



MEMORANDUM

To: Nick Warnecke (Ameren Illinois Company), Seth Craigo-Snell (SCS Analytics), Nida Khan (CAMI Energy), and Elizabeth Horne (ICC Staff)

From: The Opinion Dynamics Evaluation Team

Date: October 19, 2023

Re: Ameren Illinois Company Nonresidential Nonparticipant Spillover Research Results

INTRODUCTION

This memo presents the results from a nonresidential nonparticipant spillover (NPSO) study for Ameren Illinois Company (AIC). This study is part of a statewide study of NPSO in Illinois to update portfolio-wide assumptions for nonresidential NPSO. AIC, Nicor Gas, and Peoples Gas/North Shore Gas (PG/NSG) jointly sponsored this study.

The primary goal of this study is to estimate NPSO among nonparticipating business customers for portfolio-wide applications. As deemed possible within research constraints, this study also provides a limited amount of additional information from nonparticipants; examples of additional information include nonparticipating customer characteristics, energy-related needs, and awareness of AIC energy efficiency programs.

DATA COLLECTION

NONPARTICIPANT SURVEY

To estimate NPSO, the evaluation team conducted survey research with nonparticipating business customers to identify customers where NPSO occurred and to gather information to quantify energy savings resulting from NPSO. Opinion Dynamics employed multiple strategies to field this survey, including a mail-push-to-web (MPTW) approach and email outreach to customers with available email addresses. We elaborate on our fielding strategy below.

FIELDING

At the launch of the survey, the evaluation team recruited respondents via an MPTW approach, which involved sending mailers to customers' addresses requesting their completion of the online survey. However, the customer response rate was significantly lower than expected (see Table 2) and the evaluation team modified its fielding strategy to focus on email outreach.

SAMPLING

The evaluation team developed a valid population for the study based on the entire population of AIC business customers, selected a simple random sample of customers, and removed accounts with missing contact information.¹ We also removed duplicate addresses for the MPTW sample and email addresses for the email outreach sample. Table 1 displays the valid population, sample size, and number of completed surveys for AIC.

Table 1. Valid Population, Sample Size, and Number of Completed Surveys

Step	Count
Valid Population	124,193
MPTW Sample Size	10,000
MPTW Survey Completes	77
Email Sample Size	21,886
Email Survey Completes	254

SURVEY DISPOSITION AND RESPONSE RATE

We fielded the survey of non-residential nonparticipants from June 30th to September 11th, 2023. Table 2 presents the final survey dispositions and response rate.

Table 2. Nonparticipant Survey Dispositions

Disposition	Count
Completes (I)	331
Partial Completes (P)	27
Refusals/Break-offs (R)	252
Non-Contacts (NC)	24,382
Others (O)	0
Break-offs (with eligibility) (R1)	252
Unknown If Eligible for Survey (UH1)	0
Unknown If Eligible for Survey, Other (UO1)	0
Unknown If Eligible Household/Business/Respondent (UH2)	24,382
Unknown If Eligible Household/Business/Respondent, Other (UO2)	0
Unused Sample (UH3)	0
Ineligible for Survey (X1)	130
Ineligible Household/Business/Respondent (X2)	1,400
Ineligible Sample Units (X3)	2,573
Estimated proportion of sample that is eligible to complete survey (e1)	82.5%
Estimated proportion of sample that is eligible HH/BUS/R (e2)	34.7%
Estimated proportion of sample that is an eligible sample unit (e3)	91.2%

¹ According to Section 3.2 in Volume 4 of the IL TRM, the valid population is defined as unique business-premises that have not participated in AIC-sponsored energy efficiency programs in the past three years (2020-2022), with ineligible accounts dropped from the population. Ineligible accounts include exempt customers and/or non-retrofitable sites such as cellphone towers and utility-owned facilities.

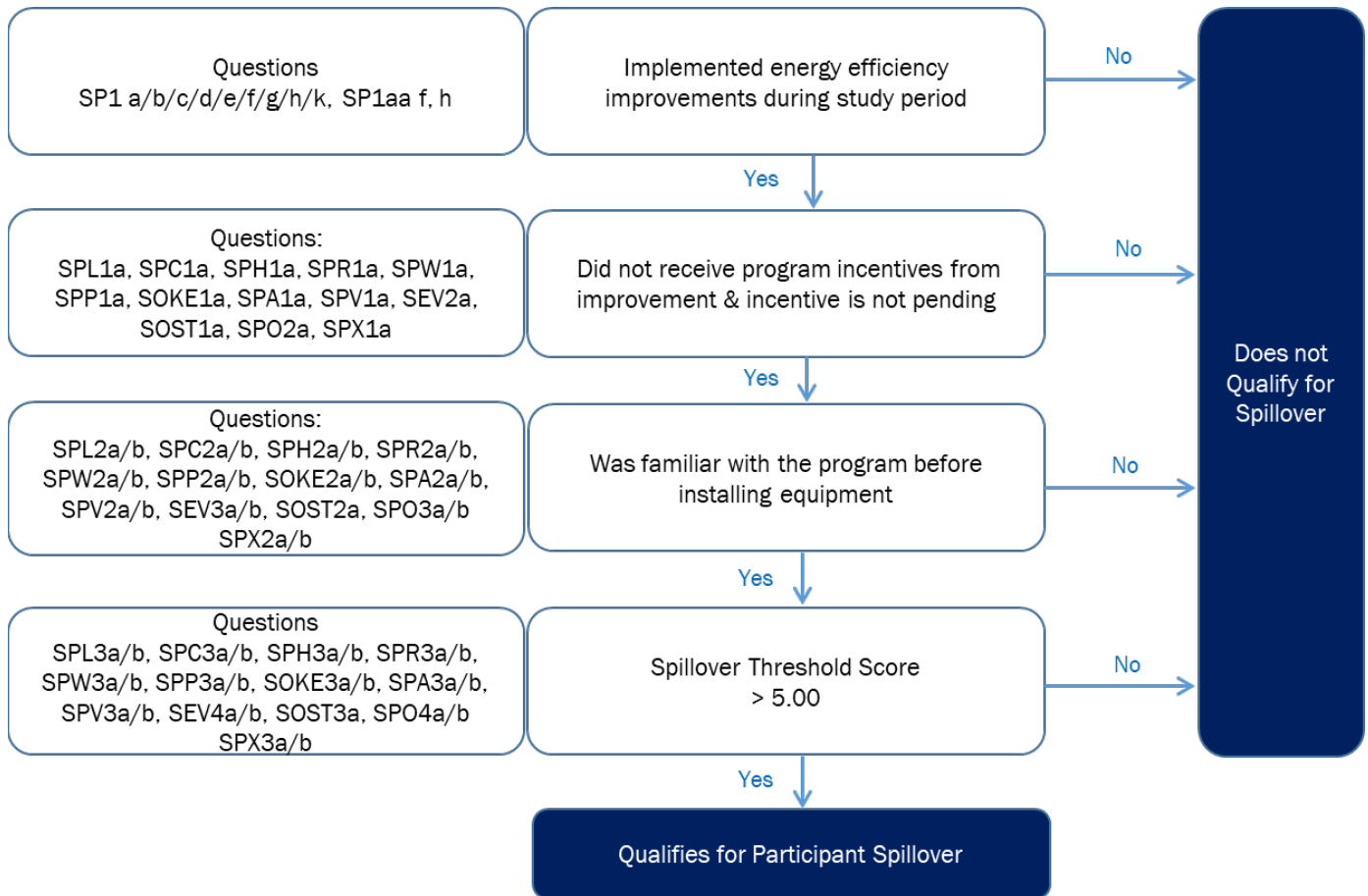
Disposition	Count
No partial completes but eligibility criteria (AAPOR RR3)	4.4%
Total Records	29,098

METHODOLOGY

NPSO refers to the installation of energy-efficient measures by program nonparticipants who were influenced by the program but did not receive an incentive. An example of potential NPSO is a customer who was aware of and previously participated in AIC’s Energy Efficiency Business Program and made an equipment upgrade at the recommendation of a contractor who stated they would fill out the incentive application on the customer’s behalf. In this example, the contractor may have failed to submit the application due to an administrative oversight, and the customer did not inquire about the incentive with the utility or the contractor. For this example to be confirmed as NPSO, the customer would need to confirm that the awareness of the program influenced their decision to make the equipment upgrade.

Calculation of NPSO involves four steps: (1) identify energy efficiency improvements that qualify as NPSO; (2) estimate annual NPSO savings for all survey respondents; (3) extrapolate respondent-level NPSO to the population; and (4) develop the NPSO ratio (for future application). Figure 1 summarizes the criteria used to identify cases of spillover, based on nonparticipant survey responses.

Figure 1. Criteria for NPSO Eligibility



We used the following questions to calculate the spillover threshold score:

- **Measure Attribution Score 1:** On a scale of 0 to 10 where 0 is “not at all influential” and 10 is “very influential”, how much influence did your knowledge of the incentives and information AIC offers have on your decision to make the <MEASURE> improvements?
- **Measure Attribution Score 2:** If you had NOT known about the incentives and information AIC offers, would you still have made the <MEASURE> improvements? Please use a scale of 0 to 10, where 0 means you “definitely WOULD NOT have made this improvement” and 10 means “definitely WOULD have made this improvement”.
- **Consistency Check:** (If the responses to the two questions above were inconsistent) In your own words, can you explain HOW your knowledge of the program influenced the decisions you made in terms of the <MEASURE> improvements that you made in the past two years?

Provided that the open-ended responses do not contradict the influence of the program, spillover is attributable to the program if the average of the Measure Attribution Score 1 and (10-Measure Attribution Score 2) exceeds 5.0. If the average is greater than 5.0, 100% of the measure energy savings referenced in the question are considered NPSO. If the average is not greater than 5.0, none of the measure energy savings are considered NPSO.

We then conducted an engineering analysis to determine savings associated with each measure identified as spillover and summed the measure-specific estimates to develop a total two-year respondent-level spillover. We extrapolated respondent-level NPSO to the population by multiplying the respondent-level NPSO value by the case weight (calculated as the eligible population at the premise level divided by the number of customers surveyed).

To develop the NPSO rate, we divided the two-year population-level NPSO value by the sum of 2021 and 2022 portfolio verified gross impacts. This approach allows us to express NPSO as a percentage of verified gross program savings and facilitates future application of the NPSO estimate. Equation 1 presents the equation used to calculate the NPSO rate.

Equation 1. Nonparticipant Spillover Rate

$$\text{Annual Portfolio NPSO Rate} = \frac{\text{Two Year Population Level NPSO}}{2021 + 2022 \text{ Portfolio Verified Gross Impacts}}$$

DETAILED FINDINGS

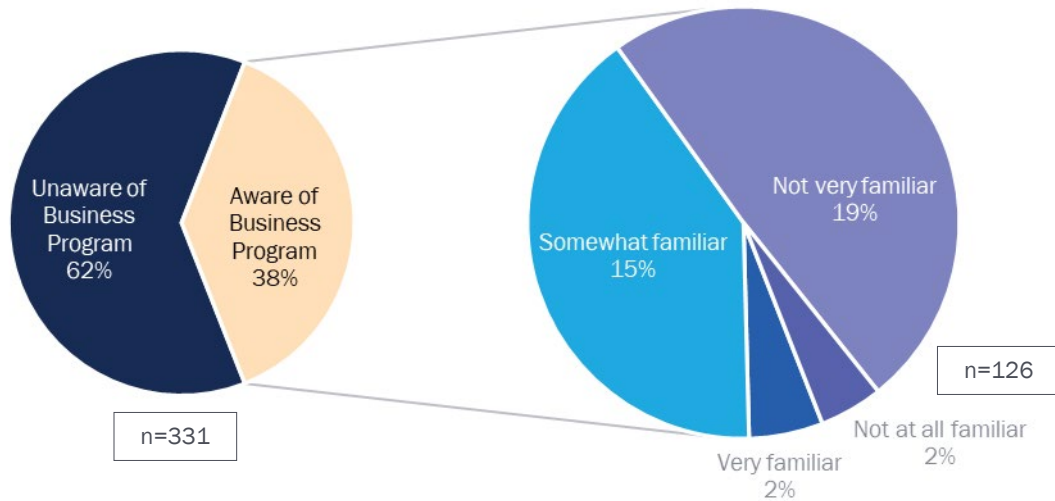
This section presents results from the nonparticipant survey, including respondents’ level of awareness of AIC’s energy efficiency programs, equipment used at their facility, upgrades and retro-commissioning their company completed at their facility in the last two years, as well as NPSO results.

AWARENESS

Nonparticipants have moderate levels of general awareness of AIC-sponsored energy efficiency programs. Approximately half (51%, or 172) of nonparticipants were generally aware that AIC offers energy efficiency programs, incentives, and information to help their industrial, commercial, and public sector customers make energy efficiency improvements at their facilities. Fewer participants (33%, or 109) were aware of the Energy Efficiency Business Program when it was mentioned by name (without it being described to them). An additional 5% (17) of respondents were aware of the program once it was described to them. This overall awareness (38%, or 126) of the program is a decrease from the 2018 report (49%). While nonparticipants are generally aware of the Energy Efficiency Business Program, less than half (46%, or 58) are somewhat or very familiar with the program structure. Fifty-four percent (68)

are not very or not at all familiar with the program. This is a decrease in overall familiarity with the program from the 2018 report (61%). Figure 2 displays respondents' levels of familiarity with the program.

Figure 2. Awareness of Energy Efficiency Business Program and Familiarity with the Program



FACILITY INFORMATION

We asked respondents about the types of equipment they currently possess and use in their facility and equipment they have upgraded or replaced in the past two years. All respondents had lighting, and most respondents had cooling (73%, or 241), heating (80%, or 265), and water heating (70%, or 233) equipment. The penetration of steam traps was the lowest, with no respondents reporting owning such equipment. Over half of respondents (57%, or 187) made upgrades to some of this equipment in the past two years, an increase from the 2018 report. The most common equipment replaced was lighting, with 40% of total respondents saying they replaced or upgraded such equipment in the past two years (132). In addition to equipment replacements and upgrades, we asked participants if they conducted retro-commissioning in the last two years, and 5% (18) of respondents reported taking such action at their facility. Table 3 depicts respondents' ownership of specific equipment types and their respective replacements or upgrades within the past two years.

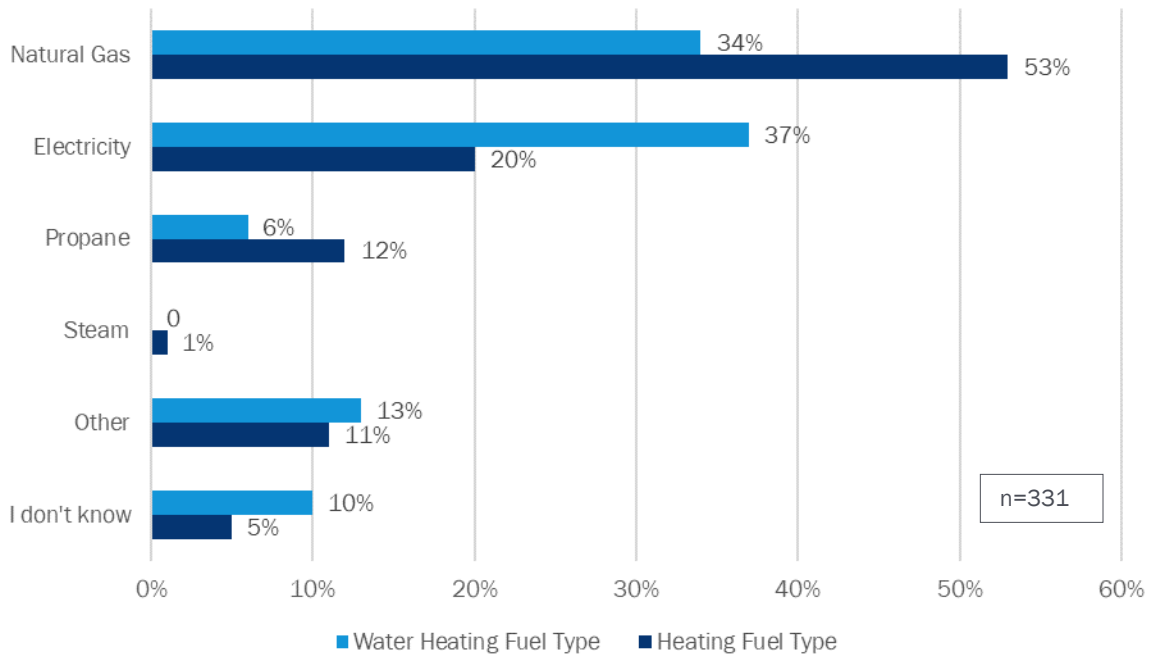
Table 3. Presence of Equipment and Replacement Status

Equipment Type/Upgrade	Share of Nonparticipants Who Have Equipment (n=332)	Replaced/Upgraded Within Past Two Years Among Nonparticipants Who Have Equipment
Lighting	100%	40%
Cooling	73%	33%
Heating	80%	28%
Refrigeration	53%	33%
Water Heating	70%	24%
Motors or Drives	33%	29%

Equipment Type/Upgrade	Share of Nonparticipants Who Have Equipment (n=332)	Replaced/Upgraded Within Past Two Years Among Nonparticipants Who Have Equipment
Kitchen Equipment	33%	38%
Compressed Air	34%	19%
Energy Management	6%	45%
Steam Traps	0%	0%
Retro-commissioning	N/A	5%

Most of the facilities are heated by natural gas (53%, or 174), electricity (20%, or 65), or propane (12%, or 39). More nonparticipants have electric water heaters (37%, or 124) than natural gas water heaters (34%, or 113), however. Figure 3 displays the heating and water heating fuel types of the respondents.

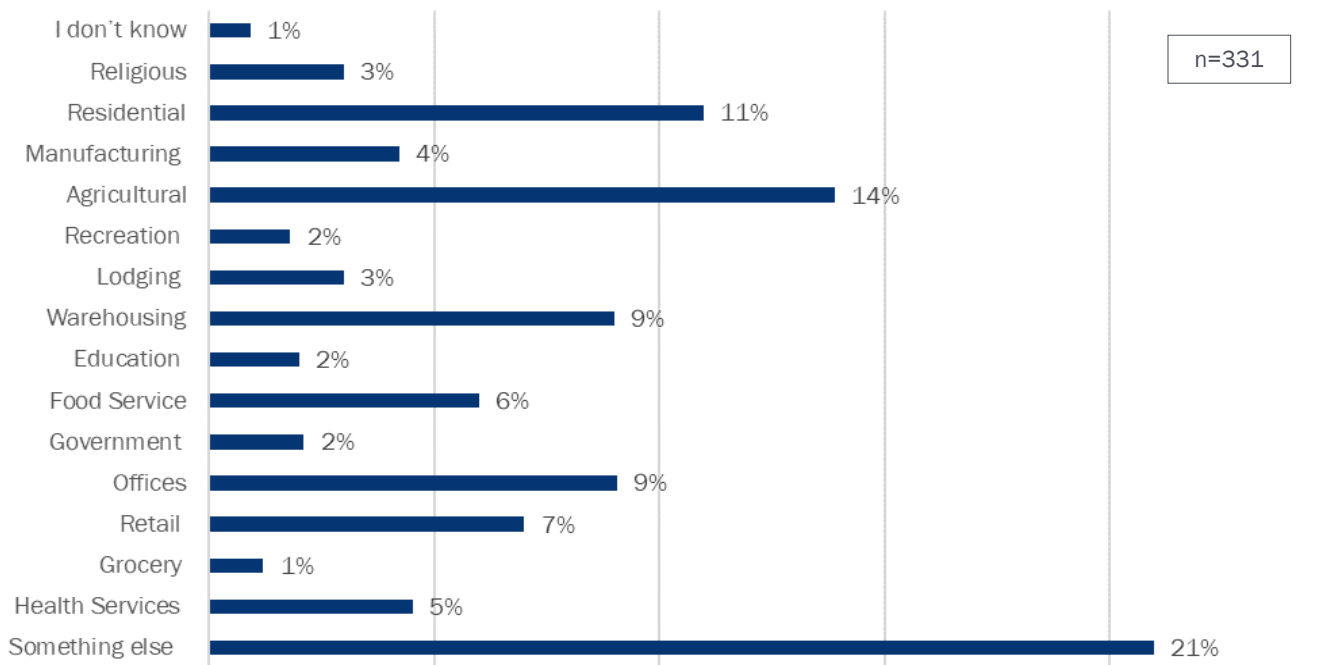
Figure 3. Heating Fuel Type and Water Heating Fuel Type



RESPONDENT FIRMOGRAPHICS

Respondents to our survey represented a wide variety of sectors. The most common facility uses were agriculture (14%, or 46), warehousing (11%, or 36), and retail (10%, or 29). Sixteen percent (37) of the respondents said their facility is primarily used for residential purposes. Twenty-one percent of respondents said their facility is used for something other than the options listed. When we asked these 70 respondents for additional information about their facility, the most frequent responses were automotive repair and service (8 of 70) and construction (7 of 70). Figure 4 below displays the various uses of respondents' facilities.

Figure 4. Primary Use of Facility



The survey captured additional firmographic information such as facility ownership, size, and age, as well as the number of employees who work at the respondent's facility. As shown in Table 4 below, most respondents reported their facilities are privately owned (85%) and two-thirds of the respondents indicated they own the facility they occupy (67%). Average respondent-reported facility age, staff size, and square footage are also displayed below.

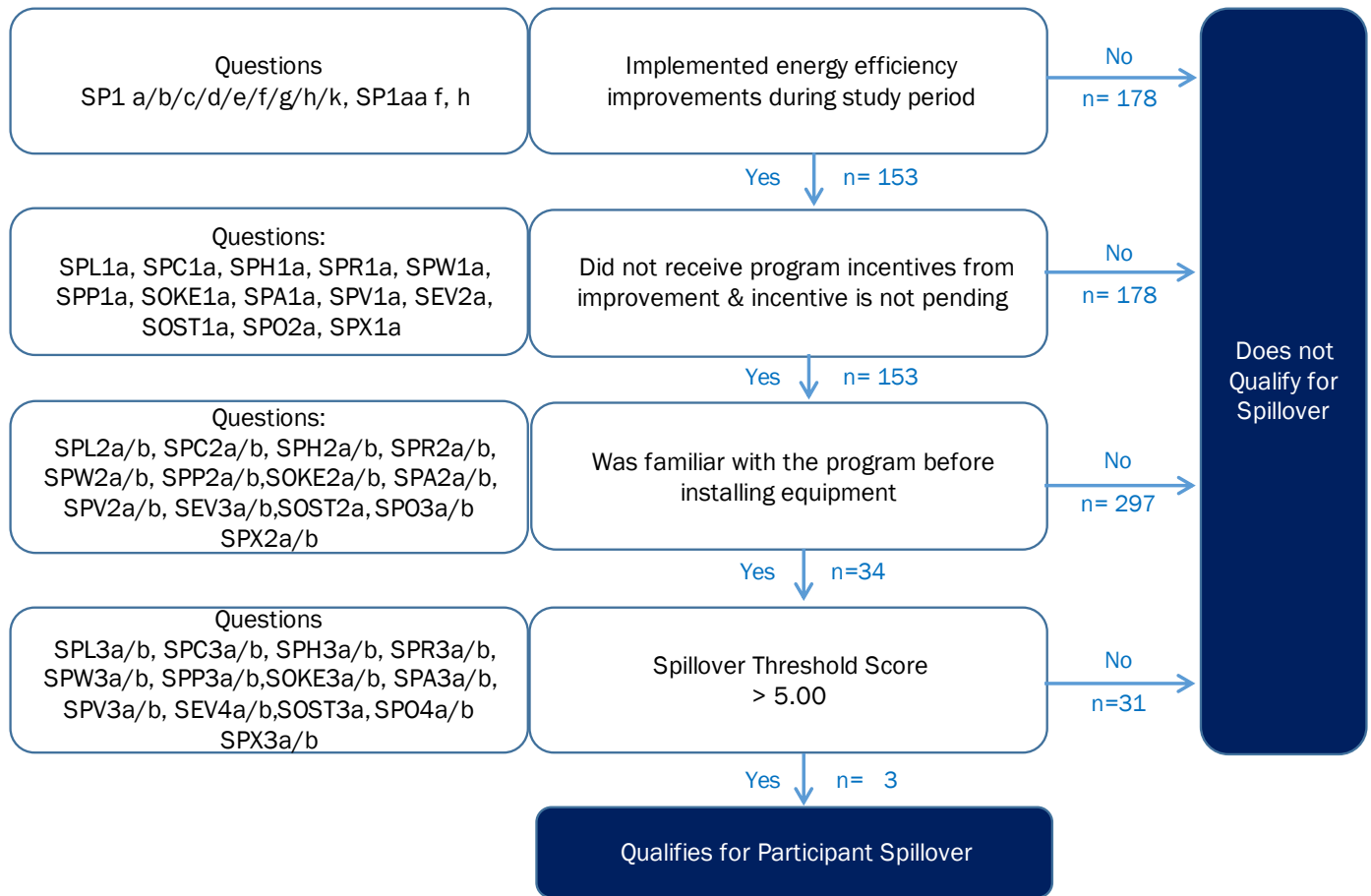
Table 4. Additional Firmographic Information

Firmographic Characteristic	Count
Proportion of privately-owned facilities	85%
Proportion of owner-occupied facilities	67%
Average reported facility age	48 years
Average reported staff size	5 employees
Average reported facility size	8,837 sq. ft.

NONPARTICIPANT SPILLOVER RESULTS

Analysis of the survey responses found that of the 331 nonparticipants surveyed, three met the criteria for spillover. One customer reported upgrading lighting and kitchen equipment at their facility, indicating that they installed LED light fixtures as well as a combination oven. The second customer who met spillover criteria also upgraded lighting at their facility, reporting installing LED light fixtures as well as LED exit signs. Like the first two customers, the third customer installed LED light fixtures at their facility. The third customer indicated upgrading kitchen equipment but did not specify the type of upgrade they completed. Figure 5 provides the full NPSO eligibility results.

Figure 5. Nonparticipant Eligibility for Spillover – Results



After identifying the respondents who met spillover criteria, the evaluation team attempted to contact each of the three customers to collect additional information required for savings calculation. An example of the necessary information for savings calculations is the number of LED light fixtures that the customers installed in their facility. However, none of the customers responded to the evaluation team's multiple rounds of email and phone outreach, and we were unable to collect the details required to calculate specific savings for the exact upgrades that the three customers made. Considering this, the evaluation team used conservative assumptions about the upgrades customers completed based on the information they provided in their responses to the survey and leveraged Illinois TRM input assumptions to calculate respondent-level spillover savings.

Based on our engineering analysis of the spillover projects the three customers completed, we estimate total spillover savings of approximately 5,051 kWh and 245 therms in our sample of 331 respondents. Next, we extrapolated these savings to the population (eligible population at business-premise level: 124,193 / number of customers surveyed: 331) of 375.2 to arrive at a two-year population-level NPSO savings of 1,895,193 kWh and 91,903 therms. These estimates are presented in Table 5.

Table 5. Nonparticipant Spillover Measures and Savings

Spillover Measure	NPSO Savings (kWh)	NPSO Savings (therms)
Two-year Respondent-level NPSO savings	5,051	245
Two-year Population-level NPSO savings	1,895,193	91,903

We then divided the annual population-level NPSO by the sum of 2021 and 2022 Business Program's verified gross impacts. Our estimated nonparticipant spillover rate is 0.45% of portfolio verified gross kWh savings and 2.43% of portfolio verified therm savings, as shown in Equation 2.

Equation 2. 2021 & 2022 Nonparticipant Spillover Rates

2021 & 2022 Portfolio Electric NPSO Rate =

$$\frac{\text{Two Year Population Level NPSO (kWh)}}{\text{2021 + 2022 Portfolio Verified Gross Impacts (kWh)}} = \frac{1,895,193 \text{ kWh}}{422,829,339 \text{ kWh}} = 0.45\%$$

2021 & 2022 Portfolio Gas NPSO Rate =

$$\frac{\text{Two Year Population Level NPSO (therms)}}{\text{2021 + 2022 Portfolio Verified Gross Impacts (therms)}} = \frac{91,903 \text{ therms}}{3,789,062 \text{ therms}} = 2.43\%$$

APPENDIX A. RESPONSE RATE CALCULATION

The response rate was calculated using the AAPOR RR3 calculation:

Equation 3. Response Rate Formula (AAPOR RR3)

$$RR3 = \frac{I}{(I + P) + (R1) + (e1 * ((UH1 + UO1) + (e2 * (UH2 + UO2)) + (e3 * UH3)))}$$

where:

$$e1 = \frac{(I + P + R1)}{(I + P + R1 + X1)}$$

$$e2 = \frac{(I + P + R1 + UH1 + UO1 + X1)}{(I + P + R1 + UH1 + UO1 + X1 + X2)}$$

$$e3 = \frac{(I + P + R1 + UH1 + UO1 + UH2 + UO2 + X1 + X2)}{(I + P + R1 + UH1 + UO1 + UH2 + UO2 + X1 + X2 + X3)}$$

APPENDIX B. DATA COLLECTION INSTRUMENT



2023 Illinois
Nonresidential Non|