

То:	Nicor Gas
From:	Christy Zook (Guidehouse)
CC:	Jennifer Morris (ICC Staff) Celia Johnson (Illinois SAG) Kevin Grabner, Stu Slote, Laura Agapay-Read, Cherlyn Seruto (Guidehouse)
Date:	October 5, 2021
Re:	Nicor Gas Small Business 2020 NTG Research Results

Executive Summary

The Nicor Gas Small Business (SB) 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 participant survey was fielded by The Blackstone Group, and Guidehouse staff interviewed trade allies.

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 Business Program FR and SO 2020 research findings.

Population	Free Ridership	Sample Relative Precision @90% Cl	Spillover
Participant	0.11	16%	0.00
Trade Ally	0.00	NA	0.00

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

Source: Guidehouse

Program Description

The Small Business (SB) Program obtains long-term natural gas savings for small business and public sector gas customers by providing financial incentives, information, and direct installation of energy saving products to overcome key market barriers. The target market for this program is Nicor Gas commercial and public sector customers using up to 60,000 therms of gas annually. While any small business customer can receive program services, the program targets

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

Nicor Gas Small Business NTG Memo Page 2 October 5, 2021

customers with substantial heating and water heating loads, including dry cleaners and other customers with boiler systems.

This program provides small commercial and public sector gas customers with two primary options to participate: rebates for installing energy-efficient improvements and assessments that provide energy education along with installation of free energy-saving products. The program offers a free energy assessment to introduce customers to energy efficiency and creates an Energy Assessment Report to help customers identify and prioritize energy efficient improvements for their business. During the assessment, Energy Advisors offer customers free energy efficient products and services including low-flow bathroom and kitchen aerators, low-flow pre-rinse spray valves, salon sprayers, low-flow showerheads, and pipe insulation.

Customers are given recommendations to improve the efficiency of their business. Recommendations align with the rebates available for small business customers for energy efficiency improvements and additions (i.e. pipe insulation, ozone laundry, and boiler reset controls), space and water heating, commercial food service equipment, steam traps, and boiler tune-ups. Small business customers may also qualify for higher custom incentives for energysaving projects. Small business customers may directly apply for a rebate for energy efficiency projects in their facility.

The 2020 program had 430 participants, including 409 in the private sector and 21 in the public sector. These participants completed 64 direct installation projects, 432 prescriptive rebate projects, and 4 custom projects. Energy savings from private-sector prescriptive projects dominated, with 99% of the net program savings. Direct installation projects provided 0.5% of programs savings while custom projects contributed about 1%. Over 99% of the savings occurred in the private sector. Steam traps dominated net program savings, accounting for 84% of the total, followed by boiler tune-ups at 12% of net savings. The remaining 4% of savings was achieved through 19 other measures, mainly high efficiency furnaces and space heaters.

Free Ridership and Spillover Sample and Survey Disposition

The participant surveys were fielded by Blackstone through computer assisted telephone interviewing software while the TA telephone surveys were fielded by Guidehouse through Qualtrics. Both surveys were fielding during Summer 2021. The samples were developed from the population of all Nicor Gas participant contacts and trade allies with realized therm savings, excluding direct installation participants and customers who only had assessments, and removing duplicate contact records. The participant sample included 2020 and Q1 2021 participants while the trade ally sample included 2019 and 2020 trade allies. The final usable sample of 365 participants achieved 82% of savings from steam traps, 11% from boiler tune-ups, and 7% from other measures, primarily furnaces and space heaters.

Out of 365 unique participant contacts, we attempted contact with all and completed 12 interviews representing 3% of the sample population and 3% of participant therm savings. Out of 158 unique TA firms with contact information, 140 had completed only one or two projects accounting for a small proportion of program savings, while the 15 largest contributing trade allies provided 91% of program savings in the sample. We attempted contact with the largest contributing trade allies and completed 3 interviews representing 2% of the population and 78% 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.

Category	Sampling Frame	Sample	Actual Completes	Response Rate	Respondent Share of Program Savings (therms)
Participants	365	Census	12	3%	3%
Trade Ally Firms	158	15	3	20%	78%

Table 2. Free Ridership and Spillover Survey Dispositions

Source: Guidehouse 2020 NTG Research

Among responding participants, 75% of savings came from steam traps, 22% from boiler tuneups, and 3% from other measures, primarily high efficiency furnaces. This profile is similar to the population.

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."

Nicor Gas Small Business NTG Memo Page 4 October 5, 2021

Participant Free Ridership Estimation

Figure 1 describes the Illinois SAG NTG Working Group algorithm that Guidehouse used to calculate the FR for the Small 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.



Preliminary PC binary questions precede this overall question. PC ranking question succeed this overall question.	In addition to the incentive, which parts of the program did you have direct experience with? [YesNo] Examples, may vary by program • [SHOW IF TA+1] Did you receive a recommendation from a vendor or contractor? • Did you previously participate in the program? • Did you receive technical assistance from the program? • Did you receive technical assistance from the program? • Did you receive technical assistance from the program? • Did you receive technical assistance from the program? • Did you receive technical assistance from the program? • Did you receive technical assistance from the program? • Did you receive technical in the program, did you learn any new information about the energy savings or other benefits of the energy efficient equipment?
did the program influence your decision to install energy efficient equipment, rather than a less efficient alternative? (scale 0-10)	Efficiency FR Score 1 (0-1)
NP1 On a scale from 0-10, if the project had not been served by the program, what is the likelihood you what is the likelihood that the project	Average (0-1)
would have installed anything? (scale 0-10), score not used in algorithm	Quantity & Timing Adjustment
NP2 Which of the following alternatives would you have been most likely to do?	n what
you installed through the program. [FR score: 0 2. Installed the same efficiency equipment, but fewer units or later. [FR score: 0.5]	.5]
3. Kept existing equipment (if needed: could be as is or repair existing equipment) [FR score: 0]	1. No specific High Efficiency plans / needed to replace equipment with something [0]
4. Done exactly the same thing as I did through the program [FR score: 1]	2. Reviewing High Efficiency costs / benefits [0.5]
Did you have plans prior to program involvement?	What were your plans? 3. Had specific High Efficiency item budgeted/selected. [1]

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.

Nicor Gas Small Business NTG Memo Page 5 October 5, 2021

We asked both the TRM questions and the WG algorithm questions. Free ridership results using TRM Alg 1 would have been 0.14, TRM Alg 2 results would have been 0.13. The WG algorithm result is a FR value of 0.11, as shown in Table 3.

Table 3 Free Ridership Component Scores, Unweighted for Savings

Algorithm	Program Component	Program Influence	Program Efficiency	No Program	Timing- Adjustment
Algorithm One	0.08	0.22		0.56	0.60
Algorithm Two	0.08	0.22		0.56	0.60
Working Group			0.26	0.56	0.60

Source: Guidehouse 2021 NTG Research

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 12 survey respondents, none reported that they completed additional energy efficient upgrades².

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

² For this program, spillover has been low historically. Larger number of completions increases the likelihood of reaching spillover candidates. We recommend "increase number of completions" as a planning goal for future surveys.

Nicor Gas Small Business NTG Memo Page 6 October 5, 2021

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)
 - o 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 any increase of sales of high efficiency products or services that are not rebated, as Figure 5 shows.

Figure 5. Trade Ally Spillover Protocol

Nicor Gas Small Business NTG Memo Page 7 October 5, 2021



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

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

- 2. Calculate the energy savings of the high efficiency equipment sales that did not receive an incentive
- $= \frac{\sum TA \ savings \ from \ Program \ Database}{1) \ \% \ of \ TA's \ HE \ Sales \ that \ received \ an \ incentive} \sum TA \ savings \ from \ Program \ Database \ * \ Size \ Adjustment$
 - 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

4) Total TA tracked program savings * 3) $\frac{2}{\sum_{1}^{n} TA} \frac{2}{\sum_{1}^{n} TA} \frac{\sum_{1}^{n} TA}{\sum_{1}^{n} TA} \frac{1}{\sum_{1}^{n} T$

5) Total Program Savings

Nicor Gas Small Business NTG Memo Page 8 October 5, 2021

There were no trade allies who passed the TRM screening criteria for spillover. Although one responding trade ally reported selling more energy efficient projects since joining the program, they reported no sales of energy efficiency projects that were not rebated by the program³. Following the algorithm outlined above, Guidehouse identified no 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 approach⁴ shown in Table 3 to arrive at one recommended FR score for the Small 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 while the FR as reported by participants is 0.11.

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 selfreporting approach, and this modification has been tested only 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 20% because we followed the TRM approach. However, there was a sample frame bias because we did not have telephone contact information for all participants. The 3% response rate may have produced some non-response bias, and earlier participants may have recall bias for a survey fielded in August 2021. We recommend a mixed survey mode in the future, combining emails with online links and follow-up phone calls.
 - b. We assigned the trade ally results a value of 10% since the response rate is lower at 2%. 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?

³ Some TAs report that they market single rebated measures to as many clients as they can. Some have reported that their clients take no action without rebates. Similar TAs have reported in other focus groups that: their marketing strategy does not emphasize small businesses; they tend to specialize in certain rebated measures and so focus on delivering that measure to as many businesses as possible in advance of their competition; while they appreciate relationships with their clients, they do not seek add-on revenue for rebate customers at the time of sale.

⁴ TRM section 5.1

Nicor Gas Small Business NTG Memo Page 9 October 5, 2021

- a. We assigned the participant results a rank of 3% because this is the amount of program savings represented by the responding participants.
- b. We assigned the trade ally results a rank of 78% because this is the amount of program savings represented by the responding trade allies.

Table 4 summarizes the weighting values and results.

Table 4. Free Ridership Triangulation Weighting Approach for Nicor Gas Small Businesses

Free Ridership Triangulation Data and Analysis	Participants (therms)	Trade Allies (therms)
FR Value	0.11	0.00
How likely is this approach to provide an accurate estimate of free ridership?	75%	60%
How valid are the data collected and analysis?	20%	10%
How representative is the sample?	3%	78%
Average Score	33%	49%
Weight	40%	60%
Weighted Average FR Value	0.0)4

Source: Guidehouse

Final NTG Results and Recommendations

Table 5 summarizes Guidehouse's recommendations for the Nicor Gas Small Business Program to be used in 2022 based on our NTG research results with 2020 participants and trade allies.

Table 5. Summary of Free Ridership, Spillover, and NTG Research Results for SmallBusiness Program

Program Path	FR	PSO	ATSO	NTG
All	0.04	0.00	0.00	0.96

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 Nicor Gas

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 fee-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 a 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 values from 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 d	GPY1	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: 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 values from 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 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		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
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 values from 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	GPY2	Free ridership 2% Spillover 2%
GPY4 NTG 1.00 Free ridership 2% Spillover 2% 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 0.93 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	GPY3	Free ridership 2% Spillover 2%
 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 	GPY4	NTG 1.00 Free ridership 2% Spillover 2% Method: NTG values for GPY4 were deemed using values from GPY3, and reported in Table 14 of
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.	GPY5	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 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
	GPY6	NTG 0.93 for Direct Install, Retrofit (custom and prescriptive projects).

	Small Business
	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. 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 participar (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 Busine: Program GPY5 participants. The GPY5 research applied the TRM v6.0 NTG algorithms.
	Interviews with 10 trade allies representing 81 percent of program therm 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

Small Business

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.

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 0.92; 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

2020 **No new research.** For CY2020, 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

Small Business

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 NPS ${\bf 0}$

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

2021 **No new research.** For CY2021, 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 NPS ${\bf 0}$

Small Business

Prescriptive Rebates, including Commercial Food Service Projects, excluding Thermostats: 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

Thermostat Rebates: NTG: 0.91; Participant Free Ridership: 0.09.

The Thermostat NTG is 1 minus 50% of the program level free ridership for Prescriptive Rebates plus NPSO, because the TRM heating savings was based on a consumption data analysis using matching to non-participants.

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

Source: Guidehouse