,248 | 96% | 1,203 | 1.00 | 4,576 |
| **Total or Weighted Average** | **3,369,925** | **91%** | **3,054,840** | **0.84** | **2,573,716** |

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).

Source: Evaluation team analysis.

# Impact Analysis Findings and Recommendations

## Impact Parameter Estimates

Table 5 shows the unit therm savings and realization rate findings by measure from our review. The realization rate is the ratio of the verified savings to the ex ante savings. Following the table, we provide findings and recommendations, including 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 | 83% | 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.

## 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 77%.

**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.

##### 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** | **N** | **Ex Ante Gross Savings** | **Sampled % of Population** |
| **(Therms)** | **(Therms)** | **(% 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** | **Mean RR** | **Standard Error** |
| --- | --- | --- | --- | --- |
| **+ or - %** |
| Business Custom and NG-RCx | 1 | 0% | 100% | 0.00 |
| 2 | 31% | 81% | 0.08 |
| 3 | 6% | 92% | 0.03 |
| 4 | - | - | - |
| RCx1 | 0% | 77% | 0.00 |
| RCx2 | 0% | 82% | 0.00 |
| RCx3 | 0% | 100% | 0.00 |
| RCx4 | - | - | - |
| Custom Total RR (90/10) | | 4% | 91% | 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.  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 | 77% | 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

##### 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 |
| 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 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | 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 | 4,512 | 3,790 |
| 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 | 295,542 | 248,256 |
| 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** | **3,054,840** | **2,573,716** |

Source: Evaluation team analysis.