



# Memorandum

**To:** Nick Warnecke and Carlotta Ruiz-Smith, AIC; Seth Craigo-Snell, SCS Analytics; and Elizabeth Horne, ICC Staff  
**From:** The Opinion Dynamics Evaluation Team  
**Date:** August 30, 2024  
**Re:** AIC 2024 Retail Products Initiative Net-to-Gross Findings

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## Introduction

The AIC Retail Products Initiative includes several channels and offers discounts on a wide range of qualifying ENERGY STAR® products, including LED lighting, advanced power strips, advanced thermostats, and over a dozen other household appliances and miscellaneous equipment.<sup>1</sup> The offering is designed to incentivize customers to purchase energy-efficient versions of selected retail products instead of less efficient (and typically cheaper) alternatives by offsetting the price difference, helping customers reduce their energy usage, energy bills, and carbon footprints. The Retail Products Initiative offers incentives in various forms through three different participation channels:

- Point-of-Sale (POS) channel: By partnering with retailers and manufacturers, the POS channel provides in-store discounts that reduce the purchase price of select products.
- Downstream Rebate channel: This channel allows AIC customers to apply for a post-purchase reimbursement (rebate) to cover a portion of the cost of qualifying product purchases.
- Online Marketplace channel: This channel offers AIC customers select products at discounted price points on AIC's own online store.

As part of the evaluation of the 2024 evaluation of the Retail Products Initiative, we conducted a survey of participants who purchased rebated advanced thermostats, air purifiers, clothes washers and dryers, dehumidifiers, refrigerators, and freezers through the Downstream Rebate or Online Marketplace channels (email addresses are not collected for POS channel participants). As part of the survey, we collected data to estimate net-to-gross ratios (NTGRs) for each of these product categories. The evaluation team relied on NTG methodologies prescribed in the Illinois Technical Reference Manual Version 12.0 (IL-TRM V12.0) Attachment A (Illinois Statewide Net-to-Gross Methodologies) to develop estimates of free-ridership (FR) and participant spillover (PSO).

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<sup>1</sup> The ENERGY STAR® name and mark are registered trademarks owned by the US Environmental Protection Agency (USEPA).

# NTGR Results

NTGR estimates developed by the evaluation team account for both FR and PSO. The evaluation team calculated FR separately for each of the seven measure categories and developed PSO at the Initiative level (given its low-incidence nature). The resulting NTGR estimates range from 0.498 for refrigerators to 0.865 for advanced thermostats. The results of our NTGR analysis are shown in Table 1.

**Table 1. NTGR Results by Measure Category**

Measure Category	FR	PSO	NTGR
Advanced Thermostat <sup>a</sup>	0.160	0.025	0.865
Air Purifier	0.435		0.590
Clothes Dryer	0.484		0.541
Clothes Washer	0.507		0.518
Dehumidifier	0.335		0.690
Freezer	0.459		0.566
Refrigerator	0.527		0.498

<sup>a</sup>. Advanced thermostat NTGR is applicable to gross savings and may require adjustment for application to heating savings recommended by the IL-TRM V12.0, which are inclusive of partial net effects. (<https://www.ilsag.info/wp-content/uploads/Consumption-Analysis-NTG-Evaluator-Presentation-2020-09-25.pdf>)

Advanced thermostat participants reported notably lower FR and higher NTGR (0.160 and 0.865, respectively) relative to the other measure categories included in the current research. Notably, the Initiative generally provided a \$125 incentive for each advanced thermostat, whereas the typical incentive was substantially lower at \$50 for the other six measure categories, most of which are generally larger and more expensive purchases. These differences in incentive size relative to total cost likely explain a substantive portion of the differences in measure-level FR results.

FR estimates account for participant self-reported influence of Initiative incentives and marketing, as well as likelihood of making comparable purchases in the Initiative’s absence (measured in terms of energy efficiency, timing, and quantity). Recipients of advanced thermostats, air purifiers, and dehumidifiers generally provided higher incentive influence ratings (between 7.4 and 8.9 out of 10 on average), than those who purchased larger appliances (average ratings between 4.0 and 4.9 out of 10). For all measure categories except advanced thermostats, respondents indicated that the Initiative had somewhat more impact on their choice of an *energy-efficient* product than it did on the timing of their purchase. Advanced thermostat participants indicated that in the absence of the Initiative, they would have been relatively unlikely to purchase a thermostat of any kind *within 12 months* (average likelihood rating of 2.2 out of 10) or that they would have purchased an *advanced* thermostat in the absence of the offering (average likelihood ratings of 3.7 out of 10). In most cases, FR scores based on self-reported program influence (Program Influence scores) aligned closely with FR scores based on reported likeliness of making similar purchase decisions in the program’s absence (No-Program scores). Additional details on the FR algorithm and scoring is provided in the subsequent methods sections.

# Methods

## Survey Sampling and Fielding

The evaluation team conducted a web survey with a total of 366 Retail Products Initiative participants, reflecting a yield of 6.8%.<sup>2</sup> Survey fielding took place in June and July of 2024. Each sampled participant received an email invitation and up to two reminder emails.

The sample frame for the survey effort included all customers who participated in the Retail Products Initiative within approximately 12 months prior to survey fielding (i.e., Q3 2023 through Q1 2024), and for whom tracking data included a valid email address. We excluded participants from more than one year prior to fielding to minimize recall bias and avoided contacting participants within one month of their purchase to avoid capturing artificially low installation rates for customers who haven't yet had a chance to make use of their new product.<sup>3</sup> Email addresses were only available for participants in the Online Marketplace and Downstream Rebate channels. Marketplace Channel participants accounted for 18% of both the sample frame and sample, with advanced thermostats accounting for the vast majority of Marketplace channel participation.

The evaluation team randomly selected up to 1,000 respondents from the sample frame to include in the final sample. We attempted a census of all eligible participants for measure categories with less than 1,000 contacts available. To reduce survey length and respondent burden, each participant was asked about a single product, even if they purchased more than one rebated product. In doing so, we prioritized the least common product type for participants who made multiple purchases. Table 2 summarizes the sample design and number of survey completes by measure category.

**Table 2. Sample Summary**

Measure Category	Participants in Sample Frame	Sampled Participants	Survey Completes
Advanced Thermostat	26,753	1,000	20
Air Purifier	330	330	24
Clothes Dryer	991	991	68
Clothes Washer	923	923	89
Dehumidifier	719	719	52
Freezer	234	234	22
Heat Pump Water Heater <sup>a</sup>	157	157	18
Refrigerator	1,721	1,000	73
<b>Total</b>	<b>31,828</b>	<b>5,354</b>	<b>366</b>

<sup>a</sup> Heat pump water heater participants were not asked FR questions or included in FR analysis given limited sample availability.

<sup>2</sup> Note that a yield of 6.8% implies a slightly higher response rate as yield does not account for the portion of non-responses assumed to be ineligible.

<sup>3</sup> Note that in-service rate (ISR) results from this effort will be presented in a separate deliverable.

## NTG Methodology

Survey respondents were asked a series of questions relating to FR and PSO. The evaluation team developed these questions using the NTGR algorithms outlined the Prescriptive Rebate (With No Audit) Protocol section of Attachment A to the Illinois Technical Reference Manual for Energy Efficiency Version 12.0 (IL-TRM V12.0). The estimate of NTGR accounts for FR and PSO, as outlined by Equation 1 below.

### Equation 1. NTGR Calculation

$$NTGR = 1 - FR + PSO$$

## FR Methodology

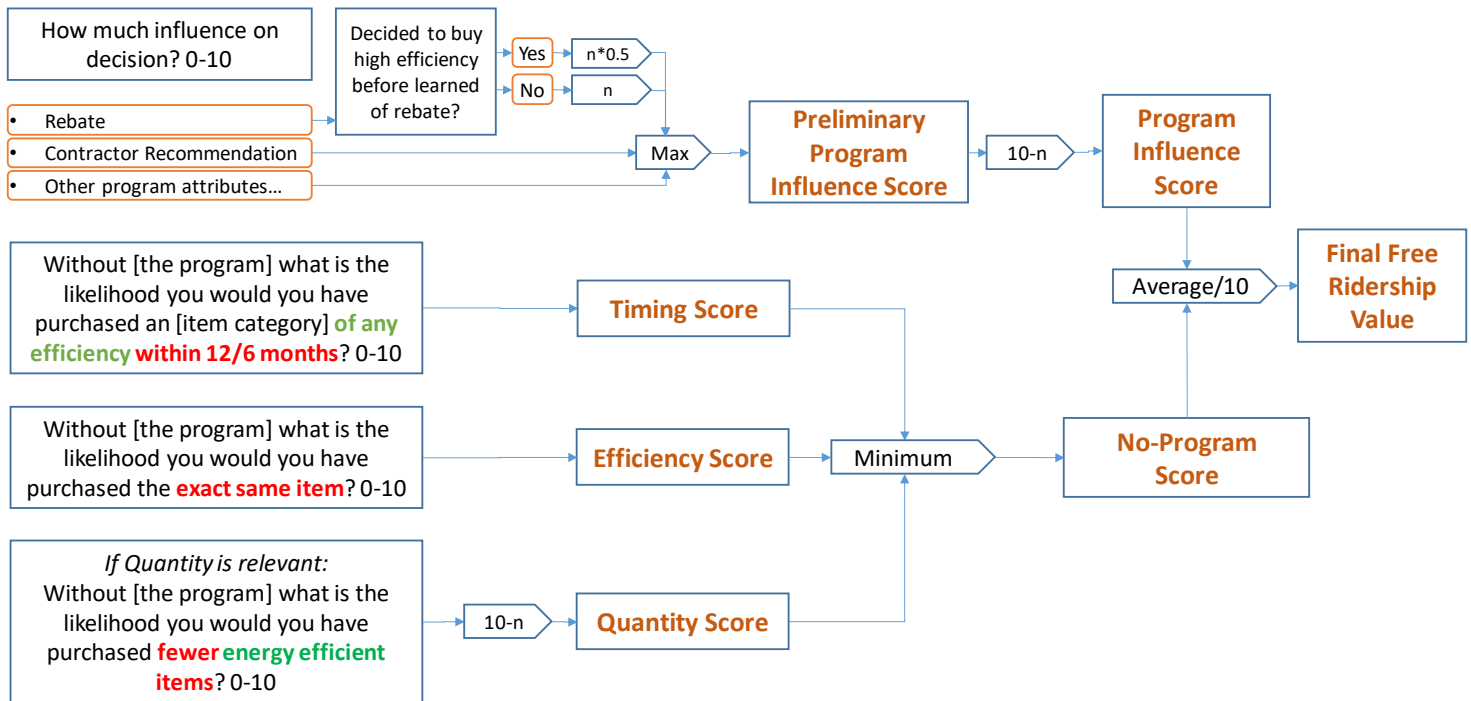
FR represents the portion of participants who would have purchased products with the same level of efficiency in the absence of program interventions. The Retail Products Initiative encourages customers to purchase efficient products by reducing the purchase price so that the price is closer to that of less efficient alternatives. The Initiative also educates customers about the benefits of energy-efficient products. The final FR score accounted for both avenues of program influence.

As prescribed in the IL-TRM V12.0, The evaluation team calculated FR as the average of two distinct scores – a Program Influence score and a No-Program score.

- The **Program Influence Score** is based on the importance of Initiative components, including the Ameren Illinois rebate and information from marketing materials or program staff. The score also accounts for the timing of program awareness relative to the decision to purchase an initiative-rebated product.
- The **No-Program Score** is based on the participant's self-reported likelihood to have installed the same type of energy-efficient equipment at the same time without the program.

Figure 1 illustrates the scoring algorithm.

Figure 1: FR Algorithm



To address the possibility of conflicting responses, the evaluation team included a consistency check by asking respondents to describe in their own words how the Initiative influenced their decision to purchase Initiative-rebated product(s). Per IL-TRM V12.0 guidance, the evaluation team analyzed individual responses for internal consistency, adjusting FR scores in cases where open-end responses helped resolve inconsistencies and omitting cases where they did not. Among the 348 respondents who answered FR questions, 68 provided contradictory ratings (i.e. difference of 7 or more between Program Influence and No-Program scores). Based on review of open-ended responses, we adjusted 44 FR scores and omitted 2 unresolvable cases.

## PSO Methodology

PSO results from the installation of non-incented, energy-efficient products by Initiative participants that were influenced by Initiative interventions. We asked survey respondents whether they purchased and installed other energy-efficient products without incentives after purchasing their Initiative-incented products. Those who reported potentially qualifying purchases were then asked to rate the influence of the Initiative on their decision to purchase the non-incented products via the following two survey questions:

- How important was your experience with the Ameren Illinois offering in your decision to make the additional energy efficiency improvements on your own? [0 to 10 scale, where 0 is not at all important and 10 is extremely important?] (referred to as **Measure Attribution Score 1**)

- If the Ameren Illinois offering had not been available, how likely is it that you would still have made the additional energy efficiency improvements on your own? [0 to 10 scale, where 0 is extremely unlikely and 10 is extremely likely] (referred to as Measure Attribution Score 2)

Leveraging responses to these questions, the evaluation team calculated an Attribution Score, consistent with Method 1 prescribed by the IL-TRM V12.0. Participants with potentially qualifying spillover purchases were considered PSO-qualified if they provided an Attribution Score of five or higher (out of ten). Equation 2 shows how Attribution Scores were calculated.

**Equation 2. Calculation of PSO Attribution Score**

$$\text{Attribution Score} = \text{Average (Measure Attribution 1, (10 - Measure Attribution 2))}$$

Thirteen respondents reported purchases qualifying as PSO with an associated Attribution Score of five or higher. These qualifying purchases included nine different product categories, and each customer reported between one and three products as PSO-qualified purchases. The evaluation team developed estimates of total verified gross savings attributable to PSO-qualified purchases (i.e. spillover savings).<sup>4</sup> PSO savings associated with the 19 purchases reported as PSO amounted to 2,230 kWh, as shown in Table 3.

**Table 3. Measure-Level PSO-Attributable Savings**

Spillover Measure	Total Quantity Reported as PSO	Verified Gross kWh from PSO
Advanced Thermostat	2	1,029
Advanced Power Strip	4	274
Air Conditioner	3	166
Clothes Washer	3	321
Dehumidifier	1	150
Dishwasher	1	41
Faucet Aerator	1	24
Low-Flow Showerhead	1	60
Refrigerator/Freezer	3	165
<b>Total</b>	<b>19</b>	<b>2,230</b>

<sup>4</sup> Verified gross savings for dishwashers are based on IL-TRM V12.0 guidance. For all other measures, we relied on average per-unit verified gross energy savings established in the AIC 2023 Residential Program Impact Evaluation Report (April 29, 2024). <https://www.ilsag.info/wp-content/uploads/2023-AIC-Residential-Program-Impact-Evaluation-Report-FINAL-2024-04-29.pdf>.

These spillover savings as a percentage of total verified gross savings associated with all Initiative-incentivized products purchased by valid survey respondents represent the PSO rate. Given the inherent need for larger samples to achieve robust estimates of low-incidence events, spillover results are calculated for the Initiative overall. The resulting PSO rate is 2.5%, as outlined in Table 4.

**Table 4. PSO Results Summary**

<b>Metric</b>	<b>Value</b>
Verified Gross kWh from PSO (n=13)	2,230
Verified Gross kWh from Initiative-Incented Purchases in Sample (n=366)	88,794
<b>PSO Rate</b>	<b>2.5%</b>

# Appendix A. Participant Survey Instrument



AIC 2024 Retail Products  
Participant Survey