Guidehouse

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From:	Celina Aguilar, Guidehouse; Kumar Chittory, Trace O'Rorke, Verdant
Date:	August 25, 2025
Re:	Nicor Gas Small Business Program NTG Survey Research Results

1. Executive Summary

This memo presents the results of surveys conducted by Guidehouse focusing on program free ridership (FR) and spillover (SO) for 2024 and 2023 program years, respectively. Guidehouse designed the surveys in accordance with the Illinois Technical Resource Manual version 13.0 (TRM). The surveys focused on customers ("participants") and vendors ("trade allies") who participated in or sold rebated equipment through the Small Business Program, respectively. The survey was conducted from March 2025 to May 2025. We secured ten responses from participants for the free ridership survey achieving 90% confidence at 23% relative precision and seven responses from trade allies achieving 90% confidence at 5% relative precision. For the Participant SO we secured 19 responses with zero spillover savings reported.

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

Table 1 summarizes the Small Business Program FR and SO research findings based on the participant and trade ally research.

Table 1. Net-to-Gross Research Results for Nicor Gas Small Business Program

Measure	Participant Free Ridership	Trade Ally Free Ridership	Weighted Free Ridership	Participant Spillover	Trade Ally Spillover	NTG Ratio
All Measures	0.26	0.02	0.06	0.00	0.02	0.96

Source: Evaluation team analysis

The free ridership 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. Of the 22 participants who completed a spillover survey, none reported undertaking high-efficiency improvements that would qualify as spillover. Among the trade ally respondents, two of the seven respondents reported spillover activity, with an associated spillover rate of two percent.

2. Survey Disposition

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

Table 2. Participant Survey Disposition

Survey	Population	Sample	Target Completes	Analyzed Completes	Share of Program Savings Represented by Analyzed Completes
Participant Free Ridership	442	124*	55	10	6%
Participant Spillover	370	279	63	22	N/A
Trade Ally	66	9	9	7	91%

* The sample design for the participant free ridership survey excluded the smallest projects, those with savings less than 2,500 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, the evaluation team conducted additional outreach by requesting Nicor Gas to send emails to projects with higher savings, encouraging the participants to complete the web surveys. The evaluation team conducted enhanced recruitment to Korean-speaking participants (whose savings amount to at least 44% of program savings) via email outreach in Korean with a link to conduct a telephone survey in Korean.

The evaluation team completed nine web surveys and one phone interview with a Korean speaking participant which represent approximately 6% of the total population therms savings. The SO participants reported no spillover savings.

2.2 Trade Ally Survey

The evaluation team targeted nine completed surveys for trade allies who participated in the program. The evaluation team completed seven interviews from trade allies that represented approximately 91% of the total program savings in 2024.

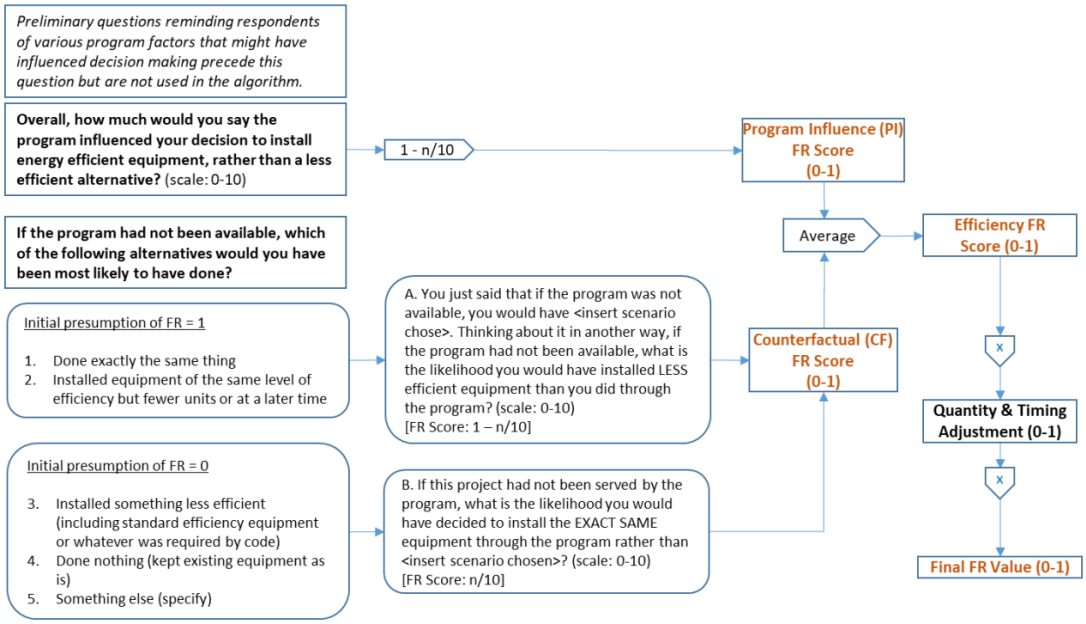
3. Free Ridership and Spillover Protocols

The evaluation team applied the relevant participant and trade ally free ridership and spillover protocols from Illinois TRM v13.0, 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.

Figure 1. Core Non-Residential Participant Free Ridership Protocol



Source: 2025 Illinois Statewide Technical Reference Manual (TRM) for Energy Efficiency Version 13.0, Compiled Version (page 1658). 2024 Illinois TRM

The Quantity and Timing adjustment shown in the NTG algorithm above is estimated using the following equations from Illinois TRM v13.0 (page 1661 of Compiled version of the TRM).

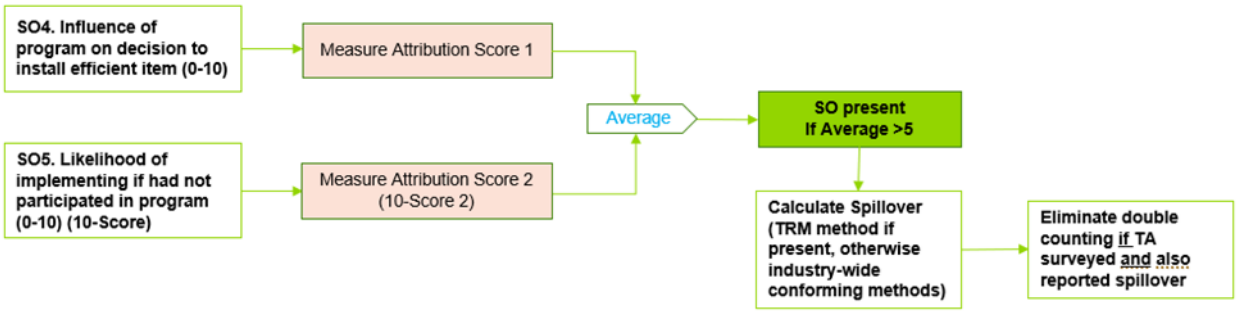
$$\textit{2-year Time Horizon Timing Adjustment} = 1 - (\textit{Number of Months Expedited} - 6)/18$$

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

3.2 Participant Spillover

The evaluation team applied the Core Non-Residential protocol for calculating participant spillover based on the Illinois TRM v13.0 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

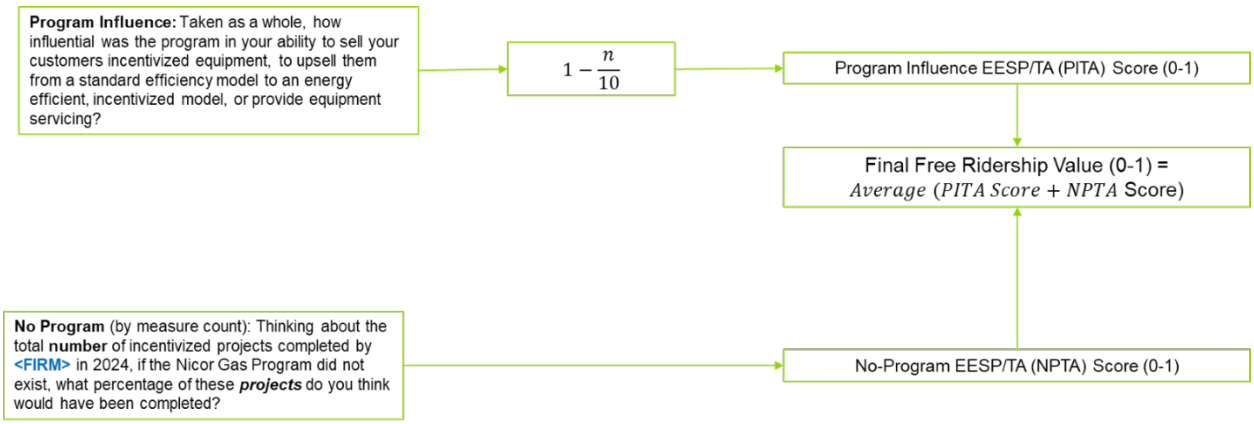


Source: Guidehouse designed this depiction of the algorithm based on the content from the 2025 Illinois TRM Version 13.0, Compiled Version, Attachment A, Sections 3.1.2 and 3.1.3, from pages 1662-1665 and pages 1665-1669 respectively.

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. As the TRM does not specify a method to estimate trade ally FR, Guidehouse developed the algorithm illustrated below.

Figure 3. Trade Ally Free Ridership Algorithm

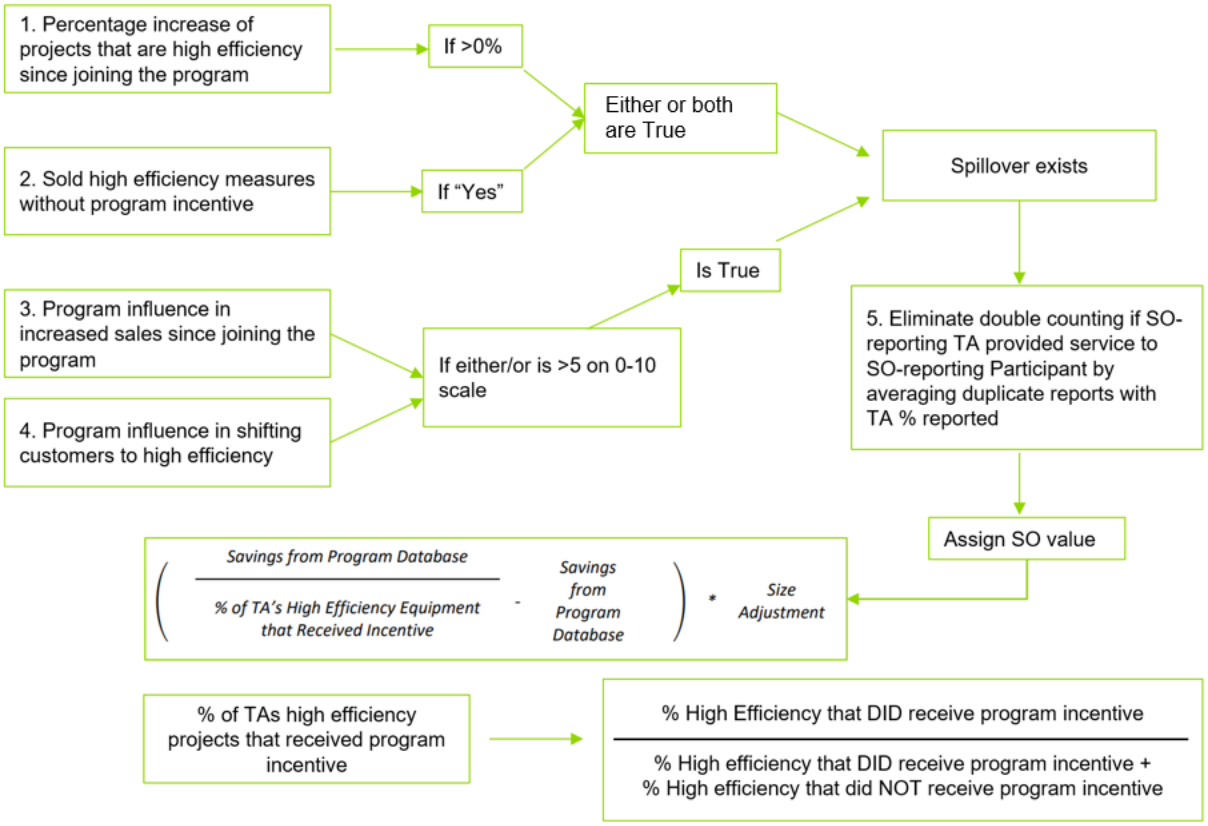


Source: Guidehouse

3.4 Trade Ally Spillover

Figure 4 presents the questions and algorithm used for calculating spillover scores for trade allies. The algorithm (depicted below by Guidehouse) is based on the Illinois TRM v13.0 Attachment A section 5.2. This formula directly calculates spillover as a percentage of program savings from responding trade allies.

Figure 4. Trade Ally Spillover Algorithm



Source: Guidehouse designed this depiction of the algorithm based on the content from the 2025 Illinois TRM Version 13.0, Compiled Version, Attachment A, Section 5.2.1. pages 1709-1711.

4. Participant and Trade Ally Free Ridership Results

The evaluation team calculated FR estimates for the Small Business 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	0.26	0.23
Trade Ally	0.02	0.05
Combined Free Ridership	**0.06**	**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 Small Business 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 v13.0, 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, one of the ten respondents triggered a consistency check. Based on the evaluation teams' review of this participant's scores and open-ended responses, no adjustments were required.

For trade allies, none of the seven respondents provided responses that triggered a consistency check, and therefore no adjustments were required.

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 v13.0 (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 participant surveys have a Relative Precision (RP) of 0.23, while the trade ally surveys have an RP of 0.05. Since lower RP values indicate more precise data, the higher RP for the participant survey suggests they are less reliable. To reflect this in our accuracy scoring, we normalized and inverted the RP values using the equation below. This resulted in a weight of 18 percent for the participant data and 82 percent for the TA data.

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

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 ten of the 442 participant projects completed surveys, resulting in a normalized score of two percent (Refer to the formula below). In comparison, seven out of 66 trade allies completed surveys, yielding a normalized score of 11 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. In contrast, TA surveys cover multiple projects over the year. Alone these factors would lead us to score participant validity higher than TA's. However, because Small Business participants typically do not understand the market to the extent that TAs do, we rate TA validity at 60% and participant validity at 40%.
    c. By averaging the quantitative and qualitative scores, the final Validity scores are 29 percent for participants and 71 percent for trade allies.

3. **Representativeness**: How representative is the sample?
    a. We assigned six percent weight to the participant portion, which is the percentage of Small Business Program savings represented by the participants who responded to the participant survey.
    b. We assigned 94 percent weight to the trade ally portion, which is the percentage of Small Business Program savings represented by the trade allies who responded to the trade ally survey.

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

Table 4. Free Ridership Triangulation Weighting Approach

Free Ridership Triangulation Data and Analysis	Participant	Trade Ally
How likely is this approach to provide an accurate estimate of free ridership?	18%	82%
How valid is the data collected/analysis?	29%	71%
How representative is the sample?	6%	94%
Average Score (Weight)	**18%**	**82%**

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.

$$\begin{aligned} Free\ Ridership &= (Participant\ FR) * (Participant\ Weight) + (TA\ \ FR) * (TA\ \ Weight) \\ &= 0.26 * 0.18 + 0.02 * 0.82 \\ &= 0.06 \end{aligned}$$

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 0.06.

4.3 Participant and Trade Ally Spillover Results

None of the participant responses demonstrated spillover. Participants either indicated they did not install additional measures, or reported measure attribution scores that did not meet the threshold to qualify as spillover. Therefore, participant spillover is zero.

Of the seven trade allies in the analysis, only two reported selling additional non-program-incentivized high efficiency measures and passing all spillover attribution screening criteria. For the two respondents, the estimated gross energy savings from non-rebated measures totals 23,135 therms. In comparison, the total gross energy savings of the seven trade allies who responded to the survey was 1,533,837 therms, resulting in a trade ally spillover rate of two percent. Table 5 summarizes all spillover results.

Table 5. Spillover Research Results by Measure

Population	Respondents Contributing to Spillover	Spillover Therms	Spillover Rate
Participants	0	0	0%
Trade Allies	2	23,135	2%

Source: Evaluation team analysis

5. Final NTG Results and Recommendations

The final NTG value is calculated as 1- free ridership, 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:

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

The final, combined components of the NTG are shown in Table 6.

Table 6. Free Ridership and Participant Spillover for Nicor Gas Small Business Program

Measure	Participant Free Ridership	Trade Ally Free Ridership	Weighted Free Ridership	Participant Spillover	Trade Ally Spillover	NTG Ratio
All Measures	0.26	0.02	**0.06**	**0.00**	**0.02**	**0.96**

Source: Evaluation team analysis

Appendix A: Nicor Gas Small Business Program NTG History

	SMALLBUSINESS PROGRAM
GPY1	**NTG** 1.00 **Free ridership** 2% **Spillover** 2% **Method:** Customer self-report combined with trade ally input. 24 participant surveys completed from a population of 272. Basic method of participant free-ridership analysis was used. No participant spillover was found. Customer participant self-reported free ridership was 20 percent for Nicor. Individual trade ally responses (representing over 80% of PY1 program savings) to free ridership questions were weighted by their respective fuel-specific program savings contributions and combined for a fuel-specific maximum overall free ridership rate. This approach resulted in an evaluation estimate of 0.02 free ridership for gas measures that was balanced by spillover of 0.02 resulting in the NTG ratio of 1.00 for Nicor.
GPY2	**NTG** 1.00 **Free ridership** 2% **Spillover** 2% **Method:** SAG deemed NTG ratio based on GPY1 evaluation research.
GPY3	**NTG** 1.00 **Free ridership** 2% **Spillover** 2% **Method:** SAG deemed NTG ratio based on GPY1 evaluation research.
GPY4	**NTG** 1.00 **Free ridership** 2% **Spillover** 2% **Method:** NTG values for GPY4 were deemed using the researched value from GPY1 (carried forward to GPY3) and reported in Table 14 of the Nicor Gas filed Energy Efficiency Plan for GPY4-GPY6.
GPY5	**NTG** 0.93 **Free ridership** 9% **Spillover** 2% **Method:** The GPY5 NTG value uses an equal-weight average of the free-ridership estimate from participant survey research performed on ComEd participants during EPY7 with the free-ridership estimate derived from Nicor Gas trade ally interviews in GPY1. For participant spillover, the EPY7 ComEd result was 2%, the Nicor Gas GPY1 result was 2%, and PGL/NSG GPY1 result was 1%. A value of 2% for participant spillover was set for all three utilities. This results in the NTG ratio of 0.93. For ComEd PY7 NTG research, Navigant conducted a CATI survey of 70 program projects drawn at random from a sample frame of 4,441 projects with ex-ante savings of 5,000 kWh or greater, representing 82 percent of PY7 projects and 98 percent of PY7 expected savings. Sample size chosen to attain +/- 10 percent precision at 90 percent confidence.
GPY6	**NTG** 0.93 for Direct Install, Retrofit (custom and prescriptive projects). **Free ridership 0.09; average of participant (0.16) and trade ally (0.03)** **Participant Spillover** 0.02 **Non-Participant Spillover** 0.00

	SMALLBUSINESS PROGRAM
	Method: The GPY6 NTG value uses an equal-weight average of the 16 percent free ridership estimate from participant survey research performed on ComEd participants during EPY7 (described in GPY5 above) with the three percent free-ridership estimate derived from PGL and NSG trade ally interviews in GPY4. The PGL and NSG GPY4 trade ally free ridership is based on 12 trade ally interviews from a population of 55. The GPY4 trade ally interviews found no spillover. The GPY4 PGL & NSG trade ally free ridership was considered the best available research value for Nicor Gas, based on similarities in program design and measure mix, and trade ally overlap. For participant spillover, the EPY7 ComEd result was 2%, the Nicor Gas GPY1 result was 2%, and PG/NSG GPY1 result was 1%. A value of 2% for participant spillover was set for all three utilities.
2018 (GPY7)	Direct Installation: NTG 0.87; Free ridership 0.14, average of participant (0.23) and trade ally (0.06); Participant Spillover: 0.01; Non-Participant Spillover 0.00. Prescriptive Rebates: NTG 0.81; Free ridership 0.20, average of participant (0.34) and trade ally (0.06); Participant Spillover: 0.01; Non-Participant Spillover 0.00. Custom Incentives: NTG 0.88; Free ridership 0.13, average of participant (0.21) and trade ally (0.06); Participant Spillover: 0.01; Non-Participant Spillover 0.00. Comprehensive Project Roll-up Average: NTG 0.81; Free ridership 0.20, average of participant (0.34) and trade ally (0.06); Participant Spillover: 0.01; Non-Participant Spillover 0.00. Method: Participant free ridership values are from GPY5 evaluation research conducted by CATI telephone survey with GPY5 decision-makers for these two paths: 30 respondents for direct install (90/6); 40 respondents for prescriptive rebates (90/7). The GPY5 research applied the TRM v6.0 NTG algorithms. Due to the small population of Small Business custom projects, the GPY5 research completed only five Small Business custom project participant interviews, achieving a 90/23 result. Participant FR research conducted on the GPY5 Business Custom Program produced a free ridership estimate of 0.21, at 90/12, and 0.21 is judged to be the best available value for a custom path-level free ridership. The GPY5 Business Custom Program research used TRM v6.0 NTG algorithms. Participant spillover of 0.01 is a program-level research result from 75 interviews with Small Business Program GPY5 participants. The GPY5 research applied the TRM v6.0 NTG algorithms. Interviews with 10 trade allies representing 81 percent of program therms savings produced a free ridership value of 0.06, applicable at the program-level, but did not find evidence of PSO or NPSO. The comprehensive roll-up NTG value covers Direct Install, Prescriptive, and Custom Small Business path participants. Participant free ridership of 0.34 is a program-level research result from 75 interviews with Small Business Program GPY5 participants, weighted by GPY5 path savings. The GPY5 research applied the TRM v6.0 NTG algorithms. The roll-up NTG value may be used instead of the path-level NTGs.

	SMALLBUSINESS PROGRAM
2019-2021	No new research. From CY2019, Navigant recommended using the TRM v7.0 methodology to weight the participant and service provider free ridership scores because the weighted triangulation method appropriately gives more weight to more certain results. The free ridership research we used for scoring the weighting of service providers and participants was conducted in GPY5. Navigant reviewed the reports that documented our methodology, sample sizes, survey instruments, and results for free ridership research, and then used judgement to assign scores to the triangulation factors according to TRM v7.0. The TRM v7.0 weighting methodology is not applied to spillover. See Navigant memo: Weighting Gas Utility Small Business Service Provider and Participant Free Ridership using the TRM Version 7.0 Protocol and CY2019 NTG Recommendations, 9/19/18. Direct Install: NTG 0.92; Participant Free Ridership: 0.23; Service Provider Free Ridership: 0.00; 40/60: 0.09; Participant Spillover: 0.01. FR based on responses from GPY5 participants (90/6). Service Provider for direct install is the program implementation contractor - FR is set at zero PSO based on responses from GPY5 participants, TRM v6 NPSO: Ten GPY5 SB trade ally interviews (representing 81% of program savings) found no PSO or NPSO Prescriptive Rebates: NTG -0.83; Participant Free Ridership: 0.34; Trade Ally Free Ridership: 0.06; 44/56: 0.18; Participant Spillover: 0.01. FR based on responses from GPY5 participants (90/7) and TAs, TRM v6 PSO based on responses from GPY5 participants, TRM v6 NPSO: Ten GPY5 SB trade ally interviews found no PSO or NPSO Custom Rebates: NTG: 0.93; Participant Free Ridership: 0.21; Trade Ally Free Ridership: 0.06; 12/88: 0.08; Participant Spillover: 0.01. Participant FR based on Business Custom Program - insufficient number of Small Business custom responses (5) to make path-level estimate (90/23) Trade Ally FR based on ten GPY5 SB TA interviews. PSO based on responses from GPY5 SB participants, TRM v6 NPSO: Ten SB GPY5 trade ally interviews found no PSO or NPSO
2022-2025	NTG 0.96 Free ridership 0.04; weighted average of participant (0.11) and trade ally (0.00) Participant Spillover 0.00 Trade Ally Spillover 0.00 Method: Participant FR and SO based on 12 responses from 2020 and Q1 2021 program participants. Trade Ally FR and SO based on three responses from 2019-2020 program vendors. Program FR determined by savings-weighted averages of P and TA FR and spans all program measures.

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