Opinion Dynamics

Memorandum

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From: The Opinion Dynamics Evaluation Team

Date: September 26th, 2023 - Final

Re: Nicor Gas Non-residential Nonparticipant Spillover Research Results

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Introduction

This memo presents the results from a nonresidential nonparticipant spillover (NPSO) study for Nicor Gas. This study is part of a state-wide study of NPSO in Illinois, which supports updating portfolio-wide assumptions for nonresidential NPSO as part of the 2023 Illinois Stakeholder Advisory Group Net-to-Gross update process. Ameren Illinois Company (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 application. 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 Illinois 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. The survey instrument is provided in Appendix B. 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 Nicor Gas business customers, selected a simple random sample of customers, and removed accounts with missing contact information.[1] We also removed duplicate records from the sample; we 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 Nicor Gas.

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

Step	Count
Valid Population	77,421
MPTW	9,984
MPTW Completes	40
Email Sample Size	77,420
Email Only Survey Completes	292

Survey Disposition and Response Rate

We fielded the survey of non-residential nonparticipants from June 30th to September 15th, 2023. Table 2 presents the final survey dispositions and response rate.

Table 2. Non-Participant Survey Dispositions

Disposition	Count
Completes (I)	332
Partial Completes (P)	25
Refusals/Break-offs (R)	490
Non-Contacts (NC)	71,964
Others (O)	0
Break-offs (with eligibility) (R1)	490
Unknown If Eligible for Survey (UH1)	0
Unknown If Eligible for Survey, Other (UO1)	0
Unknown If Eligible Household/Business/Respondent (UH2)	71,964
Unknown If Eligible Household/Business/Respondent, Other (UO2)	0
Unused Sample (UH3)	0
Ineligible for Survey (X1)	248
Ineligible Household/Business/Respondent (X2)	2,100
Ineligible Sample Units (X3)	2,262
Estimated proportion of sample that is eligible to complete survey (e1)	77.4%
Estimated proportion of sample that is eligible HH/BUS/R (e2)	34.3%

[1] Guidehouse developed the valid population and customer sample Nicor Gas. 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 Nicor-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-retrofittable sites such as cellphone towers and utility-owned facilities.

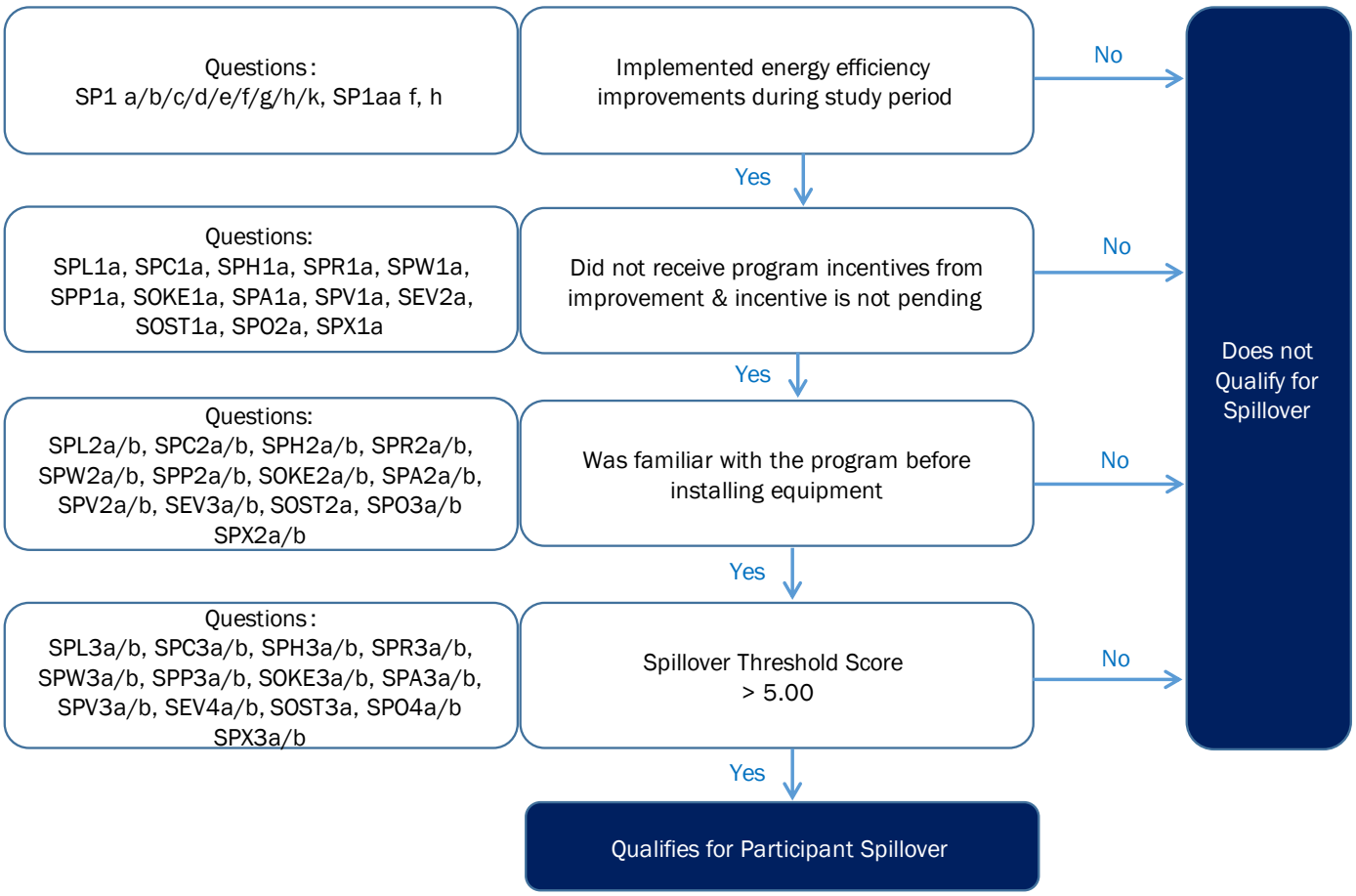
Disposition	Count
Estimated proportion of sample that is an eligible sample unit (e3)	97.1%
No partial completes but eligibility criteria (AAPOR RR3)	1.7%
Total Records	**77,421**

Methodology

NPSO refers to the installation of energy-efficient measures by program non-participants 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 Nicor Gas's Energy Efficiency 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 non-participant survey responses.

Figure 1. Criteria for NPSO Eligibility



The following questions were used 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 Nicor Gas offers have on your decision to make the <MEASURE> improvements?
- **Measure Attribution Score 2:** If you had NOT known about the incentives and information Nicor Gas 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 ex post 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. Non-Participant Spillover Rate

$$Annual\ Portfolio\ NPSO\ Rate = \frac{Two\ Year\ Population\ Level\ NPSO}{2021 + 2022\ Portfolio\ Ex\ Post\ Impacts}$$

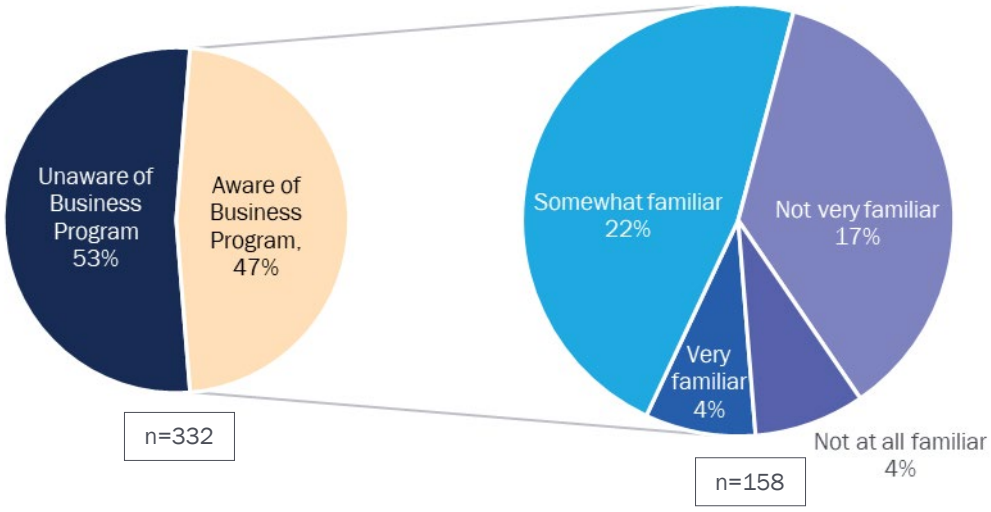
Detailed Findings

This section presents results from the non-participant survey, including respondents' level of awareness of Nicor Gas'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

Non-participants have moderate levels of general awareness of Nicor Gas-sponsored energy efficiency programs. Slightly less than half (47%, or 158) of non-participants were generally aware that Nicor Gas 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 (43%, or 145) were aware of the Energy Efficiency Program when it was mentioned by name (without it being described to them). An additional 4% (13) of respondents were aware of the program once it was described to them. Among the 158 respondents who reported being aware of the program, non-participants were generally familiar with the program structure (55%, or 87). Forty-four percent (71 of 158) were not very or not at all familiar with the program. Figure 2 displays respondents' levels of familiarity with the program.

Figure 2. Awareness of the Energy Efficiency 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. To be comprehensive, the survey asked respondents about a range of equipment, including gas-consuming as well as electricity-consuming equipment. Although not relevant to Nicor Gas's energy efficiency program as a gas utility, we summarize all types of equipment to provide a complete representation of respondent characteristics.

In addition to lighting equipment, many respondents had cooling (81%, or 269), heating (94%, or 312), and water heating (90%, or 300) equipment. The penetration of energy management systems was the lowest among types of equipment we asked about (10%, or 33). Over half of respondents (67%, or 224) made upgrades to some of this equipment in the past two years. The most common equipment replaced was lighting, with 49% (162) of respondents who made upgrades saying they replaced or upgraded such equipment in the past two years. In addition to equipment replacements and upgrades, we asked participants if they conducted retro-commissioning in the last two years, and 6% (20) 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.

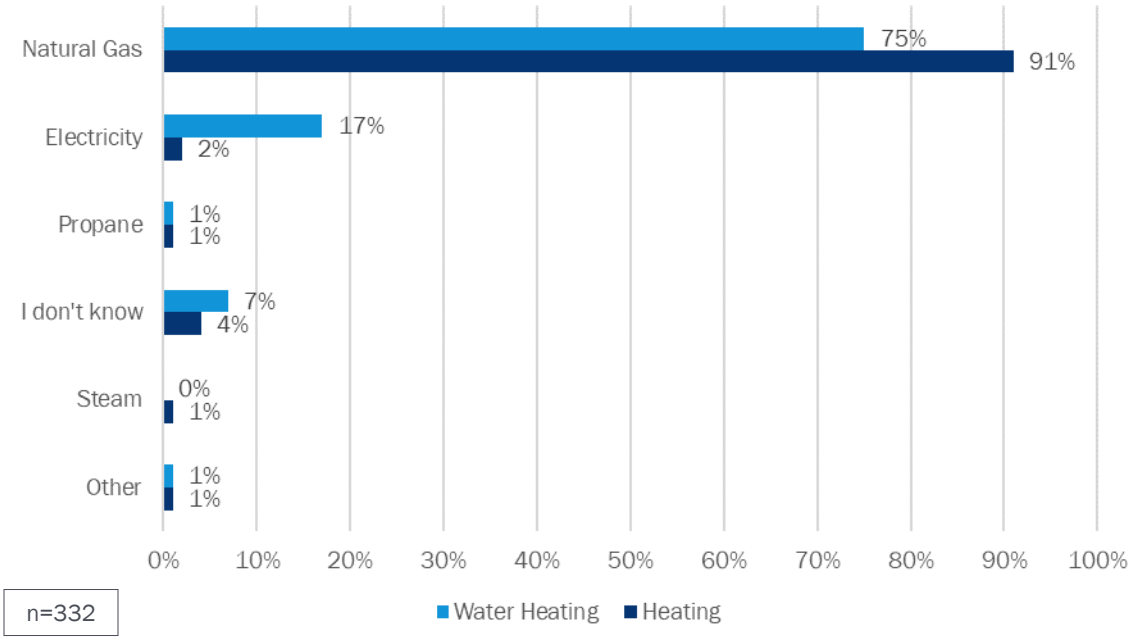
Table 3. Presence of Equipment and Replacement Status

Equipment Type/Upgrade	Share of Non-Participants Who Have Equipment (n=332)	Replaced/Upgraded Within Past Two Years Among Non-Participants Who Have Equipment
Lighting	100%	49%
Cooling	81%	32%
Heating	94%	27%
Refrigeration	56%	29%
Water Heating	90%	24%

Equipment Type/Upgrade	Share of Non-Participants Who Have Equipment (n=332)	Replaced/Upgraded Within Past Two Years Among Non-Participants Who Have Equipment
Motors or Drives	33%	26%
Kitchen Equipment	39%	30%
Compressed Air	31%	18%
Energy Management	10%	18%
Steam Traps	1%	0%
Retro-commissioning	N/A	6%

Most respondents reported using natural gas for space heating (91%, or 302) and water heating (75%, or 248) at their facility. Figure 3 displays the heating and water heating fuel types of the respondents.

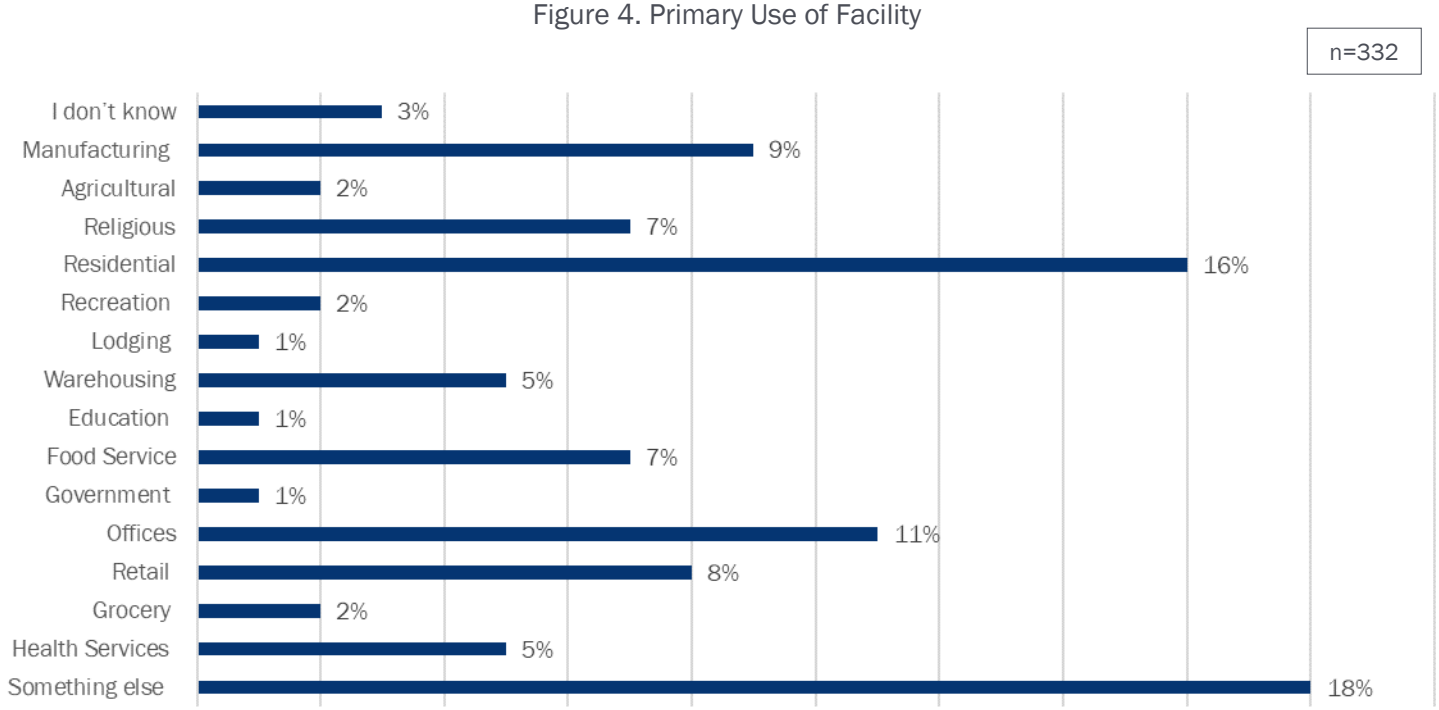
Figure 3. Heating and Water Heating Fuel Types



Respondent Firmographics

Respondents to our survey represented a wide variety of sectors. The most common facility uses were residential (16%, or 53), offices (11%, or 35), manufacturing (9%, or 29), and retail (8%, or 27). Eighteen percent (61) of respondents said their facility use is something other than the options listed. When we asked these 61 respondents for additional information about their facility, the most frequent responses were automotive repair and service (14 of 61), non-profit organizations (8 of 61), and construction (7 of 61). Examples of the less common primary use respondents provided include a golf course, a funeral home, and a veteran's organization, among others. 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 (83%) and more than half of the respondents indicated they own the facility they occupy (60%). Average respondent-reported facility age, staff size, and square footage are also displayed below.

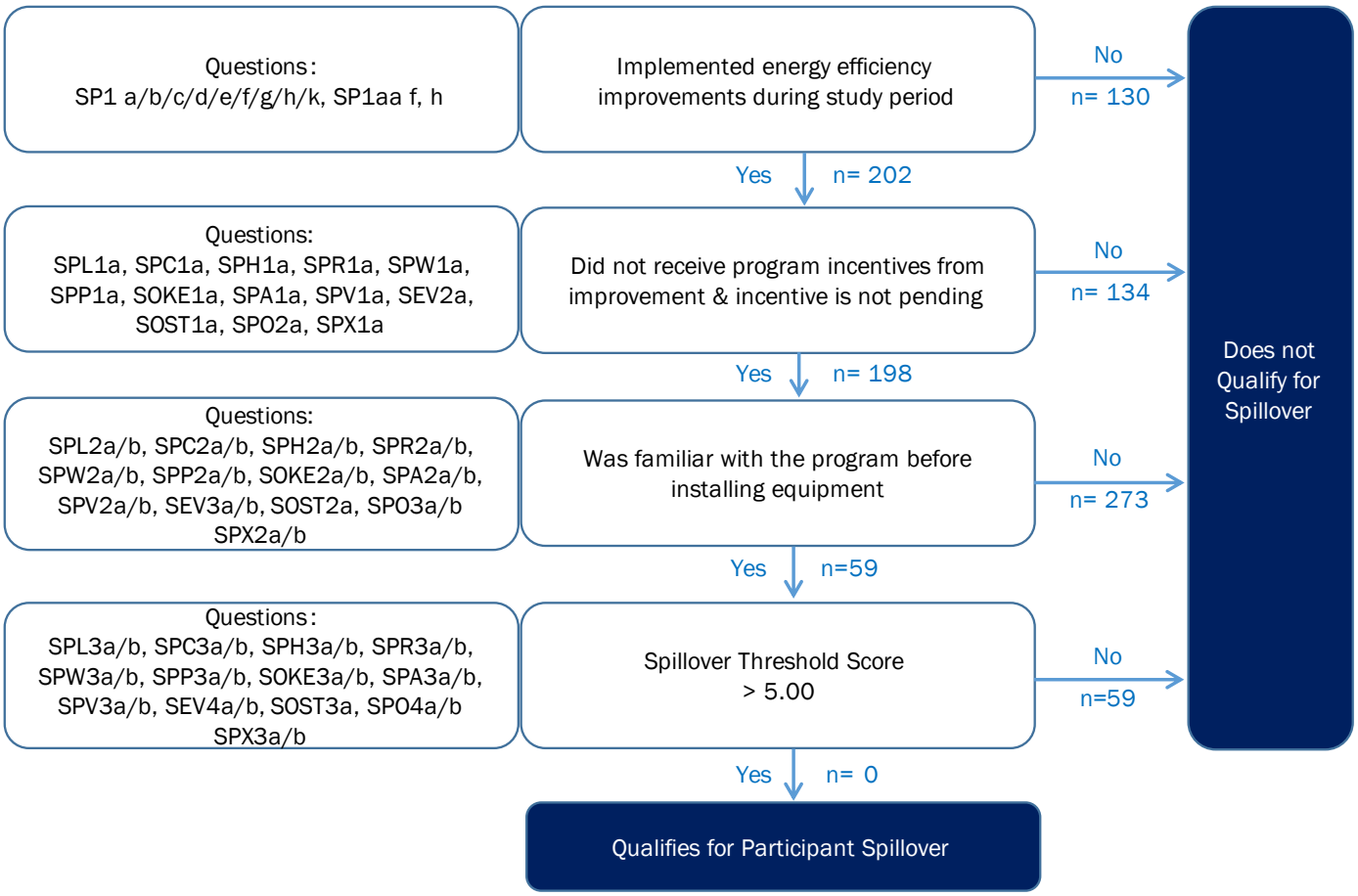
Table 4. Additional Firmographic Information

Firmographic Characteristic	Count
Proportion of privately-owned facilities	83%
Proportion of owner-occupied facilities	60%
Average reported facility age	51 years
Average reported staff size	9 employees
Average reported facility size	7,345 sq. ft.

Non-Participant Spillover Results

Analysis of the survey responses found that none of the 332 non-participants surveyed met the criteria for spillover. Figure 5 provides the full NPSO eligibility results.

Figure 5. Non-Participant Eligibility for Spillover -- Results



Appendix A. Response Rate Calculation

The response rate was calculated using the AAPOR RR3 calculation:

Equation 2. Response Rate Formula (AAPOR RR3)

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

where:

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

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

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

Appendix B. Data Collection Instrument

2023 Illinois Nonresidential Non