Guidehouse

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CC:	Laura Agapay-Read, Jeff Erickson, Guidehouse
From:	Celina Aguilar, Steph Grisell, Guidehouse; Kumar Chittory, Gregory Vitz, Verdant
Date:	Aug 27, 2025
Re:	Peoples Gas and North Shore 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" or "TA") who participated in or sold rebated equipment through the Small Business Program, respectively. The survey was conducted from April 2025 to July 2025[1]. We analyzed five responses from participants for the free ridership survey achieving 90% confidence at 24% relative precision, and five responses from trade allies achieving 90% confidence at 5% relative precision. For the participant SO, we secured four responses from the PGL/NSG Small Business program participants, and two of the four reported spillover.

These results will inform Guidehouse's September 2025 recommendations to the Illinois Stakeholder Advisory Group (IL 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 PGL-NSG Gas Small Business Program

Measure	Participant Free Ridership	Trade Ally Free Ridership	Weighted Free Ridership	Participant Spillover	Trade Ally Spillover	NTG Ratio
All Measures	0.18	0.08	0.10	0.02	0.00	0.92

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 four participants who completed a spillover survey, two did not report undertaking high-efficiency improvements or qualified for spillover. Two respondents reported 820 therms of spillover savings, equivalent to two percent of program savings achieved by surveyed participants. None of the five trade ally respondents reported any spillover activity.

[1] 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.

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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	82	68*	21	5	11%
Participant Spillover	100	census	42	4	N/A
Trade Ally	30	census	30	5	55%

* The sample design for the PGL/NSG Small Business participant free ridership survey excluded the smallest projects, those with savings less than 3,000 therms, as their savings-weighted result would have negligible impact on the free ridership of the program.

Source: Evaluation team analysis

2.1 Participant Free Ridership and Spillover Surveys

For participant surveys, the evaluation team conducted web surveys with key decision makers. To enhance recruitment, the evaluation team conducted additional outreach by requesting Peoples Gas and North Shore Gas to send emails to projects with higher savings, encouraging the participants to complete the web surveys.

The evaluation team completed five web surveys, which represent approximately 11% of the total population therm savings. The evaluation team also completed four participant SO surveys.

2.2 Trade Ally Survey

The evaluation team took a census approach to gathering responses from the trade allies. The evaluation team analyzed five interviews from trade allies who accounted for 55% of total program savings. Six interviews were completed, but one respondent with small total savings was dropped during analysis due to inconsistencies with their responses (see section 4.1 for more details regarding consistency checks).

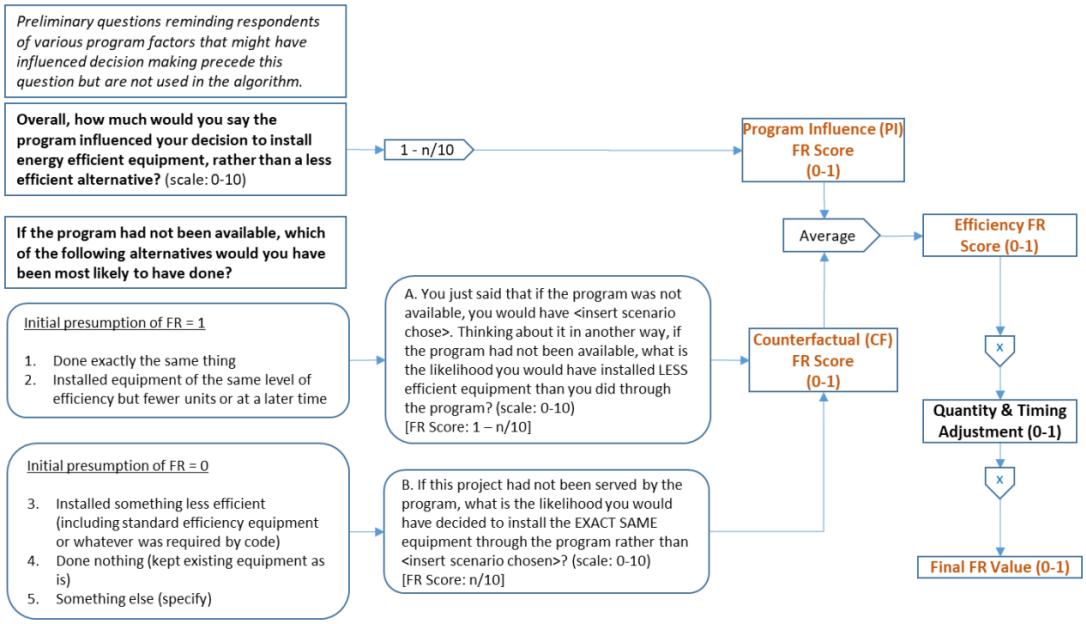
3. Free Ridership and Spillover Protocols

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).

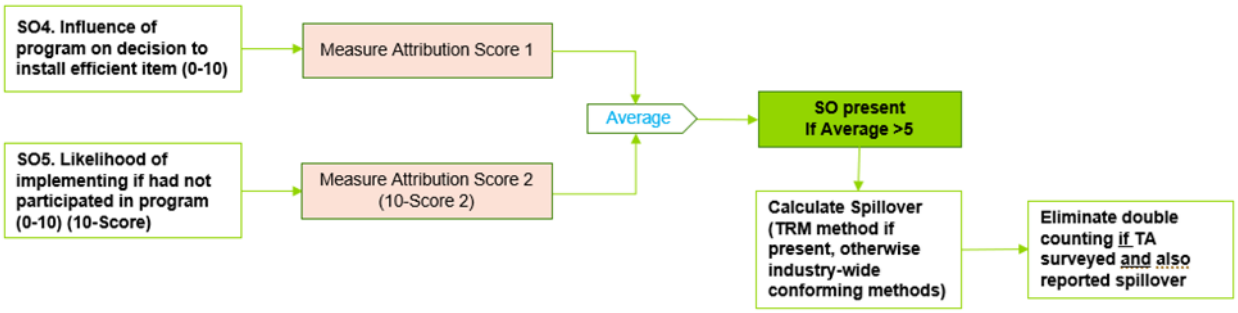
$$\text{2-year Time Horizon Timing Adjustment} = 1 - (\text{Number of Months Expedited} - 6)/18$$

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

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

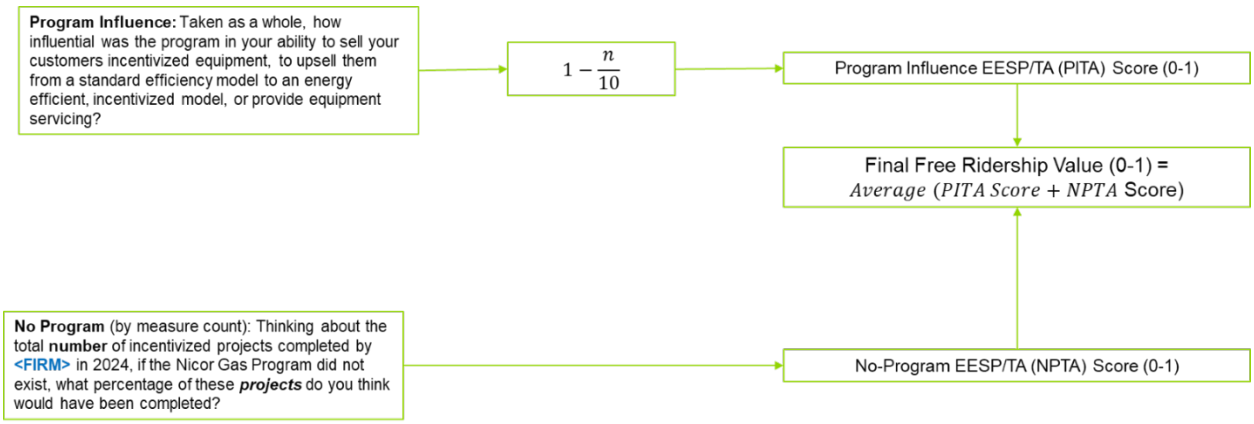


Source: Guidehouse designed this depiction of the algorithm based on the content from the 2025 Illinois TRM Version 13.0, Compiled Version, Attachment A, Sections 3.1.2 and 3.1.3, from pages 1662-1665 and pages 1665-1669 respectively.

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

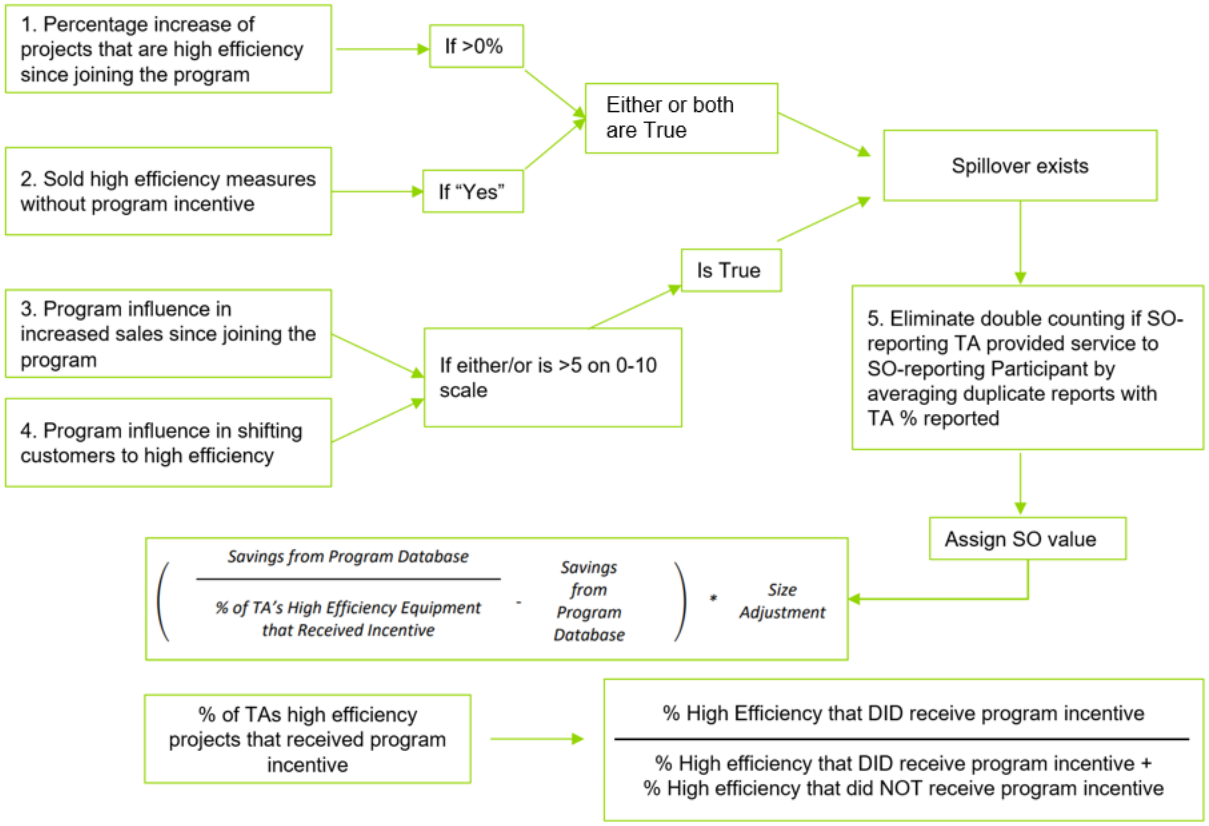


Source: Guidehouse

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	0.18	0.24
Trade Ally	0.08	0.05
Combined Free Ridership	0.10	**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

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 PGL-NSG 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, two of the five 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, two respondents provided responses that triggered a consistency check. One respondent's FR score was adjusted to reflect an update to their program influence response after following up with the TA. The other respondent that triggered a consistency check was removed entirely from the analysis after a review of their scores and verbatims, leaving a total of five TA responses.

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 0.24, while the trade ally surveys have an RP of 0.05. Since a lower RP means higher precision, the participant data is 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 17 percent for the participant data and 83 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 five of the 78 participant projects completed surveys, resulting in a normalized score of 28 percent (Refer to the formula below). In comparison, five out of 30 trade allies completed surveys, yielding a normalized score of 72 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 TAs. However, because Small Business participants typically do not understand the market to the extent that TAs do, we rate TA validity at 40% and participant validity at 60%.

c. By averaging the quantitative and qualitative scores, the final Validity scores are 44 percent for participants and 56 percent for trade allies.

3. Representativeness: How representative is the sample?
   a. The participant responses for the PGL/NSG Small Business Program represent 11 of the total population therm savings which results in a normalized score of 17 percent (Refer to the formula below).
   b. The trade ally responses of the PGL/NSG Small Business Program represent 55% of the population therm savings which results in a normalized score of 83 percent (Refer to the formula below.

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

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

Table 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?	17%	83%
How valid is the data collected/analysis?	44%	56%
How representative is the sample?	17%	83%
Average Score (Weight)	**26%**	**74%**

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.

$$\begin{aligned} Free\ Ridership &= (Participant\ FR) * (Participant\ Weight) + (TA\ \ FR) * (TA\ \ Weight) \\ &= 0.18 * 0.26 + 0.08 * 0.74 \\ &= 0.10 \end{aligned}$$

Using the formula shown above, the evaluation team calculated a weighted average of participant and trade ally FR, with weights derived from the triangulation approach. This yielded a combined free ridership estimate of 0.10.

4.3 Participant and Trade Ally Spillover Results

Two of the four participant responses demonstrated spillover. These respondents reported spillover savings of 820 therms or two percent of savings. The other two participants either indicated they did not install additional measures or reported measure attribution scores that did not meet the threshold for attributing spillover to the program for additional measures they had installed.

Table 5. Spillover Research Results by Measure

Population	Respondents Contributing to Spillover	Spillover Therms	Spillover Rate
Participants	2	820	2%
Trade Allies	0	0	0%

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 any spillover reported by participants 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 PGL-NSG Gas Small Business Program

Measure	Participant Free Ridership	Trade Ally Free Ridership	Weighted Free Ridership	Participant Spillover	Trade Ally Spillover	NTG Ratio
All Measures	0.18	0.08	**0.10**	**0.02**	**0.00**	**0.92**

Source: Evaluation team analysis

6. Peoples Gas / North Shore Gas Small Business Program NTG History

GPY1	**NTG** 0.99 **Free ridership** 0.02 **Participant Spillover** 0.01 **Method and Source:** Evaluation research consisting of GPY1 participating customer self-report combined with trade ally input. Customer self-reports: 30 participant NTG interviews completed covering 31 projects from a population of 396 projects. Basic method of participant free ridership analysis was applied. One percent participant spillover was found from customer self-reports. Customer participant self-reported free-ridership was 18 percent for Peoples Gas and North Shore Gas. Trade ally interviews: Three trade allies interviewed representing 98% of ex ante program therm savings. Individual trade ally responses to free-ridership questions were weighted by their respective fuel-specific program savings contributions and combined for a fuel-specific overall free-ridership rate. This approach resulted in an evaluation estimate of 2 percent free-ridership for gas measures.
GPY2	**Peoples Gas: Deemed NTG** 0.99; **Free ridership** 0.02; **Participant Spillover**: 0.01 **North Shore Gas: Deemed NTG** 0.99; **Free ridership** 0.02; **Participant Spillover:** 0.01 **Method and Source:** Deemed by SAG consensus from GPY1 evaluation research.
GPY3	**Peoples Gas: Deemed NTG** 0.99; **Free ridership** 0.02; **Participant Spillover**: 0.01 **North Shore Gas: Deemed NTG** 0.99; **Free ridership** 0.02; **Participant Spillover:** 0.01 **Method and Source:** Deemed by SAG consensus from GPY1 evaluation research.
GPY4	**NTG** 0.99; **Free ridership** 0.02; **Participant Spillover**: 0.01 **Method and Source**: Based on evaluation recommendation. Did not reach consensus.
GPY5	**NTG** 0.93 (for Direct Install and Retrofit Incentives) **Free ridership** 0.09 **Spillover** 0.02 **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 PG/NSG trade ally interviews in GPY1. 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. This results in a NTGR 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

	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 freeridership 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. 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)	NTG 0.92 for Direct Install and Retrofit (custom and prescriptive projects) Free ridership 0.09; equal weighted average of participant (0.15) and trade ally (0.03) results Participant Spillover 0.01 Non-Participant Spillover 0.00 Method: The 2018 (GPY7) NTG value uses an equal-weight average of the 15 percent free ridership estimate from participant telephone survey research conducted on 44 PGL & NSG participants from GPY5, and a three percent freeridership estimate for 12 PGL & NSG trade allies from interviews conducted in GPY4. The participant free ridership estimate was based on "Option 1" of the TRM v5.0 NTG protocol which is now the protocol in TRM v6.0. The PGL and NSG GPY4 trade ally free ridership is based on a representative stratified sample of 12 trade ally interviews from a population of 55. The GPY4 trade ally interviews found no spillover. For participant spillover, both GPY5 and GPY1 results for PGL & NSG were 1 percent.
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 0.95; Participant Free Ridership: 0.15; Service Provider Free Ridership: 0.00; 40/60: 0.06; Participant Spillover: 0.01 Method: No new research. FR (40% weight to participant FR value researched in GPY5; 60% weight to service provider. Service provider for direct install is the program implementation contractor - FR is set at zero. PSO (Value based on GPY5 participant research); NPSO (no value). GPY5 FR and PSO researched values based on TRM v6.0 algorithms Retrofit Incentives: NTG; 0.92; Participant Free Ridership: 0.15; Trade Ally Free Ridership: 0.03; 46/54: 0.09; Participant Spillover: 0.01 Method: No new research. FR (46% weight to participant FR value researched in GPY5; 54% weight to FR from GPY4 PGL & NSG trade ally research); PSO (Value based on GPY5

	participant research); NPSO (no value). GPY5 FR and PSO researched values based on TRM v6.0 algorithms Thermostat Rebates: NTG: 0.96; Participant Free Ridership: 0.04. Method: The Thermostat NTG is 1 minus 50% of the program level free ridership for Retrofit Incentives plus NPSO, because the TRM heating savings was based on a consumption data analysis using matching to non-participants.
2022-2025	NTG 0.93 Free ridership 0.07; weighted average of participant (0.05) and trade ally (0.09) Participant Spillover <0.01 Trade Ally Spillover 0.00 Method: Participant FR and SO based on 31 responses from 2020 program participants. Trade Ally FR and SO based on 17 responses from 2020 program vendors. Program FR determined by savings-weighted averages of P and TA FR and spans all program measures. Thermostat Rebates: NTG: 0.97; Participant Free Ridership: 0.03. Method: The Thermostat NTG is 1 minus 50% of the program level free ridership for Retrofit Incentives plus NPSO, because the TRM heating savings was based on a consumption data analysis using matching to non-participants.

Source: Annual NTG Recommendations