



# MEMORANDUM

**To:** Nick Warnecke, Tammy Jackson, AIC; Seth Craigo-Snell, SCS Analytics; and Elizabeth Horne, ICC Staff  
**From:** The Opinion Dynamics Evaluation Team  
**Date:** September 25, 2024  
**Re:** AIC 2024 Midstream HVAC Channel Initiative Net-to-Gross Findings

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## INTRODUCTION

As part of the 2024 evaluation of the Ameren Illinois Company (AIC) Market Rate Single Family Initiative's Midstream HVAC Channel, Opinion Dynamics conducted research with contractors participating in the offering to expand upon distributor and contractor research completed in 2023. The evaluation team aggregated the results of the 2024 and 2023 research to update the net-to-gross ratios (NTGRs) for heating, ventilation, and air conditioning (HVAC), advanced thermostats, and heat pump water heater (HPWH) equipment for potential application in 2025.

The evaluation team used the net-to-gross (NTG) methodology prescribed in the Illinois Technical Reference Manual Version 12.0 (IL-TRM V12.0) Attachment A (Illinois Statewide Net-to-Gross Methodologies), modified with a set of deviations approved by the Illinois Stakeholder Advisory Group (SAG).<sup>1</sup> Specifically, we used the IL-TRM V12.0 Midstream Free Ridership (FR) Protocol. Per this protocol, the NTGR estimates presented in this memo triangulate FR assessed from the distributor perspective researched in 2023 and contractor perspective researched in 2023 and 2024. The estimates do not include the participant (end-use customer) perspective on FR or an assessment of spillover (SO).<sup>2</sup> We discuss this research decision in greater depth in the Midstream FR Protocol section of this memo.

## KEY FINDINGS

We estimated an overall FR of 0.525 (NTGR of 0.475) for the Midstream HVAC Channel. The distributor-based FR score was 0.621 (NTGR of 0.379) and the contractor FR was 0.429 (NTGR of 0.571). These results reflect a 0.01 increase in FR relative to the 2023 research, resulting from a small increase in the contractor FR score and a very slight change in the triangulation weights used to combine contractor and distributor results.

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<sup>1</sup> <https://www.ilsag.info/wp-content/uploads/AIC-Midstream-NTG-Deviation-Memo-2023-08-21.docx>

<sup>2</sup> Note that market effects (a concept related to SO) will be presented in a separate upcoming deliverable.

Table 1 summarizes the results of our NTGR analysis.

Table 1. NTGR Results by Respondent Type and Overall

Respondent Type	FR	NTGR (1 - FR)
Distributors (n=13)	0.621	0.379
Contractor (n=19) <sup>a</sup>	0.429	0.571
<b>Overall</b>	<b>0.525</b>	<b>0.475</b>

a. The evaluation team calculated the contractor FR score as the average of respondent-level FR from both the 2023 survey (0.332, n=6) and 2024 in-depth interviews (0.473, n=13).

## METHODS

### DATA COLLECTION AND SAMPLING

The results presented in this memo are inclusive of three research efforts across two evaluation years: 2023 distributor in-depth interviews (n=13); 2023 contractor web surveys (n=6); and 2024 contractor in-depth interviews (n=13).<sup>3</sup>

Due to the midstream nature of the offering, AIC does not directly track contractors associated with each project; as such, there is no reliable list of recently engaged contractors. To ensure the inclusion of a broad group of contractors likely to be actively engaged with the offering, the evaluation team compiled sample from five AIC data sources:

- 1) 2024 list of legacy HVAC contractors (N=322)
- 2) 2023 HPWH training plumber contact list (N=12)
- 3) June 2023 list of Program Allies (N=34)
- 4) 2021 end-of-year tracking data (N=120)
- 5) 2020 end-of-year tracking data (N=200)

The evaluation team reviewed, standardized, and excluded duplicate records by company name, keeping the record from the most recent data source, resulting in a sample of 345 unique contractors. We fielded interviews in June and July 2024, sending each contact an initial scheduling email and up to two follow-up emails. We initially targeted 15 completed interviews but encountered scheduling challenges, possibly due to a spike in demand for HVAC services during the intense heat wave occurring at the time. To maximize reach, we conducted outbound calling to select contacts, prioritizing those registered as Program Allies, identifiable as HPWH installers, or who completed the previous contractor survey in 2023. We reached out via telephone to each of these contacts up to three times. The final completed interviews included 13 contractors for a yield of 4%.<sup>4</sup> Additional details regarding the data collection and sampling approach for the 2023 distributor and contractor research efforts are included in the AIC 2023 Midstream HVAC Channel NTG Memo.<sup>5</sup>

<sup>3</sup> Note that final FR results exclude survey responses from three 2023 respondents who also completed an in-depth interview in 2024.

<sup>4</sup> Note, a yield of 4% implies a slightly higher response rate as yield does not account for the portion of non-responses assumed to be ineligible.

<sup>5</sup> <https://www.ilsag.info/wp-content/uploads/AIC-2023-Residential-Midstream-HVAC-NTG-Memo-DRAFT-2023-09-15.docx>

## MIDSTREAM FR PROTOCOL

The evaluation team used NTG methodology as prescribed in the IL-TRM V12.0 Attachment A (Illinois Statewide Net-to-Gross Methodologies) Midstream FR Protocol, modified with a set of deviations approved by the Illinois SAG.<sup>6</sup> This methodology calculates overall FR as the average of two FR sub-scores (Program Influence FR Score and Counterfactual FR Score). These scores are calculated based on two items: overall program influence and a percentage-based counterfactual. These items gauge the influence of the offering and the likelihood of comparable outcomes in the offering's absence.

The IL-TRM V12.0 Midstream FR Protocol directs evaluators to estimate FR for midstream offerings based on research with distributors, intermediaries (contractors or installers), and/or end-use customers dependent on the offering design, contractor or installer involvement/influence, end-use customer awareness, and constraints for conducting high-quality research. The evaluation team determined assessments of distributors' and contractors' perspectives on FR were critical to assessing attribution for the offering based on multiple factors. The offering's design includes significant direct interactions with and attempts to influence the behavior of distributors. On the other hand, the potential effect on distributor behaviors and the monetary incentive available through the offering have the potential to influence the projects undertaken by participating contractors. End-use customers typically rely heavily on contractors' recommendations to inform their choice of equipment available through the offering (e.g., HVAC, HPWH, etc.), and contractors are often responsible for informing customers of incentive availability. Given this, we expected contractors could speak better to the influence of the offering than end-use customers.

The evaluation team decided not to explore SO as part of the distributor and contractor research efforts. Although the evaluation did not explore SO, the research sought to understand and quantify market effects (a related concept), which will be presented in a separate deliverable (expected in September 2024).

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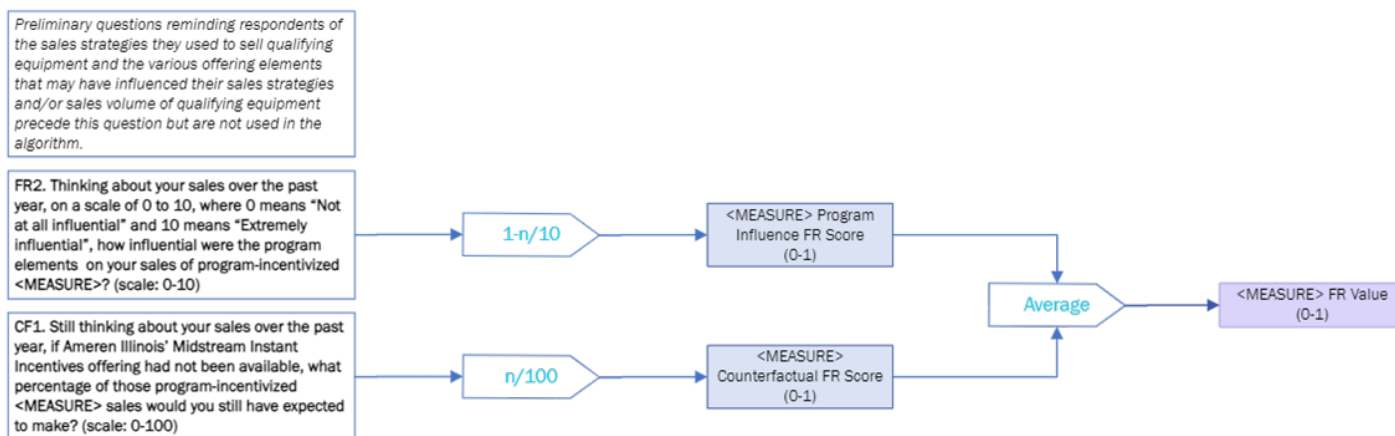
<sup>6</sup> <https://www.ilsag.info/wp-content/uploads/AIC-Midstream-NTG-Deviation-Memo-2023-08-21.docx>  
Opinion Dynamics

## DISTRIBUTOR FR ALGORITHM

Given the availability of data detailing distributors' sales and savings by measure, as well as the likelihood that distributors' sales tactics and the offering's influence on sales varied by measure type, the evaluation team calculated measure-specific FR scores for HVAC, advanced thermostats, and HPWHs. The evaluation team applied the FR algorithm to calculate measure-specific FR scores for each distributor as the average of (1) the measure-specific Program Influence FR Score, and (2) the measure-specific Counterfactual FR Score. For each distributor's individual measures, the evaluation team averaged the two elements to assess the degree of FR on a scale of 0 to 1, where 0 means the distributor was a non-free rider and 1 means the distributor was a full free rider.<sup>7</sup>

The distributor FR algorithm is depicted in Figure 1 below.

Figure 1. Distributor FR Algorithm



To obtain measure-specific FR scores for the offering overall, the evaluation team weighted distributors' measure-specific FR scores by their ex ante gross MMBtu savings relative to the total ex ante gross MMBtu savings for that measure across the entire interviewed sample and then calculated a weighted average. Next, the evaluation team weighted the measure-specific FR scores for the offering overall by the proportion of ex ante gross MMBtu savings the measure accounted for across the entire population of distributors (interviewed and non-interviewed) to compute the overall offering-level distributor FR score. The majority of MMBtu savings came from HVAC equipment (80%), with 19% coming from advanced thermostats and 1% coming from HPWHs. The final offering-level distributor NTGR was equal to  $(1 - \text{Overall Offering-Level Distributor FR Score})$ .

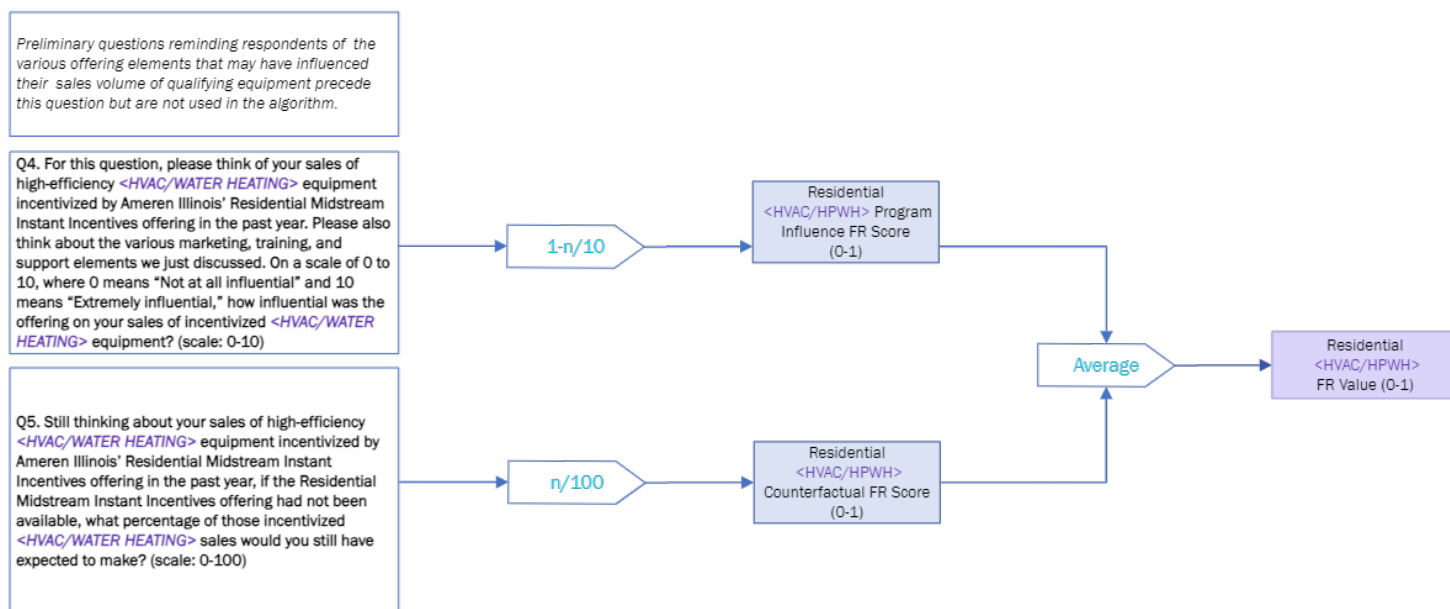
<sup>7</sup> If a respondent's Program Influence FR Score and Counterfactual FR Score conflicted, they were asked a series of consistency check follow-up questions. The evaluation team used these responses to contextualize and interpret distributors' ratings and adjusted reported FR in one case.

## CONTRACTOR FR ALGORITHM

The IL-TRM V12.0 does not give guidance specific to midstream FR research with intermediaries like contractors and installers. The evaluation team determined that the general methodology used to calculate distributor FR was also appropriate for contractors. The 2024 in-depth interviews followed the same methodology as the 2023 web survey, with minor differences to accommodate the change in data collection format. Notably, the 2024 in-depth interviews asked contractors to consider FR separately for HVAC and HPWH projects completed through the offering, whereas the 2023 survey did not distinguish by equipment type. Given the lack of data detailing the equipment types or quantities contractors installed through the offering, the evaluation team relied on contractors' estimation of the percentage of projects they completed through the offering for each equipment type.<sup>8</sup> The evaluation team estimated contractor-based FR as the average of the two sub-scores: (1) the Program Influence FR Score, and (2) the Counterfactual FR Score.<sup>9</sup> The resulting FR estimates range from 0 to 1, where 0 means the contractor was a non-free rider and 1 means the contractor was a full free rider.

The contractor FR algorithm is depicted in Figure 2 below, and the full 2024 contractor in-depth interview guide is included in Appendix A.

Figure 2. Contractor FR Algorithm (Updated for 2024 Research)



In most cases (n=17), where contractors completed HVAC projects only, the evaluation team calculated a single respondent-level FR score as the average of the two sub-scores: (1) the Program Influence FR Score, and (2) the Counterfactual FR Score. For the remaining two 2024 interview respondents who completed both HVAC and HPWH projects, the evaluation team calculated equipment-specific FR scores. For each of these two respondents, the evaluation team then calculated an average of the HVAC- and HPWH-specific FR scores, weighted by the number of projects they reported completing with each equipment type over the past year. The evaluation team then averaged respondent-level FR results from both 2023 and 2024 research to calculate the overall offering-level contractor FR

<sup>8</sup> Of the 13 interviewed contractors, all reported completing HVAC projects and two reported completing HPWH projects in the past year.

<sup>9</sup> If a respondent's Program Influence FR Score and Counterfactual FR Score conflicted, they were asked a series of consistency check follow-up questions. The evaluation team used these responses to contextualize and interpret contractors' ratings and adjusted reported FR in three cases.

score, excluding survey responses from three 2023 respondents who also completed an in-depth interview in 2024. The final offering-level contractor NTGR was equal to  $(1 - \text{Overall Offering-Level Contractor FR Score})$ .

## TRIANGULATION OF DISTRIBUTOR AND CONTRACTOR FR SCORES

In alignment with the IL-TRM V12.0, the evaluation team combined results from the distributor and contractor research to arrive at a final FR score and NTGR for the Midstream HVAC Channel. The evaluation team weighted results from each of the two groups based on a range of considerations (detailed in Table 3) in accordance with IL-TRM V12.0 guidance. We assigned each consideration an Importance Score of “Low,” “Medium,” or “High” based on its value to the overall quality of the research relative to the other considerations. These Importance Scores translated into the following weights: “High” – 1, “Medium” – 0.66, “Low” – 0.33. For each consideration, the evaluation team rated the distributor and contractor research on the relevant 0 to 10 scale. Scores for the distributor research did not change from 2023 as the current evaluation did not include additional distributor research; however, the evaluation team considered how changes made for the 2024 contractor research relative to 2023 changed the quality of the contractor research overall to develop updated scores.

The evaluation team calculated the final distributor and contractor triangulation weights by calculating the weighted average score for each type of respondent and dividing each by the sum of the weighted averages. Relative to 2023, the triangulation weights are slightly higher for contractors and lower for distributors (previously 0.46 for contractors and 0.54 for distributors), primarily reflecting the broadened contractor sample and advantages of the in-depth interview format, as well as an adjustment to the considerations included in the weighting scheme.<sup>10</sup> The resulting triangulation weights are shown in Table 2.

Table 2. Triangulation Weights for Combining Distributor and Contractor Results

Respondent Type	Triangulation Weight
Distributors	0.50
Contractors	0.50

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<sup>10</sup> The evaluation team was unable to score the contractor research on the consideration of how those surveyed/interviewed were of the larger population due to the lack of information available with which to characterize the full population of participating contractors. Given this, we elected to remove this consideration from the triangulation process

Table 3 details the four key considerations used to establish triangulation weights.

Table 3. Midstream HVAC Channel Distributor and Contractor FR Score Triangulation

Consideration	Scale	Notes	Distributor Research	Contractor Research	Importance Score
How was the sample created and what implications does the quality of the sample have on the execution of the research and analysis of results?	0 (Low Quality) - 10 (High Quality)	<p><b>Sample Sources</b>  <i>Distributor Sample:</i> Drawn from tracking data covering January 2022 through May 2023. Includes all participating distributors in that timeframe as well as the quantity of equipment sold and the associated energy savings.  <i>2023 Contractor Sample:</i> Drawn from contact list sent by AIC. Only includes contractors registered as Program Allies, does not include contractors who participated in the program without becoming an Ally. Multiple contractors confirmed a different sector than contact lists suggested.  <i>2024 Contractor Sample:</i> Drawn from five sources: a 2024 list of legacy HVAC contractors, a 2023 HPWH training plumber contact list, a June 2023 list of Program Allies, and 2020-2021 end-of-year tracking data from when the offering was downstream.</p> <p><b>Larger Implications</b>  <i>Distributor Research:</i> Having measure quantities and savings allowed the evaluation team to weight measure-level scores by distributors' measure-specific MMBtu savings and weight the overall score by the measures' full sample MMBtu savings.  <i>2023 Contractor Research:</i> Given the lack of contractor-specific tracking data, the evaluation team had little to no information to understand the population/contextualize results.  <i>2024 Contractor Research:</i> Aggregating multiple contact list sources allowed the evaluation team to contact a broader group of contractors. As with 2023, the lack of contractor-specific tracking data meant the evaluation team did not have reliable population-level data.</p>	10	4	High
Which population is closer to the point of program influence in terms of distance from decision-makers?	0 (Far) - 10 (Close)	<p><i>Distributor Research:</i> Distributors have little direct engagement with end-users. The only direct touchpoints distributors have with end-users are in the form of any end-user facing marketing/outreach they do about qualifying units/the available incentive.  <i>2023 &amp; 2024 Contractor Research:</i> Contractors are directly interfacing with end-users and influencing/guiding their purchasing decisions.</p>	4	8	High
Where is there the potential for bias given the program structure and data collection approach?	0 (High Chance of Bias) - 10 (Low Chance of Bias)	<p><i>Distributor Research:</i> Distributors serve as the point of contact for incentive distribution and have less direct visibility into end-user purchase decisions, which may bias their impressions of the offering's influence. Although the interview allowed some flexibility, it also allowed distributors to comment on satisfaction and issues with the Channel throughout the conversation, which may have primed their perspectives on Channel influence.  <i>2023 &amp; 2024 Contractor Research:</i> Contractors are less directly engaged with implementer staff and have direct visibility into end user decision-making. While the survey format did not allow for real-time clarification, satisfaction questions were only asked at the end of the survey. The in-depth interviews addressed FR early in the conversation and allowed for additional clarifications and insights to help avoid potential biases.</p>	4	8	Medium

Consideration	Scale	Notes	Distributor Research	Contractor Research	Importance Score
<p>What is the level of granularity of the scores given the data collection and analysis approach?</p>	<p>0 (Low Granularity) - 10 (High Granularity)</p>	<p><i>Distributor Research:</i> Scores were asked at the measure level. Distributors' responses suggest there were notable differences in program influence by measure with, in general, advanced thermostat sales being the least influenced and HPWH sales being the most influenced.</p> <p><i>2023 Contractor Research:</i> Due to the lack of tracking data for contractors, FR questions did not distinguish by equipment type.</p> <p><i>2024 Contractor Research:</i> Although tracking data did not include contractor-specific information, the interview format allowed the evaluation team to assess FR by end-use (for HVAC and HPWH projects, respectively). For respondents who reported completing both types of projects, the interviewer asked about each type separately to inform equipment-specific scores, and then combined them based on the number of projects each contractor reported competing with each equipment type.</p>	<p>8</p>	<p>6</p>	<p>Low</p>



## DETAILED NTGR RESULTS

Based on combined results from research with participating distributors and contractors, we estimated an overall FR of 0.525 (NTGR of 0.475) for the Midstream HVAC Channel. The distributor-based FR score, established by 2023 research, was 0.621 (NTGR of 0.379). The contractor FR, based on aggregated results from 2023 and 2024 research, was 0.429 (NTGR of 0.571). The evaluation team applied a triangulation weight of 0.50 to both the distributor and contractor FR scores to calculate a weighted average representing the overall FR score for the offering. These results reflect a 0.01 increase in FR relative to the 2023 research, resulting from a 0.03 increase in the contractor FR score and a 0.04 change in the triangulation weights (weighing the research equally).

Table 3 summarizes the results of the NTGR analysis.

Table 4. NTGR Results by Respondent Type and Overall

Respondent Type	FR	NTGR (1 - FR)	Triangulation Weight
Distributors (n=13)	0.621	0.379	0.50
Contractor (n=19)*	0.429	0.571	0.50
<b>Overall</b>	<b>0.525</b>	<b>0.475</b>	<b>N/A</b>

\*The evaluation team calculated the contractor FR score as the average of respondent-level FR from both the 2023 survey (0.332, n=6) and 2024 in-depth interviews (0.473, n=13).

For contractor interviewees who indicated they would have made over 60% of their incentivized sales regardless of the offering's availability (n=9), we inquired about their rationale. Three contractors indicated they almost exclusively sold high-efficiency equipment that was eligible for the offering—of these three, two indicated they served more affluent areas. Two contractors indicated that while they would have made the sales regardless, the incentive encouraged customers to move forward with the project faster, and two reported they felt the incentives available were not large enough to drive decision-making (one noting incentive levels had not kept up with inflation). A separate upcoming deliverable will provide market effects and process-oriented results from the 2024 contractor interviews.

# APPENDIX A. 2024 CONTRACTOR IN-DEPTH INTERVIEW GUIDE



[2024 Contractor In-Depth  
Interview Guide](#)