

**To:** Nicor Gas

**CC:** Elizabeth Horne, ICC; Laura Agapay-Read, Christopher Frye, Guidehouse

**From:** Oxana Petritchenko, Dave Bluestein, Guidehouse; Sharon Mullen, Glenn Gavi, EcoMetric Consulting

**Date:** September 3, 2024

**Re:** Net-to-Gross Research Results for the Nicor Gas Multi-Family Property Manager and Trade Ally Free Ridership and Spillover Surveys – Final

## Executive Summary

This memo presents findings from the net-to-gross (NTG) research of the Nicor Gas Multi-Family Program. The purpose of this research is to derive a program-level NTG value that covers both the prescriptive and the Central Plant Optimization (CPOP) paths of the Multi-Family Program<sup>1</sup>. The NTG results for this program are based on the free ridership (FR) and spillover (SO) algorithms specified in the 2024 Illinois Technical Reference Manual (TRM) version 12.0.

The evaluation team administered an online survey to research FR and SO for property managers and trade allies who participated in the program via the CPOP path or prescriptive rebate path. The team administered the survey to multi-family property managers to assess the participant perspective and trade allies to assess the trade ally<sup>2</sup> perspective. The participant FR survey covered a census of property managers who participated in the program January 1, 2023 through December 31, 2023, and the spillover survey covered a census of property managers who participated in the program January 1, 2022 through December 31, 2022. Guidehouse administered the spillover and FR survey to a census of trade allies who implemented projects that generated program savings during 2022 and 2023.

Table 1 summarizes the Multi-Family Program FR and SO research findings based on the participant and trade ally research.

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<sup>1</sup> However, the FR developed in this memo for the Multi-Family program is not applicable to in-unit faucet aerators and high efficiency showers because the IL TRM specifies FR = 0 for those measures. (IL TRM v12.0, Volume 3: Residential Measures, Sections 5.4.4 and 5.4.5, pg. 259, 269). Thus those measures have a different NTG.

<sup>2</sup> In this memo we use the terms "trade ally" to refer to the distributors who help deliver the program.

**Table 1. NTG Research Results for Multi-Family Program**

Program Measure	Free Ridership	Spillover	NTG Ratio*
All measures except in-unit faucet aerators and high efficiency showerheads	0.27	0.25	0.98
In-unit faucet aerators and high efficiency showerheads**	0.00	0.25	1.25

\* Numbers may not sum due to rounding.

\*\*As noted in IL TRM v12.0, Sections 5.4.4 and 5.4.5, FR for residential high efficiency showerheads and residential faucet aerators has a deemed value of zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures.

Source: Evaluation team analysis

## 1. FR and Spillover Research Sample Disposition

Guidehouse fielded the participant and trade ally online surveys using web survey software. The team sent survey invitations to Multi-Family property managers who participated in the program in 2022 and 2023 and trade allies who implemented program projects in 2022 and 2023. After the initial survey invitation email, the Guidehouse team emailed two additional reminders to encourage completion of the survey. As an incentive, Guidehouse offered property managers and trade allies who qualified and completed the survey a \$50 Tango e-gift card. Additionally, to increase the survey response rate, Guidehouse sought assistance from the Nicor Gas trade ally coordinator who sent additional emails to participants with a request to complete the online survey.

Table 2 and Table 3 present the sample disposition for the two categories of web surveys.

**Table 2. FR Sample Disposition**

Category	Unique Participants	Target Completes	Actual Completes	Analyzed Completes	Response Rate	Respondent Share of Program Savings
Participant	40	26	10	10	25%	12%
Trade Ally	35	24	12	12	34%	68%

Source: Evaluation team analysis

**Table 3. Spillover Sample Disposition**

Category	Unique Participants	Target Completes	Actual Completes	Made Additional Efficiency Improvements	Qualified for Spillover
Participant	34	24	11	4	1
Trade Ally	35	24	12	7	3

Source: Evaluation team analysis

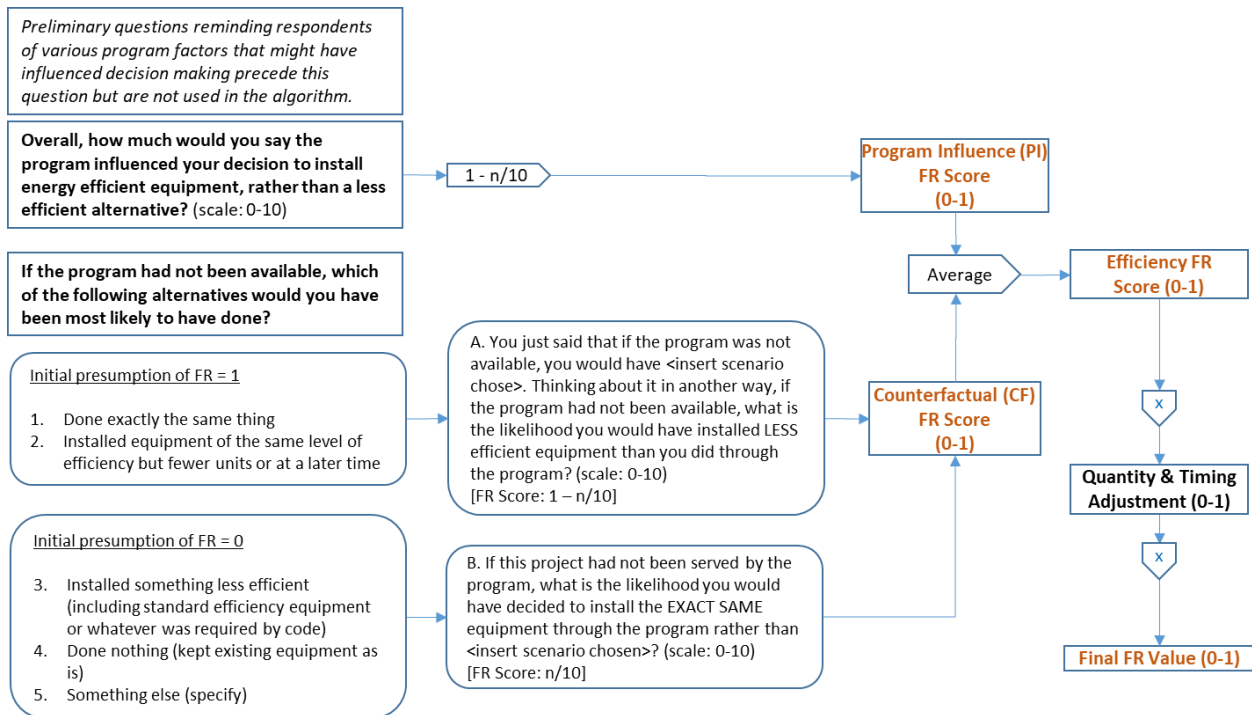
## 2. FR and Spillover Protocols

The evaluation team applied the participant FR, SO, and trade ally protocols from the 2024 TRM v12.0. The results from the two sets of surveys were combined using the methodology in TRM v12.0 Section 5.1, “Combining Participant and Trade Ally FR Scores.”

### 2.1. Participant FR Estimation

Figure 1 describes the algorithm used to calculate participant FR for the Multi-Family Property Manager surveys.

Figure 1. FR Algorithm

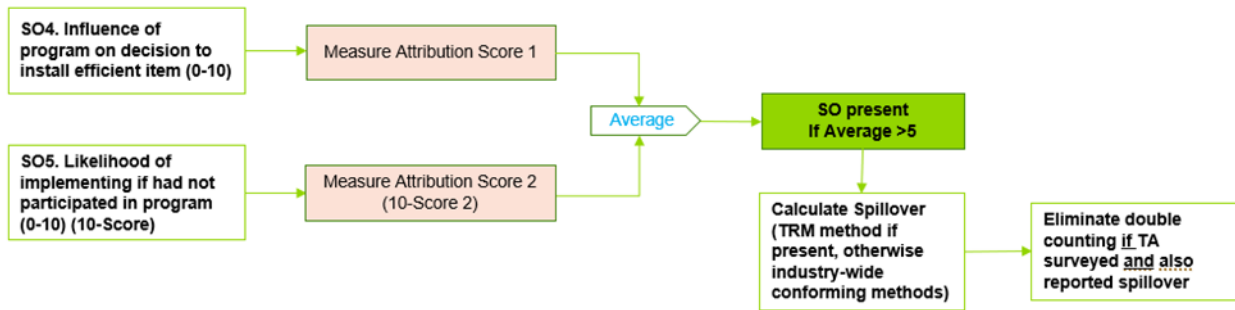


Source: 2024 Illinois Statewide Technical Reference Manual (TRM) for Energy Efficiency Version 12.0 – Compiled Version (page 1625)

### 2.2. Participant Spillover Estimation

Guidehouse calculated participant spillover based on the 2024 Illinois TRM Volume 12.0, Sections 3.1.2 and 3.1.3 summarized in Figure 2.

**Figure 2. Multi-Family Spillover Algorithm**

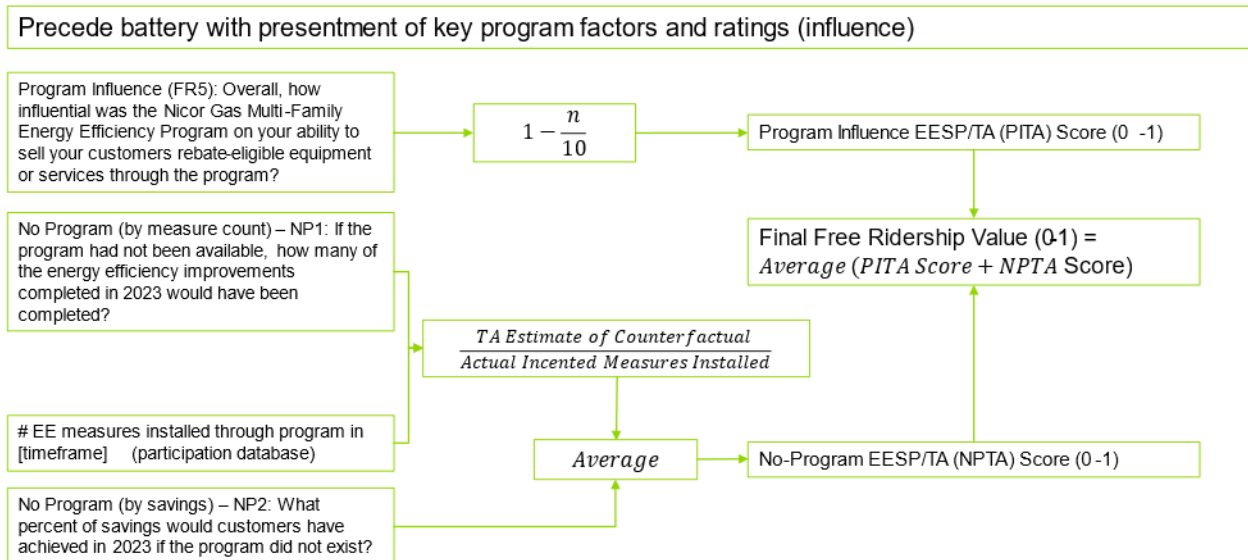


Source: Algorithm based on the content from the 2024 Illinois TRM Volume 12.0, Sections 3.1.2 and 3.1.3

### 2.3. Trade Ally FR Estimation

The IL TRM v12.0 does not specify an evaluation methodology for trade ally FR. Therefore, the evaluation team used an algorithm that Guidehouse developed from previous years to assess trade ally’s perspective. This methodology is summarized in Figure 3 below.

**Figure 3. Trade Ally FR Algorithm**

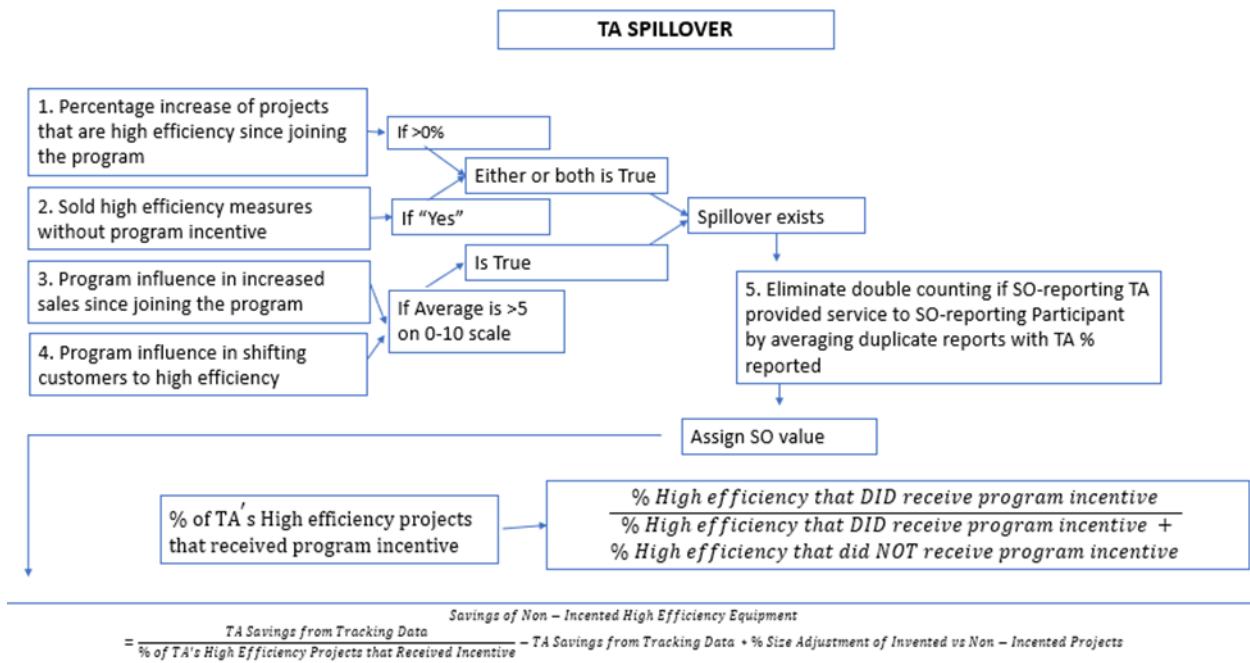


Source: Guidehouse

### 2.4. Trade Ally Spillover Estimation

The evaluation team quantified the trade ally’s perspective of participant spillover using the methodologies laid out in IL TRM v12.0 Section 5.2.1. The team assessed trade ally spillover by estimating the increase in sales of high efficiency measures that were influenced by the program but not rebated, as Figure 4 shows.

**Figure 4. Trade Ally Multi-Family Spillover Algorithm**



Source: Algorithm based on the content from 2024 IL TRM v12.0 Vol. 4 - Attachment A – Section 5.2.1.1

### 3. Participant and Trade Ally FR Results

Using the protocols detailed above and data collected via the participant and trade ally surveys, the team calculated FR estimates for the Multi-Family Program participants and trade allies. Table 4 below presents the FR estimates and the relative precision of the estimates for participants, trade allies, and the combined value.

**Table 4. Participant and Trade Ally FR Results**

Population	FR	Relative Precision @ 90% CI
Participant	0.27	0.11
Trade ally	0.27	0.14
<b>Combined FR</b>	<b>0.27</b>	<b>0.12</b>

Source: Evaluation Team Analysis

#### 3.1. FR Consistency Check Analysis

The evaluation team checked for consistency in free rider responses. Respondents were asked to describe in their own words any influence that the Nicor Gas Multi-Family Program had on their decision to implement the measures at their facilities.

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

- 1) The Program Influence FR Score is greater than 0.7 AND the Counterfactual FR Score is less than 0.3.

OR

- 2) The Program Influence FR Score is less than 0.3 AND the Counterfactual 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.

The evaluation team determined that two of the 10 participant respondents failed the consistency check. A detailed review of their verbatim responses found that their counterfactual score was consistent with their verbatim. As a result, and in accordance with the TRM, the team utilized the counterfactual score in the calculation of FR (and not the program influence score).

The evaluation team found one inconsistency in the verbatim responses for the trade ally FR and adjusted the FR calculation for that respondent to use their program influence score (and not the counterfactual score).

### **3.2. Combining Participant and Trade Ally FR**

Because the participant FR value and the TA's perspective of participant FR are the same, 0.27, it is not necessary to apply the TRM's triangulation weighting approach to combine them.

## **4. Participant and Trade Ally Spillover Results**

Of the 11 participant survey respondents included in the participant spillover analysis, four reported that they had installed additional energy efficient measures, and of those, two indicated they had not received program incentives. Only one survey respondent passed the spillover screening criteria<sup>3</sup>, and the evaluation team estimated the spillover energy savings from these non-rebated spillover measures at 69.6 therms. The energy savings of the 11 participants who responded to the survey were 79,733 therms, which resulted in a participant spillover rate of 0.001.

Of the 35 trade allies included in the trade ally analysis, seven reported selling additional non-program incentivized high efficiency lighting measures, and three respondents passed the spillover screening criteria. The estimated energy savings from these non-rebated spillover measures was 77,500 therms. The program energy savings achieved by the 12 trade allies who responded to the survey was 308,986 therms which resulted in a trade ally spillover rate of 0.25.

To ensure that spillover from the participant and trade allies did not lead to double counting, the evaluation team examined the data to exclude any reported spillover transactions from participants who purchased their measure from a trade ally who reported spillover. The team found no participant who qualified for spillover was a customer of the qualified trade ally spillover respondents.

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<sup>3</sup> Respondents who did not receive a rebate, or received a rebate but not from Nicor Gas, and answered to the program influence and counterfactual questions resulting in a spillover score greater than 5.

Table 5 presents the participant and trade ally spillover results, as well as the total spillover calculated, which is the sum of those results. This is then combined with the FR rate to estimate the NTG ratio.

**Table 5. Spillover Research Results**

Population	Spillover Results
Participant	<0.01
Trade ally	0.25
<b>Total Spillover</b>	<b>0.25</b>

Source: Evaluation Team Analysis

## 5. Final NTG Results and Recommendations

The final NTG value is calculated as  $1 - FR + SO$ , using savings-weighted values from participants and trade allies using the **Error! Reference source not found.** following formula:

$$NTG = 1 - FR + Participant\ SO + Trade\ Ally\ SO$$

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

**Table 6. Summary of FR, Spillover, and NTG Research Results for the Multi-Family Program**

Program Measure	FR	Participant SO	Trade Ally SO	NTG Ratio*
All measures except in-unit faucet aerators and high efficiency showerheads	0.27	<0.01	0.25	0.98
In-unit faucet aerators and high efficiency showerheads**	0.00	<0.01	0.25	1.25

Source: Evaluation team analysis

Notes: \* Numbers may not sum due to rounding.

\*\*As noted in IL TRM v12, Vol 3, Sections 5.4.4 and 5.4.5, the FR score for residential high efficiency showerheads and residential faucet aerators, has a deemed value of zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures.

## APPENDIX A. Multi-Family NTG History

This section includes the history associated with the Nicor Gas Multi-Family program's NTG results starting in GPY1 through the previous evaluation year.

**Table 7. Multi-Family NTG History**

Multi-Family NTG History	
	<p><b>Direct Install Program NTG:</b> 0.90  <b>FR:</b> 0.10  <b>Spillover:</b> 0.00</p>
<b>GPY1</b>	<p><b>Method and Source:</b> Evaluation research consisting of participating GPY1 customer self-reports (tenants and property decision-makers). NTG based on computer assisted telephone interviewing (CATI) telephone survey with participating decision-makers (21 property managers for Peoples Gas and North Shore Gas interviewed from a GPY1 population of 343). Program was delivered an assessment and direct installation offering.</p>
<b>GPY2</b>	<p><b>Peoples Gas: Deemed NTG 0.90; FR: 0.10; Participant Spillover (PSO): 0.00</b>  <b>North Shore Gas: Deemed NTG 0.90; FR: 0.10; PSO: 0.00</b>  <b>Method and Source:</b> Deemed by Stakeholder Advisory Group consensus from GPY1 evaluation research.</p>
<b>GPY3</b>	<p><b>Peoples Gas: Deemed NTG 0.90; FR 0.10; PSO: 0.00</b>  <b>North Shore Gas: Deemed NTG 0.90; FR 0.10; PSO: 0.00</b>  <b>Method and Source:</b> Deemed by Stakeholder Advisory Group consensus from GPY1 evaluation research.</p>
<b>GPY4</b>	<p><b>Peoples Gas and North Shore Gas:</b>  <b>In-Unit Direct Installation: NTG 0.90; FR 0.10; Spillover: 0.00</b>  <b>Method and Source:</b> No new research. Value from GPY1 evaluation research.  <b>Prescriptive Rebates: NTG 0.84 (PGL); 0.90 (NSG)</b>  <b>Method and Source:</b> Based on a weighting of the Commercial and industrial (C&amp;I) Prescriptive GPY4 NTG value (0.58) and Multi-family DI NTG (0.90) to reflect decision-makers, measure types, and decision scenario indicated by rate classification.</p> <p><b>Trade Ally Participant Influence (TAPI) Incentives: NTG 0.99</b>  <b>Method and Source:</b> Based on GPY1 evaluation research of the joint utility Small Business Energy Savings Program.  <b>Custom Incentives: NTG 0.68</b>  <b>Method and Source:</b> Based on the C&amp;I Custom Rebate Program GPY4 NTG value.  <b>Gas Optimization: NTG 1.02</b>  <b>Method and Source:</b> Based on GPY1 evaluation research of the joint utility Retro-Commissioning Program.</p>
<b>GPY5</b>	<p><b>In-Unit Direct Installation: NTG 0.92; FR 0.10; SO: 0.02</b>  <b>Method and Source:</b> FR value from GPY4. Spillover value from Nicor Gas CATI telephone survey with participating GPY3 decision-makers (74 property managers).</p>



## Multi-Family NTG History

**Prescriptive Rebates: NTG 0.87 (PGL); 0.92 (NSG)**

**Method and Source:** Based on a weighting of the C&I Prescriptive GPY5 NTG value (0.63) and Multi-family DI NTG (0.92) to reflect decision-makers, measure types, and decision scenario indicated by rate classification.

**TAPI Incentives: NTG 0.99**

**Method and Source:** No new research. Value from GPY4.

**Custom Incentives: NTG 0.78**

**Method and Source:** Based on the C&I Custom Rebate Program GPY5 NTG value.

**Gas Optimization: NTG 1.02**

**Method and Source:** No new research. Value from GPY4.

**In-Unit Direct Installation: NTG 0.92; FR 0.10; Spillover: 0.02**

**Method and Source:** FR value from GPY4. Spillover value from Nicor Gas CATI telephone survey with participating GPY3 decision-makers (74 property managers). Comparable research will be conducted with GPY5 PGL and NSG property owners/managers to update these values.

**Prescriptive Rebates and Partner Trade Ally Projects: NTG 0.92 (PGL); 0.92 (NSG)**

**Method and Source:** These types of projects have not been directly researched in multi-family, so proxy values from other programs have been used and weighted in previous years. When GPY4 NTG research updates in C&I Prescriptive and with Small Business trade allies are applied to the Multi-Family NTG values, the multi-family values fall in a range of 0.90 to 0.93. Differences in that range are not significant. We recommend a single value of 0.92 until research is completed with GPY5 PGL and NSG property owners/managers to establish values for these projects and decision-makers.

**Custom Incentives: NTG 0.78**

**Method and Source:** Based on GPY2 custom project research that included multi-family decision-makers. The GPY4 C&I Custom Program NTG research did not include multi-family decision-makers.

**Gas Optimization: NTG 1.02**

**Method and Source:** No new research. Value from GPY4.

**In-Unit Direct Installation (except faucet aerators): NTG 0.85; FR: 0.18; PSO: 0.03; Non-Participant Spillover (NPSO): 0.00.**

**In-Unit Direct Installation Faucet Aerators: NTG 1.03; FR 0.00; PSO: 0.03; NPSO: 0.00.**

**Prescriptive Rebates: NTG 0.76; FR 0.27; PSO: 0.03; NPSO: 0.00.**

**Partner Trade Ally Projects: NTG 0.88; FR: 0.15; PSO: 0.03; NPSO: 0.00.**

**Custom Incentives: NTG 0.72; FR: 0.31; PSO: 0.03; NPSO: 0.00.**

**Comprehensive Project Roll-up Average: NTG 0.84; FR 0.19; PSO: 0.03; NPSO: 0.00.**

**Method:** FR and Participant Spillover values from GPY5 evaluation research conducted by CATI telephone survey with GPY5 decision-makers (59 property managers or owners). Interviews with 11 trade allies did not find evidence of

GPY6

GPY7

## Multi-Family NTG History

participant spillover (PSO) or non-participant spillover (NPSO). The GPY5 research applied the TRM v6.0 NTG algorithms.

Due to the small population of multi-family custom projects, the GPY5 multi-family research completed 3 multi-family custom interviews, with a FR = 0.31, but did not achieve a 90/10 result. The GPY4 C&I Custom Rebate Program FR estimate was 0.31, and 0.31 is judged to be the best available value. The GPY4 research used TRM v5.0 NTG algorithms, and GPY5 research used TRM v6.0 NTG algorithms.

TRM version 6.0 specifies that the FR for faucet aerators be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. The comprehensive roll-up NTG value covers Prescriptive, PTA, and Custom Multi-Family participants. The roll-up value may be used instead of the path-level NTGs.

### **Gas Optimization: NTG 1.02**

**Method and Source:** No new research. Retained value from GPY6.

### **Assessment/Direct Install (all measures except faucet aerators and showerheads when using TRM specified baseline average water flow rates) NTG: 0.85; FR: 0.18; Participant Spillover: 0.03**

**Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms). Participant spillover was not estimated by program path; the 0.03 value represents the overall Multi-Family program based on 59 interviews conducted in the GPY5 Multi-Family NTG research. Trade ally interviews did not find PSO or NPSO.

### **Assessment/Direct Install (faucet aerators and showerheads when using TRM specific baseline average water flow rates) NTG: 1.03**

TRM version 7.0 specifies that the FR for faucet aerators and showerheads be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. PSO = 0.03 based on 59 interviews conducted in the GPY5 Multi-Family NTG research. Trade ally interviews did not find PSO or NPSO.

### **Multi-Family Comprehensive Prescriptive Rebates**

**NTG: 0.76; FR: 0.27; Participant Spillover: 0.03**

**Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms)

### **Multi-Family Comprehensive TAPI Incentives/Partner Trade Allies**

**NTG: 0.88; FR 0.15; Participant Spillover: 0.03.**

**Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms)

### **Multi-Family Comprehensive Custom Incentives**

**NTG; 0.72; FR: 0.31; Participant Spillover: 0.03.**

**Method:** FR (IL EM&V GPY4 for C&I Custom Program and IL EM&V GPY5 for Multi-Family Program), PSO, NPSO (PGL & NSG EM&V GPY5 for Multi-Family Program). GPY4 research used TRM v5.0 algorithms, GPY5 research used TRM v6.0 algorithms.

### **Multi-Family Comprehensive Roll-up of Prescriptive, PTA, and Custom**

**NTG; 0.84; FR 0.19; Participant Spillover: 0.03**

**Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms). The roll-up NTG value covers Prescriptive, PTA, and Custom Multi-Family participants. The roll-up value may be used instead of the path-level NTGs.

### **Multi-Family Comprehensive Gas Optimization**

2019 -  
2023

## Multi-Family NTG History

**NTG: 0.91; FR: 0.14; Participant Spillover 0.05**

**Method:** FR and PSO: 2018 Survey of 7 GPY6 participants. Memo: NTG Research Results from GPY6 for the Gas Optimization Study Offering, Navigant, 8/29/18, revised 9/13/18. The Gas Optimization offering has three paths: building heating, process, and steam plant. Multi-family buildings participate through the building heating path. Multi-Family specific GOS FR and PSO values are preferred if available. The GPY6 population did not have multi-family participants, and the two building heating respondents in the sample of seven were not compelling as multi-family representatives so Navigant used the overall program-level FR and PSO values.

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