



To: Jean Gibson, Thomas Manjarres, Christina Pagnusat, Omy Garcia (WEC)
Victoria Nielsen (AEG)
Desiree Vasquez, Jennifer Alvarado, Kevin Kopterski (Franklin Energy Services)

From: Cherlyn Seruto (Guidehouse)

CC: Jennifer Morris (ICC Staff)
Celia Johnson (Illinois SAG)
Kevin Grabner, Stu Slote, Laura Agapay-Read (Guidehouse)

Date: August 27, 2021

Re: PG/NSG Small and Midsize Business 2020 NTG Research Results

Executive Summary

The Peoples Gas / North Shore Gas (PG / NSG) Small and Midsize Business (SMB) Program net-to-gross (NTG) research asked both free ridership (FR) and spillover (SO) questions in two surveys: one gathering the participant perspective, and the other gathering the trade ally (TA) perspective. Guidehouse crafted the participant survey questions following the free ridership protocol algorithm recently developed from the Illinois Technical Reference Manual version 9.0 (TRM v9.0)¹ by the Illinois Stakeholder Advisory Group (SAG) NTG Working Group. The surveys were fielded by The Blackstone Group.

These results will inform Guidehouse's September 2021 recommendations to SAG about NTG values to be used for this program in 2022.

Table 1 summarizes the Small and Midsize Business Program FR and SO 2020 research findings.

Table 1. Net-to-Gross Research Results for 2020 SMB Program

Population	Free Ridership	Sample Relative Precision @90% CI*	Spillover
Participant	0.05	NA	<0.01
Trade Ally	0.09	NA	0

* Both samples were a census attempt.

Source: Guidehouse

Program Description

The SMB Program is offered by Peoples Gas and North Shore Gas with Franklin Energy Services operating as the program implementer. The path is targeted to small and midsize business customers with an annual usage of approximately less than 400,000 therms per year. The SMB Program seeks to secure energy savings through multiple paths:

¹ State of Illinois Technical Reference Manual version 9.0 from <http://www.ilsag.info/technical-reference-manual.html>.

- **Direct Install** Customers receive direct installation of low-cost energy and water saving measures including low flow showerheads, kitchen and bathroom faucet aerators, pipe insulation and, if applicable, pre-rinse sprayers (at no cost). A high-level, no-cost assessment of the facility will be completed while at the site to identify additional energy efficiency improvements the small business owner/tenant can pursue.
- **Prescriptive Rebates** Pre-qualified, standardized rebates are available for the most common efficiency upgrades, such as heating systems, steam traps, and pipe insulation. Incentives are based on the size and efficiency of the equipment installed.
- **Partner Trade Ally (PTA)** A network of trade allies promotes measures and assists in engaging customers to participate in site assessments to identify savings opportunities. Customers using a PTA will be eligible for enhanced rebate levels.
- **Custom Incentives** Customers may receive incentives for non-standard measures, including new construction projects. Incentives are calculated on a \$/first year therm savings basis. Staff work with customers to identify and quantify savings opportunities for complex projects.

In addition to the previous year small business restaurant kits, the 2020 direct install path included several new kits, including general kits, kits for motels, and kits for schools, grocery, and hotel. The kits were distributed to each business with attached labels on all the kits, along with an informational letter for each kit, and installation instructions. The reliance on kit distribution rather than in-person direct installation was a response to the COVID pandemic in 2020. The 2022 program offerings are not yet finalized, but may offer in-person direct installation, and/or kits.²

Prescriptive Rebates are the dominant saving path for the SMB program, accounting for 96% of net therm savings for PG in 2020, followed by Custom (3%) and Direct Install (1%). The NSG program achieved 80% of net therms from prescriptive rebates in 2020, followed by direct install (mostly kits in 2020) at 14%, and custom projects (6%). The PG program achieved savings from 30 measures in 2020, dominated by steam traps (54%) and boiler tune-ups (20%) accounting for 74% of net savings. The NSG program achieved savings from 22 measures in 2020, dominated by steam traps (57%), boiler tune-ups (10%), and kits (14%) accounting for 81% of net savings.

Free Ridership and Spillover Sample and Survey Disposition

The participant and TA surveys were fielded by Blackstone through computer assisted telephone interviewing software during 2Q 2021. The sample was developed from the population of all PG and NSG participant contacts and trade allies with realized therm savings in 2020, excluding direct installation and kit participants, and removing duplicate contact records. Out of 260 unique participant contacts, we attempted contact with all and completed 31 interviews representing 12% of the sample population and 10% of participant therm savings. Out of 50 unique TA firms with contact information, we attempted contact with all and completed 17 interviews representing 34% of the population and 38% of TA therm savings. We combined the participant and TA perspective of FR and SO using Section 5.1 of TRM v9.0. Table 2 presents dispositions for each survey.

² Peoples Gas and North Shore Gas, Energy Efficiency Plan 4, Draft filing with ICC, March 1, 2021.

Table 2. Free Ridership and Spillover Survey Dispositions

Category	Sampling Frame	Sample	Actual Completes	Response Rate	Respondent Share of Program Savings (therms)
Participants	260	Census	31	12%	10%
Trade Ally Firms	50	Census	17	34%	38%

Source: Guidehouse 2020 NTG Research

The direct installation and kit participants were not included in the survey sampling frame for three primary reasons:

1. The 2020 direct installation path was atypical due to social distancing restrictions put in place to respond to the COVID pandemic. Field visits were halted in spring 2020, and kit delivery with self-installation was emphasized. While kits may be offered in 2022, the program is expected to return to field visits and direct installation.
2. Historically, the direct installation path accounts for a small portion of the overall program savings. In 2020, direct installation (field and kits) accounted for only 3% of the combined PG and NSG savings. In the 2019 non-COVID year, the direct installation path accounted for less than 1% of Peoples Gas net savings, and 1.6% of North Shore Gas savings.
3. Historically, the direct installation NTG has been equal to or within 0.02 points of the rebate measure NTG.

The savings from measures of responding customer participants roughly matched the population, dominated by steam traps (85%) and boiler tune-ups (9%), with pipe insulation, space conditioning controls, and thermostats accounting for the remaining savings.

The sample combined the populations of Peoples Gas and North Shore Gas. By utility, the responding participant net savings followed the population: Peoples Gas respondents were 88% of the savings versus 83% of the combined 2020 program savings, and North Shore Gas was 12% respondents versus 17% population.

The savings from measures of TA respondents roughly matched the population, dominated by steam traps (78%) and boiler tune-ups (17%), with pipe insulation, demand control ventilation, linkageless controls, thermostats, and water heaters accounting for the remaining savings.

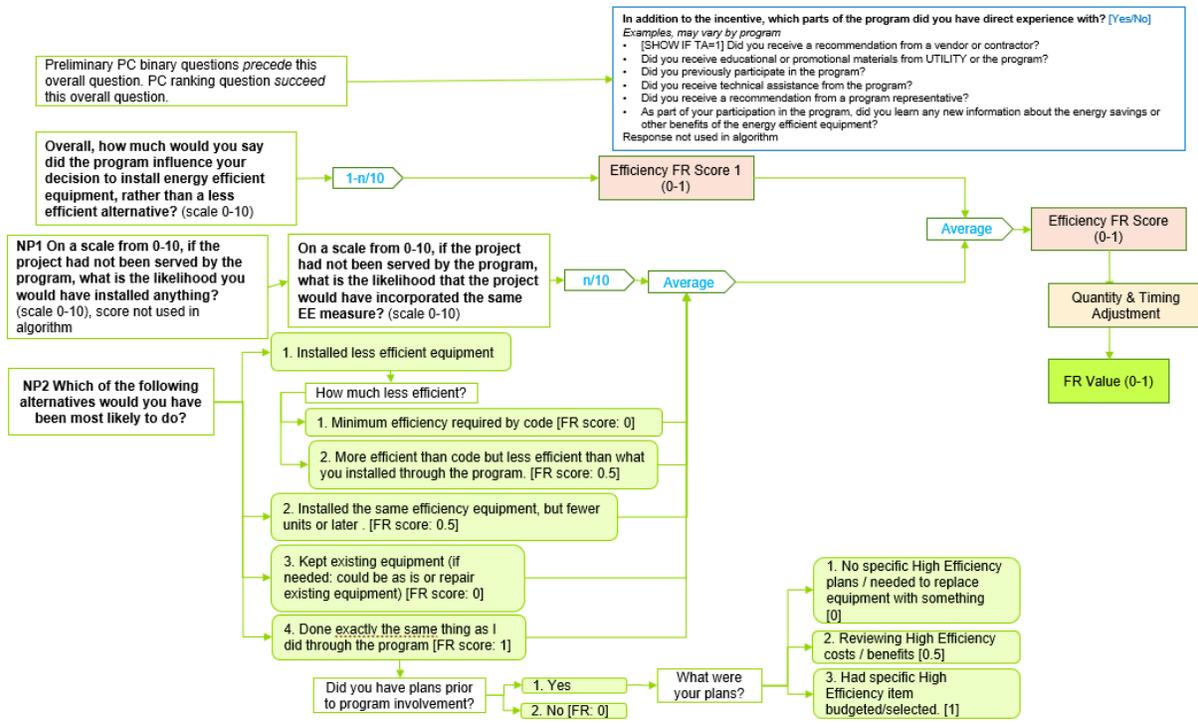
Free Ridership and Spillover Protocols

The evaluation team applied the relevant FR protocol participant algorithm recently developed from the Illinois TRM by the Illinois SAG NTG Working Group and SO protocols from TRM v9.0. The team combined participant and TA perspectives on NTG via TRM v9.0 Section 5.1, “Combining Participant and Trade Ally Free Ridership Scores.”

Participant Free Ridership Estimation

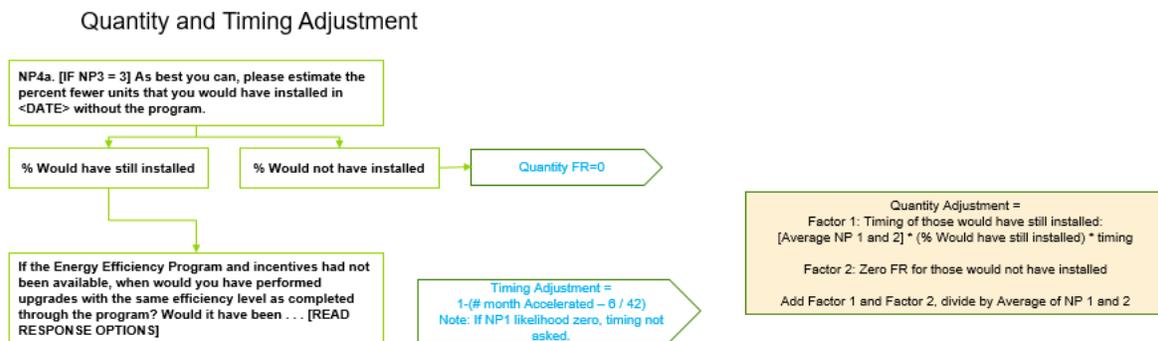
Figure 1 describes the Illinois SAG NTG Working Group algorithm that Guidehouse used to calculate the FR for the Small and Midsized Business Program. The questions and analysis are based on the TRM v9.0 Study-Based Free Ridership algorithm, with updates based on the Illinois SAG NTG Working Group consensus in 2020.

Figure 1. Small and Midsized Business Free Ridership Overview



Source: Guidehouse adjustment of TRM v9.0 Study-Based Free Ridership Score Overview, with updates based on Illinois SAG NTG Working Group consensus in 2020.

Figure 2. Quantity and Timing Adjustment

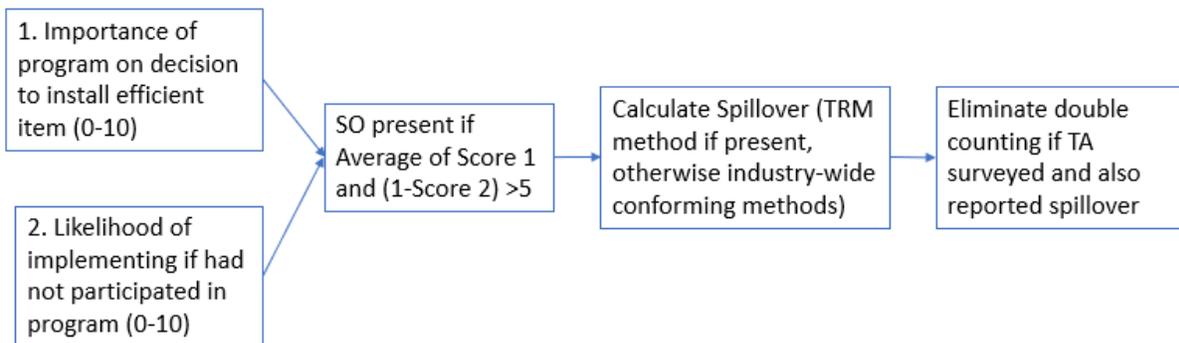


Source: Guidehouse adjustment of TRM v9.0 Study-Based Free Ridership Score Overview, with updates based on Illinois SAG NTG Working Group consensus in 2020.

Participant Spillover Estimation

Guidehouse calculated spillover based on TRM v9.0 Section 3.2.1, “Core Non-Residential Participant Spillover Protocol,” summarized in Figure 3.

Figure 3. TRM v9.0 Section 3.2.1 “Core Non-Residential Participant Spillover Protocol”



Source: Guidehouse Representation of TRM v9.0.

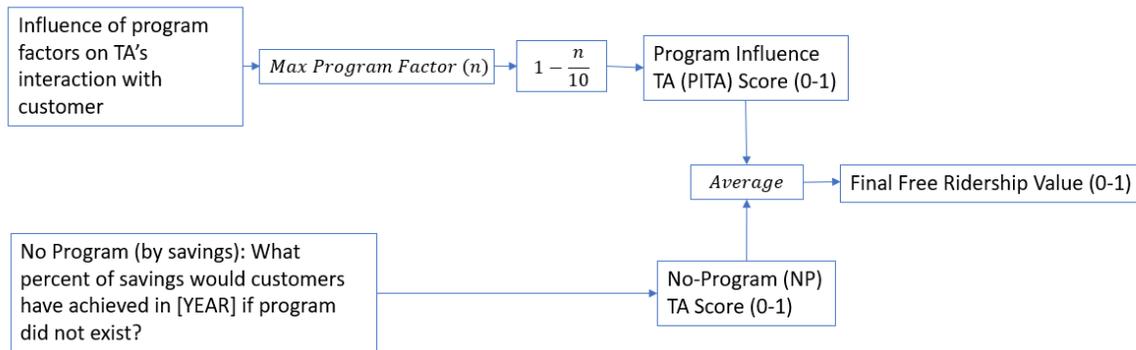
Of the 31 survey respondents, 10 reported that they completed additional energy efficient upgrades. Two of the 10 passed all spillover screening criteria. From those two, Guidehouse engineers quantified 564 gross therm savings for process steam traps. The sample of 31 respondents saved 162,798 net therms, resulting in a participant spillover of 0.3%.

Trade Ally Free Ridership Estimation

TRM v9.0 does not specify an approach for measuring the trade ally perspective of participant FR, though Guidehouse proposes that an approach should be developed for future versions of the TRM. For this study, Guidehouse developed the following method to assess participant free ridership from a trade ally perspective. We designed the method to align with the approach of the TRM’s participant FR algorithms, and it includes the following trade ally perspectives, as Figure 4 diagrams:

- An estimate of the Program’s influence on the Trade Ally (the PITA score)
 - Influence of Program factors on trade ally’s interaction with customer
- A No-Program (NP) score: Trade Allies estimate the percentage of savings that their customers would have achieved if the program did not exist

Figure 4. Trade Ally Free Ridership Protocol

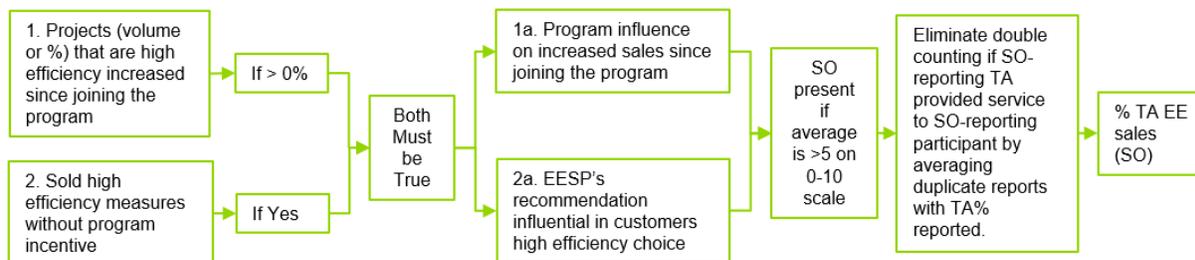


Source: Guidehouse

Active Trade Ally Spillover Estimation

Guidehouse estimated SO that occurs among active trade allies according to the TRM v9.0. We assessed active trade ally SO by estimating the increase of sales of high efficiency products or services that are not rebated, as Figure 5 shows.

Figure 5. EESP (Synonymous with Trade Ally) Spillover Protocol



Source: Guidehouse illustration of TRM v9.0

The process to calculate trade ally SO contains multiple steps (as defined in the TRM):

1. Calculate the percentage of an individual trade ally's high efficiency equipment sales that received an incentive

$$= \frac{\% \text{ of Total Sales that are HE, received incentive}}{\% \text{ of Total Sales that are HE, received incentive} + \text{HE \% that did NOT receive incentive}}$$

2. Calculate the energy savings of the high efficiency equipment sales that did not receive an incentive

$$= \frac{\sum \text{TA savings from Program Database}}{1) \% \text{ of TA's HE Sales that received an incentive}} - \sum \text{TA savings from Program Database} * \text{Size Adjustment}$$

3. Develop the SO ratio for sampled trade allies by summing individual trade ally SO savings and dividing that total by program-tracked savings achieved by the sampled trade allies
4. Develop SO savings for the population of active trade allies by applying the SO ratio from step 3 to all Program savings associated with active trade allies
5. Develop the overall SO ratio for active trade allies by dividing the trade ally SO estimate from step 4 by total program savings

$$= \frac{4) \text{ Total TA tracked program savings} * 3) \frac{2) \sum_1^n \text{TA reported spillover savings}}{\sum_1^n \text{TA sample tracked program savings}}}{5) \text{ Total Program Savings}}$$

There were no trade allies that passed the TRM screening criteria for spillover. From the survey, six trade allies reported selling more energy efficient projects since joining the program. Four trade allies reported sales of energy efficiency projects that were not rebated by the program but none were among the six that reported increased sales. Following the algorithm outlined above, Guidehouse did not identify any spillover among trade allies.

Combining Participant and Trade Ally Free Ridership

Guidehouse calculated a weighted average of the participant and trade ally FR utilizing the triangulation approach³ shown in Table 3 to arrive at one recommended FR score for the Small and Midsize Business program. Guidehouse rated the survey data on three aspects: accuracy, validity, and representativeness, using a scale where 100% means “extremely so” and 0% means “not at all.” Participant FR as reported by trade allies is 0.09 while the FR as reported by participants is 0.05.

We weighted the following items according to our analysis of the results:

1. How likely is the approach to provide an accurate estimate of FR?
 - a. We assigned the participant response a value of 75% because we followed a modification of the TRM v9.0, which was considered the most appropriate approach at the time of development based on the IL NTG Working Group and SAG perspectives. There is always slight uncertainty with the customer self-reporting approach, and this modification has only been tested one year, which is the reason for the 75%.
 - b. We assigned the TAs a value of 60% because the TRM does not currently contain a standardized approach for measuring FR from trade allies. Guidehouse has used this approach for several years now, and it should be refined and finalized in a future iteration of the TRM via the NTG Working Group process.
2. How valid are the data collected and analysis?
 - a. We assigned the participant response a value of 60% because we followed the TRM approach. However, there was a sample frame bias because we did not

³ TRM section 5.1

have telephone contact information for all participants. The 12% response rate may have produced some non-response bias, and earlier participants may have recall bias.

- b. We assigned the trade ally results a value of 95% since the response rate is high at 34%. Factors that lower this score are potential non-response bias and quantitative estimates from TAs that rely on best estimates made at the time of the call rather than historical record keeping.
3. How representative is the sample?
- a. We assigned the participant results a rank of 10% because this is the amount of program savings represented by the responding participants.
 - b. We assigned the trade ally results a rank of 38% because this is the amount of program savings represented by the responding trade allies.

Table 3 summarizes the weighting values and results.

Table 3. Free Ridership Triangulation Weighting Approach for PG/NGS Small and Midsized Businesses

Free Ridership Triangulation Data and Analysis	Participants (therms)	Trade Allies (therms)
FR Value	0.05	0.09
How likely is this approach to provide an accurate estimate of free ridership?	75%	60%
How valid are the data collected and analysis?	60%	95%
How representative is the sample?	10%	38%
Average Score	48%	64%
Weighted Average FR Value	0.07	

Source: Guidehouse

Final NTG Results and Recommendations

Table 4 summarizes Guidehouse’s recommendations for the PG/NSG Small and Midsized Business Program to be used in 2022 based on our NTG research results with 2020 participants and trade allies.

Table 4. Summary of Free Ridership, Spillover, and NTG Research Results for Small and Midsized Business Program

Program Path	FR	PSO	ATSO	NTG
All	0.07	<0.01	0.00	0.93

FR = Free Ridership; PSO = Participant Spillover; ATSO = Active Trade Ally Spillover.

$NTG = 1 - FR + PSO + ATSO$

Source: Guidehouse

Appendix A. Small Business NTG History for PG and NSG

Small Business	
GPY1	<p>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.</p>
GPY2	<p>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.</p>
GPY3	<p>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.</p>
GPY4	<p>NTG 0.99; Free ridership 0.02; Participant Spillover: 0.01 Method and Source: Based on evaluation recommendation. Did not reach consensus.</p>
GPY5	<p>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</p>

Small Business

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 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. 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 free-ridership 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

No new research. For 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

Small Business

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

2020

No new research. For 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

2021

No new research. For 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

Small Business

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 and Efficiency Kits: 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, including Commercial Food Service Projects, excluding Thermostats:

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.

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.