Guidehouse

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CC:	Laura Agapay-Read, Jeff Erickson, Guidehouse
From:	Celina Aguilar, Guidehouse; Kumar Chittory, Greg Vitz, Verdant
Date:	August 25, 2025
Re:	Nicor Gas Business Energy Efficiency Rebates (BEER) NTG Survey Research Results

1. Executive Summary

This memo presents the results of the surveys conducted by Guidehouse focusing on free ridership (FR) for the 2023 and 2024 program years and spillover (SO) for the 2022 and 2023 program years for the Nicor Gas Business Energy Efficiency Rebates (BEER) program. Guidehouse designed the surveys in accordance with the Illinois Technical Resource Manual (TRM) version 12.0 (v12.0).[1] The surveys focused on customers and vendors who participated in the BEER Program. The participant survey for program year 2023 was conducted in July 2024, while the survey for program year 2024 was conducted between February and May 2025. The combined effort secured responses from 14 participants[2], achieving 90% confidence with 13% precision. The trade ally survey was conducted in July 2024 and secured responses from 29 participants, achieving 90% confidence with 6% precision.

These results will inform Guidehouse's September 2025 recommendations to the Illinois Stakeholder Advisory Group (SAG) of net-to-gross (NTG) values to be used for this program in PY2026.

Guidehouse surveyed commercial customers who participated in the Nicor Gas BEER Program between January 1, 2023, and December 31, 2024, for free ridership and those who participated between January 1, 2022, and December 31, 2023, for spillover. Additionally, Guidehouse surveyed vendors (aka trade allies) who provided products and services through the program between January 1, 2023, and December 31, 2023, for both free ridership and spillover.

Table 1 summarizes the BEER program FR and SO research findings based on the commercial customer and trade ally research.

[1] Because the survey instrument and algorithm were finalized in 2024, TRM v12.0 was used.

[2] All participant samples excluded participants in disadvantaged communities as savings for those participants have deemed NTG values as described in the Energy Efficiency Policy Manual Section 7.4.

Table 1. Net-to-Gross Research Results for Business Energy Efficiency Rebates

Program Name	Participant Free Ridership	Participant Spillover	Trade Ally Perspective of Participant Free Ridership	Trade Ally Spillover	Weighted FR
Business Energy Efficiency Rebates	0.18	0.00	0.18	0.00	0.18

Source: Evaluation team analysis

The results from the participant and trade ally surveys were triangulated using the approach outlined in the TRM. The detailed methodology is provided in Section 4.2 of this memo. None of the respondents who completed a spillover survey reported undertaking high-efficiency improvements that would qualify as spillover. Among the trade ally respondents, only two of the 29 reported spillover activity, but the associated savings were negligible (a spillover rate less than 0.001 for that trade ally).

Guidehouse conducted NTG studies for this program in previous portfolio cycles, with researched NTG values ranging from 0.68 to 0.86. See APPENDIX A. for more information on NTG history for this program.

2. Survey Disposition

Table 2 below summarizes completed interviews and the corresponding representation of program savings across participant free ridership, participant spillover, and trade ally surveys.

Table 2. Participant Survey Disposition

	Population	Sample	Target Completes	Analyzed Completes	Share of Program Savings Represented by Analyzed Completes
Participant Free Ridership	329	158*	34	14	10%
Participant Spillover	368	280	59	15	N/A
Trade Ally	130	130	80	29	42%

* The sample design for the participant free ridership survey excluded the smallest projects, those with savings less than 1,200 therms, as their savings-weighted result would have negligible impact on the program free ridership.

Source: Evaluation Team Analysis

2.1 Participant Free Ridership and Spillover Surveys

For participant surveys, the evaluation team conducted a combination of telephone interviews and web surveys with key decision makers. To enhance recruitment, we conducted additional outreach by requesting Nicor Gas to send emails to projects with higher savings, encouraging the participants to schedule interviews and offering a web survey option.

The evaluation team was able to complete 14 participant interviews for FR that represented approximately 10% of the total population savings.

2.2 Trade Ally Survey

The evaluation team took a census approach to gathering responses from all 130 trade allies that participated in the program. The evaluation team completed 29 interviews that represented approximately 42% of the total population savings.

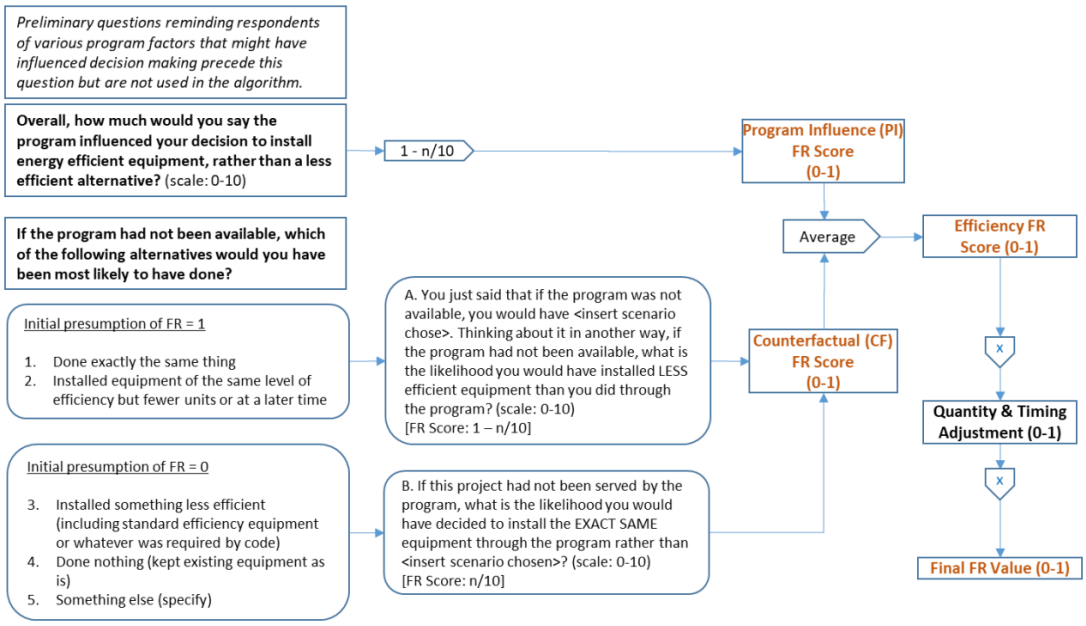
3. Free Ridership and Spillover Protocols

The evaluation team applied the relevant free ridership and spillover protocols from Illinois TRM v12.0, as described below.

3.1 Participant Free Ridership

The evaluation team applied the Core Non-Residential algorithm to calculate participant free ridership, as shown in Figure 1. The diagram is sourced directly from the Illinois TRM v12.0.

Figure 1. Core Non-Residential Participant Free Ridership Protocol



Source: 2024 Illinois Statewide Technical Reference Manual (TRM) for Energy Efficiency Version 12.0, Compiled Version (page 1625). 2024 Illinois TRM

The Quantity and Timing adjustment shown in the NTG algorithm above is estimated using the following equations from Illinois TRM v12.0 (page 1628 of Compiled version).

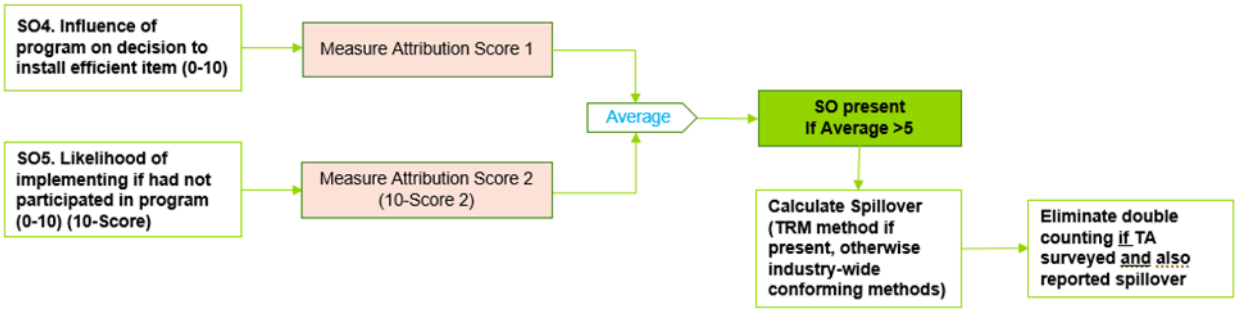
$$\textit{2-year Time Horizon Timing Adjustment} = 1 - (\textit{Number of Months Expedited} - 6)/18$$

$$\textit{Q\&T Adjustment} = (\textit{\% Not Installed at Same Time} * \textit{Timing Adjustment}) + \textit{\% Installed at Same Time}$$

3.2 Participant Spillover

The evaluation team applied the Core Non-Residential protocol for calculating participant spillover based on the Illinois TRM v12.0 Attachment A section 3.1.2. Figure 2 depicts the general technique for determining the presence of spillover and methods for its calculation.

Figure 2. Core Non-Residential Participant Spillover Protocol.

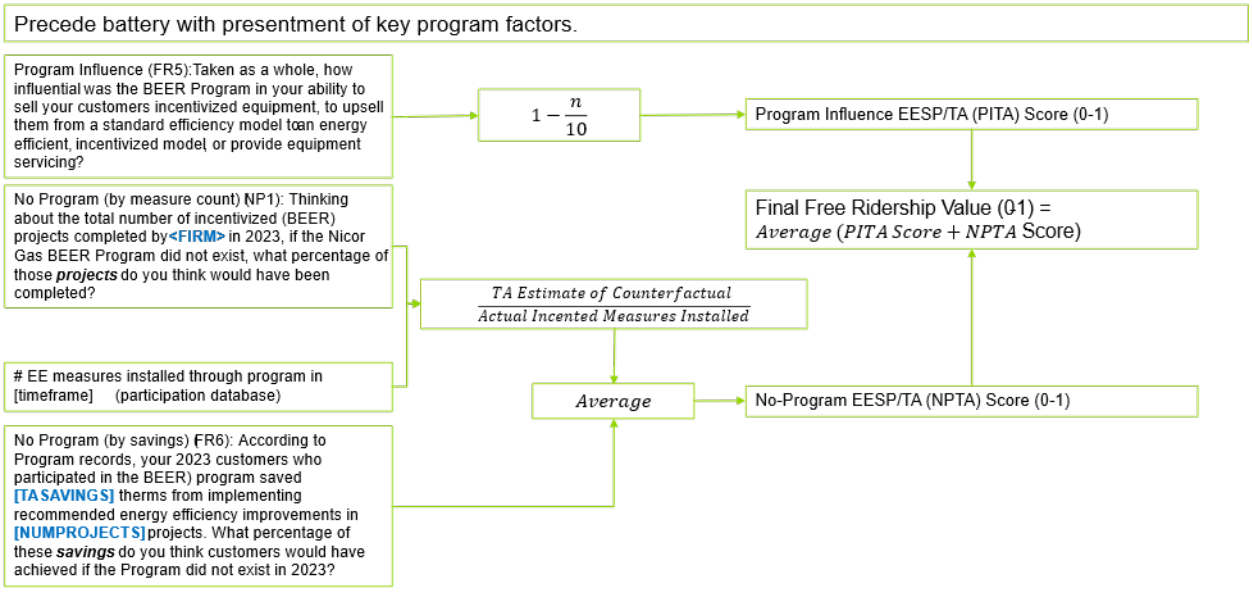


Source: Guidehouse designed this depiction of the algorithm based on the content from the 2024 Illinois TRM Version 12.0, Compiled Version, Attachment A, Sections 3.1.2 and 3.1.3, from pages 1629-1632 and pages 1632-1636 respectively.

3.3 Trade Ally Perspective of Participant Free Ridership

Figure 3 presents the questions and algorithm used for calculating free ridership scores for trade allies. The algorithm (developed by Guidehouse) is based on guidance from the Illinois TRM v12.0.

Figure 3. Trade Ally Free Ridership Algorithm



Source: Guidehouse

4. Participant and Trade Ally Free Ridership Results

The evaluation team calculated FR estimates for the BEER Program participants and vendors using the data collected via the participant and trade ally surveys and applied the protocols described

above. Table 3 below presents the FR estimates and the relative precision of the estimates for participants and trade allies both separately and combined.

Table 3. Program Free Ridership Research Results

Population	Free Ridership	Relative Precision @ 90% CI
Participant	0.18	0.129
Trade Ally	0.18	0.067
Combined Free Ridership	**0.18**	**N/A**

* The analysis estimates relative precision at the 90 percent confidence level by calculating the standard error of the NTGR mean and adjusting for the total population size."

Source: Evaluation Team Analysis, Combination process described in Section 4.2

4.1 Free Ridership Consistency Check Analysis

The evaluation team checked for consistency in participant and trade ally free ridership responses. Respondents were asked to describe in their own words any influence that the Nicor Gas BEER Program had on participants' decision to implement measures at their facilities and trade allies' ability to sell and service energy efficient equipment to their customers.

According to the IL TRM v12.0, Volume 4, Section 3.1.1.1, a consistency check is triggered when either of the following conditions is met:

1) The Program Influence FR Score is greater than 0.7 AND the Counterfactual/No-Program FR Score is less than 0.3.

OR

2) The Program Influence FR Score is less than 0.3 AND the Counterfactual/No-Program FR Score is greater than 0.7.

For respondents who failed the consistency checks, the evaluation team reviewed the verbatim responses to determine which of the program influence score and counterfactual score was inconsistent with the verbatim.

For the participant surveys, four of the 14 respondents triggered consistency checks. For three of these cases, no change was made to the original scores based on the evaluation team's review of the scores and open-ended responses (i.e., the scores and the open-ended responses aligned). For the fourth case, the evaluation team followed up with the participant to gather additional information. In that follow-up, the participant confirmed their original responses, thus no update to the original responses were necessary or made.

For trade allies, the evaluation team determined that two of the 31 respondents provided inconsistent responses between their reported Program Influence Score and No-Program Score that could not be resolved by their verbatim responses to open-ended questions. The evaluation team attempted to follow up with these respondents but were unable to obtain updated information. As a result, their responses were not included in the analysis.

4.2 Combining Participant and Trade Ally Free Ridership

Guidehouse calculated a combined participant and trade ally FR estimate utilizing the triangulation approach outlined in IL TRM v12.0 (Section 5.1 Volume 4). This approach rates the participant and trade ally survey data on three aspects: accuracy, validity, and representativeness, using a scale where 100% means "extremely so" and 0% means "not at all."

1. **Accuracy**: How likely is the approach to provide an accurate estimate of FR?
    a. We calculated the participant and trade ally portions based on a comparison of their relative precision (RP) values from the FR estimates.
    b. For this program, the Relative Precision (RP) from the participant surveys (0.13) was higher than that of the Trade Ally (TA) surveys (0.07), indicating that the participant result was less precise. To base our Accuracy score on RP, we normalized and inverted the result using the equation below. This resulted in a weight of 34 percent for the participant data and 66 percent for the TA data.

$$Normalized\ Weight = 1 - (\frac{Participant\ or\ Trade\ Ally\ RP}{Participant\ RP + Trade\ Ally\ RP})$$

2. **Validity**: How valid are the data collected and the analysis? The evaluation team averaged quantitative and qualitative scoring for Validity.
    a. The quantitative score for participants and trade allies was based on the number of complete interviews relative to their total population. Only 14 of the 319 participant projects completed surveys, resulting in a normalized score of 10 percent (Refer to the formula below). In comparison, 29 out of 130 trade allies completed surveys, yielding a normalized score of 90 percent.

$$Normalized\ \%\ Weight = \frac{\%\ Complete\ for\ Participant\ or\ TradeAlly}{(\%\ Complete_{Participant} + \%\ Complete_{TradeAlly})}$$

    b. The qualitative score reflects the nature of the surveys. Participant surveys ask project-specific questions and, thus, are likely to have lower recall bias, earning a higher qualitative score of 60 percent. Trade ally interviews cover multiple projects over the year and were assigned a qualitative score of 40 percent.
    c. By averaging the quantitative and qualitative scores, the final Validity scores are 35 percent for participants and 65 percent for trade allies.

3. **Representativeness**: How representative is the sample?
    a. Representativeness was based on the relative percentage of total savings represented by the participants and the TA surveys.
    b. For this program, the percentage of total savings represented by the participant sample is 10%, and the percentage of total savings represented by the TA sample is 42%. The percentages were normalized according to the equation below, resulting in a weight of 19% for participants and 81% for TAs.

$$Normalized\ \%\ Weight = \frac{\%\ Savings\ Responding\ Participant\ or\ TradeAlly}{(\%\ Savings_{Participant} + \%\ Savings_{TradeAlly})}$$

Table 4 describes the scoring for all aspects and the final free ridership scoring weights for participants and trade allies.

Table 44. Free Ridership Triangulation Weighting Approach for Business Energy Efficiency Rebates

Free Ridership Triangulation Data and Analysis	Participant	Trade Ally
How likely is this approach to provide an accurate estimate of free ridership?	34%	66%
How valid is the data collected/analysis?	35%	65%
How representative is the sample?	19%	81%
Average Score (Weight)	30%	70%

Source: Evaluation Team analysis

Applying these participant and trade ally average scores to the respective FR estimates yields the blended FR estimates shown in the equation below.

$$\begin{aligned} Free\ Ridership &= (Participant\ FR) * (Participant\ Weight) + (TA\ FR) * (TA\ Weight) \\ &= 0.18 * 0.30 + 0.18 * 0.70 \\ &= 0.18 \end{aligned}$$

Using the formula shown above, the evaluation team calculated a weighted average of participant and trade ally free ridership (FR), with weights derived from the triangulation approach. This yielded a combined free ridership estimate of 0.18.

4.3 Participant and Trade Ally Spillover Results

None of the participant responses included spillover. Participants either indicated they did not install additional measures, or reported Measure Attribution Scores that did not meet the threshold for calculating spillover for additional measures they had installed. Therefore, participant spillover is set to zero.

Of the 29 trade allies included in the analysis, only two reported selling additional non-program-incentivized high efficiency measures and passed all spillover screening criteria. For these two respondents, the estimated gross energy savings from non-rebated measures totaled 467 therms. In comparison, the total gross energy savings from the 29 trade allies who responded to the survey was 2,143,500 therms, resulting in a trade ally spillover rate of less than 0.1%. Table 5 summarizes all spillover results.

Table 5.5 Spillover Research Results

Population	Participants Contributing to Spillover	Spillover Therms	Spillover Rate
Participants	0	0	0.000
Trade Allies	2	467	<0.001

Source: Evaluation team analysis

5. Final NTG Results and Recommendations

The final NTG value is calculated as 1- free ridership + participant spillover + non- participant spillover, using savings-weighted values from both participants and trade allies, and incorporates spillover reported by participant and trade allies. This results in the following NTG formula:

$$NTG = 1 - [(Part\ FR * Part\ Weight) + (TA\ FR * TA\ Weight)] + Part\ and\ Non\ Part\ SO + TA\ SO$$

The final, combined components of the NTG are shown in Table 6. Guidehouse conducted NTG studies for this program in previous portfolio cycles, with researched NTG values ranging from 0.68 to 0.86.

Table 6.6 Free Ridership and Participant Spillover for BEER Program

Participant Free Ridership	Trade Ally Free Ridership	Weighted Free Ridership	Participant Spillover	Non-Participant Spillover*	Trade Ally Spillover	NTG Ratio
0.18	0.18	0.18	0.00	0.01	<0.001	0.83

* Non-participant spillover reported by non-participating trade allies in GPY2 and 2018 research.
Source: Evaluation team analysis

APPENDIX A. BEER Program NTG History

	BUSINESS ENERGY EFFICIENCY REBATE PROGRAM
GPY1	**NTG** 0.73 **Free ridership** 0.27 **Spillover** 0.00 **Method:** Customer self-report: 34 surveys completed from a population of 146. Standard Rigor approach. No quantifiable participant spillover was found from customer self-reports.
GPY2	**NTG** 0.73 **Free ridership** 27% **Spillover** 0% **Method:** SAG approved NTG ratio based on GPY1 research.
GPY3	**NTG** 0.83 **Free ridership** 27% **Spillover** 10% **Method**: SAG approved NTG ratio based on GPY1 free-ridership research and deemed spillover.
GPY4	**NTG** 0.83 **Free ridership** 27% **Spillover** 10% **Method**: NTG values for GPY4 were deemed using values from GPY3 and reported in Table 14 of the Nicor Gas filed Energy Efficiency Plan for GPY4-GPY6.
GPY5	**NTG** 0.68 **Free ridership** 35% **Participant Spillover** 1%

	BUSINESS ENERGY EFFICIENCY REBATE PROGRAM
	Non-Participant Spillover: 2% Method: NTG ratio based on GPY4 free-ridership and participant spillover research consisting of interviews with 44 GPY3 customer participants and 20 GPY3 trade ally participants. Standard Rigor approach. Non-participant spillover drawn from GPY2 research consisting of 31 non-participating trade ally interviews.
GPY6	NTG 0.68 Free ridership 35% Participant Spillover 1% Non-Participant Spillover: 2% Method: NTG ratio based on GPY4 free-ridership and participant spillover research. Nonparticipant spillover drawn from GPY2 research consisting of 31 non-participating trade ally interviews.
GPY7	NTG 0.68 Free ridership 35% Method: No new research. Retained GPY6 final value.
2019-2025	NTG 0.86 Free ridership 19% Participant Spillover 4% Non-Participant Spillover: 1% Method: Based on FR, PSO, and Steam Trap NPSO from 2018 Navigant research with 2018 BEER program participants, trade allies, and non-participating steam trap trade allies. Participant FR value of 0.23 based on 31 interviews (C/P=90/11). Trade Ally FR of 0.11 is based on interviews with 12 non-steam trap TAs and 7 steam trap TAs. Participant/TA FR results weighted 66/34. Participant spillover from 2 respondents of 31 interviews with 2018 participants: installed steam traps (majority of PSO) and non-steam trap measures (minimal PSO). Non-Steam Trap NPSO (Nicor Gas EM&V GPY2) value is 0.02 weighted with steam trap NPSO (0.0) to equal 0.01. Non-participant spillover from GPY2 research consisted of 31 non-participating trade ally interviews, of which 10 responded to spillover questions and two identified spillover amounting to 2% of program savings. Reviewing the 2018 steam trap NTG research that included participants, and participating and non-participating trade allies, we revised the steam trap non-participant spillover to zero. We did not change the non-participant spillover for non-steam traps.

Source : https://www.ilsag.info/policy/net-to-gross-framework/