National Grid Rhode Island

2019 Commercial and Industrial Programs Free-Ridership and Spillover Study

TETRA TECH

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6410 Enterprise Lane, Suite 300 | Madison, WI 53719
Tel 608.316.3700 | Fax 608.661.5181

tetratech.com

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1.0 EXECUTIVE SUMMARY

This executive summary summarizes the findings of the Free-Ridership and Spillover Study conducted for National Grid Rhode Island for their 2019 Commercial and Industrial (C&I) natural gas and electric programs. The purpose of this study was to assess program free-ridership and spillover for the programs based on projects completed in the calendar year 2019. For gas, this includes Custom and Prescriptive pathways for both New Construction and Retrofit programs, along with the Small Business Direct Install program. For electric, the study consists of the Custom and Prescriptive pathways for New Construction, Retrofit, and Small Business Direct Install programs; this includes the upstream lighting initiative, Bright Opportunities, which is part of the Retrofit program.

Due to time constraints in fielding the study before the filing deadline, the study excluded the following records:

- New Construction: Electric HVAC upstream and Misc. Tier (primarily kitchen equipment) records,
- Upstream gas records.

1.1 STUDY OBJECTIVE

The primary objective of the 2019 program year Free-Ridership and Spillover Study was to assist National Grid in quantifying the net impacts of their commercial and industrial electric and natural gas energy efficiency programs in Rhode Island by estimating the extent of:

- Program free-ridership
- Early participant “like” and “unlike” spillover
- Nonparticipant “like” spillover.

Together, these components calculate the net-to-gross (NTG) ratio, which is the ratio of program-attributable savings to program gross savings. We calculate the NTG ratio as follows:

100% – free-ridership + participant “like” spillover + nonparticipant “like” spillover

This executive summary first provides an overview of the study methodology. It also includes the free-ridership, participant “like” spillover, and nonparticipant “like” spillover estimates at the program level by fuel type. The full report provides more detail on each program's results at the measure level and provides early observations of participant “unlike” spillover.

1.2 STUDY METHODOLOGY

The methodology used for this study follows the 2011, 2013, and 2017 Commercial and Industrial Programs Free-ridership and Spillover studies conducted for National Grid Rhode Island.[1] For the upstream lighting program, the study follows the methodology used in the 2013 and 2017 reports

[1] “National Grid Rhode Island 2011 Commercial and Industrial Programs Free-ridership and Spillover Study Final Report” September 6, 2012 and “National Grid Rhode Island 2013 Commercial and Industrial Programs Free-ridership and Spillover Study Final Report” September 30, 2014 and “National Grid Rhode Island 2016 Commercial and Industrial Programs Free-Ridership and Spillover Study” Sept 11, 2017

for Rhode Island and previously implemented by KEMA in Massachusetts[2].

To accomplish the study objectives, we conducted telephone surveys with a sample of 2019 program participants in each of the C&I electric and natural gas programs. The 2019 study included the following C&I programs:

- Large Commercial and Industrial New Construction (custom and prescriptive - electric and gas)
- Large Commercial Retrofit (custom and prescriptive - electric and gas)
- Small Business Direct Install (electric and gas).

In addition to the customer surveys, we conducted additional surveys with:

- *Design professionals and vendors identified by customers as influential in their decision to install the energy-efficient equipment through the programs.* These surveys were used to estimate free-ridership for those installations where customers said the design professional/equipment vendor was more influential in the decision than the customer.
- *Design professionals and equipment vendors who had recommended, sold, and/or installed equipment through the C&I programs.* These surveys were used for estimating the extent of nonparticipant "like" spillover at a statewide level for all the programs.
- *Distributors from the upstream lighting initiative who sold lighting products at a discounted price.* These surveys were used to estimate the free-ridership rate, which is averaged with the participant (end-user) data.

1.2.1 Participant Free-Ridership Methodology

A program's *free-ridership rate* is the percentage of program savings attributed to free-riders. A *free-rider* refers to a program participant who received an incentive or other assistance through an energy efficiency program who would have installed the same high-efficiency measure type[3] on their own at that same time if the program had not been offered. For free-riders, the program is assumed to have had no influence or only a slight influence on their decision to install or implement the energy-efficient measure type. Consequently, none or only some of the energy savings from the energy-efficient measure installed or performed by this group of customers should be attributable to the energy efficiency program.

In addition to simply identifying free-riders, it is important to estimate the *extent* of free-ridership for each customer. Pure free-riders (100 percent) would have adopted exactly the same energy-efficient measure type at that same time in the absence of the program. Partial free-riders (1–99 percent) are those customers who would have adopted some measure type on their own, but of a lesser efficiency or a lesser quantity, or at a later time. Thus, the program had some impact on their decision. Non-free-riders (0 percent) are those who would not have installed or implemented any energy-efficient measure type (within a specified period of time) absent the program services.

[2] "Process Evaluation of the 2012 Bright Opportunities Program Final Report" prepared by KEMA, Inc., June 14, 2014.

[3] For purposes of this discussion, an "energy efficient measure type" includes high efficiency equipment, an efficiency measure type such as building envelope improvements, or an energy efficient practice such as boiler tune-ups.

1.2.2 Spillover Methodology

Spillover refers to additional energy-efficient measures adopted by a customer due to program influences but without any financial or technical assistance from the program. *Participant "like" spillover* refers to the situation where a customer installed energy-efficient measures through the program and then installed additional measures of the same type due to program influences. *Participant "unlike" spillover* is where the customer installs other types of energy-efficient measures than those received by the individual respondent through the program but are influenced by the program to do so.

1.2.2.1 Early "Like" Spillover

A "like" spillover estimate was computed based on how much more of the same energy-efficient equipment the participant installed outside the program and did so because of their experience with the program.

One of the issues with quantifying spillover savings is how to value the savings of measures installed or conducted outside the program since we are relying on customer self-reports of the quantity and efficiency of any measure type installed. Estimating early "like" spillover uses a conservative approach and reports only those measures installed outside the program that were of the same type and efficiency as the ones installed through the program. This, in turn, makes it possible for us to use the estimated program savings for that measure to calculate the customer's "like" spillover savings. Program-eligible measures installed by the participant that were not of the same type as what was installed through the program are excluded from "like" spillover estimates. These measures would be included in any "unlike" spillover analysis (see discussion below).

1.2.2.2 Early "Unlike" Spillover

The evaluation team included questions to address "unlike" spillover—energy-efficient equipment installed by a participant due to program influence that is not identical to the equipment they received through the program. However, given the difficulties in estimating savings for these installations, we present only observations of "unlike" spillover in the main report and not savings estimates.

1.2.2.3 Nonparticipant "Like" Spillover Estimates

Nonparticipant spillover (sometimes called *free-drivers)* refers to energy-efficient measures adopted by program nonparticipants due to the program's influence. The program can have an influence on design professionals and vendors as well as an influence on product availability or practices, product or practice acceptance, customer expectations, and other market effects. All of these may induce nonparticipants to implement energy-efficient measures. *Nonparticipant "like" spillover* refers to additional measures of the same type as offered through the program that are adopted due to the program's influence.

1.3 NET-TO-GROSS RESULTS – RECOMMENDED FOR APPLICATION

Table 1 summarizes the free-ridership and spillover estimates for electric programs to be used in setting prospective NTG ratios for the 2021-2023 period. The consultants, along with National Grid and the Rhode Island Energy Efficiency and Resource Management Council consultant team adjusted the retrospective NTG estimate values, outlined in Chapter 6, to set the figures to be used

for application during the 2021-2023 period. Adjustments were made due to insufficient survey completes (ten or fewer[4]) for a measure type or pathway.

The overall free-ridership rate for electric measures installed through these programs ranges from 12.3 percent to 76.9 percent, the participant "like" spillover rate ranges from 0.0 percent to 2.1 percent, and the nonparticipant "like" spillover rate from 0.0 to 1.6 percent, resulting in an overall NTG rate ranging from 23.3 percent to 88.2 percent. Section 6 of this report details the retrospective results for each measure within each program and initiative.

Table 1. C&I Electric Free-Ridership and Spillover Results Summary by Measure Type and Program/Initiative

Program/Initiative	Measure Type/Pathway	Free-Ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Lighting - fixtures, fixture with controls, LED retrofit kits	31.2%	0.3%	NA	69.1%
	Lighting—screw-ins	76.9%	0.2%	NA	23.3%
	Lighting—TLEDs	54.9%	0.0%	NA	45.1%
Large Commercial and Industrial New Construction	Total	28.0%	2.1%	1.6%	75.7%
Large Commercial Retrofit	Custom	35.8%	0.5%	0.7%	65.5%
	Prescriptive	14.7%	0.1%	0.1%	85.5%
Small Business Direct Install	Lighting	12.3%	0.3%	0.2%	88.2%
	Non-lighting	29.1%	0.3%	0.0%	71.2%

Table 2 summarizes the free-ridership and spillover estimates for natural gas programs by program pathway to be used in setting prospective NTG ratios for the 2021-2023 period. Free-ridership rates vary between 6.8 percent to 47.7 percent, participant "like" spillover rates range from 0.0 percent to 2.2 percent, and nonparticipant "like" spillover rates range from 0.0 to 15.6 percent. The resulting NTG rates range from 57.6 percent to 108.8 percent. The Large Commercial Retrofit program had the highest NTG rate (108.8 percent), while the Large Commercial and Industrial New Construction had the lowest (57.6 percent).

Table 2. C&I Natural Gas Free-Ridership and Spillover Results Summary by Program and Program Pathway

Program	Free-Ridership Rate	Participant Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction	47.7%	2.2%	3.1%	57.6%
Large Commercial Retrofit	6.8%	0.0%	15.6%	108.8%
Small Business Direct Install	11.4%	1.7%	0.0%	90.4%

[4] There was sufficient number of completes (n) at the measure level for electric Energy Initiative Lighting and gas Commercial New Construction— Prescriptive Food Service, however, it was decided in consultation with National Grid and the RI Energy Efficiency and Resource Management Council consultant team to instead apply the custom, prescriptive or overall program values for consistency within these programs.

1.4 NET-TO-GROSS RESULTS – RESULTS DETAIL

The values in Table 3 through Table 6 were used for setting prospective NTG ratios for application for the 2021-2023 period. We adjusted the retrospective NTG estimates values as follows:

- (Electric) Where there were insufficient survey completes for a measure type (ten or fewer[5]), we applied the custom/prescriptive value within the program, except for upstream lighting.
- (Electric) If the custom/prescriptive level had an insufficient number of survey completes, then the overall program-level NTG values were applied.
- (Gas) Due to the overall low number of completed surveys, all measure-level NTG values were replaced with their respective overall program-level results.

While we also considered the margin of error when deciding on the above criteria, the number of completed surveys was the primary data point used to decide on the reported level of aggregation.

1.4.1 Electric

Table 3 summarizes the free-ridership and spillover estimates for electric programs by measure type. The cells highlighted in gray are using the overall program or custom/prescriptive level free-ridership and spillover rates due to an insufficient number of responses or low precision, as outlined above. For the Bright Opportunities initiative, nonparticipant "like" spillover is not measured due to customers not being knowledgeable whether or not they received equipment at a discount. Individual measure with an NA means no surveys were completed for that stratum.

Within the Large Commercial and Industrial New Construction program, the overall program total was imputed for all measure types. For the Large Commercial Retrofit program, the prescriptive results were imputed for non-custom measure types. Within the Bright Opportunities initiative, the fixtures and kits had the highest NTG (69.1 percent), while the screw-ins had the lowest NTG rate (23.3 percent).

Table 3. C&I Electric Free-Ridership and Spillover Results Summary by Measure Type and Program/Initiative

Program/Initiative	Measure Type	Free-Ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Lighting - fixtures, fixture with controls, LED retrofit kits	31.2%	0.3%	NA	69.1%
	Lighting—screw-ins	76.9%	0.2%	NA	23.3%
	Lighting—TLEDs	54.9%	0.0%	NA	45.1%
	Total	**39.3%**	**0.2%**	**NA**	**60.9%**

[5] There was sufficient (n) at the measure level for electric Energy Initiative Lighting and gas Commercial New Construction— Prescriptive Food Service, however, it was decided in consultation with National Grid and the RI Energy Efficiency and Resource Management Council consultant team to instead apply the custom, prescriptive or overall program values for consistency within these programs.

Program/Initiative	Measure Type	Free-Ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction	Compressed Air	28.0%	2.1%	1.6%	75.7%
	Custom	28.0%	2.1%	1.6%	75.7%
	Food Service	28.0%	2.1%	1.6%	75.7%
	HVAC Non-unitary	28.0%	2.1%	1.6%	75.7%
	Lighting	28.0%	2.1%	1.6%	75.7%
	Other	NA	NA	NA	NA
	VSD	28.0%	2.1%	1.6%	75.7%
	Total	**28.0%**	**2.1%**	**1.6%**	**75.7%**
Large Commercial Retrofit	Custom	35.8%	0.5%	0.7%	65.5%
	HVAC	14.7%	0.1%	0.1%	85.5%
	Lighting	14.7%	0.1%	0.1%	85.5%
	VSD	14.7%	0.1%	0.1%	85.5%
	Total	**23.8%**	**0.3%**	**0.9%**	**77.3%**
Small Business Direct Install	Lighting	12.3%	0.3%	0.2%	88.2%
	Non-lighting	29.1%	0.3%	0.0%	71.2%
	Total	**15.1%**	**0.3%**	**0.2%**	**85.5%**
Total		**29.0%**	**0.5%**	**2.8%**	**74.3%**

Cells highlighted in gray are using the overall program, or custom/prescriptive level, free-ridership and spillover rates due to insufficient responses or low precision.
A value of NA means no surveys were completed for that stratum.

Table 4 summarizes the free-ridership and spillover estimates for electric programs by program pathway. Similar to the table above, the cells highlighted in gray are using the overall program or custom/prescriptive level free-ridership and spillover rates due to an insufficient number of responses or low precision.

Within the Large Commercial and Industrial New Construction program, the overall program total was imputed for both custom and prescriptive pathways. The highest NTG was in the Small Business Direct Install program, which only had the prescriptive pathway (85.5 percent), and the lowest was in the Bright Opportunities initiative (60.9 percent). Among the electric programs, the prescriptive pathway had an overall NTG rate of 75.0 percent, while the custom pathway had a NTG rate of 68.6 percent.

Table 4. C&I Electric Free-Ridership and Spillover Results Summary by Program/Initiative and Program Pathway

Program/Initiative	Program Pathway	Free-ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Prescriptive	39.3%	0.2%	NA	60.9%
	Total	**39.3%**	**0.2%**	**NA**	**60.9%**
Large Commercial and Industrial New Construction	Custom	28.0%	2.1%	1.6%	75.7%
	Prescriptive	28.0%	2.1%	1.6%	75.7%
	Total	**28.0%**	**2.1%**	**1.6%**	**75.7%**
Large Commercial Retrofit	Custom	35.8%	0.5%	0.7%	65.5%
	Prescriptive	14.7%	0.1%	0.1%	85.5%
	Total	**23.8%**	**0.3%**	**0.9%**	**77.3%**

Program/Initiative	Program Pathway	Free-ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Small Business Direct Install	Prescriptive	15.1%	0.3%	0.2%	85.5%
	Total	**15.1%**	**0.3%**	**0.2%**	**85.5%**
Total	**Custom**	**33.4%**	**0.4%**	**1.6%**	**68.6%**
	Prescriptive	**26.7%**	**0.6%**	**1.2%**	**75.0%**
	Total	**29.0%**	**0.5%**	**2.8%**	**74.3%**

Cells highlighted in gray are using the overall program, or custom/prescriptive level, free-ridership and spillover rates due to insufficient responses or low precision.

1.4.2 Natural Gas

Table 5 summarizes the free-ridership and spillover estimates for natural gas programs and pathways by measure type. The cells highlighted in gray are using the overall program or custom/prescriptive level free-ridership and spillover rates due to an insufficient number of responses or low precision, as detailed above. Individual measure with an NA means no surveys were completed for that stratum.

Within the Large Commercial and Industrial New Construction program, the overall program total was imputed for all measure types for both the custom and prescriptive pathways. For the Large Commercial Retrofit program, the custom results were imputed for all measure types, and there was no prescriptive measure completes. For the Small Business Direct Install program, the overall program total was used for all measure types for both the custom and prescriptive pathways.

Table 5. C&I Natural Gas Free-Ridership and Spillover Results Summary by Measure Type and Program and Pathway

Program and Pathway	Measure Type	Free-Ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction—Custom	Controls	NA	NA	NA	NA
	Food service	47.7%	2.2%	3.1%	57.6%
	HVAC	47.7%	2.2%	3.1%	57.6%
	HVAC—Distribution	NA	NA	NA	NA
	HVAC—Plant	NA	NA	NA	NA
	Insulation	47.7%	2.2%	3.1%	57.6%
	Water Heating	47.7%	2.2%	3.1%	57.6%
	Other	NA	NA	NA	NA
	Total	**47.7%**	**2.2%**	**3.1%**	**57.6%**
Large Commercial and Industrial New Construction—Prescriptive	Food service	47.7%	2.2%	3.1%	57.6%
	HVAC	47.7%	2.2%	3.1%	57.6%
	HVAC—Plant	NA	NA	NA	NA
	Other	47.7%	2.2%	3.1%	57.6%
	Water heating	47.7%	2.2%	3.1%	57.6%
	Total	**47.7%**	**2.2%**	**3.1%**	**57.6%**

Program and Pathway	Measure Type	Free-Ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial Retrofit—Custom	Controls	6.8%	0.0%	15.6%	108.8%
	HVAC	6.8%	0.0%	15.6%	108.8%
	HVAC—Distribution	NA	NA	NA	NA
	HVAC—Plant	NA	NA	NA	NA
	Insulation	6.8%	0.0%	15.6%	108.8%
	Other	6.8%	0.0%	15.6%	108.8%
	Water heating	6.8%	0.0%	15.6%	108.8%
	Total	**6.8%**	**0.0%**	**15.6%**	**108.8%**
Large Commercial Retrofit—Prescriptive	Controls	NA	NA	NA	NA
	Other	NA	NA	NA	NA
	Water Heating	NA	NA	NA	NA
	Total	**NA**	**NA**	**NA**	**NA**
Small Business Direct Install—Custom	Controls	NA	NA	0.0%	NA
	Custom	11.4%	1.7%	0.0%	90.4%
	Insulation	NA	NA	NA	NA
	Other	11.4%	1.7%	0.0%	90.4%
	Water heating	NA	NA	NA	NA
	Total	**11.4%**	**1.7%**	**0.0%**	**90.4%**
Small Business Direct Install—Prescriptive	Controls	11.4%	1.7%	0.0%	90.4%
	Insulation	11.4%	1.7%	0.0%	90.4%
	Water heating	11.4%	1.7%	0.0%	90.4%
	Total	**11.4%**	**1.7%**	**0.0%**	**90.4%**
Total		**16.1%**	**0.5%**	**2.1%**	**86.6%**

Cells highlighted in gray are using the overall program, or custom/prescriptive level, free-ridership and spillover rates due to insufficient responses or low precision.
A value of NA means no surveys were completed for that stratum.

Table 6 summarizes the free-ridership and spillover estimates for the natural gas programs by program pathway. Similar to the tables above, the cells highlighted in gray are using the overall program or custom/prescriptive level free-ridership and spillover rates due to an insufficient number of responses or low precision.

Within the Large Commercial and Industrial New Construction and Small Business Direct Install programs, the overall program total was imputed for both custom and prescriptive pathways. Across all programs, the custom pathway had an overall NTG rate of 96.3 percent, drive by the low free-ridership rate (11.7 percent) and high nonparticipant “like” spillover (7.8 percent). The prescriptive pathway had a free-ridership rate of 54.4 percent, participant “like” spillover of 3.4 percent, and nonparticipant “like” spillover of 0.9 percent, which resulted in the overall NTG rate of 50.0 percent.

Table 6. C&I Natural Gas Free-Ridership and Spillover Results Summary by Program and Program Pathway

Program	Program Pathway	Free-Ridership Rate	Participant “Like” Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction	Custom	47.7%	2.2%	3.1%	57.6%
	Prescriptive	47.7%	2.2%	3.1%	57.6%
	Total	**47.7%**	**2.2%**	**3.1%**	**57.6%**

Program	Program Pathway	Free-Ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial Retrofit	Custom	6.8%	0.0%	15.6%	108.8%
	Prescriptive	NA	NA	NA	NA
	Total	**6.8%**	**0.0%**	**15.6%**	**108.8%**
Small Business Direct Install	Custom	11.4%	1.7%	0.0%	90.4%
	Prescriptive	11.4%	1.7%	0.0%	90.4%
	Total	**11.4%**	**1.7%**	**0.0%**	**90.4%**
Total	**Custom**	**11.7%**	**0.2%**	**7.8%**	**96.3%**
	Prescriptive	**54.4%**	**3.4%**	**0.9%**	**50.0%**
	Total	**16.1%**	**0.5%**	**2.1%**	**86.6%**

Cells highlighted in gray are using the overall program free-ridership and spillover rates due to insufficient responses or low precision.
A value of NA means no surveys were completed for that stratum.

1.5 ORGANIZATION OF REPORT

In Section 2, we review the study's objectives, methodology, and survey response rates. Section 3 summarizes the survey questions used to identify the key decision-maker and the questions designed to serve as a project review for the respondent. Section 3 also describes the questions and approach used to estimate the extent of participant free-ridership, participant "like" spillover, and participant "unlike" spillover. Section 4 presents the questions and approach for vendors who customers identified as being influential in their decision to participate along with the questions and approach used to estimate nonparticipant "like" spillover. Section 5 presents the questions asked to distributors who sold equipment through the upstream lighting initiative and how the results were calculated. Section 6 presents the free-ridership and spillover results at the program, initiative level, and individual measure-type level.

We also present the following appendices:

- Appendix A details the sampling plan for the participant surveys
- Appendix B documents the weighting methodology used to produce the participant free-ridership and "like" spillover estimates
- Appendix C contains the survey instruments
- Appendix D details response rate and program savings coverage
- Appendix E contains an example of the Design Professional and Vendor spillover calculation
- Appendix F charts the free-ridership and spillover scoring algorithms.

2.0 INTRODUCTION

This report summarizes the free-ridership and spillover study findings conducted for National Grid, Rhode Island for their 2019 Commercial and Industrial (C&I) electric and natural gas programs. The purpose of this study was to assess program free-ridership and spillover for the programs based on projects completed in calendar year 2019. For gas, this includes Custom and Prescriptive pathways for both New Construction and Retrofit programs, along with the Small Business Direct Install program. For electric, the study consists of the Custom and Prescriptive pathways for New Construction, Retrofit, and Small Business Direct Install programs; this includes the upstream lighting initiative, Bright Opportunities, which is part of the Retrofit program.

There were substantial changes in participation between 2019 and the prior study that was conducted in 2017 that caused the team to reevaluate the sample design. Due to time constraints in fielding the study before the filing deadline, the study excluded the following records:

- New Construction Electric HVAC upstream and Misc. Tier (primarily kitchen equipment) records,
- Upstream gas records.

One important concept affecting the interpretation of the free-ridership and spillover estimates is generalizing the results. This study's results can only be generalized to the population of 2019 program year participants and the design professionals and equipment vendors who were active in the 2019 program year. Essentially, the current study is a performance audit of the year 2019 programs using survey research methods to estimate the free-ridership and spillover rates.

The 2019 study results, along with discussions from the program team, are the best indication what NTG figures will look like in upcoming years. Therefore, these results are used to estimate prospective figures that are to be used for the 2021-2023 period.

2.1 STUDY OBJECTIVE

The primary objective of the 2019 program year free-ridership and spillover study was to assist National Grid in quantifying the net impacts of their commercial and industrial energy efficiency programs by estimating the extent of:

- Program free-ridership
- Early participant “like” and “unlike” spillover
- Nonparticipant “like” spillover.

2.2 STUDY METHODOLOGY

The methodology used for this study follows the 2011, 2013, and 2017 Commercial and Industrial Programs Free-ridership and Spillover studies conducted for National Grid Rhode Island.[6] For the upstream lighting program, the study follows the methodology used in the 2013 and 2017 reports

[6] These studies followed the methodology presented in the “National Grid Rhode Island 2011 Commercial and Industrial Programs Free-ridership and Spillover Study Final Report” September 6, 2012 and “National Grid Rhode Island 2013 Commercial and Industrial Programs Free-ridership and Spillover Study Final Report” September 30, 2014 and “National Grid Rhode Island 2016 Commercial and Industrial Programs Free-Ridership and Spillover Study” Sept 11, 2017

for Rhode Island and previously implemented by KEMA in Massachusetts[7]. The following C&I programs were included in the 2019 study:

- Large Commercial and Industrial New Construction (custom and prescriptive – electric and gas)
- Large Commercial Retrofit (custom and prescriptive – electric and gas)
- Small Business Direct Install (electric and gas).

2.2.1 Participant Free-Ridership Methodology

A program's *free-ridership rate* is the percentage of program savings attributed to free-riders. A *free-rider* refers to a program participant who received an incentive or other assistance through an energy efficiency program who would have installed the same high-efficiency measure type[8] on their own at that same time if the program had not been offered. For free-riders, the program is assumed to have had no influence or only a slight influence on their decision to install or implement the energy-efficient measure type. Consequently, none or only some of the energy savings from the energy-efficient measure installed or performed by this group of customers should be attributable to the energy efficiency program.

In addition to simply identifying free-riders, it is important to estimate the *extent* of free-ridership for each customer. Pure free-riders (100 percent) would have adopted exactly the same energy-efficient measure type at that same time in the absence of the program. Partial free-riders (1–99 percent) are those customers who would have adopted some measure type on their own, but of a lesser efficiency or a lesser quantity, or at a later time. Thus, the program had some impact on their decision. Non-free-riders (0 percent) are those who would not have installed or implemented any energy efficient measure type (within a specified period of time) absent the program services.

It is important for programs that offer monetary incentives for multiple measure categories to estimate free-ridership by specific measure type. Category-specific estimates produce feedback on the program at the level at which it actually operates. In addition, for commercial and industrial incentive programs, free-ridership has often been found to be highly variable among measure categories, making it essential to produce measure-specific estimates. The ability to provide reliable estimates by measure type is dependent on the number of observed installations within that measure type—the fewer observations, the less reliable the estimate.

Once calculated, each individual's free-ridership rate is then applied to the measure savings associated with that project. The total free-ridership estimates in this report include pure, partial, and non-free-riders.

Our approach to estimating free-ridership consisted of a sequential question technique to identify free-riders. This sequential approach asks program participants about the actions they would have taken if the program services had not been offered. This approach addresses the program's impact on project timing, measure quantity, and efficiency levels while explicitly recognizing that the cost of energy-efficient equipment can be a barrier to installation in the absence of energy efficiency programs. This method walks survey respondents through their decision process to help them recall the program's impact upon all aspects of project decision making.

[7] "Process Evaluation of the 2012 Bright Opportunities Program Final Report" prepared by KEMA, Inc., June 14, 2014.

[8] For purposes of this discussion, an "energy efficient measure type" includes high efficiency equipment, an efficiency measure type such as building envelope improvements, or an energy efficient practice such as boiler tune-ups.

Program total free-ridership rates (including pure, partial, and non-free-riders) illustrated in the tables in the Results Summary section of this executive summary are weighted by measure therm or kWh savings. Weighting by (therm or kWh) savings ensures that overall measure savings are considered in the overall results. For programs where we were unable to complete any interviews for a given measure type, we were unable to weight by all measure types for that program. In these situations, results do not include those measure types. When reviewing the measure-type free-ridership rates, it is important to consider the number of survey completions that the estimate is based upon.

The upstream lighting program starts with the same methodology and then includes distributor survey information to refine the results. Distributors were asked about the customer's decision-making process and how the project would have changed absent the program. These results were then averaged with the participant results to come up with an overall free-ridership rate.

2.2.2 Spillover Methodology

Spillover refers to additional energy efficiency measures adopted by a customer due to program influences, but without any financial or technical assistance from the program. *Participant "like" spillover* refers to the situation where a customer installed energy efficiency measures through the program, and then installed additional measures of the same type due to program influences. *Participant "unlike" spillover* is where the customer installs other types of energy-efficient measures than those received by the individual respondent through the program but are influenced by the program to do so. *Nonparticipant "like" spillover* refers to energy-efficient measures of the same type as offered through the program adopted by program nonparticipants due to the program's influence.

Survey free-ridership questions were followed by questions designed to estimate "like" and "unlike" spillover. These questions asked about recent purchases (since program participation in 2019) of any additional energy-efficient equipment that were made *without* any additional technical or financial assistance from National Grid but were influenced by the program. Surveying customers not long after installation does not allow customers much time to install additional equipment based on their experiences with the program. Therefore, these are *early* indicators of spillover. As time passes, additional equipment may be installed because they participated in a National Grid program. These early spillover estimates are included in the report tables.

2.2.2.1 Early "Like" Spillover

A "like" spillover estimate was computed based on how much more of the same energy-efficient equipment the participant installed outside the program and did so because of their experience with the program.

One of the issues with quantifying spillover savings is how to value the savings of measures installed or conducted outside the program since we are relying on customer self-reports of the quantity and efficiency of any measure type installed. Estimating early "like" spillover uses a conservative approach and reports only those measures installed outside the program that were of the same type and efficiency as the ones installed through the program. This, in turn, makes it possible for us to use the estimated program savings for that measure to calculate the customer's "like" spillover savings. Program-eligible measures installed by the participant but were not of the same type as what was installed through the program are excluded from "like" spillover estimates. These measures would be included in any "unlike" spillover analysis (see discussion below).

Note that the "like" spillover rates illustrated in the Results Summary section of this executive summary are weighted by measure category therm or kWh savings and the disproportionate probability of being surveyed. When reviewing the measure category "like" spillover, it is important

to consider the number of survey completions that the estimate is based upon. The number of survey completions for some measure categories is low because very few customers in the sample installed the measure type.

2.2.2.2 Early "Unlike" Spillover

The evaluation team included questions to address "unlike" spillover—energy-efficient equipment installed by a participant due to program influence that is not identical to the equipment they received through the program. However, given the difficulties in estimating savings for these installations, we present only observations of "unlike" spillover in the main report and not savings estimates.

2.2.2.3 Nonparticipant "Like" Spillover Estimates

Nonparticipant spillover (sometimes called *free-drivers)* refers to energy-efficient measures adopted by program nonparticipants due to the program's influence. The program can have an influence on design professionals and vendors as well as an influence on product availability or practices, product or practice acceptance, customer expectations, and other market effects. All of these may induce nonparticipants to implement energy-efficient measures. *Nonparticipant "like" spillover* refers to additional measures of the same type as offered through the program that are adopted due to the program's influence.

The study methodology estimated only a portion of nonparticipant like-measure type spillover based on responses from design professionals and vendors participating in National Grid's programs. The data for the analysis could have been collected from nonparticipants directly or from the design professionals and vendors who recommended and/or installed qualifying high-efficiency equipment. We surveyed the design professionals and vendors primarily because they could typically provide much more accurate information about the efficiency level of installed equipment than could the nonparticipants. Experience has shown that customers cannot provide enough data to a telephone interviewer about the new equipment they have installed to allow for accurate estimates of the energy savings achieved from the equipment. While they usually can report what type of equipment was installed, they typically cannot provide sufficient information about the quantity, size, efficiency, and/or operation of that equipment to allow us to determine whether the equipment is "program-eligible." On the other hand, design professionals and equipment vendors who have worked with the program are typically more knowledgeable about the equipment and are familiar with what is and is not "program-eligible."

Another argument in favor of using design professionals and equipment vendors to estimate nonparticipant spillover was to use data in the program tracking system database to attach therm or kWh savings estimates to nonparticipant spillover. In the program tracking system database, measure type-specific program therm or kWh savings are associated with each design professional and vendor who participated in the program in 2019. Also, one design professional/vendor accounts for multiple customers, so surveying design professionals is a more efficient way to cover more of the market.

To determine nonparticipant spillover, design professionals and equipment vendors were asked (by measure type they installed through the program in 2019) what percentage of their sales were program eligible and what percentage of these sales did not receive an incentive through the programs. They were then asked about the program's impact on their decision to recommend/install this efficient equipment outside the program. Using the survey responses and measure type savings data from the program tracking system, the participating vendor nonparticipant "like" spillover savings could be estimated for each design professional/vendor and the results extrapolated to the total savings for all programs.

This method of estimating nonparticipant spillover is a *conservative* estimate for two reasons. First, not all design professionals and equipment vendors familiar with the programs specified and/or installed equipment through the program in 2019. Thus, we miss any nonparticipant spillover that was associated with these other design professionals/vendors (although it is less likely these design professionals/vendors had nonparticipant spillover if they were not involved with the program in 2019).

Second, this method only allows us to extrapolate nonparticipant spillover for those same measure type categories that a particular design professional/vendor was associated with for the 2019 programs. Thus, if a vendor installed program-eligible equipment in other measure type categories in the year 2019 outside the program, but none through the program, we did not capture nonparticipant spillover savings with that particular type of equipment. In essence, we measured only "like" nonparticipant spillover; that is, spillover for measure types like those installed through the program in 2019.

It is important to note that nonparticipant spillover was analyzed at the statewide level by measure type. These estimates were then applied to each program that offered that measure type. Participant “like” spillover estimates are removed from the vendor reported spillover to avoid double counting spillover savings.

2.3 SURVEY RESPONSE

2.3.1 Participant Free-Ridership, “Like” and “Unlike” Spillover Surveys

The program participant sample consisted of unique *accounts*[9], not unique customer names. The same customer name, or business identity, can have multiple accounts in multiple locations, but program technical support and incentives are provided on behalf of an individual account. Thus, for this study, a customer or participant is defined as a unique account.[10] Appendix D presents the number of participant accounts sampled for the 2019 study, as well as the number of telephone surveys completed for each program.

The majority of the telephone interviews were completed with program participants between July 30 and September 2, 2020. The duration of interviews with program participants averaged 16 minutes. Repeated call attempts (an average of five call attempts per customer was made to reach sampled customers during the calling period) resulted in an overall response rate of 14 percent. Multiple factors contributed to the response rate being lower than the previous study response rate of 21 percent. The condensed timeline, the large portion of projects where the phone number was not correct (over 30 percent), and the large portion of the sample (61 percent) that was identified as having overlapping contact names, phone numbers, or companies, which resulted in fewer individual cases to attempt to complete all drove the response rate. Additionally, COVID-19 also had an impact on calling efforts. Instead of advance letters, customers with an email address were sent an email requesting their participation in the survey. We used the email addresses to gain survey cooperation given customers may be working from home with the pandemic and more likely to get an email then a hard copy letter. We recommend making sure contact details, including name, telephone, and email address, are captured and entered for each project as part of the tracking system.

[9] Each account could include multiple applications for efficiency projects. For example, if one account has five lighting applications and one VSD application, this account would show up twice in the sample frame; once for lighting (aggregating all the lighting applications) and once for VSD.

[10] Unique accounts with two or more measures were asked about the two largest saving measures during one interview.

The number of survey completions for some measure types is low because the number of installations within these measure categories for the program year 2019 was small (i.e., less than 50). Thus, some caution should be used when interpreting these results for specific measure types.

In addition to the customer surveys, additional surveys were conducted with:

- Design professionals and vendors identified by customers as being the most knowledgeable about the decision to install the energy-efficient equipment through the programs. These surveys were used to estimate free-ridership for those installations where customers said the design professional/equipment vendor was more influential in the decision than the customer.
- Design professionals and equipment vendors who had recommended, sold and/or installed equipment through the C&I programs. These surveys were used for estimating the extent of nonparticipant "like" spillover at a statewide level for all the programs.
- Distributors from the upstream lighting program who sold lighting products at a discounted price. These surveys were used to estimate the free-ridership rate, which is averaged with the participant (end-user) data.

Table 7. 2019 Participant Free-Ridership and Spillover Survey Cooperation and Response Rate[11]

Disposition	Total
Starting Sample	**2,692**
Residential line	17
Adjusted Sample	**2,675**
Does not recall participating	157
Respondent can only be reached by email[12]	44
Ineligible—vendor/contractor	20
Refusal	172
Incompletes (partial surveys)	12
Language barrier	17
Bad phone number[13]	91
Attempted but not completed	1,775
Completed	387
Response Rate	
Response Rate (Completed/Adjusted Sample)	**14.5%**

2.3.2 Design Professional/Vendor Surveys

In addition to the customer surveys, surveys were conducted with design professionals and equipment vendors who had installed equipment through the C&I programs in 2019. This survey was used for estimating the extent of nonparticipant "like" spillover for the programs.

[11] Appendix D contains a detailed response rate by program.
[12] The evaluation team sent emails to those customers who provided an email address.
[13] The evaluation team utilized a combination of Internet lookups and directory assistance to attempt to identify working telephone numbers.

The program tracking system databases contained the names of design professionals and vendors for some of the projects. After removing names that did not appear to be actual vendors (for example, some "vendors" were actually customers such as schools who were responsible for their own installation) and duplicate names, 186 design professionals and vendors remained. A census was taken for data collection due to the lower quantity.

Table 8 presents the number of designers/vendors sampled and the number surveyed. Multiple attempts (on different days of the week and different weeks) were made to complete interviews with these designers and vendors in August and September 2020. The 35.5 percent response rate was lower than the prior study's response rate of 42.0 percent. Again, COVID-19 had an impact on calling efforts.

Table 8. 2019 Nonparticipant Spillover Survey Response Rate

Disposition	Total
Starting Sample	**186**
Residential line	0
Adjusted Sample	**186**
Does not recall participating	15
Contact information is for the customer	18
Refusal	5
Bad phone number	5
Attempted but not completed	77
Completed	66
Response Rate	
Response Rate (Completed/Adjusted Sample)	**35.5%**

In conjunction with the nonparticipant vendor spillover survey, interviews were completed with 17 of the 32 design professionals and equipment vendors mentioned by customers during the participant surveys as influential in the decision to install the efficient measures. Table 9 shows the response rate to the survey effort. Again, the response rate for the influential vendors dropped between 2019 and the prior study (53.1 percent and 59.6 percent, respectively).

Table 9. 2019 Influential Vendor Survey Response Rate

Disposition	Total
Sample	**32**
Residential line	0
Not a utility customer	0
Adjusted sample	**32**
Does not recall participating	1
Contact information is for customer	1
Refusal	0
Incompletes (partial surveys)	0
Language barrier	0
Bad number	2
Not completed	11
Completed	17
Response Rate	
Response Rate (Completed / Adjusted Sample)	**53.1%**

3.0 PARTICIPANT SURVEY QUESTIONS

This chapter summarizes the survey questions used to identify the primary decision-maker, put the decision making in context by reviewing the project, and the questions used to estimate the extent of free-ridership and participant spillover. Particularly for the free-ridership questions, the skip patterns (dependent upon the response to one or more questions) are complex. To simplify the questions' discussion, we have only shown the questions and not the potential response categories or skip patterns. The upstream lighting participants were asked the same series of questions except for customers who were unaware of the discount. These “unaware” customers received questions with modified wording reminding them of the discount they received. Appendix C of this document contains the detailed free-ridership survey questions for participants in both the upstream and downstream initiatives. Appendix C also includes the participant “like” spillover survey questions, a parallel version of the free-ridership survey suitable for designers/vendors who are the decision-makers, and the nonparticipant designer/vendor spillover survey.

Before discussing the specific questions used to identify the key decision-maker and questions used to review the decision-making process, we discuss the surveys' format.

3.1 FORMAT

The surveys for free-ridership (and spillover) contain several complex skip patterns and repeat questions for each measure category installed. The surveys also automatically incorporate information about each participant’s project (i.e., measures installed, incentive amount, and participation date) into the appropriate questions.

Given that the same survey instrument was used for the different programs, the survey instrument contains several areas where fills were used to customize the instrument. These fills are listed and explained in Table 10:

Table 10. Survey Fills and Explanations

Fill	Explanation
Program	Program name
Address	Street address of project
City	City of project
Date	Date project was completed
Customer	Name of customer
Measure Category 1	First measure installed through program
Measure Category 2	Second measure installed through program
Measure Description 1	Detailed measure description for first measure installed
Measure Description 2	Detailed measure description for second measure installed
All program assistance	All assistance provided by the program included rebates and technical assistance, as well as financing
Study	Indicator of whether the customer received an assessment (audit) or study funded by the program

Fill	Explanation
Finance	Indicator of whether the customer received financing assistance from the program
Incentive	Amount of financial incentive
Project Cost	Total cost of project for customer

3.2 SUMMARY OF THE 2019 SURVEY QUESTIONS

In order to estimate free-ridership and spillover, the participant survey instrument contains nine key sections.

- Identification of key decision maker(s)
- Project and decision-making review
- Event type identification
- Initial free-ridership questions
- Consistency check questions
- Influence of technical assessment (if applicable)
- Influence of past program participation
- Participant “like” spillover questions
- Participant “unlike” spillover questions.

3.2.1 Identification of Key Decision Maker(s)

Identifying and surveying the key decision-maker(s) is critical for collecting accurate information on free-ridership and spillover. Therefore, the first part of the survey is devoted to identifying the appropriate decision-maker within the organization (i.e., the person involved in the decision-making process when the equipment was being considered).

If the listed contact person was not the primary decision maker, information is collected on the person within and outside the company who was the primary decision-maker, and the survey is conducted with that individual. In cases where the customer tells the interviewer that a designer/vendor was the key decision-maker, the interviewer collected contact information for the designer/vendor. In these cases, the survey was still completed with the customer, although attempts were made to complete the designer/vendor survey with the designer/vendor. In cases where the designer/vendor agreed they were the most influential, their responses were used to estimate free-ridership for that customer. If the designer/vendor did not agree that they were the most influential or if attempts to survey the designer/vendor failed, the customer’s responses were used to estimate free-ridership.

Once the appropriate respondent was identified, they were assured their responses would be kept confidential by Tetra Tech and National Grid.

The questions used to identify the key decision maker(s) are detailed below.

IN2 Are you the person who was most involved in making the decision to get <ASSIST> from National Grid at <ADDRESS> in <CITY>?

OTHER_R
Who was primarily responsible for making the decision to get <ASSIST> through National Grid?

IN4 Are you employed by <COMPANY_NAME> or are you a contractor who provides design and/or installation services for <COMPANY_NAME>?

DM2 Just to confirm, our records indicate the [EFFICIENCY IS APPLICABLE (IF EFF = 1): energy efficient] <MEASURE CATEGORY> project around <DATE> you implemented at <ADDRESS> with National Grid's assistance included <MEASURE DESCRIPTION>.

Were you involved in the decision-making process when the [EFFICIENCY IS APPLICABLE (IF EFF = 1): energy efficient] <MEASURE CATEGORY> equipment was being considered for this facility?

3.2.2 Project and Decision-Making Review

The interview then asks about corporate purchasing policies, important factors that the respondent considers when purchasing any new equipment, and important factors for the specific incentivized project. This section is intended to "prime" the participant by asking them to recall all the various factors that may have been important in the purchase decision. The question text is listed below.

BG3 Does your company have any formal requirements or informal guidelines for the purchase, replacement or maintenance of energy-using equipment?

BG4 Which of the following best describes these requirements or guidelines? Purchase energy efficient equipment regardless of cost, purchase energy efficient equipment if it meets payback or return on investment criteria, purchase standard efficiency equipment that meets code or something else.

DM15c
Do you have a memo of understanding, or MOU with National Grid? [IF NEEDED: A MOU where National Grid works with you to encourage, support and financially incentivize energy saving improvements typically on a three-year commitment?]

DM15d
How would you describe your involvement with the MOU development? Aware but not at all involved in meetings where improvements are discussed, aware and sometimes participate in meetings, primarily responsible for meeting MOU requirements with National Grid, or something else.

FR1 Please think back to the time when you were considering implementing the specific <MEASURE CATEGORY 1> project [IF TOTMEAS=2 SHOW "and <MEASURE CATEGORY 2> project"] around <DATE 1> [IF TOTMEAS=2 SHOW "and <DATE 2>"]. What factors motivated your business to consider implementing new <MEASURE CATEGORY 1> [IF TOTMEAS=2 SHOW "and <MEASURE CATEGORY 2> equipment through National Grid's program?

3.2.3 Event Type Identification

New for 2019 includes a series of questions to identify if the equipment was for a new construction project, new equipment that did not replace existing equipment, equipment that was replaced because it failed, or equipment that was replaced early. These questions were used to determine if respondents should be asked about timing. New construction and replace on failure projects were skipped out of the timing component (see questions below). The questions used to identify the event type are listed below.

ET1 Was the high efficiency <MESAURE CATEGORY> installed as part of a new construction or major renovation project?

ET2 Did the high efficiency <MESAURE CATEGORY> you installed replace any existing <MESAURE CATEGORY> or was it a new type of equipment that you did not have before?

ET3 Which of the following best describes the condition of your old equipment? The old equipment was working with no need of repair, working with need of minor repair, working with need of major repair, no longer working.

ET4 Do you think your old equipment would have lasted another 2/4 years?

3.2.4 Initial Free-Ridership Questions

The instrument then asks what influence, if any, the program had on the decision to install equipment through the program. As there are several dimensions to the decision to purchase and install new equipment,[14] the battery discusses the timing of the installation and the quantity and the efficiency level of the equipment installed. These questions reference both the overall effect of the program (including staff recommendations and any technical assistance) and the specific effect of the financial incentive. The questions are listed below. Note that these questions are measure-specific and are repeated for up to two measure categories. Before the free-ridership battery, customers were asked if they were aware they received their lighting equipment at a discount for the upstream lighting program. If so, respondents were asked the standard free-ridership questions. Those who were unaware were asked similar questions but were reminded of the discount they received. Questions, where the wording was revised in these instances, are included below.

[14] The instrument is designed to handle both rebated equipment (e.g., HVAC equipment) and rebated services (e.g., boiler tune-ups).

FR10 I'd like to go over all the program assistance you received from National Grid.

According to our records:

[IF (DualFuelProj=1)] You received rebates for both gas and electric equipment around the same time through National Grid.

(IF incentive amount was missing) The total cost for the project implemented at your facility around <DATE> through the program was about $<CST>. National Grid paid about $<INCENTIVE> of the total cost of the [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "energy efficient"] <MEASURE CATEGORY> project implemented through the program.

(IF CST=0 OR INC=0) National Grid paid a portion of the total cost of the [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "energy efficient"] <MEASURE CATEGORY> project implemented through the program.

[IF STUDY=1 OR DM8=1: In addition, as I previously mentioned, National Grid paid a portion of the cost for the <STUDYTYPE1, STUDYTYPE2>.]

[IF DM14 = 1] National Grid also provided financing or repayment assistance for your portion of the project costs.

FR12 Would your business have implemented <u>any</u> <u>type</u> of <MEASURE CATEGORY> project <u>at the same time</u> without the assistance from National Grid?

[upstream lighting unaware question wording] If the <MEASURE CATEGORY> lamp had cost [IF INC>0 SHOW "$<INCENTIVE>"] more, would your organization have installed **any** lighting at all at the same time?

FR13 Would your business have implemented the <u>exact same quantity</u> or size of <MEASURE CATEGORY> project without the assistance from National Grid?

[upstream lighting unaware question wording] If the <MEASURE CATEGORY> had cost [IF INC>0 SHOW "$<INCENTIVE>"] more, would your organization have implemented the <u>exact same **quantity**</u> of lighting discounted from National Grid?

FR14 Would your business have implemented the exact same high efficiency <MEASECAT> equipment as what was installed through the program without the assistance from National Grid?

[upstream lighting unaware question wording] If the <MEASURE CATEGORY> had cost [IF INC>0 SHOW "$<INCENTIVE>"] more, would your organization have implemented the exact same high efficiency lighting equipment?

FR15 Would you have implemented the <MEASURE CATEGORY> project earlier than you did, at a later date, or never without the assistance from National Grid?

[upstream lighting unaware question wording] Would you have installed the lighting earlier than you did, at a later date, or never if the lamp had cost [IF INC >0 SHOW "$<INCENTIVE>"] more?

FR16 How much [earlier/later] would you have implemented the <MEASURE CATEGORY> project?

FR17 [ASK IF FR13 = 02, 88, 99] Compared to the amount of <MEASURE CATEGORY> equipment that you implemented through the National Grid program, what percent of the project do you think your business would have purchased on its own without the assistance from National Grid?

[upstream lighting unaware question wording] Compared to the amount of <MEASURE CATEGORY> that you installed, what percent of the lighting do you think your organization would have installed on its own if they had cost [IF INC>0 SHOW "$<INCENTIVE>"] more?

FR18 You said your business would have installed
[IF FR13=1-Yes SHOW "all";
IF FR13= 2-No SHOW <FR17> %; IF FR17=888,999 SHOW "some";
IF FR13=88,99 SHOW "some"]
of the equipment on its own if the assistance from National Grid had not been available.

What percent of this equipment would have been standard efficiency or minimum code?

FR19 and what percent would have been between standard efficiency and what you installed through the program?

FR20 [ASK IF QTYFLAG=0 AND IF FR14=02,88,99 AND INTEFF=1] Thinking about the <MEASURE CATEGORY> project you would have implemented on your own if the National Grid assistance had not been available, would it have been standard efficiency or minimum code **or** between standard efficiency and what you installed through the program?

[upstream lighting unaware question wording] Thinking about the lighting project you would have implemented on your own if they had cost [IF INC >0 SHOW "$<INCENTIVE>"] more, would it have been standard efficiency or minimum code **or** between standard efficiency and what you installed through the program?

FR21 [for insulation projects] Thinking about the energy saving improvements you would have implemented on your own if the National Grid assistance had not been available; would you have done the same improvements as you did?

FR22 [for insulation projects] Compared to what you installed through the National Grid program, how much would you have done? For example, would it have been 50% as much as what was done with the National Grid assistance?

3.2.5 Consistency Check Questions

The instrument also included questions that would identify and correct inconsistent responses. For example, if participants reported that they were likely to install the equipment without the program but also reported that they would not have installed the energy-efficient equipment within four years, the interviewer asked them to confirm which statement was more accurate. These questions are listed below.

FR11 On a scale of 0 to 10, with 0 being ‘not at all likely’ and 10 being ‘very likely’, how likely is it that your business would have implemented the same [IF QUANTITY IS GREATER THAN (IF QTYFLAG=1) SHOW "quantity of"] [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "efficiency of"] <MEASURE CATEGORY> equipment at that same time if National Grid had not provided all of this program assistance?

[upstream lighting unaware question wording] According to our information, the distributor or retailer you bought the <MEASURE CATEGORY> lamps from received a discount [IF INC>0 SHOW "of $<INCENTIVE>"] from National Grid which was passed on to you. On a scale of 0 to 10, with 0 being “not at all likely” and 10 being “very likely,” how likely is it that your organization would have implemented the same [IF QTYFLAG=1 SHOW "quantity"] [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "and efficiency of"] <MEASURE CATEGORY> at that same time if they had cost [IF INC>0 SHOW "$<INCENTIVE>"] more?

FR25 On a scale of 0 to 10, with 0 being ‘no influence’ and 10 being a ‘great deal of influence’, how much influence did the [IF INC>0 SHOW "roughly $<INCENTIVE>" ELSE SHOW "incentive"] you received from National Grid have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "high efficiency"] <MEASURE CATEGORY> project?

[upstream lighting unaware question wording] On a scale of 0 to 10, with 0 being “no influence” and 10 being “a great deal of influence,” how much influence did the discounted price have on your decision to install the <MEASURE CATEGORY>?

FR11 On a scale of 0 to 10, with 0 being ‘not at all likely’ and 10 being ‘very likely’, how likely is it that your business would have implemented the same [IF QUANTITY IS GREATER THAN (IF QTYFLAG=1) SHOW "quantity of"] [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "efficiency of"] <MEASURE CATEGORY> equipment at that same time if National Grid had not provided all of this program assistance?

[upstream lighting unaware question wording] According to our information, the distributor or retailer you bought the <MEASURE CATEGORY> lamps from received a discount [IF INC>0 SHOW "of $<INCENTIVE>"] from National Grid which was passed on to you. On a scale of 0 to 10, with 0 being “not at all likely” and 10 being “very likely,” how likely is it that your organization would have implemented the same [IF QTYFLAG=1 SHOW "quantity"] [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "and efficiency of"] <MEASURE CATEGORY> at that same time if they had cost [IF INC>0 SHOW "$<INCENTIVE>"] more?

CC1 You said that you would have installed the same quantity and efficiency equipment at that same time, but you also just said that the National Grid incentive was influential in your decision to implement the <MEASURE CATEGORY> project. Which of these is more accurate?

CC6 Earlier in the interview, you said there was a <FR11 SCORE> in 10 likelihood that you would have implemented the same quantity and efficiency of <MEASURE CATEGORY> equipment at that same time in the absence of the National Grid program assistance. But you also said you would not have implemented the <MEASURE CATEGORY> project within 2/4 years of when you did. Which of these is more accurate?

CC8 Please think about all the assistance you received through the National Grid program. In your own words, please describe what impact, if any, that assistance had on your decision to install the amount of energy efficient <MEASURE CATEGORY> equipment at the time you did?

As inputs into the algorithm, Tetra Tech constructed a scoring system based on the influence and consistency check questions above. The scoring calculates two scores—a quantity score and an efficiency score. The quantity score represents the percentage of the incentivized equipment that would have been installed in the absence of the program. The efficiency score is the percentage of savings *per unit installed* that would have occurred without the program. For equipment that is reported to be more efficient than standard but less efficient than what was installed through the program, we assume 50 percent of those measures' savings. Multiplying these two scores together gives the percentage of the incentivized savings that would have occurred without the program. This percentage is the raw free-ridership estimate. Table 11 details these calculations.

Table 11. Quantity and Efficiency Scores

Score	Responses	Result
Quantity Score (FR_QTY)	If would have installed same quantity without program (FR13 = Yes)	FR_QTY = 1
	If would have installed fewer quantity without program (FR17 = No)	FR_QTY = FR17
	If never would have installed (FR15 = Never)	FR_QTY = 0
Efficiency Score (FR_EFF)	If would have installed at least some equipment on their own	FR_EFF = (1-FR18-FR19) + (FR18*.50)
	If never would have installed (FR15 = never)	FR_EFF = 0
	If insulation and would not have installed same R value	FR_EFF = FR22
Initial Free-Ridership Score	The percent of the rebated savings that would have occurred without the program.	FR_EFF * FR_QTY

A timing factor then adjusts the product of these two scores. The timing factor adjusts the raw free-ridership estimate downward for all or part of the savings that would have occurred without the program, but not until much later. By doing so, the program is given credit for accelerating the installation of energy-efficient equipment. For example, if the participant states that he or she would have installed equipment at the same time, regardless of the program, the quantity-efficiency factor is not adjusted. However, if the participant states that, without the program, they would have completed the project more than six months later than they actually did, any free-ridership identified in the quantity-efficiency factor is adjusted downward.[15] The degree of the adjustment depends on the program. As small businesses' equipment planning schedule is likely shorter than the planning

[15] Projects that were accelerated by fewer than 6 months are not adjusted. As installation timelines are subject to shifting, we assume these projects are just as likely to have been installed at the same time.

schedule for large businesses, small business programs receive a greater acceleration benefit. This reduced adjustment for small businesses reflects the increased effect the program has on the planning schedule[16]. This adjustment is detailed in Table 12 and visualized in Figure 1.

Table 12. Timing Factor Adjustment

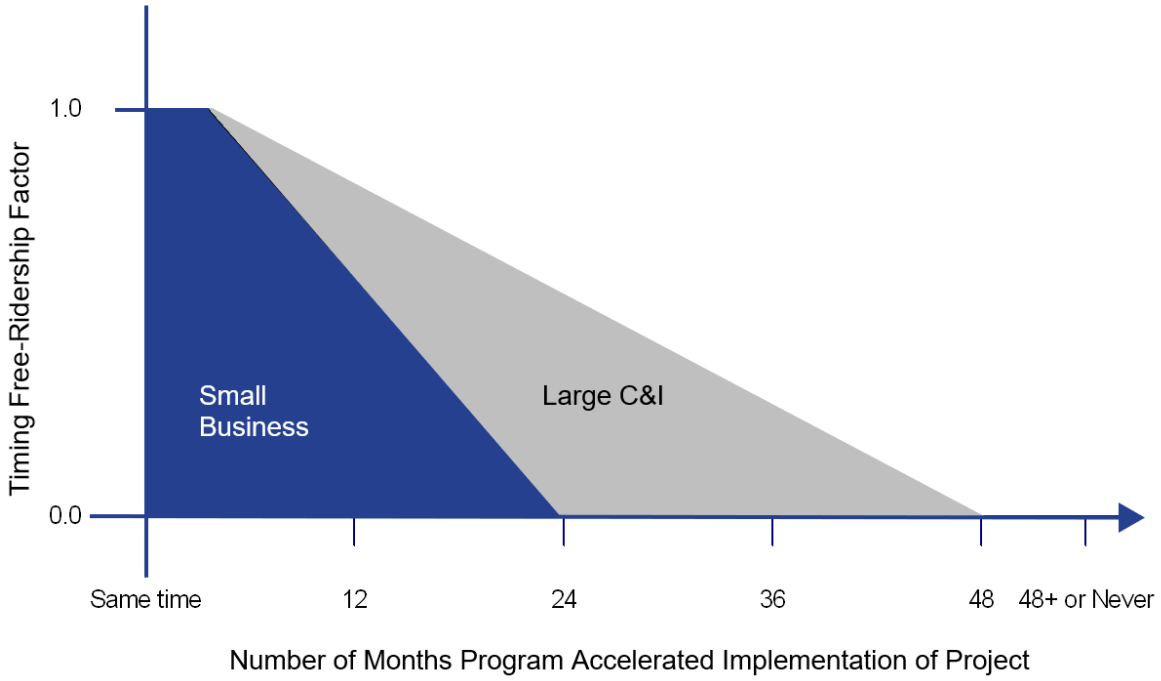
Score	Responses	Result
Timing Factor—Small Business Programs (FR_TIMING)	Would have installed at the same time without the program (FR12 = Yes)	*FR_TIMING = 1*
	Would have installed within six months of when participant actually did without the program (FR16 <= 6 months)	*FR_TIMING = 1*
	Would have installed sometime between 7 and 24 months of when participant actually did without the program (FR16 > 6 months & < 24 months)	*FR_TIMING = 1-((FR16-6) * .056[17])*
	Would have installed sometime after 24 months of when participant actually did without the program (FR16 > 24 months)	*FR_TIMING = 0*
	Would have never installed without the program (FR15 = Never)	*FR_TIMING = 0*
Timing Factor—Large Business Programs (FR_TIMING)	Would have installed at the same time without the program (FR12 = Yes)	*FR_TIMING = 1*
	Would have installed within six months of when participant actually did without the program (FR16 ≤ 6 months)	*FR_TIMING = 1*
	Would have installed sometime between 7 and 48 months of when participant actually did without the program (FR16 > 6 months & < 48 months)	*FR_TIMING = 1-((FR16-6 * .024[18])*
	Would have installed sometime after 48 months of when participant actually did without the program (FR16 > 48 months)	*FR_TIMING = 0*
	Would have never installed without the program (FR15 = Never)	*FR_TIMING = 0*
Adjusted Free-Ridership Score	*The raw free-ridership estimate adjusted for all or part of the savings that would have occurred without the program, but not until much later*	*FR_TIMING * Initial Free-Ridership Score*

[16] Business Programs: Acceleration Treatment and Life Cycles Net Savings. State of Wisconsin Public Service Commission of Wisconsin. March 10, 2010. https://focusonenergy.com/sites/default/files/bpaccelerationtreatmentandlcns_evaluationreport.pdf.

[17] 1 divided by 18 months is 0.056, which is one month out of the 18-month period (between 6 months and 24 months)

[18] 1 divided by 42 months is 0.024, which is one month out of the 42-month period (between 6 months and 48 months)

Figure 1. Timing Free-Ridership Factor—Number of Months Program Accelerated Implementation by Business Type



This adjusted score is reviewed for consistency and, if applicable, for vendor influence via a follow-up interview with vendors that are rated influential by participants. Questions FR7 and FR8 (below) are used to assess vendor influence. Details regarding the Influential Vendor survey are discussed in Section 4 of this report.

FR7 Who was MOST responsible for actually recommending or specifying the [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "high efficiency"] <MEASURE CATEGORY> project that was implemented through the program?

FR8 On a scale of 0 to 10, with 0 being no influence and 10 being a great deal of influence, how much influence did (the) [FR7 response] have on your company's decision to implement the [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "high efficiency"] <MEASURE CATEGORY> project so that it would qualify for the program?

3.2.6 Influence of Technical Assessment

The initial free-ridership score is further adjusted by the influence of any program-sponsored technical assistance or audit and by the influence of previous program participation. If a participant rates the influence of the technical assistance as high (7 or greater on a scale of 0–10), the free-ridership score is reduced by half. This reduction is necessary because the previous factors focus on the specific effect of the program incentive and the overall effect of the program. Without this adjustment, the influence of the technical assessment is under-represented.

DM11 On a scale of 0 to 10, with 0 being ‘no influence’ and 10 being a ‘great deal of influence,’ how much influence did the information provided by the technical assessment have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; IF EFF=1: high efficiency] <MEASURE CATEGORY> project?

In 2019, a programming error resulted in respondents being inadvertently skipped out of this question. Historically, this question resulted in very few adjustments. In 2016, 10 respondents had technical assistance, of which six respondents indicated the influence of the technical assessment was high. Of those six, three had their free-ridership score adjusted. So, the impact of the programming error is low.

3.2.7 Influence of Past Program Participation

Likewise, if a participant has previously participated in the program, they are asked about the influence of that past participation on their perceptions and behaviors. Participants are asked to state whether they agree or disagree with four statements about the effect past participation has had on their decision making. Based on the number of statements with which they agree, their free-ridership is reduced by 75 percent, 37.5 percent, or not reduced at all. This reduction is done to account for the influence positive program experiences have had on participants' purchasing decisions—with the program administrators, implementers, or the equipment incented.

PP3 I'm going to read you several statements. For each statement, please tell me whether you agree or disagree that this statement applies to your business. There are no right or wrong answers; we just want your honest opinion.

Our previous experience implementing energy efficient projects through a National Grid Rhode Island program …

a. Has made our firm more likely to consider energy efficient equipment
b. Has made our firm more likely to install energy efficient equipment
c. Has given us more confidence in the financial benefits of energy efficient equipment
d. Has given us more confidence in the nonfinancial benefits of energy efficient equipment

As mentioned previously, the previous program participation adjustment is made to account for the market effects associated with implementing energy efficiency programs over time. These market effects will result in net savings estimates that do not capture the full cumulative effect of the program. This methodology attempted to capture some of these market effects by making this adjustment for previous program participation. While it could be argued that the influence of previous participation should count as spillover rather than reduced free-ridership, the traditional definition of spillover does not count measures installed through a program as spillover. Table 13 details these adjustments.

Out of 438 respondents, 187 had a score adjustment from past participation. Adjustments are made for respondents to agree with three or four the of the statements listed above. Third-three respondents agreed with three statements and 154 respondents agreed with all four statements. Overall, the electric program saw a decrease of about four percent when the adjustment of past participation was removed (74.3 percent to 70.6 percent). The natural gas programs saw a similar decrease changing from 86.6 percent to 83.7 percent. Across both electric and natural gas programs, the custom program type tended to be impacted more than prescriptive.

Table 13. Adjustments for the Influence of Technical Assessments and Previous Participation

Adjustment	Responses	Result
Technical Assessment Adjustment	No technical assessment, audit, or study conducted	No adjustment
	Participant would have performed assessment, audit, or study without program assistance, or it was not influential (DM11 ≤ 6)	No adjustment
	Participant would **not** have performed assessment, audit, or study without program assistance, and it was influential (DM11 > 6)	Adjusted Free-Ridership Score * .5
Previous Participation Adjustment	No previous participation in program	No adjustment
	Agrees with four statements regarding the positive influence of past participation (PP3)	Adjusted Free-Ridership Score * .25
	Agrees with three statements regarding the positive influence of past participation (PP3)	Adjusted Free-Ridership Score * .625
	Agrees with two or fewer statements regarding the positive influence of past participation (PP3)	No adjustment

Flowchart diagrams detailing these calculations have been included in Appendix F of this report.

3.2.8 Participant "Like" Spillover

The "like" spillover estimates are computed based on how much more of the same energy-efficient equipment the participant installed outside the program that were, in fact, influenced by the program. This is a conservative approach because it assumes the exact same equipment, including efficiency level and size. The following questions, in conjunction with the savings assigned to that same equipment by the program, are used to estimate possible spillover savings:

SP1 Now I'd like you to think of the time since you participated in the National Grid program around <DATE>. Has your company implemented any <MEASURE CATEGORY> projects for this or other facilities in Rhode Island **on your own,** that is, without a rebate from National Grid?

SP2 Was this equipment of **the same efficiency level or a higher level of efficiency** as the equipment you installed through the program?

SP3 Was this equipment more energy efficient than standard efficiency or code equipment?

SP4 Thinking of the <MEASURE CATEGORY> equipment that you installed on your own, was this more, less or the same amount of <MEASURE CATEGORY> equipment as what you installed through the program?

For respondents that answer “Yes” to SP1 and SP2, spillover savings are calculated as the measure-specific savings identified by the program multiplied by the quantity identified in SP4. For respondents who answer “Yes” to SP1 and SP3, spillover savings are calculated as 50 percent of the program's measure-specific savings identified by the program multiplied by the quantity identified in SP4. If the respondent answers “No” to SP1 or SP3, there are no identifiable “like” spillover savings.

For those measures, a program-attributable spillover rate is then calculated based on the following questions:

SP8 Did a recommendation by the contractor, engineer, or designer who you worked with under the National Grid program influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "efficient"] <MEASURE CATEGORY> equipment on your own?

SP9 Did your experience with the energy efficient projects implemented through the National Grid program influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "efficient"] <MEASURE CATEGORY> equipment on your own?

SP10 Did your participation in any past program offered by National Grid influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "efficient"] <MEASURE CATEGORY> equipment on your own?

SP11 On a scale of 0 to 10, where 0 is “no influence at all” and 10 is “a great deal of influence”, how much influence did your participation in the National Grid program have on your decision to install this equipment without an incentive?

SP12 Why didn't you implement this <MEASURE CATEGORY> project through a National Grid program?

SP13 [IF THE EQUIPMENT WOULD NOT QUALIFY] Why wouldn't the equipment qualify?

If the respondent reports that the contractor influenced their decision to install the like equipment on their own, we attribute the program with 50 percent of those savings based on the influence the program has on the trade allies. If the respondent reports that either their experience with the program-sponsored project or past programs influenced their decision to implement the like equipment, we attribute the program with 100 percent of the spillover savings.

To summarize:

If (SP8=yes AND (SP9 = no AND SP10 = no)), spillover rate = 50%.

If (SP9=yes OR SP10 = yes), spillover rate = 100%.

That rate, applied to the estimated spillover savings, results in the program-attributable spillover savings for that participants.

3.2.9 Participant “Unlike” Spillover

In addition to “like” spillover, the 2019 study also asked about “unlike” spillover (i.e., measures outside of those installed through the program). To establish spillover savings, program eligibility was used as a proxy for energy efficiency. The following questions were used to identify “unlike” spillover.

US1 Since participating in National Grid program, has your company purchased, installed, or implemented any **other** type of energy efficient equipment **on your own,** that is, without a rebate from National Grid Rhode Island?

US2 What type of energy efficient equipment did you install on your own?

US3 What quantity of energy efficient equipment did you install?

US4 What size or capacity of energy efficient equipment did you install?

US5 Would this project have qualified for an incentive through a National Grid Rhode Island program?

Once identified, program influence needs to be established. Using the same methodology as with "like" spillover, we ask a series of questions to determine if the spillover is program-attributable spillover:

US6 Did a recommendation by the contractor, engineer, or designer who you worked with under a National Grid Rhode Island program influence your decision to implement some or all of this equipment on your own?

US7 Did your experience with the energy efficient project implemented through a National Grid Rhode Island program influence your decision to implement some or all of this equipment on your own?

US8 Did your participation in any past program offered by National Grid Rhode Island influence your decision to implement some or all of this equipment on your own?

As with "like" spillover, if the respondent reports that the contractor influenced their decision to install the like equipment on their own, we would attribute the program with 50 percent of those savings based on the influence the program has on the trade allies. If the respondent reports that either their experience with the program-sponsored project or past programs influenced their decision to implement the "unlike "equipment, we will attribute the program with 100 percent of the spillover savings. However, given the difficulties in estimating savings for these installations using regular telephone interviewers, we present only observations of "unlike" spillover and not savings estimates.

4.0 VENDOR/DESIGN PROFESSIONAL SURVEY QUESTIONS

4.1 OVERVIEW OF INFLUENTIAL VENDOR SURVEY QUESTIONS

As mentioned earlier, we attempted to contact vendors and design professionals identified by program participants as being most influential in their decision to install the energy-saving measures through the program (Questions FR7 and FR8 discussed above). A separate survey tailored to these designers/vendors was administered for the purposes of estimating free-ridership (see Appendix C).

Design professionals'/vendors' responses to the free-ridership questions replaced participants' responses if the designer/vendor agreed they were most influential (VA3 = 4 or 5). If the designer/vendor did not agree they were the most influential (VA3 is less than 4) or attempts to survey the designer/vendor failed, the customer's responses were used to estimate free-ridership.

4.1.1 Design Professional/Vendor's Identification of Decision Maker

Participant-identified design professionals/vendors were first asked a series of introductory questions designed to verify that they were influential in the decision to install the equipment (VA1 > 5). The questions are shown in Table 14.

Table 14. Design Professional/Vendor's Identification of Decision Maker

Item	Text
V1A	Were you involved in the decision-making process at the design stage when the <MEASURE CATEGORY> project was specified and agreed upon for this facility?
V1B	*(IF NO)* At what point in the process did you become involved?
V1C	What was your role?
VA1	On a scale of 0 to 10, with 0 being no influence and 10 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of the <MEASURE CATEGORY> project so that it would qualify for National Grid assistance?

4.1.2 Design Professional/Vendor Free-Ridership Questions

The design/vendor free-ridership survey questions are a parallel version of the customer survey questions and are not discussed here. Questions from the customer version of the survey that are inappropriate for designers/vendors were not asked.

4.2 OVERVIEW OF NONPARTICIPANT SPILLOVER SURVEY QUESTIONS

Nonparticipant ***spillover*** refers to energy-efficient equipment installed by program nonparticipants due to the program's influence. The program can influence design professionals and vendors as well as an influence on product availability, product acceptance, customer expectations, and other market effects, all of which may induce nonparticipants to buy high-efficiency products.

An important issue related to quantifying nonparticipant spillover savings is how to value the savings of equipment installed outside the program. Experience has shown that customers cannot provide adequate equipment-specific data on new equipment installed either through or outside a program to a telephone interviewer. Although they are usually able to report what type of equipment

was installed, they typically cannot provide sufficient information about the quantity, size, efficiency, and/or operation of that equipment to decide about its program eligibility.

Thus, it was decided to survey design professionals, and equipment vendors who were more knowledgeable about the equipment and who were familiar with what is/is not program eligible. Since there were electric and natural gas savings associated with design professionals or vendors (by measure category) in the program tracking system database included in the study, we knew for each design professional/vendor the savings attributable to them for eligible equipment installed through the program.

To determine nonparticipant spillover, design professionals and equipment vendors were asked (by measure category) what percent of their sales to the customers of National Grid met or exceeded the program standards for each program measure category installed through the program(s) and what percent of these sales did not receive an incentive. They were then asked several questions about the program's impact on their decision to recommend/install this efficient equipment outside the program. Using the survey responses and measure savings data from the program tracking system, the potential nonparticipant spillover savings could be estimated for each design professional/vendor, and the results extrapolated to the total program savings.

This method of estimating nonparticipant spillover is a *conservative* estimate for two reasons. First, not all design professionals and equipment vendors who are familiar with the programs will have specified and/or installed equipment through the program during the study period. Thus, we miss any nonparticipant spillover that is associated with these other design professionals/vendors (although it is less likely these design professionals/vendors had nonparticipant spillover if they are not involved with the programs).

Second, this method only allows extrapolation of nonparticipant spillover *for those same measure categories that a particular design professional/vendor is associated within the program database*. Thus, if a vendor installed program-eligible equipment in other equipment categories outside the program, but none through the program, this method does not capture nonparticipant spillover savings for that particular type of equipment. In essence, this method measures only "like" nonparticipant spillover; that is, spillover for measures like those installed through the program during the study period.

Four steps were used to determine nonparticipant "like" spillover:

- For each design professional/vendor, the survey determined the percentage of all program-eligible equipment sold/installed outside the program in National Grid's territory.
- For each design professional/vendor, the survey determined whether the sale or installation of program-eligible equipment outside the program was due to the program (nonparticipant spillover).
- For each design professional/vendor, savings associated with this "nonparticipant spillover" equipment were determined by examining the participant database, and quantities installed.
- Nonparticipant spillover savings were then extrapolated from the survey to the total program savings in the year.

Each of these steps is discussed in more detail below.

4.2.1 Step 1: Determine the Percentage of All Program-Eligible Equipment Installed Outside the Program

Using the program database, we identified which equipment design professionals/vendors had installed and how that equipment fit into the measure categories used as part of the participant survey. For those measure categories, design professionals/vendors were asked what percent of the equipment would have been eligible for a program and what percent of that eligible equipment did not receive an incentive through a program. Those who said some of the eligible equipment did not receive an incentive through a program are included in Step 2 of the nonparticipant spillover analysis.

VNP1a

Our records show that your firm specified, sold, and/or installed <MEASURE CATEGORY> to commercial and industrial customers in 2019 through the National Grid offerings. Is that correct?

VNP2 Please think about all the program-eligible <MEASURE CATEGORY> you specified, sold, and/or installed for National Grid customers in 2019. Did you specify, sell and/or install any of this program-eligible <MEASURE CATEGORY> to customers of National Grid <u>without</u> the customer receiving assistance from National Grid?

VNP3 [IF VNP2 = Yes] Again, thinking about all the program-eligible <MEASURE CATEGORY> you specified, sold, and/or installed for National Grid customers in 2019, what percent did <u>not</u> receive an incentive through National Grid?

4.2.2 Step 2: Determine Whether the Program-Eligible Equipment Specified/Installed Outside the Program was Due to the Program

A number of additional questions were asked of design professionals/vendors who had program energy savings associated with the types of program-eligible equipment specified/installed outside the program. These questions measured the causal effect of the program on design professionals/vendors actions. These questions and the preliminary nonparticipant “like” spillover rate are shown below.

VNP5 I’m going to read you 3 statements. For each statement, please tell me whether you agree or disagree that this statement applies to your company. There are no right or wrong answers; we just want your honest opinion.

"Our past experience specifying or installing <MEASURE CATEGORY> through energy efficiency programs and offerings has convinced us that this equipment is cost effective or beneficial even without a program incentive."

VNP6 "We are better able to identify opportunities to improve energy efficiency by using high efficiency <MEASURE CATEGORY> because of our previous experience with the performance of energy efficient equipment installed through energy efficiency programs and offerings, and what we learned through working with National Grid."

VNP7 "We are more likely to discuss energy efficient options with all of our customers when developing project plans for <MEASURE CATEGORY> because of our previous experience with the performance of energy efficient equipment installed through energy efficiency programs and offerings, and what we learned through working with National Grid."

Based on these responses, we calculated a preliminary nonparticipant “like” spillover rate, as shown in Table 15. This method follows the approach used in the 2013 and 2017 Commercial and Industrial Programs Free-Ridership and Spillover Study report for Rhode Island.

Table 15. Preliminary Nonparticipant "Like" Spillover Rate

# of Agreements to VNP5–VNP7	Preliminary Nonparticipant "Like" Spillover Rate
3	100%
2	50%
1 or 0	0%

4.2.2.1 Nonparticipant Spillover Consistency Checks

To improve the reliability of the nonparticipant spillover estimates, two consistency check questions were also asked:

VNP4 In 2019, you mentioned that about <VNP3> of the <MEASURE CATEGORY> you specified and/or installed would have been eligible for an incentive through National Grid but did not receive an incentive.

What are the main reasons why your firm or the customer did not request a customer incentive for this energy saving equipment you specified/installed?

VNP8 Please describe what impact, if any, the National Grid offerings had on your decision to specify or install <MEASURE CATEGORY> outside of the National Grid programs and offerings.

Note that in the preliminary "like" spillover questions, we asked the respondent to refer to program-eligible equipment. Therefore, we ideally would have no cases that respond "did not qualify" to VNP4. However, in the event this response was provided, the preliminary nonparticipant estimate is reduced by 50 percent. We did not completely exclude "did not qualify" measures as nonparticipant spillover since this response only suggested some uncertainty about the eligibility requirements.

The final consistency question was asked to ensure that the responses given to the first set of nonparticipant spillover questions were consistent. The response to this last question was visually examined by two analysts. If the response to the last question contradicted the other responses, the adjusted nonparticipant spillover rate was reduced by one-half or increased by half the distance to 100 percent. For example, if a vendor agreed with all three statements about the impact of their past experience with the program on the installation of program-eligible equipment outside the program, they received a preliminary nonparticipant spillover estimate of 100 percent. If the main reason why they did not have the customer apply for the incentive was something other than "didn't qualify" (e.g., wasn't worth the paperwork hassle), the adjusted nonparticipant spillover rate remained at 100 percent. If, however, in the open-ended question the vendor said, "I would say that, let's see, it really didn't impact the business because our business is driven by more than rebates" or "I don't think it's had much" or "almost no" impact, the final nonparticipant spillover rate was reduced to 50 percent. These responses may indicate that the program influenced a number of installations/sales, but the customer/vendor did not want to prepare the paperwork to get the incentive. If a vendor agreed with two statements, they have a spillover rate of 50 percent. If during the consistency check, the vendor responded such as "I would not have sold nearly as much without the program incentives," then the spillover rate would increase from 50 percent to 75 percent.

4.2.3 Step 3: Determine the Savings Associated with this Nonparticipant Spillover Equipment

At the end of Step 2, respondents with nonparticipant spillover were assigned a nonparticipant spillover percent for one or more measure categories. As illustrated in the footnote at the bottom of this page, the third step associated savings with each nonparticipant spillover measure for each respondent.[19]

For example, assume a vendor had 2,000 therm savings in the program tracking system database attributable to HVAC measures. If that vendor said that 25 percent of all their program-eligible HVAC equipment were sold outside the program, the potential nonparticipant spillover savings would be 667 therms (2,000 therm * 0.25/(1–0.25) = 667 therms).

1. First, determine the savings associated with all the program eligible sales.
2. 2000 / (1 - 0.25) = 2,677 therm savings of all program eligible sales
3. Then, subtract the tracking data to get the savings from sales outside of the program
4. 2,667 - 2,000 = 667 therm savings outside of the program
5. Result, 667 therm savings from non-program equipment

If this vendor was assigned (in Step 2) a nonparticipant spillover rate of 100 percent for HVAC equipment, the nonparticipant spillover therm savings for that vendor remains at 667 therms. But if that same vendor was assigned (in Step 2) a nonparticipant spillover rate of only 50 percent for program-eligible HVAC equipment, the nonparticipant spillover therm savings for that vendor was 667 * 0.5 = 334 therms. This type of calculation was made by measure category for each design professional and vendor who had a nonparticipant spillover rate of more than 0 percent.

As discussed earlier under the participant spillover measurement, the participating customer survey and analysis included calculations of “like” spillover. “Like” spillover was defined as measures exactly like the participant’s measures installed through the program that the participant installed at a later time *and* for which they did not receive an incentive even though they said the program

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[19] The formula for calculating therm savings for each measure was derived as follows:

Definitions:

a = Gross therm in program tracking system database (measures that received an incentive)
b = Percent of program-eligible equipment that received no incentive (survey question)
x = therm nonparticipant spillover (spillover reported by design professional/vendor—”like” spillover by participants associated with design professional/vendor)

Solve for x:

Total therm for all program-eligible equipment= therm savings for efficient equipment sold through program +therm savings for efficient equipment sold outside the program = a+x

b = nonparticipant spillover/total therm = x/(a+x)

Therefore:

b = x/(a+x)
solving for x yields
x = b*a/(1-b)

Nonparticipant spillover = fraction of equipment receiving no incentive * therm in database/(1 - fraction of equipment receiving no incentive).

influenced their decision. To avoid double-counting the spillover for the same measures reported by both participants and their design professionals/vendors, we eliminated any savings that had been identified as “like” spillover by participants and that were also associated with a design professional or vendor who had demonstrated nonparticipant spillover for the same measure category. This conservative approach assumed that the same design professional or vendor was involved in the participant’s “like” spillover project.

4.2.4 Step 4: Extrapolate the Survey Nonparticipant Spillover Savings to the Total Vendor Population Savings During the Study Period

The last step in the nonparticipant spillover estimation involved extrapolating the results to all vendors in the program tracking system database for each measure category. This was done by first calculating the ratio of nonparticipant spillover as determined by the vendor survey. This ratio (the estimated spillover percent) was then applied to the savings (both electric and gas) represented by vendors in the program tracking system database.

For example, if the survey covered 857,814 therms in measure category savings and the surveyed nonparticipant spillover totals 62,221 therms for that measure category, the surveyed nonparticipant spillover divided by the surveyed total therms savings is 7.3 percent. This identified nonparticipant spillover savings was extrapolated to all vendors related to the programs by proportionally applying the identified savings to each program at the measure-level.

5.0 DISTRIBUTOR SURVEY QUESTIONS AND RESULTS

As mentioned earlier, we attempted to contact distributors who offered lighting products at a discounted price through the Bright Opportunities initiative. A separate survey tailored to these distributors was administered for the purposes of estimating free-ridership (see Appendix C).

Distributor responses were used to calculate a free-ridership score. This score was then averaged with the participant free-ridership score to develop an overall free-ridership score for the upstream lighting program and at the measure type level.

5.1 DISTRIBUTOR'S IDENTIFICATION OF DECISION MAKER

The survey first asked distributors an introductory question designed to verify that they were knowledgeable about their company's participation in the program. Contacts who were knowledgeable about their company's participation were then asked about specific customers who participated. The questions are shown in Table 16:

Table 16. Distributor's Identification of Decision Maker

Item	Text
I1	According to our records, your company has been selling lighting products as part of Bright Opportunities initiative. [If needed, name some recent projects that used the program discounts]. We would like to ask you some questions about your participation in this program. Who would be most familiar with your participation? [If respondent is not familiar with the program, ask for someone who may be familiar and repeat I1]
PI0	According to our records you sold some lighting products that were discounted by the Bright Opportunities initiative to <CUSTOMER> in 2019. Do you recall this sale?

5.2 DISTRIBUTOR FREE-RIDERSHIP QUESTIONS

The distributor free-ridership survey questions are similar to the questions asked of the participating customers. These questions were asked for each lighting type that the customer purchased.

Table 17. Distributor's Free-Ridership Questions

Item	Text
PI3	According to our records you sold the <TYPE> bulbs/lamps at a <PROMOTIONAL PRICE> which was <BUYDOWN AMOUNT> less than your normal retail price for a discount of <DISCOUNT> percent. If this discount had not been available, do you think you would have sold any of these types of bulbs/lamps to this customer in 2019?
PI4	[IF RESPONSE TO PI3 <> "NO"] If this discount of <DISCOUNT> percent had not been available, would your sales of these <TYPE> bulbs/lamps to <CUSTOMER> been the same, lower, or higher?
PI4a	[IF SAME OR HIGHER] Why do you say this?
PI4b	[IF LOWER] By what percentage do you estimate your sales of these <TYPE> bulbs/lamps to <CUSTOMER> to be lower in absence of the discount?

The free-ridership score was then calculated for each lighting type as follows:

Table 18. Distributor Free-Ridership Calculations

Responses	Result
If customer would not have purchased any equipment without program (PI3 = No)	FR = 0%
If would have purchased fewer quantity without program (PI3 = Yes or Don't know)	FR = PI4b/100%
If would have purchased same amount regardless of the program (PI3 = Yes and PI4 = same)	FR = 100%

Free-ridership results from the distributors were then averaged with the results from the participant surveys. This method follows the approach used in the 2013 and 2017 Commercial and Industrial Programs Free-Ridership and Spillover Study reports for Rhode Island and as previously implemented by KEMA in Massachusetts[20].

Table 19. Upstream Lighting Free-Ridership Rates by Lamp Type

Type	End-user Free-ridership rate	Distributor Free-ridership rate	Recommended Free-ridership rate
Fixture, fixture with controls, retrofit kits	21.0%	41.4%	31.2%
Screw-ins	53.7%	100.0%	76.9%
TLEDs	9.9%	100.0%	54.9%
Total	**26.6%**	**52.0%**	**39.3%**

[20] "Process Evaluation of the 2012 Bright Opportunities Program Final Report" prepared by KEMA, Inc., June 14, 2014.

6.0 FREE-RIDERSHIP AND SPILLOVER STUDY RESULTS

This section presents the results of the 2019 electric and natural gas free-ridership and spillover study. First, we present summary tables that include portfolio-wide figures. Following the summary tables, we present detailed results for each program. The detailed results include free-ridership and spillover rates by program pathway, measure type, and by program, along with corresponding error margins. We then present observations of participant "unlike" spillover.

Nonparticipant "like" spillover was assessed at the statewide level, resulting in statewide estimates by measure type. These estimates were then applied to each program that offered that measure type**.** Once the identified participant spillover savings were removed from the nonparticipant estimate (to avoid double-counting spillover projects), we could only attribute nonparticipant spillover savings for the compressed air, custom, and lighting measure types for the electric programs and the HVAC measure type for the gas programs. All other measure types had no attributable spillover.

6.1 NET-TO-GROSS RESULTS – RECOMMENDED FOR APPLICATION

Table 20 summarizes the free-ridership and spillover estimates for electric programs to be used in setting prospective NTG ratios for the 2021-2023 period. The consultants, along with National Grid and the Rhode Island Energy Efficiency and Resource Management Council consultant team, adjusted the retrospective NTG estimates values to set the figures to be used for application during the 2021-2023 period. Adjustments were made due to insufficient survey completes (ten or fewer[21]) for a measure type or pathway and the margin of error.

The overall free-ridership rate for electric measures installed through these programs ranges from 12.3 percent to 76.9 percent, the participant "like" spillover rate ranges from 0.0 percent to 2.1 percent, and the nonparticipant "like" spillover rate from 0.0 to 1.6 percent, resulting in overall NTG rates ranging from 23.3 percent to 88.2 percent.

Table 20. C&I Electric Free-Ridership and Spillover Results Summary by Measure Type and Program/Initiative

Program/Initiative	Measure Type/Pathway	Free-Ridership Rate	Participant "Like" Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Lighting - fixtures, fixture with controls, LED retrofit kits	31.2%	0.3%	NA	69.1%
	Lighting—screw-ins	76.9%	0.2%	NA	23.3%
	Lighting—TLEDs	54.9%	0.0%	NA	45.1%
Large Commercial and Industrial New Construction	Total	28.0%	2.1%	1.6%	75.7%
Large Commercial Retrofit	Custom	35.8%	0.5%	0.7%	65.5%
	Prescriptive	14.7%	0.1%	0.1%	85.5%
Small Business Direct Install	Lighting	12.3%	0.3%	0.2%	88.2%
	Non-lighting	29.1%	0.3%	0.0%	71.2%

[21] There was sufficient (n) at the measure level for electric Energy Initiative Lighting and gas Commercial New Construction— Prescriptive Food Service, however, it was decided in consultation with National Grid and the RI Energy Efficiency and Resource Management Council consultant team to instead apply the custom, prescriptive or overall program values for consistency within these programs.

Table 21 summarizes the free-ridership and spillover estimates for natural gas programs by program pathway to be used in setting prospective NTG ratios for the 2021-2023 period. Free-ridership rates vary between 6.8 percent to 47.7 percent, participant “like” spillover rates range from 0.0 percent to 2.2 percent, and nonparticipant “like” spillover rates range from 0.0 to 15.6 percent. The resulting NTG rates range from 57.6 percent to 108.8 percent. The Large Commercial Retrofit program had the highest NTG rate (108.8 percent), while the Large Commercial and Industrial New Construction had the lowest (57.6 percent).

Table 21. C&I Natural Gas Free-Ridership and Spillover Results Summary by Program and Program Pathway

Program	Free-Ridership Rate	Participant Spillover Rate	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction	47.7%	2.2%	3.1%	57.6%
Large Commercial Retrofit	6.8%	0.0%	15.6%	108.8%
Small Business Direct Install	11.4%	1.7%	0.0%	90.4%

6.2 NET-TO-GROSS RESULTS – RESULTS DETAIL

The values in Table 22 through Table 25 were used for setting prospective NTG ratios for application for the 2021-2023 period. We adjusted the retrospective NTG estimates values as follows:

- (Electric) Where there was insufficient survey completes for a measure type (ten or fewer[22]), we applied the custom/prescriptive value within the program, except for upstream lighting.
- (Electric) If the custom/prescriptive level had an insufficient number of survey completes, then the overall program-level NTG values were applied.
- (Gas) Due to the overall low number of completed surveys, all measure-level NTG values were replaced with their respective overall program-level results.

While we also considered the margin of error when deciding on the above criteria, the number of completed surveys was the primary data point used to determine on the reported level of aggregation.

6.2.1 Electric

Table 22 summarizes the free-ridership and spillover estimates for electric programs by measure type. The cells highlighted in gray are using the overall program or custom/prescriptive level free-ridership and spillover rates due to an insufficient number of responses or low precision, as outlined above. For the Bright Opportunities initiative, nonparticipant “like” spillover is not measured due to customers not being knowledgeable about whether they received equipment at a discount. Individual measure with an NA means no surveys were completed for that stratum.

[22] There was sufficient (n) at the measure level for electric Energy Initiative Lighting and gas Commercial New Construction— Prescriptive Food Service, however, it was decided in consultation with National Grid and the RI Energy Efficiency and Resource Management Council consultant team to instead apply the custom, prescriptive or overall program values for consistency within these programs.

Within the Large Commercial and Industrial New Construction program, the overall program total was imputed for all measure types. For the Large Commercial Retrofit program, the prescriptive results were imputed for non-custom measure types. The fixtures and kits had the highest NTG (69.1 percent) within the Bright Opportunities initiative, while the screw-ins had the lowest NTG rate (23.3 percent).

Table 22. C&I Electric Free-Ridership and Spillover Results Summary by Measure Type and Program/Initiative

Program/ Initiative	Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)*	Participant "Like" Spillover Rate	90% Margin Error (±)*	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Lighting - fixtures, fixture with controls, LED retrofit kits	91	2,642	16,909,798	31.2%	7.9%	0.3%	0.9%	NA	69.1%
	Lighting—screw-ins	34	711	6,389,077	76.9%	11.6%	0.2%	1.2%	NA	23.3%
	Lighting—TLEDs	28	791	4,672,299	54.9%	15.2%	0.0%	0.0%	NA	45.1%
	Total	**153**	**4,144**	**27,971,174**	**39.3%**	**6.4%**	**0.2%**	**0.6%**	**NA**	**60.9%**
Large Commercial and Industrial New Construction	Compressed Air	6	22	358,959	28.0%	Census	2.1%	Census	1.6%	75.7%
	Custom	9	76	11,253,874	28.0%	Census	2.1%	Census	1.6%	75.7%
	Food Service	6	60	503,856	28.0%	Census	2.1%	Census	1.6%	75.7%
	HVAC Non-unitary	1	5	328,220	28.0%	Census	2.1%	Census	1.6%	75.7%
	Lighting	4	46	3,657,323	28.0%	Census	2.1%	Census	1.6%	75.7%
	Other	0	2	820	28.0%	Census	2.1%	Census	1.6%	75.7%
	VSD	1	5	173,930	28.0%	Census	2.1%	Census	1.6%	75.7%
	Total	**27**	**216**	**16,276,982**	**28.0%**	**Census**	**2.1%**	**Census**	**1.6%**	**75.7%**
Large Commercial Retrofit	Custom	16	133	27,267,088	35.8%	Census	0.5%	Census	0.7%	65.5%
	HVAC	1	18	800,818	14.7%	Census	0.1%	Census	0.1%	85.5%
	Lighting	35	311	29,793,677	14.7%	9.3%	0.1%	0.7%	0.1%	85.5%
	VSD	5	29	2,652,783	14.7%	Census	0.1%	Census	0.1%	85.5%
	Total	**57**	**491**	**60,514,366**	**23.8%**	**8.7%**	**0.3%**	**1.1%**	**0.9%**	**77.3%**
Small Business Direct Install	Lighting	71	640	10,206,033	12.3%	6.1%	0.3%	1.1%	0.2%	88.2%
	Non-lighting	42	339	1,978,580	29.1%	10.8%	0.3%	1.3%	0.0%	71.2%
	Total	**113**	**979**	**12,184,613**	**15.1%**	**5.2%**	**0.3%**	**0.8%**	**0.2%**	**85.5%**
Total		**350**	**5,830**	**116,947,135**	**29.0%**	**3.9%**	**0.5%**	**0.6%**	**2.8%**	**74.3%**

*When a census of the population is sampled, confidence intervals cannot be estimated.
Cells highlighted in gray are using the overall program, or custom/prescriptive level, free-ridership, and spillover rates due to insufficient responses.
A value of NA means no surveys were completed for that stratum.
Program measures with no program participation are not shown.

Table 23 summarizes the free-ridership and spillover estimates for electric programs by program pathway. Similar to the table above, the cells highlighted in gray are using the overall program or custom/prescriptive level free-ridership and spillover rates due to an insufficient number of responses or low precision.

Within the Large Commercial and Industrial New Construction program, the overall program total was imputed for both Custom and Prescriptive pathways. The highest NTG was in the Small Business Direct Install program, which only had Prescriptive pathway (85.5 percent), and the lowest was in the Bright Opportunities initiative (60.9 percent). Among the electric programs, the Prescriptive pathway had an overall NTG rate of 75.0 percent, while the custom pathway had an overall NTG rate of 68.6 percent.

Table 23. C&I Electric Free-Ridership and Spillover Results Summary by Program/Initiative and Program Pathway

Program/ Initiative	Program Pathway	Surveyed	Population	Population Savings	Free-ridership Rate	90% Margin Error (±)	Participant " Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Prescriptive	153	4,144	27,971,174	39.3%	6.4%	0.2%	0.6%	NA	60.9%
	Total	**153**	**4,144**	**27,971,174**	**39.3%**	**6.4%**	**0.2%**	**0.6%**	**NA**	**60.9%**
Large Commercial and Industrial New Construction	Custom	9	76	11,253,874	28.0%	Census	2.1%	Census	1.6%	75.7%
	Prescriptive	18	140	5,023,108	28.0%	Census	2.1%	Census	1.6%	75.7%
	Total	**27**	**216**	**16,276,982**	**28.0%**	**Census**	**2.1%**	**Census**	**1.6%**	**75.7%**
Large Commercial Retrofit	Custom	16	130	26,066,973	35.8%	Census	0.5%	Census	0.7%	65.5%
	Prescriptive	41	361	34,447,393	14.7%	8.6%	0.1%	0.6%	0.1%	85.5%
	Total	**57**	**491**	**60,514,366**	**23.8%**	**8.7%**	**0.3%**	**1.0%**	**0.9%**	**77.3%**
Small Business Direct Install	Prescriptive	113	979	12,184,613	15.1%	5.2%	0.3%	0.8%	0.2%	85.5%
	Total	**113**	**979**	**12,184,613**	**15.1%**	**5.2%**	**0.3%**	**0.8%**	**0.2%**	**85.5%**
Total	**Custom**	**25**	**206**	**37,320,847**	**33.4%**	**14.5%**	**0.4%**	**1.9%**	**1.6%**	**68.6%**
	Prescriptive	**325**	**5,624**	**79,626,288**	**26.7%**	**3.9%**	**0.6%**	**0.7%**	**1.2%**	**75.0%**
	Total	**350**	**5,830**	**116,947,135**	**29.0%**	**3.9%**	**0.5%**	**0.6%**	**2.8%**	**74.3%**

*When a census of the population is sampled, confidence intervals cannot be estimated.
Cells highlighted in gray are using the overall program free-ridership and spillover rates due to insufficient responses.

6.2.2 Natural Gas

Table 24 summarizes the free-ridership and spillover estimates for natural gas programs and pathways by measure type. The cells highlighted in gray are using the overall program or custom/prescriptive level free-ridership and spillover rates due to an insufficient number of responses or low precision, as detailed above. Individual measure with an NA means no surveys were completed for that stratum.

Within the Large Commercial and Industrial New Construction program, the overall program total was imputed for all measure types for both the custom and prescriptive pathways. For the Large Commercial Retrofit program, the custom results were imputed for all measure types and there were no prescriptive measure completes. For the Small Business Direct Install program, the overall program total was used for all measure types for both the custom and prescriptive pathways.

Table 24. C&I Natural Gas Free-Ridership and Spillover Results Summary by Program, Pathway and Measure Type

Program and Pathway	Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)*	Participant "Like" Spillover Rate	90% Margin Error (±)*	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction—Custom	Controls	0	9	34,546	47.7%	Census	2.2%	Census	3.1%	57.6%
	Food service	1	3	12,017	47.7%	Census	2.2%	Census	3.1%	57.6%
	HVAC	2	3	21,267	47.7%	Census	2.2%	Census	3.1%	57.6%
	HVAC—Distribution	0	3	72,497	47.7%	Census	2.2%	Census	3.1%	57.6%
	HVAC—Plant	0	3	21,737	47.7%	Census	2.2%	Census	3.1%	57.6%
	Insulation	1	4	33,175	47.7%	Census	2.2%	Census	3.1%	57.6%
	Water Heating	2	10	82,333	47.7%	Census	2.2%	Census	3.1%	57.6%
	Other	0	1	3,640	47.7%	Census	2.2%	Census	3.1%	57.6%
	Total	**6**	**36**	**281,212**	**47.7%**	**Census**	**2.2%**	**Census**	**3.1%**	**57.6%**
Large Commercial and Industrial New Construction—Prescriptive	Food service	38	172	120,223	47.7%	Census	2.2%	Census	3.1%	57.6%
	HVAC	5	5	7,469	47.7%	Census	2.2%	Census	3.1%	57.6%
	HVAC—Plant	0	27	18,045	47.7%	Census	2.2%	Census	3.1%	57.6%
	Other	1	1	4,300	47.7%	Census	2.2%	Census	3.1%	57.6%
	Water heating	5	116	47,213	47.7%	Census	2.2%	Census	3.1%	57.6%
	Total	**49**	**321**	**197,251**	**47.7%**	**Census**	**2.2%**	**Census**	**3.1%**	**57.6%**
Large Commercial Retrofit—Custom	Controls	2	36	227,664	6.8%	Census	0.0%	Census	15.6%	108.8%
	HVAC	5	40	481,331	6.8%	Census	0.0%	Census	15.6%	108.8%
	HVAC—Distribution	0	5	35,632	6.8%	Census	0.0%	Census	15.6%	108.8%
	HVAC—Plant	0	4	48,005	6.8%	Census	0.0%	Census	15.6%	108.8%
	Insulation	5	15	125,199	6.8%	Census	0.0%	Census	15.6%	108.8%
	Other	1	16	662,531	6.8%	Census	0.0%	Census	15.6%	108.8%
	Water heating	2	6	27,611	6.8%	Census	0.0%	Census	15.6%	108.8%
	Total	**15**	**122**	**1,607,973**	**6.8%**	**Census**	**0.0%**	**Census**	**15.6%**	**108.8%**
Large Commercial Retrofit—Prescriptive	Controls	0	10	2,122	6.8%	Census	0.0%	Census	15.6%	108.8%
	Other	0	1	6,669	6.8%	Census	0.0%	Census	15.6%	108.8%
	Water Heating	0	4	1,374	6.8%	Census	0.0%	Census	15.6%	108.8%
	Total	**0**	**15**	**10,165**	**6.8%**	**Census**	**0.0%**	**Census**	**15.6%**	**108.8%**
Small Business Direct Install—Custom	Controls	0	4	418	11.4%	Census	1.7%	Census	0.0%	90.4%
	Custom	1	14	2,091	11.4%	Census	1.7%	Census	0.0%	90.4%
	Insulation	0	1	105	11.4%	Census	1.7%	Census	0.0%	90.4%
	Other	1	11	1,285	11.4%	Census	1.7%	Census	0.0%	90.4%
	Water heating	0	10	1,516	11.4%	Census	1.7%	Census	0.0%	90.4%
	Total	**2**	**40**	**5,415**	**11.4%**	**Census**	**1.7%**	**Census**	**0.0%**	**90.4%**

Program and Pathway	Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)*	Participant "Like" Spillover Rate	90% Margin Error (±)*	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Small Business Direct Install—Prescriptive	Controls	9	26	3,480	11.4%	Census	1.7%	Census	0.0%	90.4%
	Insulation	1	3	2,345	11.4%	Census	1.7%	Census	0.0%	90.4%
	Water heating	6	62	18,139	11.4%	Census	1.7%	Census	0.0%	90.4%
	Total	**16**	**91**	**23,963**	**11.4%**	**Census**	**1.7%**	**Census**	**0.0%**	**90.4%**
Total		**88**	**625**	**2,125,979**	**16.1%**	**Census**	**0.5%**	**Census**	**2.1%**	**86.6%**

*When a census of the population is sampled, confidence intervals cannot be estimated.
Cells highlighted in gray are using the overall program, or custom/prescriptive level, free-ridership, and spillover rates due to insufficient number of responses or low precision.
A value of NA means no surveys were completed for that stratum.
Program measures with no program participation are not shown.

Table 25 summarizes the free-ridership and spillover estimates for the natural gas programs by program pathway. Similar to the tables above, the cells highlighted in gray are using the overall program or custom/prescriptive level free-ridership and spillover rates due to an insufficient number of responses or low precision.

Within the Large Commercial and Industrial New Construction and Small Business Direct Install programs, the overall program total was imputed for both the Custom and Prescriptive pathways. Across all programs, the custom pathway had an overall NTG rate of 96.3 percent, drive by the low free-ridership rate (11.7 percent) and high nonparticipant “like” spillover (7.8 percent). The prescriptive pathway had a free-ridership rate of 54.4 percent, participant “like” spillover of 3.4 percent, and nonparticipant “like” spillover of 0.9 percent, which resulted in the overall NTG rate of 50.0 percent.

Table 25. C&I Natural Gas Free-Ridership and Spillover Results Summary by Program and Program Pathway

Program	Program Pathway	Surveyed	Population	Population Savings	Free-ridership Rate	90% Margin Error (±)	Participant Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction	Custom	6	36	281,212	47.7%	Census	2.2%	Census	3.1%	57.6%
	Prescriptive	49	321	197,251	47.7%	Census	2.2%	Census	3.1%	57.6%
	Total	**55**	**357**	**478,463**	**47.7%**	**Census**	**2.2%**	**Census**	**3.1%**	**57.6%**
Large Commercial Retrofit	Custom	15	122	1,607,973	6.8%	Census	0.0%	Census	15.6%	108.8%
	Prescriptive	0	15	10,165	**6.8%**	**Census**	**0.0%**	**Census**	**15.6%**	**108.8%**
	Total	**15**	**137**	**1,618,138**	**6.8%**	**Census**	**0.0%**	**Census**	**15.6%**	**108.8%**
Small Business Direct Install	Custom	2	40	5,415	11.4%	Census	1.7%	Census	0.0%	90.4%
	Prescriptive	16	91	23,963	11.4%	Census	1.7%	Census	0.0%	90.4%
	Total	**18**	**131**	**29,378**	**11.4%**	**Census**	**1.7%**	**Census**	**0.0%**	**90.4%**

Program	Program Pathway	Surveyed	Population	Population Savings	Free-ridership Rate	90% Margin Error (±)	Participant Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Total	Custom	23	198	1,894,601	11.7%	Census	0.2%	Census	7.8%	96.3%
	Prescriptive	65	427	231,379	54.4%	Census	3.4%	Census	0.9%	50.0%
	Total	**88**	**625**	**2,125,979**	**16.1%**	**Census**	**0.5%**	**Census**	**2.1%**	**86.6%**

*When a census of the population is sampled, confidence intervals cannot be estimated.
Cells highlighted in gray are using the overall program free-ridership and spillover rates due to insufficient responses or low precision.
A value of NA means no surveys were completed for that stratum.

6.3 DETAILED RESULTS

This section presents results for each measure type, which can vary by program type and fuel. National Grid chose the measure type categories, and measure type was assigned based on the equipment installed. Table 26 details which equipment were assigned to which measure type classification, combining gas and electric measures. These measure types exclude the Bright Opportunities program which were broken out by three categories: fixture, fixture with controls, and retrofit kits; screw-ins; and TLEDs.

Table 26. Breakdown of Equipment in Measure Type Categories

Measure Type	Equipment
Compressed Air	Compressors
Controls	Boiler controls
	Hood controls
	Thermostats
Custom	Control system
	EMS
	Lighting project
	Motors
	Pumps
Food Service	Fryer
	Oven
	Ice machine
HVAC	Boiler
	EMS
	Furnace
	Water heater/boiler combo
HVAC—Distribution	Steam traps
	Heat recovery
HVAC—Plant	Boilers (condensing, custom and steam)
	Furnace
HVAC Non-unitary	Chiller

Measure Type	Equipment
Insulation	Air sealing
	Duct insulation
	Attic insulation
	Pipe insulation
Lighting (non-Bright Opportunities)	Custom lighting
	Fluorescent lights (T8)
	LEDs
	Occupancy sensor
Non-lighting (Small Business only)	Controls
	Cooler
	Custom compressed air
	Custom hot water
	HVAC
	Motors/drives
	Refrigeration
	Vending machine
Other	Comprehensive design/retrofit
	Other
	Replace thermal oxidizers
	Retro commissioning
	Steam traps
VSD	Fans
	Hot water pump
	Motors
	VFDs
Water Heating	Aerator, showerhead
	Salon nozzle
	Spray valves
	Pipe and tank insulation
	Water Heater

6.3.1 Detailed Program Results

Table 27 presents National Grid's free-ridership and spillover rates for each electric measure type by program. The highest free-ridership rates were screw-in bulbs within the Bright Opportunities initiative at 76.9 percent, followed by VSDs within the Large Commercial Retrofit program at 69.2 percent. However, this program had only five surveyed participants. The highest participant "like" spillover rate was with Large Commercial and Industrial New Construction—food service with 67.8 percent. This was driven by a single respondent and did not weigh heavily in the overall analysis. The lowest free-ridership rate appears with the Small Business Direct Install program (15.1 percent).

Table 27. 2019 C&I Electric Free-Ridership and Spillover Results by Program and Measure Type

Program/ Initiative	Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)	Participant "Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities*	Lighting—fixture, fixture with controls, retrofit kits	91	2,642	16,909,798	31.2%	7.9%	0.3%	0.9%	NA	69.1%
	Lighting—screw-ins	34	711	6,389,077	76.9%	11.6%	0.2%	1.2%	NA	23.3%
	Lighting—TLEDs	28	791	4,672,299	54.9%	15.2%	0.0%	0.0%	NA	45.1%
	Total	**153**	**4,144**	**27,971,174**	**39.3%**	**6.4%**	**0.2%**	**0.6%**	**NA**	**60.9%**
Large Commercial and Industrial New Construction	Compressed Air	6	22	358,959	31.4%	Census	0.0%	Census	0.9%	69.5%
	Custom	9	76	11,253,874	14.0%	Census	0.0%	Census	1.6%	87.6%
	Food Service	6	60	503,856	42.5%	Census	67.8%	Census	0.0%	125.3%
	HVAC Non-unitary	1	5	328,220	62.5%	Census	0.0%	Census	0.0%	37.5%
	Lighting	4	46	3,657,323	60.0%	Census	0.0%	Census	0.2%	40.2%
	Other	0	2	820	NA	NA	NA	NA	NA	NA
	VSD	1	5	173,930	100.0%	Census	0.0%	Census	0.0%	0.0%
	Total	**27**	**216**	**16,276,982**	**28.0%**	**Census**	**2.1%**	**Census**	**1.6%**	**75.7%**
Large Commercial Retrofit	Custom	16	133	27,267,088	35.8%	18.5%	0.5%	2.8%	1.6%	66.4%
	HVAC	1	18	800,818	25.0%	Census	0.0%	Census	0.0%	75.0%
	Lighting	35	311	29,793,677	9.6%	Census	0.1%	Census	0.2%	90.7%
	VSD	5	29	2,652,783	69.2%	Census	0.0%	Census	0.0%	30.8%
	Total	**57**	**491**	**60,514,366**	**24.0%**	**8.7%**	**0.3%**	**1.1%**	**0.9%**	**77.2%**
Small Business Direct Install	Lighting	71	640	10,206,033	12.3%	6.1%	0.3%	1.1%	0.2%	88.2%
	Non-lighting	42	339	1,978,580	29.1%	10.8%	0.3%	1.3%	0.0%	71.2%
	Total	**113**	**979**	**12,184,613**	**15.1%**	5.2%	**0.3%**	0.8%	**0.2%**	85.5%
Total		**350**	**5,830**	**116,947,135**	**29.0%**	**3.9%**	**0.5%**	**0.6%**	**2.8%**	**74.3%**

*The free-ridership rate is an average of the participant (end user) and distributor results (see Section 5). Number surveyed and participant like spillover are based on participant data.

Table 28 presents detailed free-ridership and participant “like” spillover rates for each natural gas measure type and program. The Large Commercial Retrofit—Custom pathway has the highest NTG rate (93.2 percent) due to the lowest free-ridership (6.8 percent). The Large Commercial and Industrial New Construction—Prescriptive pathway has the lowest NTG rate (44.2 percent) driven by the high free-ridership rate (59.3 percent).

Table 28. 2019 C&I Natural Gas Free-Ridership and Spillover Results by Program, Pathway, and Measure Type

Program and Pathway	Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)	Participant "Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction—Custom	Controls	0	9	34,546	NA	NA	NA	NA	NA	NA
	Food service	1	3	12,017	12.5%	Census	0.0%	Census	0.0%	87.5%
	HVAC	2	3	21,267	25.0%	Census	8.6%	Census	52.0%	135.6%
	HVAC - Distribution	0	3	72,497	NA	NA	NA	NA	NA	NA
	HVAC - Plant	0	3	21,737	NA	NA	NA	NA	NA	NA
	Insulation	1	4	33,175	62.5%	Census	0.0%	Census	0.0%	37.5%
	Other	2	10	82,333	33.0%	Census	0.0%	Census	0.0%	67.0%
	Water heating	0	1	3,640	NA	NA	NA	NA	NA	NA
	Total	**6**	**36**	**281,212**	**36.8%**	**Census**	**1.2%**	**Census**	**0.0%**	**64.5%**
Large Commercial and Industrial New Construction—Prescriptive	Food service	38	172	120,223	47.0%	Census	5.2%	Census	0.0%	58.2%
	HVAC	5	5	7,469	24.3%	Census	0.0%	Census	52.0%	127.7%
	HVAC - Plant	0	27	18,045	NA	NA	NA	NA	NA	NA
	Other	1	1	4,300	25.0%	Census	0.0%	Census	0.0%	75.0%
	Water heating	5	116	47,213	98.7%	Census	0.0%	Census	0.0%	1.3%
	Total	**49**	**321**	**197,251**	**59.3%**	**Census**	**3.5%**	**Census**	**0.0%**	**44.2%**
Large Commercial Retrofit—Custom	Controls	2	36	227,664	10.0%	Census	0.0%	Census	0.0%	90.0%
	HVAC	5	40	481,331	4.0%	Census	1.4%	Census	52.0%	149.4%
	HVAC - Distribution	0	5	35,632	NA	NA	NA	NA	NA	NA
	HVAC - Plant	0	4	48,005	NA	NA	NA	NA	NA	NA
	Insulation	5	15	125,199	48.0%	Census	0.0%	Census	0.0%	52.0%
	Other	1	16	662,531	0.0%	Census	0.0%	Census	0.0%	100.0%
	Water heating	2	6	27,611	6.0%	Census	0.0%	Census	0.0%	94.0%
	Total	**15**	**122**	**1,607,973**	**6.8%**	**Census**	**0.0%**	**Census**	**0.0%**	**93.2%**

Program and Pathway	Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)	Participant "Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Large Commercial Retrofit—Prescriptive	Controls	0	10	2,122	NA	NA	NA	NA	NA	NA
	Other	0	1	6,669	NA	NA	NA	NA	NA	NA
	Water heating	0	4	1,374	NA	NA	NA	NA	NA	NA
	Total	**0**	**15**	**10,165**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Small Business Direct Install	Controls	9	30	3,898	12.7%	Census	14.6%	Census	0.0%	102.0%
	Custom	1	14	2,091	**0.0%**	Census	**0.0%**	Census	0.0%	100.0%
	Insulation	1	4	2,449	**0.0%**	Census	**0.0%**	Census	0.0%	100.0%
	Other	1	11	1,285	0.0%	Census	0.0%	Census	0.0%	100.0%
	Water heating	6	72	19,655	16.0%	Census	0.0%	Census	0.0%	84.0%
	Total	**18**	**131**	**29,378**	**11.4%**	**Census**	**1.8%**	**Census**	**0.0%**	**90.4%**
Total		**88**	**625**	**2,125,979**	**16.1%**	**Census**	**0.5%**	**Census**	**2.1%**	**86.6%**

Table 29 presents free-ridership and spillover rates for each measure type combined across all electric programs. The lighting measure type has the lowest free-ridership (14.5 percent), while the lighting-screw-ins (from the Bright Opportunities initiative) measure type has the highest free-ridership rate (76.9 percent). Participant "like" spillover is highest for the food service measure type (67.8 percent). As previously mentioned, this was driven by a single respondent and did not weigh heavily in the overall analysis.

Table 29. 2019 C&I Electric Free-Ridership and Spillover Results by Measure Type

Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)	Participant "Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Compressed Air	6	22	358,959	31.4%	10.4%	0.0%	0.0%	0.9%	69.5%
Custom	25	209	38,520,962	29.2%	5.5%	0.4%	1.9%	1.6%	72.8%
Food Service	6	60	503,856	42.5%	12.3%	67.8%	29.8%	0.0%	125.3%
HVAC	1	18	800,818	25.0%	27.1%	0.0%	0.0%	0.0%	75.0%
HVAC Non-unitary	1	5	328,220	62.5%	27.9%	0.0%	0.0%	0.0%	37.5%
Lighting (excluding Bright Opportunities)	110	997	43,657,033	14.5%	2.0%	0.1%	0.5%	0.2%	85.9%
Non-lighting (Small Business only)	42	339	1,978,580	29.1%	4.2%	0.3%	1.3%	0.0%	71.2%
VSD	6	34	2,826,713	71.1%	10.8%	0.0%	0.0%	0.0%	28.9%
Other	0	2	820	NA	NA	NA	NA	NA	NA
Lighting—fixture, fixture with controls, retrofit kits (Bright Opportunities only)	91	2,642	16,909,798	31.2%	3.1%	0.3%	0.9%	NA	69.1%

Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)	Participant "Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Lighting—screw-ins (Bright Opportunities only)	34	711	6,389,077	76.9%	4.6%	0.2%	1.2%	NA	23.3%
Lighting—TLEDs (Bright Opportunities only)	28	791	4,672,299	54.9%	6.0%	0.0%	0.0%	NA	45.1%
Total	**350**	**5,830**	**116,947,135**	**29.0%**	**3.9%**	**0.5%**	**0.6%**	**2.8%**	**74.3%**

Table 30 presents free-ridership and spillover rates for each measure type combined across all the natural gas programs. The custom and other measure types had the lowest free-ridership (0.0 percent and 3.7 percent, respectively); although, both had few responses (one for custom and five for other). The water heater measure type had the highest free-ridership rate (55.0 percent). Only the HVAC measure type had nonparticipant "like" spillover (52.0 percent). This was driven by one vendor who said 85 percent of their HVAC sales were not through the program, and they had 61 percent of the HVAC measure savings. This measure type-level result did not drive an unusual overall spillover rate.

Table 30. 2019 C&I Natural Gas Free-Ridership and Spillover Results by Measure Type

Measure Type	Surveyed	Population	Population Savings	Free-Ridership Rate	90% Margin Error (±)	Participant "Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Controls	11	85	268,230	10.0%	Census	0.2%	Census	0.0%	90.2%
Custom	1	14	2,091	0.0%	Census	0.0%	Census	0.0%	100.0%
Food service	39	175	132,240	43.8%	Census	4.7%	Census	0.0%	60.9%
HVAC	12	48	510,067	5.2%	Census	1.7%	Census	52.0%	148.5%
HVAC—Distribution	0	8	108,129	NA	NA	NA	NA	NA	NA
HVAC—Plant	0	34	87,788	NA	NA	NA	NA	NA	NA
Insulation	7	23	160,823	50.3%	Census	0.0%	Census	0.0%	49.7%
Other	5	39	757,117	3.7%	Census	0.0%	Census	0.0%	96.3%
Water Heating	13	199	99,493	55.0%	Census	0.0%	Census	0.0%	45.0%
Total	**88**	**625**	**2,125,979**	**16.1%**	**Census**	**0.5%**	**Census**	**2.1%**	**86.6%**

Table 31 presents free-ridership and spillover rates for the electric programs by program type. Overall, the custom projects had a net-to-gross rate of 68.6 percent, being driving by a free-ridership rate of 33.4 percent. Prescriptive projects had a higher net-to-gross rate, 75.0 percent, with a free-ridership rate of 26.7 percent. The Small Business Direct Install program only had prescriptive projects and had the highest NTG, 85.5 percent while the Bright Opportunities initiative also only had prescriptive projects but has the lowest NTG, 60.9 percent. The Large Commercial and Industrial New Construction prescriptive projects had the highest participant "like" spillover (6.8 percent).

Table 31. 2019 C&I Electric Free-Ridership and Spillover Results by Program and Program Pathway

Program	Program Pathway	Surveyed	Population	Population Savings	Free-ridership Rate	90% Margin Error (±)	Participant "Like" Spillover Rate	90% Margin Error (±)	Nonparticipant "Like" Spillover Rate	Net-to-Gross Rate
Bright Opportunities	Prescriptive	153	4,144	27,971,174	39.3%	6.4%	0.2%	0.6%	NA	60.9%
	Total	**153**	**4,144**	**27,971,174**	**39.3%**	**6.4%**	**0.2%**	**0.6%**	**NA**	**60.9%**
Large Commercial and Industrial New Construction	Custom	9	76	11,253,874	14.0%	Census	0.0%	Census	1.6%	87.6%
	Prescriptive	18	140	5,023,108	57.8%	Census	6.8%	Census	1.2%	50.2%
	Total	**27**	**216**	**16,276,982**	**28.0%**	**Census**	**2.1%**	**Census**	**1.6%**	**75.7%**
Large Commercial Retrofit	Custom	16	130	26,066,973	35.8%	Census	0.5%	Census	0.7%	65.5%
	Prescriptive	41	361	34,447,393	14.7%	8.6%	0.1%	0.6%	0.1%	85.5%
	Total	**57**	**491**	**60,514,366**	**23.8%**	**8.7%**	**0.3%**	**1.0%**	**0.9%**	**77.3%**
Small Business Direct Install	Prescriptive	113	979	12,184,613	15.1%	5.2%	0.3%	0.8%	0.2%	85.5%
	Total	**113**	**979**	**12,184,613**	**15.1%**	**5.2%**	**0.3%**	**0.8%**	**0.2%**	**85.5%**
Total	Custom	25	206	37,320,847	33.4%	14.5%	0.4%	1.9%	1.6%	68.6%
	Prescriptive	325	5,624	79,626,288	26.7%	3.9%	0.6%	0.7%	1.2%	75.0%
	Total	**350**	**5,830**	**116,947,135**	**29.0%**	**3.9%**	**0.5%**	**0.6%**	**2.8%**	**74.3%**

Table 32 presents free-ridership and spillover rates by natural gas programs and program type. Overall, the custom projects had a free-ridership rate of 9.5 percent and had 0.5 percent participant "like" spillover and 7.8 percent nonparticipant "like" spillover, which resulted in a net-to-gross rate of 98.8 percent. Prescriptive projects had an overall net-to-gross rate of 50.4 percent driven by a free-ridership rate of 53.9 percent, participant "like" spillover rate of 3.3 percent, and 0.9 percent nonparticipant "like" spillover.

Table 32. 2019 C&I Natural Gas Free-Ridership and Spillover Results by Program and Program Pathway

Program	Program Pathway	Surveyed	Population	Population Savings	Free-ridership Rate	90% Margin Error (±)	Participant Spillover Rate	90% Margin Error (±)	Nonparticipant " Like" Spillover Rate	Net-to-Gross Rate
Large Commercial and Industrial New Construction	Custom	6	36	281,212	36.8%	Census	1.2%	Census	7.8%	72.2%
	Prescriptive	49	321	197,251	59.3%	Census	3.5%	Census	0.9%	45.2%
	Total	**55**	**357**	**478,463**	**47.7%**	**Census**	**2.2%**	**Census**	**3.1%**	**57.6%**
Large Commercial Retrofit	Custom	15	122	1,607,973	6.8%	Census	0.4%	Census	7.8%	101.4%
	Prescriptive	0	15	10,165	NA	NA	NA	NA	NA	NA
	Total	**15**	**137**	**1,618,138**	**6.8%**	**Census**	**0.0%**	**Census**	**15.6%**	**108.8%**
Small Business Direct Install	Custom	2	40	5,415	0.0%	Census	0.0%	Census	7.8%	107.8%
	Prescriptive	16	91	23,963	13.9%	Census	2.1%	Census	0.9%	89.1%
	Total	**18**	**131**	**29,378**	**11.4%**	**Census**	**1.7%**	**Census**	**0.0%**	**90.4%**

Program	Program Pathway	Surveyed	Population	Population Savings	Free-ridership Rate	90% Margin Error (±)	Participant Spillover Rate	90% Margin Error (±)	Nonparticipant " Like" Spillover Rate	Net-to-Gross Rate
Total	Custom	23	198	1,894,601	9.5%	Census	0.5%	Census	7.8%	98.8%
	Prescriptive	65	427	231,379	53.9%	Census	3.3%	Census	0.9%	50.4%
	Total	**88**	**625**	**2,125,979**	**16.1%**	**Census**	**0.5%**	**Census**	**2.1%**	**86.6%**

The table below shows the 2019 results compared to the prior study. Across both electric and natural gas programs/initiatives, almost all the NTG rates were lower in 2019 than the 2016 results. The Large Commercial Retrofit gas and Large Commercial and Industrial New Construction electric prescriptive programs were the exception, where there was an increase between the two studies.

Table 33. C&I Free-Ridership and Spillover Results Comparison Summary

Fuel	Program/Initiative	Measure Type/ Pathway/ Program Type	2019 Net-to-Gross Rate	2016 Net-to-Gross Rate
Electric	Bright Opportunities	Lighting - fixtures, fixture with controls, LED retrofit kits	69.1%	98.4%
		Lighting—screw-ins	23.3%	
		Lighting—TLEDs	45.1%	
	Large Commercial and Industrial New Construction	Custom	75.7%	94.0%
		Prescriptive		73.9%
	Large Commercial Retrofit	Custom	65.5%	84.2%
		Prescriptive	85.5%	99.8%
	Small Business Direct Install	Lighting	88.2%	97.1%
		Non-lighting	71.2%	
Natural gas	Large Commercial and Industrial New Construction	Custom	57.6%	100.0%
		Prescriptive		88.5%
	Large Commercial Retrofit	Custom	108.8%	88.9%
		Prescriptive		99.8%
	Small Business Direct Install	Prescriptive	90.4%	98.6%

6.3.2 "Unlike" Spillover Observations

The evaluation team included questions to address "unlike" spillover—energy-efficient equipment installed by a participant due to program influence that was not identical to the equipment they received through the program. However, given the difficulties in estimating savings for these installations using regular telephone interviewers, we present only observations of "unlike" spillover and not savings estimates.

Seven National Grid respondents reported that they have installed other types of energy-efficient equipment outside of a National Grid program and that National Grid's programs were influential in the installation. Below we list out the different kinds of equipment identified, and any additional information provided about the equipment.

- One respondent indicated they installed two boilers and six thermostats.
- One respondent installed some HVAC and lighting equipment but did not provide any additional details.
- One respondent installed 48 6-inch recessed lights.
- One respondent indicated they installed three ovens. One was electric, and two were gas, each with six burners.
- One respondent installed two 4-ton electric economizers rooftop units.
- One respondent indicated they had done small projects of installing electrical drives and other equipment.
- One respondent indicated they installed asphalt tank insulation on their one-million-gallon tank, of which they insulated about 250,000 gallons.

APPENDIX A: PARTICIPANT SAMPLING PLAN

To:	Michael Strom, National Grid
Cc:	Pam Rathbun, Tetra Tech
From:	Carrie Koenig, Theresa Holmes, Tetra Tech
Date:	July 22, 2020
Subject:	2019 National Grid Rhode Island Free-ridership and Spillover Study Sample Plan

This memorandum presents our sample plan for National Grid's Rhode Island 2019 free-ridership (FR) and spillover (SO) study. The 2019 free-ridership study includes gas, electric, and upstream lighting customers.

In this document, we discuss the steps used in the:

- Preparation of the data file and aggregation of the participant data
- Selection of the sample
- Preparation of sample for data collection
- Review of the sample to identify companies with multiple sampled locations

This is followed by a characterization of the proposed sample plan.

The current sample plan estimates 657 (209 gas and 448 electric) measure-level completed surveys.

Background

Tetra Tech will be conducting the FR and SO study for the following programs: Design 2000, Energy Initiative, Large Commercial New Construction, Large Commercial Retrofit, Small Business Solutions and the Bright Opportunities programs for the 2019 program year. The tracking data files transferred to us by National Grid provide information for Rhode Island participants and included measures installed between January 1, 2019, and December 31, 2019.[23] From the files that were provided, we dropped the following records:

- 184 Design 2000 Cool Choice records.
- 2 Large Commercial New Construction and 1 Large Commercial Retrofit gas record due to zero or negative savings values.

[23] Files used for sampling include the following: LCI_ELECTRIC_DATA_RI_2019.xls, LCI_GAS_RI_2019_DATA (1).xls, Small_Business_Program_RI_2019_Data.xls, LCI_Upstream_Lighting_Program_RI_2019_Data.xls, LCI_Customer_Information.xls, Electric_Measure&Project_Information.xls, Gas_Measure&Project_Information.xls, SBS Measure_And_Project_Information.xls, SBS_Customer_Information.xls

- 26 Bright Opportunities records due to zero savings.
- 54 Bright Opportunities records due to negative savings values.
- All upstream gas records[24].

After dropping these records, a total of 21,067 records remained in the data files. Each record in the data represents a measure type installed through a program for a particular location. A single account may have installed multiple different measure types. Therefore, it is necessary to take steps to collapse – or aggregate – the data through the sampling process, yet retain all the measure-specific information for each account[25].

Preparation of the Data File and Aggregation of the Participant Data

We took the following steps to prepare the tracking data for sampling:

1) **Identify program and measure category participation**. The study estimates free-ridership at the measure category level as well as free-ridership at the program and program type (custom vs prescriptive) levels. The first step in sample preparation is to assign measures to a measure category. Using the information provided in the data files[26], we identify the measure categories within the following programs:

    a. The Design 2000 program consists of electric measure categories: custom, compressed air, food service, HVAC non-unitary, lighting, other, and VSD.

    b. The Energy Initiative program consists of the electric measure categories: custom, HVAC, lighting, other, and VSD.

    c. The Small Business program electric measure categories consist of the lighting and non-lighting measure categories. Gas measure categories consist of: controls, custom, insulation, and water heating.

    d. The Commercial New Construction program consists of the gas measure categories: controls, food service, HVAC, insulation, and other.

    e. The Large Commercial Retrofit prescriptive program consists of the gas measure categories: controls, HVAC, insulation, other, and water heating.

    f. The Bright Opportunities program consists of the upstream lighting measure category broken into the following types: fixtures, fixtures with controls, LED retrofit kits, screw-ins, and TLEDs[27].

[24] We will attempt to add these to the study at a later date, once we are able to design the questionnaire to accommodate upstream measures other than lighting, time permitting.

[25] An account is defined as a unique Account Number (acct_no, bill_acct_no) and program is defined by "program" and "PrescrCustom".

[26] The field used to identify measure categories was "InstalledMeasureDescription," "MeasureDescr," and "ProductTypeName" and in some cases the field "MeasureCode" was also used in combination with the "MeasureDescr" field.

[27] Based on the variable "ProductTypeName"

2) **Aggregate the records by Program, Account Number, and Measure Category**. This aggregation sets the file up so that we have one record for each account for each measure category within a program. As we do the aggregation, we sum the therm and kwh savings[28], quantity of measures installed[29], the measure cost and authorized incentive[30] so that the values are represented at an account level[31]. The detailed measure descriptions are retained. These descriptions are used when describing to customers what equipment is included in a measure category.

Selection of the Sample

In general, we always want to pull a census of measure categories with less than or equal to 50 accounts associated with them within a program. For this study, we will pull a census of all accounts for each program with the exception of lighting measures for the Small Business, Energy Initiative and Bright Opportunities programs. For the Small Business and Energy Initiative programs, we selected the top 10 percent then randomly selected the remaining cases. For the Bright Opportunities program lighting measures, we selected the top 3 percent then randomly selected the remaining cases.

To limit respondent burden, in the interview we discuss no more than two measure categories for each account and program the account participated in. There were a number of accounts that had measures installed in more than two measure types. In these instances, we apply a set of rules to select which measure types we want to include in the study.

1. First select measure types in the top 10th or 3rd percentile of savings for that specific program and measure type ("priority" category).
2. Select rare measure types, defined as the measure type with the least number of records. There were a few exceptions where we selected the non-rare measure type because it represented a large share of the program's savings.

These prioritization steps resulted in the removal of 267 measures that were included in the sample as part of the measure category census.

Preparation of Sample for Data Collection

The next step is to restructure the sample file so that each record represents one participant account within a program (an account may show up more than once in the dataset but never more than one time in a program). Each measure type sampled for a given account is represented in a separate column in this new data file (i.e., MeasureCategory1, MeasureCategory2, etc.). Correspondingly, measure category therm/kWh savings and detailed descriptions are represented in associated columns (e.g., therms1, therms2, kWh1, kWh2).

Using this file structure, participants will be taken through the net-to-gross questions for each measure category sampled for that account (up to two measure categories). This approach allows for us to assess free-ridership and like-spillover for each measure type.

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[28] For the gas programs, we used "GrossAnnualGasThermsSaving" to identify the total therm savings associated with that measure. For the electric programs, we used "TotalGrosskwh" and for the upstream program we used "TotalGrossAnnualKWh".

[29] For the gas programs, we used "quantity" and the electric programs we used "InstalledQuantity" and the upstream program we used "TotalQuantity" to identify quantity installed.

[30] The project costs and incentive amounts provided in the sample will not be used as they are the calculated incentive and not the authorized incentive amounts.

[31] Account numbers were not provided for Upstream Lighting participants; accounts were defined by APPLICATION_ID.

Review of Sample to Identify Companies with Multiple Sampled Accounts

Prior to survey implementation, we attempt to identify records that appear in the sample more than one time ("multiples"). Records that appear to potentially be the same facility, the same company, or have the same contact point are grouped and flagged so they are attempted at the same time. We manually sort and review the sample on the following criteria:

- Account number
- Customer name
- Contact name
- Telephone number
- Address

All sample records are loaded into the Computer Assisted Telephone Interview (CATI) system. Any cases identified and flagged as "multiples" using the criteria above are put on hold. Senior interviewers are specially trained on how to deal with these multiples. Once we are a few days into the calling, our senior interviewers are responsible for calling multiples.

During our initial contact with the respondent, our first step is to verify whether the respondent is the appropriate person to provide information for each of the accounts. If not, we determine which accounts should be assigned to that respondent, and which should be discussed with someone else.

For contact persons associated with multiple accounts, we will ask these contacts about up to 2 measures per account for each program they participate in. Therefore, the interview may be slightly longer for these contacts.

Characterization of the Proposed Sample Plan and Sample

Table 34 and Table 35 outline the sampling plan for National Grid's Rhode Island 2019 study, gas and electric programs. This sample plan also includes the structure on how results will be reported; including free-ridership results at the program, program type and measure type levels.

Table 34. National Grid Rhode Island Proposed Sample Plan – Gas Programs

Program Type	Program	Measure Type	Population of Measures	Projected Sample of Measures	Population Therm Savings	Projected Sampled Therm Savings	Percent of Therm Savings Sampled*	Expected Completed Measures from Survey **	+/- 90% Confidence Interval at Measure Level ***
Prescriptive	Large Commercial New Construction - Prescriptive	Controls	9	9	34,546	34,546	100%	3	NA
		Food service	175	175	132,240	132,240	100%	61	6.1%
		HVAC	41	41	141,016	141,016	100%	14	NA
		Insulation	4	4	33,175	33,175	100%	1	NA
		Other	11	11	85,762	85,762	100%	4	NA
		Water heating	117	116	50,782	50,782	100%	41	NA
		Total	**357**	**356**	**477,521**	**477,521**	**100%**	**125**	**4.2%**
	Large Commercial Retrofit - Prescriptive	Controls	46	45	229,786	224,904	98%	16	NA
		HVAC	49	47	564,968	529,194	94%	16	NA
		Insulation	15	13	125,199	122,751	98%	5	NA
		Other	17	13	669,200	653,954	98%	5	NA
		Water heating	10	9	28,986	24,478	84%	3	NA
		Total	**137**	**127**	**1,618,138**	**1,555,281**	**96%**	**44**	**NA**
	Small Business	Controls	26	25	3,898	3,709	95%	9	NA
		Custom	14	14	2,091	2,091	100%	5	NA
		Insulation	3	3	2,449	2,449	100%	1	NA
		Other	11	11	1,285	1,285	100%	4	NA
		Water heating	62	62	19,655	19,655	100%	22	NA
		Total	**116**	**115**	**29,378**	**29,188**	**99%**	**40**	**NA**
	Total		**610**	**598**	**2,125,037**	**2,061,990**	**97%**	**209**	**NA**
Total Gas			**610**	**598**	**2,125,037**	**2,061,990**	**97%**	**209**	**NA**

*Sampled therm savings divided by the population of therm savings.

** Assumes a 35 percent response rate of sampled measures. We will strive for a higher response rate.

*** When a census of the population is sampled, confidence intervals cannot be estimated.

Table 35. National Grid Rhode Island Proposed Sample Plan – Electric Programs

Program Type	Program	Measure Type	Population of Measures	Projected Sample of Measures	Population Therm Savings	Projected Sampled Therm Savings	Percent of Therm Savings Sampled*	Expected Completed Measures from Survey **	+/- 90% Confidence Interval at Measure Level ***
Custom	Design 2000	Custom	76	76	11,253,874	11,253,874	100%	27	NA
		Total	**76**	**76**	**11,253,874**	**11,253,874**	**100%**	**27**	**NA**
	Energy Initiative	Custom	130	130	26,066,973	26,066,973	100%	46	NA
		Total	**130**	**130**	**26,066,973**	**26,066,973**	**100%**	**46**	**NA**
	Total		**206**	**206**	**37,320,847**	**37,320,847**	**100%**	**72**	**NA**
Prescriptive	Bright Opportunities	Lighting - fixture	2,084	100	13,893,319	4,812,208	35%	35	9.9%
		Lighting - fixture with controls	47	36	83,553	71,062	85%	13	NA
		Lighting - LED retrofit kits	511	92	2,932,926	1,380,170	47%	32	10.1%
		Lighting - screw-ins	711	96	6,389,077	2,837,492	44%	34	9.8%
		Lighting - TLEDs	791	97	4,672,299	2,477,352	53%	34	9.9%
		Total	**4,144**	**421**	**27,971,174**	**11,578,284**	**41%**	**147**	**4.8%**
	Design 2000	Compressed Air	22	21	358,959	339,831	95%	7	NA
		Food service	60	60	503,856	503,856	100%	21	NA
		HVAC Non-unitary	5	5	328,220	328,220	100%	2	NA
		Lighting	46	45	3,657,323	3,633,827	99%	16	NA
		Other	2	2	820	820	100%	1	NA
		VSD	5	5	173,930	173,930	100%	2	NA
		Total	**140**	**138**	**5,023,108**	**4,980,484**	**99%**	**48**	**NA**
	Energy Initiative	Custom	3	3	1,200,115	1,200,115	100%	1	NA
		HVAC	18	18	800,818	800,818	100%	6	NA
		Lighting	311	100	29,793,677	21,629,760	73%	35	NA
		VSD	29	28	2,652,783	2,598,189	98%	10	NA
		Total	**361**	**149**	**34,447,393**	**26,228,882**	**76%**	**52**	**NA**
	Small Business	Lighting	640	100	10,206,033	3,742,835	37%	35	9.7%
		Non-lighting	339	265	1,978,580	1,685,519	85%	93	5.2%
		Total	**979**	**365**	**12,184,614**	**5,428,355**	**45%**	**128**	**NA**
	Total		**5,624**	**1,073**	**79,626,289**	**48,216,004**	**61%**	**376**	**NA**
Total Electric			**5,830**	**1,279**	**116,947,136**	**85,536,851**	**73%**	**448**	**NA**

*Sampled kWh savings divided by the population of kWh savings.

** Assumes a 35 percent response rate of sampled measures. We will strive for a higher response rate.

*** When a census of the population is sampled, confidence intervals cannot be estimated.

APPENDIX B: WEIGHTING METHODOLOGY

This appendix outlines the steps necessary to prepare the free-ridership data for analysis.

1. Calculating the sample weight (Phase 1 Weight)

Completed surveys must be weighted to represent population savings unless a census of all measures and customers is sampled ***and*** all customers respond to the survey.

The data were first weighted to correct for disproportional sampling and non-response to the survey. These weights—hereafter referred to as measure weights—were applied when analyzing the participant free-ridership and spillover results.

Because our population of interest was technically the savings, we used *measure category savings* to determine the weight that should be applied to each case. The measure category savings were stratified by priority and non-priority cases.[32] Priority cases were sampled at 100 percent. Including this stratification in the weighting scheme ensured the premises sampled at 100 percent were not overrepresented, and the sampled premises (sampled at less than 100 percent) were represented appropriately.

The following table is an example of weights applied to a sample stratified by measure category for a given program. The measure-related savings in the program tracking system database are listed in the population column. The corresponding savings accounted for by completed surveys and weights are listed under the "Surveyed Savings" and "Measure Weight" columns respectively. To calculate the "Measure Weight" for a given measure type, we divided the population of savings by the surveyed savings.

Table 36. Examples of Weighting Calculations Using Three Measure Categories

	Strata (priority/non-priority)	Population of savings	Surveyed savings	Measure weight
HVAC	Census	4,110,798	1,165,510	3.52
Lighting	Non-priority	5,326,009	1,265,701	5.00
	Priority	6,438,192	1,243,262	5.18
VSD	Census	6,767,628	4,027,164	1.68

To make sure measure weights are assigned correctly, we apply the weight to the energy savings of each surveyed case and check to make sure the total weighted energy savings for each measure category and overall match the total population savings.

2. Extrapolating the data to the expected savings (Phase 2 Weight)

The next step in preparing for the analysis is extrapolating the weight to the expected savings. To do this, the measure weight is multiplied by the kwh savings (or therms) per account surveyed. The data are then analyzed taking into account the kwh (or therm) savings.

[32] As discussed in the sampling plan, priority cases are cases that are considered multi-measure accounts, and accounts that represent the top 10 percentile of measure category savings.

Conducting this next step determines the net free-ridership rate and spillover rates and ensures the overall free-ridership rates are computed taking into consideration the therm (or MMBtu) savings for each individual account. The free-ridership and spillover rates would be skewed if the savings were not considered when determining free-ridership. This also means that large energy savers can have significant impacts on the overall free-ridership and spillover rates, particularly when the sample sizes are small.

Below we illustrate the preparation procedures, and effect of the procedures, using two cases.

Case A:	**Case B:**
Situation	
Received Lighting measures	Received Lighting measures
Flagged as a priority case	Flagged as non-priority
Has a free-ridership rate of 75 percent	Has a free-ridership rate of 25 percent
Recorded a savings of 10,000 kwh	Recorded a savings of 1,000 kwh
Step 1: Compute measure weight (discussed in prior section)	
Measure weight = 5.18	Measure weight =5.00
Step 2: Compute measure category-weighted kwh	
Adjusted kwh =10,000*5.18 = 51,800	Adjusted kwh = 1,000*5.00 = 5,000
Step 3: Calculate kwh associated with the free-ridership based on the measure category weighted kwh, calculated in Step 1	
FR savings = 51,800*.75 = 38,850	FR savings = 5,000*.25 = 1,250
Step 4: Sum the free-ridership attributed savings and population savings.	
Total FR attributed savings: 38,850 + 1,250 = 40,100 kwh Population savings: 51,800 + 5,000 = 56,800 kwh	
Step 5: Divide the Total FR attributed savings by population savings to determine free-ridership rate.	
Net free-ridership rate = 40,100/56,800 = 70.6 percent	

As illustrated above, the net free-ridership rate takes into account the savings of each account. As such, the estimates are *weighted for the disproportionate probability of being surveyed and measure category savings.*

3. Creating a one-stage weighting scheme

Creating two weighting variables introduces the risk of error in reporting the data. To eliminate the risk, the analysis syntax only includes one weighting variable. This variable multiplies the weight calculated in Phase 1 with the energy units associated with that measure and account, for example:

Measure weight = sample weight * individual kwh savings

The measure weight was applied when running any analysis to determine net free-ridership and spillover rates.

APPENDIX C: SURVEY INSTRUMENTS

C.1 FREE-RIDERSHIP AND SPILLOVER SURVEY USING CUSTOMER SELF REPORT APPROACH

Variable List

<CONTACT_NAME> Customer Contact Name

<COMPANY_NAME Customer/Facility Name

<CITY> Customer City

<DATE1, DATE2> Date of participation

<YEAR> Year of participation

<PA> Program Administrator
1 National Grid

<PA CONTACT INFORMATION>
Utility Contact Name and Phone Number

<FUEL1, FUEL2> Type of fuel (electric or natural gas)

<ADDRESS>, <CITY>, <STATE>, <ZIP>
Service address where measure was installed

<SMALL>
0 Not small business
1 Small business

<DualFuelProj > Flag if customer received both electric and gas rebate

<MultFlag> Indicator if the case is part of a multiple
<MultID>, <MultQty>, <MultPriority>, <Primary>

<PROGRAM_TXT1, PROGRAM_TXT2>

<PROGRAM1, PROGRAM2> Program participated in
1 Bright Opportunities program
2 Large Commercial New Construction Program program
3 Large Commercial Retrofit program
4 Small Business Direct Install program
5 Design 2000 program
6 Energy Initiative program

<PROGRAMTYPE1, PROGRAMTYPE2>

<TOTMEAS> Number of measures sampled for (1 or 2)

<MEASCAT_TXT1, MEASCAT_TXT2>

<MEASCAT1, MEASCAT2> End-use Category (i.e. lighting)

1	(Upstream) Lighting
2	Compressed Air
3	Controls
4	Custom
5	Food Service
6	HVAC
7	HVAC - Distribution
8	HVAC - Plant
9	HVAC Non-unitary
10	Insulation
11	Lighting
12	Non-lighting
13	Other
14	VSD
15	Water Heating
20	(Upstream) Lighting – fixture
21	(Upstream) Lighting – fixture with controls
22	(Upstream) Lighting - LED retrofit kits
23	(Upstream) Lighting - screw-ins
24	(Upstream) Lighting - TLEDs

<QTYFLAG1, QTYFLAG2>

0	quantity is not applicable for this measure category (measure count = 1 or quantity is not relevant as in delamping)
1	quantity greater than 1

<EFF1, EFF2>

0	efficiency is not applicable for this measure category (e.g., insulation, VFD, delamping, occupancy sensors)
1	efficiency is applicable

<EQUIP1, EQUIP2>

0	if installed measure is not equipment that is operational (e.g., insulation)
1	if installed measure is operational

<MEASDESC1, MEASDESC2> detailed measure descriptions

<STUDY1, STUDY2> Flag is received a study

0	did not receive technical assessment
1	received technical assessment
2	unknown if customer received a technical assessment

<INC1, INC2> Utility incentive for specific measure categories

<CST1, CST2> Total cost of project for specific measure categories

<ASSIST> Description of all technical assistance, financing, MOU, and rebates for measures installed through program

<ISPflag1, ISPflag2> Indicator if record gets ISP section

1 sampled for ISP questions
0 sampled for regular battery

<INTEFF1, INTEFF2> Flag as to whether intermediate efficiencies apply

1 Yes, there is intermediate efficiency
0 No intermediate efficiencies available

<ApplNo1>

<ALTCOMPANY> <ALTCONTACTN> <ALTPHONE_NUM>

<MAIL_ADDRESS> <MAIL_CITY> <MAIL_STATE> <MAIL_ZIP>

<KWH1, KWH2>

<THERM1, THERM2>

Introduction

INT01 Hello, my name is <INTERVIEWER>, and I'm calling on behalf of <PA> regarding your firm's participation in their energy saving solutions in 2019.

May I please speak with [IF CONTACT_NAME IS AVAILABLE SHOW: "<CONTACT_NAME> or"] the person who is familiar with your firm's participation with <PA>'s energy savings offering?

IF NEEDED:
[We are following up with customers who participated in a <PA> energy savings offering called <PROGRAM1> around <DATE1> <and DATE2> to learn about their experiences. You or someone at your facility may have received a letter from <PA> letting you know to expect this call.]

[According to our records around <DATE1> <and DATE2> your business implemented <MEASCAT1 and MEASCAT2> project at <ADDRESS>.]

[The company name we have on file is <COMPANY_NAME>.]

[According to our records the <MEASCAT1> project consisted of <MEASDESC1>.
[IF TOTMEAS=2 SHOW "And the <MEASCAT2> project consisted of <MEASDESC2>.]

[When the survey refers to the term "program" we are describing energy efficiency solutions or energy saving offerings received through National Grid's <PROGRAM1>.]

01 Yes / Continue
02 No [ATTEMPT TO CONVERT. MENTION ADVANCE LETTER THEY SHOULD HAVE RECEIVED REGARDING THE CALL.]
03 Dispo case

PREAMBLE I'm with Tetra Tech, an independent research firm. On behalf of <PA>, we are following up with customers who participated in an energy efficiency solution or energy saving offering in <YEAR> to learn about their experiences.

I'm not selling anything; I'd just like to ask about the energy efficiency project you implemented with the assistance from <PA> at <ADDRESS> in <CITY>.

Your individual responses will be kept confidential by Tetra Tech and <PA>.

Before we start, I would like to inform you that for quality control purposes, this call will be recorded and monitored.

01 Continue
02 Continue but address/date is off [SPECIFY but continue with survey]

MULTCHK [ASK IF MultFlag=1]
[INTERVIEWER QUESTION: Is this the first case of a multiple?]

01 Yes, First case
02 No; Subsequent case [SKIP TO DM2R1]

IN2 Are you the person who was most involved in making the decision to get <ASSIST> from <PA> at <ADDRESS> in <CITY>?

01 Yes [SKIP TO IN4]
02 No [SKIP TO OTHER_R]
03 No, I don't recall participating / Didn't do those projects [THANK AND TERMINATE 82]
88 Don't know [SKIP TO OTHER_R]
99 Refused [THANK AND TERMINATE]

IN4 Are you employed by <COMPANY_NAME> or are you a contractor who provides design and/or installation services for <COMPANY_NAME>?

[INTERVIEWER NOTE: CODE UNPAID MEMBERS OF AN ADVISORY BOARD OR COMMITTEE AS EMPLOYEES]

01 Work directly for company / Employee / Volunteer
02 Vendor / Contractor

IN5 [ASK IF IN4=02] Do you have the contact information of the person you worked with at <COMPANY_NAME>?

01 Yes [RECORD CONTACT INFO; ATTEMPT NEW R] [TERMINATE 87]
02 No [TERMINATE 87]

DM2R1
Just to confirm, our records indicate the [EFFICIENCY IS APPLICABLE (IF EFF1 = 1): energy efficient] <MEASCAT1> project around <DATE1> you implemented at <ADDRESS> with <PA>'s assistance included <MEASDESC1>.

Were you involved in the decision-making process when the [EFFICIENCY IS APPLICABLE (IF EFF1 = 1): energy efficient] <MEASCAT1> equipment was being considered for this facility?

01 Yes
02 No
88 Don't know
99 Refused

DM2R2

[ASK IF TOTMEAS=2] Additionally, the [EFFICIENCY IS APPLICABLE (IF EFF2 = 1): energy efficient] <MEASCAT2> project you implemented at <ADDRESS> with <PA>'s assistance included <MEASDESC2>.

Were you involved in the decision-making process when the [EFFICIENCY IS APPLICABLE (IF EFF2 = 1): energy efficient] <MEASCAT2> equipment was being considered for this facility?

01	Yes
02	No
88	Don't know
99	Refused

C_DM2_SKIP

[IF (DM2R1=1 OR DM2R2=1) SKIP TO NEXT SECTION (BG3) OTHERWISE SKIP TO OTHER_R]

OTHER_R

Who was primarily responsible for making the decision to get <ASSIST> through <PA>?

[RECORD NAME AND DISPOSITION]

01	There's somebody else	[RECORD CONTACT INFORMATION FOR CALL NOTES]
02	Nobody else	[THANK AND TERMINATE 81]
03	Didn't participate	[THANK AND TERMINATE 82]
04	Participated but installed ALL different measures than what we have on record [SPECIFY]	[THANK AND TERMINATE 86]
88	Don't know / Nobody to talk to	[THANK AND TERMINATE 81]
99	Refused	[THANK AND TERMINATE 91]

AVAILABLE_R

May I please speak with that person?

01	Yes, currently available	[SKIP TO INT01]
02	Yes, but R is not currently available	[SET UP CALLBACK]
03	No	[THANK AND TERMINATE 91]
88	Don't know	[THANK AND TERMINATE 81]
99	Refused	[THANK AND TERMINATE 91]

Background

FAQ READ FOLLOWING ONLY AS NEEDED:

(Sales concern: I am not selling anything; I simply want to understand what factors were important to your company when deciding to implement this new energy efficiency project and receive an incentive through <PA>. Your responses will be kept confidential by our firm and <PA>. If you would like to talk with someone from <PA>, you can call <PA CONTACT INFORMATION>.)

(Who is doing this study: <PA>has hired our firm to evaluate these offerings. As part of the evaluation, we're talking with customers who received assistance from <PA>to better understand their experiences.)

(Why are you conducting this study: Studies like this help <PA>better understand customers' need for and interest in energy efficiency offerings and services, and to improve the effectiveness of their services.)

(Timing: This survey should take about 15 minutes of your time. Is this a good time for us to speak with you? IF NOT, SET UP CALL BACK APPOINTMENT OR OFFER TO LET THEM CALL US BACK AT 1-800-454-5070.)

BG3 [SKIP TO NEXT SECTION IF MULTCHK=2] Does your company have any formal requirements or informal guidelines for the purchase, replacement or maintenance of energy-using equipment?

01	Yes	
02	No	[SKIP TO DM15c]
88	Don't know	[SKIP TO DM15c]
99	Refused	[SKIP TO DM15c]

BG4 Which of the following best describes these requirements or guidelines? [READ LIST; SELECT ONE]

01 Purchase energy efficient equipment regardless of cost
02 Purchase energy efficient equipment if it meets payback or return on investment criteria
03 Purchase standard efficiency equipment that meets code
04 Or something else [SPECIFY]
88 Don't know
99 Refused

DM15c

Do you have a memo of understanding, or MOU with National Grid? [IF NEEDED: A MOU where National Grid works with you to encourage, support and financially incentivize energy saving improvements typically on a three-year commitment?]

01 Yes
02 No [SKIP TO BG6]
88 Don't know [SKIP TO BG6]

DM15d How would you describe your involvement with the MOU development? [READ LIST]

01 Aware but not at all involved in meetings where improvements are discussed
02 Aware and sometimes participate in meetings
03 Primarily responsible for meeting MOU requirements with National Grid
04 Something else (Specify)
88 Don't know
99 Refused

DM15ER1

On a scale of 0 to 10, with 0 being 'no influence' and 10 being a 'great deal of influence', how much influence did the MOU have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; IF EFF1= 1: high efficiency] <MEASCAT1> project?

__ [ENTER INFLUENCE RANKING] [0-10]
88 Don't know
99 Refused

DM15ER2

[ASK IF TOTMEAS=2] On a scale of 0 to 10, with 0 being 'no influence' and 10 being a 'great deal of influence', how much influence did the MOU have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; IF EFF2= 1: high efficiency] <MEASCAT2> project?

__ [ENTER INFLUENCE RANKING] [0-10]
88 Don't know
99 Refused

BG6 Does your organization have a dedicated account representative from <PA>? [SELECT ONE]

01 Yes
02 No
88 Don't know

BG7 [ASK IF BG6=1] Did your account representative assist you with the <MEASCAT1> (or <MEASCAT2>) project that you implemented?

This could have included identifying potential energy saving opportunities, specifying program-qualifying equipment, or providing assistance during project implementation. [SELECT ONE]

01 Yes
02 No
88 Don't know
99 Refused

Decision Making

START ROSTER LOOP [ASK DM1 THROUGH SP13 FOR MEASCAT1 AND THEN MEASCAT2 IF TOTMEAS=2]

*R1 Use DM2R1, MEASCAT1, MEASDESC1, PROGRAM1, EQUIP1, FUEL1, STUDY1, STUDYTYPE1, EFF1, QTYFLAG1, CST1, INC1

*R2 Use DM2R2, MEASCAT2, MEASDESC2, PROGRAM2, EQUIP2, FUEL2, STUDY2, STUDYTYPE2, EFF2, QTYFLAG2, CST2, INC2

DM1 [SKIP IF MULKCHK=2 AND 1st LOOP] Next, I'd like to focus on the <MEASCAT > equipment you implemented through the <PA> offering. This would have included <MEASDESC>.

01 Continue

DM3 Is the <MEASCAT> equipment installed with <PA>'s assistance still at least partially installed [IF INSTALLED MEASURE IS OPERATIONAL; (IF EQUIP=1 SHOW "and operating"] at this facility?

01 Yes
02 No
88 Don't know [SKIP TO NEXT MEASURE]
99 Refused [SKIP TO NEXT MEASURE]

DM4 [ASK IF DM3=2] Why is the <MEASCAT> equipment no longer installed [IF INSTALLED MEASURE IS OPERATIONAL; [IF EQUIP=1 SHOW "or no longer operating"] at this facility?

01	Equipment failed (no longer working)	[SKIP TO NEXT MEASURE]
02	Equipment not working as intended (lights not bright enough, etc.)	[SKIP TO NEXT MEASURE]
03	Other [SPECIFY]	[SKIP TO NEXT MEASURE]
88	Don't know	[SKIP TO NEXT MEASURE]

C_DM2_SKIP1

[ASK NTG sections of only of decision makers. SKIP TO NEXT MEASURE IF DM2<>1]

DM8 [ASK IF STUDY =0] Did your company receive a technical assessment from <PA> as part of your participation in <PA>'s program?

01 Yes
02 No
88 Don't know
99 Refused

DM10 [ASK IF STUDY=1 OR DM8=1] If <PA> had not paid a portion of the cost the technical assessment you received; would your company have paid to have a similar assessment done at that same time?

01 Yes
02 No
88 Don't know
99 Refused

DM11 [ASK IF DM10 = 02] On a scale of 0 to 10, with 0 being 'no influence' and 10 being a 'great deal of influence', how much influence did the information provided by the technical assessment have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; IF EFF=1: high efficiency] <MEASCAT> project?

__ [ENTER INFLUENCE RANKING] [0-10]
88 Don't know
99 Refused

DM14 Did you receive any financing or repayment assistance from <PA> that allowed you to pay for your portion of the <MEASCAT> project cost over time?

01 Yes
02 No
88 Don't know

Event Type Categorization

ET1 Was the high efficiency <MEASCAT> installed as part of a new construction or major renovation project? (SELECT ONE)

01 Yes (new construction) [SKIP TO CALCULATIONS]
02 No
88 Don't know
99 Refused

ET2 Did the high efficiency <MEASCAT> you installed replace any existing <MEASCAT> or was it a new type of equipment that you did not have before? (select one)

01 Replaced existing equipment
02 New equipment (new equipment) [SKIP TO CALCULATIONS]
88 Don't know
99 Refused

ET3 Which of the following best describes the condition of your old equipment? The old equipment was… (READ LIST)

01 working with no need of repair
02 working with need of minor repair
03 working with need of major repair (rof) [SKIP TO CALCULATIONS]
04 no longer working (rof) [SKIP TO CALCULATIONS]
88 Don't know
99 Refused

ET4 Do you think your old equipment would have lasted another [IF SMALL=1 SHOW "two years" ELSE SHOW "four years"]? (SELECT ONE)

01 Yes (er)
02 No (rof)
88 Don't know (rof)
99 Refused (rof)

CALCULATIONS [SET TO 1]

ROF Computing replace on failure (ROF) flag to use as skips later one and in the influential vendor survey.
[IF (ET3=3,4) OR (ET4=2,88,99) SET ROF=1 ELSE ROF=0]

NC Computing new construction (NC) flag to use as skips later one and in the influential vendor survey.
[IF ET1=1 OR ET2=2 SET NC=1 ELSE NC=0]

NE Computing new equipment (NE) flag to use as skips later one and in the influential vendor survey
[IF (ET2=2) SET NE=1 ELSE NE=0]

ER Computing early replacement (ER) flag [IF ET4=1 SET ER=1 ELSE ER=0]

Awareness (for Upstream Lighting)

UL1 [ASK IF MEASCAT=1,20,21,22,23,24 (UPSTREAM LIGHTING)] Were you aware the <MEASCAT> you purchased received a price discount sponsored by <PA>? (SELECT ONE)

01 Yes
02 No
88 Don't know
99 Refused

UL2 [ASK IF UL1=1] Where did you learn about the price discount?
(DO NOT READ; SELECT ONE)

01 Contractor or equipment vendor
02 <PA> (my electricity provider)
03 Internet other than the utility provider
04 Colleagues within organization
05 Colleagues outside organization
06 Other (SPECIFY –be as specific as possible, include the organization)
88 Don't know
99 Refused

UL2O [ASK IF UL2=6] Other ways specified.

Free-Ridership if not aware of upstream Incentive (not aware of UL1 <> 1)

MEASCHK [ASK IF MULTCHK=2 ELSE SKIP TO FR41] [INTERVIEWER QUESTION: Is this case's measure category of <MEASCAT> the same as a previous case's measure category of this multiple?]

01 Yes; Duplicate measure
02 No; New measure [SKIP TO FR41]

DECISIONCHK [ASK IF MEASCHK=1] Now, thinking about the <MEASCAT> project at <ADDRESS> in <CITY>, was the decision-making process **the same or different** from the previous <MEASCAT> project we discussed?

01 SAME decision-making process [SPECIFY RECORD NUMBER OF ORIGINAL CASE] [SKIP TO NEXT MEASURE]
02 DIFFERENT decision-making process [SKIP TO FR41]

C_LAMP_EQUIP [SET TO 1 if MEASCAT=1,20,21,22,23,24 ELSE SET TO 0]
1 lamp
0 equipment

C_LIGH_EQUIP [SET TO 1 if MEASCAT=1,20,21,22,23,24 ELSE SET TO 0]
1 lighting
0 equipment

FR41 [ASK IF UL1=2,88,99 ELSE SKIP TO NEXT SECTION]
According to our information, the distributor or retailer you bought the <MEASCAT> <C_LAMP_EQUIP> from received a discount [IF INC>0 SHOW "of $<INCENTIVE>"] from <PA> which was passed on to you.

On a scale of 0 to 10, with 0 being "not at all likely" and 10 being "very likely," how likely is it that your organization would have implemented the same [IF QTYFLAG=1 SHOW "quantity"] [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "and efficiency of"] <MEASCAT> at that same time if they had cost [IF INC>0 SHOW "$<INCENTIVE>"] more?

__ (0 TO 10)
88 Don't know
99 Refused

FR42 If the <MEASCAT> <C_LAMP_EQUIP> had cost [IF INC>0 SHOW "$<INCENTIVE>"] more, would your organization have installed **any** <C_LIGH_EQUIP> at all at the same time?

[IF MEASCAT=1,20,21,22,23,24 SHOW "[IF NEEDED: And by any lighting, I mean <MEASCAT> or any other kind of lamps.]" ELSE SHOW "[IF NEEDED: And by any equipment, I mean <MEASCAT> or any other kind of equipment.]"]

01 Yes
02 No
88 Don't know
99 Refused

FR43 [ASK IF QTYFLAG=1] If the <MEASCAT> had cost [IF INC>0 SHOW "$<INCENTIVE>"] more, would your organization have implemented the <u>exact same **quantity**</u> of <C_LIGH_EQUIP> discounted from <PA>?

01 Yes
02 No
88 Don’t know
99 Refused

FR44 If the <MEASCAT> had cost [IF INC>0 SHOW "$<INCENTIVE>"] more, would your organization have implemented the exact same high efficiency [IF MEASCAT=1,20,21,22,23,24 SHOW “lighting”] equipment?

01 Yes
02 No
88 Don’t know
99 Refused

FR45 [ASK IF FR42 = 02, 88, 99 ELSE SKIP TO FR47] Would you have installed the <C_LIGH_EQUIP> earlier than you did, at a later date, or never if the <C_LIGH_EQUIP> had cost [IF INC >0 SHOW "$<INCENTIVE>"] more?

01	Earlier	
02	Same time	[update FR42 to 1 and SKIP TO FR47]
03	Later	
04	Never	
88	Don't know	
99	Refused	

FR46 [ASK IF FR45 = 01, 03] How much [earlier/later] would you have installed the <C_LIGH_EQUIP>?

FR46Y	__	Years [0-60]
FR46M	__	Months [0-12]
	88	Don't know

C_FR46_CALC [SET EQUAL TO FR46Y*12 + FR46M]

FR47 [ASK IF FR43 = 02, 88, 99] Compared to the amount of <MEASCAT> that you installed, what percent of the <C_LIGH_EQUIP>do you think your organization would have installed on its own if they had cost [IF INC>0 SHOW "$<INCENTIVE>"] more?

(PROBE: Would you have purchased about one- fourth (25%), one-half (50%), three fourths (75%) of what you installed through the <PA> program?)

___	(ENTER PERCENTAGE: 0-500%)	
888	Don't know	[SKIP TO C43]
999	Refused	[SKIP TO C43]

FR48 [ASK IF QTYFLAG=1 AND IF FR44=02,88,99 ELSE SKIP TO FR50] You said your organization would have installed
[IF FR43=1-Yes SHOW "all";
IF FR43= 2-No SHOW <FR47> %; IF FR47=888,999 SHOW "some";
IF FR43=88,99 SHOW "some"]
of the equipment on its own if the <UTILITY> program had not been available.

What percent of this equipment would have been standard efficiency or minimum code?

[PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?]

___	(ENTER PERCENTAGE: 0-100%)
777	Not applicable
888	Don't know

FR49 [ASK IF INTEFF=1] and what percent would have been between standard efficiency and what you installed through the program?

___ [ENTER PERCENTAGE: 0-100%]
777 Not applicable
888 Don't know

FR50 [ASK IF QTYFLAG=0 AND IF FR44=02,88,99 AND INTEFF=1] Thinking about the [IF MEASCAT=1,20,21,22,23,24 SHOW "lighting"] project you would have implemented on your own if they had cost [IF INC >0 SHOW "$<INCENTIVE>"] more, would it have been standard efficiency or minimum code **or** between standard efficiency and what you installed through the program?

01 Standard efficiency or minimum code
02 Between standard efficiency and what you installed through the program
77 Not applicable
88 Don't know
99 Refused

FR51 [ASK IF FR50=01,02 OR (FR48 AND FR49 ≠0 AND ≠777 AND ≠888] What specific efficiency level(s) were you considering?

[RECORD RESPONSE VERBATIM]

C43 On a scale of 0 to 10, with 0 being "no influence" and 10 being "a great deal of influence," how much influence did the discounted price have on your decision to install the <MEASCAT>?

__ (ENTER INFLUENCE RANKING)
88 Don't know
99 Refused

Free-Ridership

C_FR1_SKIP1 [IF UL1 = 2, 88, or 99, SKIP TO CC8]

FR1 [ASK ONCE] Please think back to the time when you were considering implementing the specific <MEASCAT1> project [IF TOTMEAS=2 SHOW "and <MEASCAT2> project"] around <DATE1> [IF TOTMEAS=2 SHOW "and <DATE2>"].

What factors motivated your business to consider implementing new <MEASCAT1> [IF TOTMEAS=2 SHOW "and <MEASCAT2> equipment through <PA>'s program?

[PROBE: What other factors motivated you?]

[DO NOT READ LIST. SELECT ALL THAT APPLY]

01 Old equipment failed
02 Old equipment working poorly
03 Old equipment scheduled for replacement
04 Wanted to reduce maintenance costs
05 The incentive being offered through the program
06 The technical assistance offered through the program
07 Wanted to reduce energy bills
08 Wanted to save energy
09 Recommendation of third party contractor / engineer / design professional
10 Recommendation of utility program staff
11 Recommendation of internal staff
12 Past experience with the program
13 Other [SPECIFY]
88 Don't know
99 Refused

FR2 [ASK IF FIRST LOOP] Now, I'd like to ask you about your decision to implement the <MEASCAT1> project around <DATE1> through <PA>'s program.
[IF THERE IS ALSO A SECOND MEASURE: Then, I'll repeat these questions for the <MEASCAT2> project that was implemented around <DATE2>].

01 Continue

FR3 [ASK IF SECOND LOOP] Now I'd like to review your decision to implement the <MEASCAT2> project around <DATE2>.

01 Continue

FR30 Did your organization install the <MEASCAT> equipment due to automation, or due to another workplace benefit, or for neither of those reasons?

[IF NEEDED: This includes projects installed for non-energy reasons, such as improvement of workplace quality and automation of existing manual processes (e.g., to control and manage building systems such as HVAC, lighting, security, and building access).]

01 Yes; Automation / Another workplace benefit
02 No; Neither of those reasons
88 Don't know
99 Refused

FR4 Did your company have any funds allocated to implement the <MEASCAT> project BEFORE you talked with anyone about the program?

01 Yes
02 No [SKIP TO FR7]
88 Don't know [SKIP TO FR7]
99 Refused [SKIP TO FR7]

FR5 Was it necessary to change the timing of the implementation, [IF QUANTITY IS GREATER THAN 1 (IF QTYFLAG=1) SHOW "the quantity"] [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "the efficiency level"] of the <MEASCAT> equipment in order to qualify for the program?

01 Yes
02 No [SKIP TO FR7]
88 Don't know [SKIP TO FR7]
99 Refused [SKIP TO FR7]

FR6 What changes were necessary?
[DO NOT READ. SELECT ALL THAT APPLY (max 5 choices)]

01 Installation occurred SOONER than planned
02 Installation occurred LATER than planned
03 Installed MORE equipment than planned
04 Installed LESS equipment than planned
05 Equipment was MORE efficient than planned
06 Equipment was LESS efficient than planned
07 Removed MORE equipment than planned
08 Removed LESS equipment than planned
09 Other [SPECIFY]
88 Don't know
99 Refused

FR7 Who was **MOST** responsible for actually recommending or specifying the [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "high efficiency"] <MEASCAT> project that was implemented through the program?
[DO NOT READ LIST. RECORD ONLY ONE]

01 Respondent
02 Someone else in company [SPECIFY AND PROBE TO SEE IF SHOULD BE SPEAKING WITH THIS R]
03 <PA> account manager
04 <PA> representative
05 Third-party design professional or architect
06 Third-party engineer
07 Contractor
08 Vendor / Manufacturer's representative
09 Auditor
10 Someone else OUTSIDE the company [SPECIFY]
88 Don't know
99 Refused

FR8 [ASK IF FR7= THIRD-PARTY DESIGN PROFESSIONAL, THIRD-PARTY ENGINEER, CONTRACTOR MANUFACTURER'S REPRESENTATIVE, OR UTILITY ACCOUNT MANAGER (ASK IF FR7=03,04,05,06,07,08,09,10)]

On a scale of 0 to 10, with 0 being no influence and 10 being a great deal of influence, how much influence did (the) [FR7 response] have on your company's decision to implement the [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "high efficiency"] <MEASCAT> project so that it would qualify for the program?

__ [ENTER INFLUENCE RANKING] [0-10]
88 Don't know
99 Refused

FR25 On a scale of 0 to 10, with 0 being 'no influence' and 10 being a 'great deal of influence', how much influence did the [IF INC>0 SHOW "roughly $<INCENTIVE>" ELSE SHOW "incentive"] you received from <PA> have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "high efficiency"] <MEASCAT> project?

__ [ENTER INFLUENCE RANKING] [0-10]
88 Don't know
99 Refused

FR10 I'd like to go over all the program assistance you received from <PA>.

According to our records:

[IF (DualFuelProj=1)] You received rebates for both gas and electric equipment around the same time through <PA>.

(IF CST>0 AND INC>0) The total cost for the project implemented at your facility around <DATE> through the program was about $<CST>. <PA> paid about $<INCENTIVE> of the total cost of the [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "energy efficient"] <MEASCAT> project implemented through the program.

(IF CST=0 OR INC=0) <PA> paid a portion of the total cost of the [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "energy efficient"] <MEASCAT> project implemented through the program.

[IF STUDY=1 OR DM8=1: In addition, as I previously mentioned, <PA> paid a portion of the cost for the <STUDYTYPE1, STUDYTYPE2>.]

[IF DM14 = 1] <PA> also provided financing or repayment assistance for your portion of the project costs.

01 Continue

FR11 On a scale of 0 to 10, with 0 being 'not at all likely' and 10 being 'very likely', how likely is it that your business would have implemented the same [IF QUANTITY IS GREATER THAN (IF QTYFLAG=1) SHOW "quantity of"] [IF EFFICIENCY IS APPLICABLE (IF EFF=1) SHOW "efficiency of"] <MEASCAT> equipment at that same time if <PA> had not provided all of this program assistance?

__ RECORD LIKELYHOOD [0 TO 10]
88 Don't know
99 Refused

FR12_intro [SKIP IF (QTYFLAG=0 AND EFF=0) Now I would like you to think about what you would have done if this same program assistance had not been available.

01 Continue

FR12 [SKIP IF ROF=1 OR NC=1] Would your business have implemented <u>any</u> <u>type</u> of <MEASCAT> project <u>at the same time</u> without the assistance from <PA>?

01 Yes
02 No
88 Don't know
99 Refused

FR13 [ASK IF QTYFLAG=1] Would your business have implemented the exact same quantity or size of <MEASCAT> project without the assistance from <PA>?

01 Yes
02 No
88 Don't know
99 Refused

FR14 [ASK IF EFF=1 (if efficiency applies)] Would your business have implemented the exact same high efficiency <MEASECAT> equipment as what was installed through the program without the assistance from <PA>?

01 Yes
02 No
88 Don't know
99 Refused

Timing

FR15 [ASK IF FR12 = 02, 88, 99 ELSE SKIP TO NEXT SECTION (FR17)] Would you have implemented the <MEASCAT> project earlier than you did, at a later date, or never without the assistance from <PA>?

01 Earlier
02 Same time [SKIP BACK TO FR12 to change to 01]
03 Later
04 Never [SKIP TO ISP1]
88 Don't know
99 Refused

FR16 [ASK IF FR15 = 01, 03] How much [earlier/later] would you have implemented the <MEASCAT> project?

FR16Y __ YEARS [0-60]
FR16M __ MONTHS [0-12]
88 Don't know

C_FR16_CALC [SET EQUAL TO FR16Y*12 + FR16M]

Quantity

[IF QUANTITY IS NOT APPLICABLE FOR THIS MEASURE CATEGORY (IF QTYFLAG=0), SKIP TO NEXT SECTION (FR18)]

FR17 [ASK IF FR13 = 02, 88, 99] Compared to the amount of <MEASCAT> equipment that you implemented through the <PA>program, what percent of the project do you think your business would have purchased on its own without the assistance from <PA>?

[PROBE: Would you have purchased about one- fourth (25%), one-half (50%), three fourths (75%) of what you installed through the <PA> program?]

___ [ENTER PERCENTAGE: 0-500%]
888 Don't know
999 Refused

Efficiency

[IF EFFICIENCY IS NOT APPLICABLE FOR THIS MEASURE CATEGORY (IF EFF= 0 OR FR17=0), SKIP TO NEXT SECTION (FR21)]

FR18 [ASK IF QTYFLAG=1 AND IF FR14=02,88,99 ELSE SKIP TO C_EF_SKIP1]
You said your business would have installed
[IF FR13=1-Yes SHOW "all";
IF FR13= 2-No SHOW <FR17> %; IF FR17=888,999 SHOW "some";
IF FR13=88,99 SHOW "some"]
of the equipment on its own if the assistance from <PA> had not been available.

What percent of this equipment would have been **standard efficiency or minimum code**?

[PROBE: For example, "Would about one-fourth (25%), one-half (50%), three-fourths (75%)?"]

___ [ENTER PERCENTAGE: 0-100%]
777 Not applicable
888 Don't know

FR19 [ASK IF INTEFF=1] and what percent would have been between standard efficiency and what you installed through the program?

___ [ENTER PERCENTAGE: 0-100%]
777 Not applicable
888 Don't know

C_EF_SKIP1

[IF (QTYFLAG=1 AND IF FR14 = 2, 88, 99 AND FR18<>888 AND FR19<>888) OR FR14=1 CALCULATE EFb, EFc, EFa ELSE SKIP TO FR20]

EFb (between percent) IF FR14=1 EFb=0 ELSE SET EQUAL TO FR19
EFc (standard efficiency percent) IF FR14=1 EFc=0 ELSE SET EQUAL TO FR18
EFa (high efficiency percent) IF FR14=1 EFa = 100 ELSE EFa = (100-EFb-EFc)

FR20 [ASK IF QTYFLAG=0 AND IF FR14=02,88,99 AND INTEFF=1] Thinking about the <MEASCAT> project you would have implemented on your own if the <PA> assistance had not been available, would it have been standard efficiency or minimum code **or** between standard efficiency and what you installed through the program?

01 Standard efficiency or minimum code
02 Between standard efficiency and what you installed through the program
77 Not applicable
88 Don't know
99 Refused

FR31 [ASK IF FR20=01,02 OR (FR18 AND FR19 ≠0 AND ≠777AND ≠888)]
What specific efficiency level(s) were you considering?

[RECORD VERBATIM RESPONSE]

[SKIP TO NEXT SECTION IF ISPFLAG=1]

FR32a [ASK IF (FR18>0 AND ≠777 AND ≠888) OR FR20=1] When you talk about **standard** <MEASCAT> equipment, which of the following best describes what you mean? (READ LIST, Select one)

01 Whatever most customers install
02 Whatever was standard or least expensive
03 Whatever was readily available
04 Whatever the contractor recommended
05 Whatever is required by code
06 Or something else? [SPECIFY]
88 Don't know
99 Refused

FR32b [ASK IF (FR19>0 AND ≠777 AND ≠888) OR FR20=2] When you talk about **mid-level efficiency** <MEASCAT1, MEASCAT> equipment, which of the following best describes what you mean? (READ LIST, Select one)

01 Whatever most customers install
02 Whatever was mid-level or less expensive than the high efficiency option
03 Whatever was readily available
04 Whatever the contractor recommended
05 Whatever is required by code
06 Or something else? [SPECIFY]
88 Don't know
99 Refused

Insulation

FR21 [ASK IF MEASCAT=10-Insulation] Thinking about the energy saving improvements you would have implemented on your own if the <PA> assistance had not been available; would you have done the same improvements as you did?

01 Yes [SKIP TO NEXT SECTION (ISP1)]
02 No
88 Don’t know
99 Refused

FR22 [ASK IF MEASCAT=10-Insulation] Compared to what you installed through the <PA>program, how much would you have done? For example, would it have been 50% as much as what was done with the <PA>assistance?

___ [ENTER PERCENTAGE: 0-99%]
0 I wouldn't have done the improvement
888 Don’t know
999 Refused

ISP insight Questions

[SKIP TO NEXT SECTION IF ISPFLAG=0 OR INTEFF=0]

ISP1 Now I would like you to think about what you would have installed if the <ISPMEASDESC> equipment was not available anywhere in the market and you had to install something else instead.

If you had NOT installed <ISPMEASDESC> equipment, which of the following would you most likely have installed instead? [READ LIST]

01 Installed <TechB> [e.g., “BETTER”]
02 Installed <TechC> [e.g., “GOOD”]
03 Installed <TechD> [e.g., “WORST/STANDARD”]
04 Installed <TechE>
05 Installed something else [SPECIFY something other than <ISPMEASDESC>]
06 I would not have installed anything at this time if I could not install <ISPMEASDESC>
07 [DO NOT READ] would have installed the same technology <ISPMEASDESC> [e.g., “BEST”]
88 [DO NOT READ] Don’t know
99 [DO NOT READ] Refused

ISP2 [ASK IF ISP1= 1,2,3,4] OK, you said if you had not installed <ISPMEASDESC> equipment you would have installed <ISP1 response >.

If you had not received the assistance from the program, how likely is it that you still would have installed <ISPMEASDESC> equipment and not <ISP1 response>, even without the program help? [READ LIST]

01 Absolutely would **not** have installed <ISPMEASDESC> equipment without the program help
02 Very unlikely
03 Unlikely
04 Neutral
05 Likely
06 Very likely
07 Absolutely would have installed <ISPMEASDESC> equipment without any program help
08 Would not have installed anything

Consistency Check Prompts

100% Free ridership Consistency Check

C_CC_SKIP1 [IF WOULD HAVE PURCHASED AT THE SAME TIME, IN THE SAME QUANTITY, AND OF THE SAME EFFICIENCY LEVEL;
ASK IF FR12=1 AND (FR13=1 OR FR17>=100) AND (FR14=1 or EFa=100%), ASK CC1-CC5, ELSE SKIP TO CC6]

CC1 [ASK IF FR25 =8,9,10 ELSE SKIP TO CC6] You said that you would have installed the same quantity and efficiency equipment at that same time, but you also just said that the <PA> incentive was influential in your decision to implement the <MEASCAT> project. Which of these is more accurate?

01 Installed same quantity & efficiency at same time [SKIP TO CC6]
02 Confirmed incentive was influential in decision
03 Something else [SPECIFY]

CC2 How would your project have changed if <PA> had not contributed to the cost of the <MEASCAT> project? [SELECT ALL THAT APPLY. DO NOT READ]

01 Would not have changed [SKIP TO CC6]
02 Would have postponed the project
03 Would have cancelled the project altogether
04 Would have repaired existing equipment
05 Kept using existing equipment
06 Purchased less efficient equipment
07 Purchased fewer quantity
08 Installed DIFFERENT type of equipment than planned [SPECIFY: What type of equipment?]
09 Other [SPECIFY]
88 Don’t know
99 Refused

CC2a [ASK IF CC2=2] Approximately how many months would you have postponed the project?

__ SPECIFY NUMBER OF MONTHS [1 – 75]
88 Don't know
99 Refused

CC3 [ASK IF CC2=PURCHASED FEWER QUANTITY; IF CC2=7) Compared to the amount of <MEASCAT> equipment that you implemented through the <PA> program, what percent do you think your business would have purchased on its own at that same time without the assistance from <PA>?

[PROBE: Would you have purchased about one-fourth (25%), one-half (50%), three-fourths (75%) of what you installed through the <PA> program?]

___ [ENTER PERCENTAGE: 1-99%]
888 Don't know
999 Refused

CC4 [ASK IF CC2=PURCHASED LESS EFFICIENT EQUIPMENT; IF CC2=6 ELSE SKIP TO CC6) Thinking about the equipment you would have implemented on your own, what percent of this equipment would have been **standard efficiency or minimum code**?

[PROBE: Would about one-fourth (25%), one-half (50%), three-fourths (75%) been of equal efficiency?]

___ [ENTER PERCENTAGE: 0-100%]
777 Not applicable
888 Don't know

CC5 [ASK IF CC2=06 AND INTEFF=1] and what percent would have been between standard efficiency and what you installed through the program?

___ ENTER PERCENTAGE: 0-100%]
777 Not applicable
888 Don't know

C_CEF_SKIP [SKIP TO CC6 IF CC4=888 OR CC5=888 OR CC4=777 OR CC5=777]

cEFb (between percent) SET EQUAL TO CC5
cEFc (standard efficiency percent) SET EQUAL TO CC4
cEFa (high efficiency percent) SET EQUAL TO (100-cEFb-cEFc)

0% Free ridership Consistency Check

CC6 (IF SMALL BUSINESS - ASK IF AT LEAST SOMEWHAT LIKELY TO HAVE INSTALLED THE MEASURE WITHOUT THE PROGRAM BUT LATER STATES WOULD HAVE WAITED AT LEAST TWO YEARS)

[ASK IF
SMALL=1 AND
FR11 = 4,5,6,7,8,9,10 AND
((FR16>24 MONTHS AND NOT =88 AND FR12<>1) OR FR15=4)]

Earlier in the interview, you said there was a <FR11 SCORE> in 10 likelihood that you would have implemented the same quantity and efficiency of <MEASCAT> equipment at that same time in the absence of the <PA> program assistance. But you also said you would not have implemented the <MEASCAT> project within 2 years of when you did. Which of these is more accurate? [READ LIST, SELECT ONE]

01 The likelihood of installing this without the program assistance was (FR11 SCORE)
02 Would not have installed anything within 2 years
03 Something else [SPECIFY]
88 Don't know
99 Refused

CC7 (IF MED/LARGE C&I - ASK IF AT LEAST SOMEWHAT LIKELY TO HAVE INSTALLED THE MEASURE WITHOUT THE PROGRAM BUT LATER STATES WOULD HAVE WAITED AT LEAST FOUR YEARS)

[ASK IF
SMALL=0 AND
FR11 = 4,5,6,7,8,9,10 AND
((FR16>48 MONTHS AND NOT =88 AND FR12<>1) OR FR15=4)

Earlier in the interview, you said there was a <FR11 SCORE> in 10 likelihood that you would have implemented the same quantity and efficiency of <MEASCAT>equipment at that same time in the absence of the <PA> program assistance. But you also said you would not have implemented the <MEASCAT> project within 4 years of when you did. Which of these is more accurate? [READ LIST, SELECT ONE]

01 The likelihood of installing this without the program assistance was (FR11 SCORE)
02 Would not have installed anything within 4 years
03 Something else [SPECIFY]
88 Don't know
99 Refused

Additional Consistency Check

CC8a [ASK IF 100% FREE-RIDER;
IF FR12=1 AND FR13=1 AND (FR14 = 1 or EFa = 100) AND CC1 = 1 AND (DM11=07,08,09,10 OR FR25=07,08,09,10)]
Previously you stated that you would have installed the exact same equipment at the same time without the <PA> assistance. But, you also stated that the …
(IF DM11 > 6 FILL: program-sponsored study was)
(IF FR25 > 6 FILL: program incentive and financing options were)
(IF DM11 > 6 & FR25 > 6 FILL: program-sponsored study, incentive, and financing options were)
… influential in your decision.

01 Continue to CC8

CC8b [ASK IF 0% FREE-RIDER:
IF FR15 = 4-NEVER OR 88-DK AND (DM11=00,01,02,03,04 OR FR25=00,01,02,03,04]
Previously you stated that you would not have installed any equipment without the <PA>assistance. You also stated that the …
(IF DM11 < 5 FILL: program-sponsored study was)
(IF FR25 < 5 FILL: program incentive and financing options were)
(IF DM11 < 5 AND FR25 < 5 FILL: program-sponsored study, incentive, and financing options were)
… not influential in your decision.

01 Continue to CC8

CC8 (ASK OF ALL) Please think about all the assistance you received through the <PA> program. In your own words, please describe what impact, if any, that assistance had on your decision to install the amount of energy efficient <MEASCAT> equipment at the time you did?

[RECORD VERBATIM RESPONSE]

Like Spillover

[IF MEASCHK=1 SKIP TO Next Measure/Section]

FR33 Prior to participating in the program, did your organization previously install this <MEASCAT> equipment in any facility?

01 Yes
02 No
88 Don't know
99 Refused

SP1 Now I'd like you to think of the time since you participated in the <PA> program around <DATE>.

Has your company implemented any <MEASCAT> projects for this or other facilities in Rhode Island **on your own,** that is, without a rebate from <PA>?

01	Yes	
02	No	[SKIP TO Next Measure/Section]
88	Don't know	[SKIP TO Next Measure/Section]

SP2 [IF EFFICIENCY IS NOT APPLICABLE; IF EFF = 0, SKIP TO SP4]
Was this equipment of **the same efficiency level or a higher level of efficiency** as the equipment you installed through the program?

01	Yes	[SKIP TO SP4]
02	No	
88	Don't know	

SP3 Was this equipment more energy efficient than standard efficiency or code equipment?

01	Yes	
02	No	[SKIP TO Next Measure/Section]
88	Don't know	[SKIP TO Next Measure/Section]

SP4 Thinking of the <MEASCAT> equipment that you installed on your own, was this more, less or the same amount of <MEASCAT> equipment as what you installed through the program?

01	More	
02	Less	
03	Same	[SKIP TO SP8]
88	Don't know	[SKIP TO SP8]

SP5 [ASK IF SP4=01] Compared to the amount of <MEASCAT> equipment that you installed through the program at <ADDRESS> in <CITY>, how much <MEASCAT> equipment did you install on your own?

We're looking for a percent compared to the amount installed through the program. For example, if it was about twice as much as what you installed through the program you would say 200%. (Enter whole number)

____	[Enter percentage: 101-1000%]
8888	Don't know

SP6 [ASK IF SP4=02] Compared to the amount of <MEASCAT> equipment that you installed through the program at <ADDRESS> in <CITY>, how much <MEASCAT> equipment did you install on your own?

We're looking for a percent compared to the amount installed through the program. For example, if it was about half as much as what you installed through the program you would say 50%. (Enter whole number)

____ [Enter percentage: 1-99%]
8888 Don't know

SP7 [SKIP IF SP5 = 8888 or SP6 = 8888] So the additional energy efficient equipment you bought on your own was <percentage from SP5 or SP6> as much as you got through the program?

01 Yes
02 No [SKIP BACK TO SP4 TO CORRECT]

SP8 Did a recommendation by the contractor, engineer, or designer who you worked with under the <PA> program influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "efficient"] <MEASCAT> equipment on your own?

01 Yes
02 No
77 Not applicable
88 Don't know
99 Refused

SP9 Did your experience with the energy efficient projects implemented through the <PA> program influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "efficient"] <MEASCAT> equipment on your own?

01 Yes
02 No
88 Don't know
99 Refused

SP10 Did your participation in any past program offered by <PA> influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; IF EFF=1 SHOW "efficient"] <MEASCAT> equipment on your own?

01 Yes
02 No
88 Don't know
99 Refused

SP11 On a scale of 0 to 10, where 0 is “no influence at all” and 10 is “a great deal of influence”, how much influence did your participation in the <PA> program have on your decision to install this equipment without an incentive?

__ [RECORD INFLUENCE 0-10]
88 Don’t know
99 Refused

SP12 Why didn't you implement this <MEASCAT> project through a <PA> program?

[DO NOT READ; SELECT ALL THAT APPLY]

01 Too much paperwork
02 Cost savings not worth the effort of applying
03 Takes too long for approval
04 The equipment would not qualify
05 Vendor does not participate in program
06 Outside <PA>’s service territory
07 No time — needed equipment immediately
08 Thought the program ended
09 Didn't know the equipment qualified under another program
10 Just didn't think of it
11 Unable to get rebate—unsure why
12 Other [SPECIFY]
88 Don’t know
99 Refused

SP13 [ASK IF SP12 = THE EQUIPMENT WOULD NOT QUALIFY; ASK IF SP12=4) Why wouldn't the equipment qualify?

[RECORD VERBATIM RESPONSE]

[END MEASURE LOOP;
IF TOTMEAS=2 SKIP BACK TO DM1 AND ASK QUESTIONS ABOUT MEASCAT2
OTHERWISE CONTINUE TO UNLIKE SPILLOVER]

Unlike Spillover

C_MULT_SKIP [IF MULTCHK=2 SKIP TO NEXT SECTION (PP1)]

US1 Since participating in <PA> program, has your company purchased, installed, or implemented any **other** type of energy efficient equipment **on your own,** that is, without a rebate from <PA> Rhode Island?

01 Yes
02 No [SKIP TO NEXT SECTION]
88 Don't know [SKIP TO NEXT SECTION]

US2 What type of energy efficient equipment did you install on your own?

[RECORD VERBATIM RESPONSE]
88 Don't know

US3 What quantity of energy efficient equipment did you install?

[RECORD VERBATIM RESPONSE]
88 Don't know

US4 What size or capacity of energy efficient equipment did you install?

[RECORD VERBATIM RESPONSE]
88 Don't know

US5 Would this project have qualified for an incentive through a <PA> Rhode Island program?

[IF YES: "Did you implement this project through a <PA> Rhode Island program?"]

01 Yes, Did not implement through a program
02 Yes, Implemented through a program [SKIP TO NEXT SECTION]
03 No [SKIP TO NEXT SECTION]
88 Don't know [SKIP TO NEXT SECTION]

US6 Did a recommendation by the contractor, engineer, or designer who you worked with under a <PA> Rhode Island program influence your decision to implement some or all of this equipment on your own?

01 Yes
02 No
77 Not applicable
88 Don't know
99 Refused

US7 Did your experience with the energy efficient project implemented through a <PA> Rhode Island program influence your decision to implement some or all of this equipment on your own?

01 Yes
02 No
88 Don't know
99 Refused

US8 Did your participation in any past program offered by <PA> Rhode Island influence your decision to implement some or all of this equipment on your own?

01 Yes
02 No
88 Don't know
99 Refused

US9 On a scale of 0 to 10, where 0 is "no influence at all" and 10 is "a great deal of influence", how much influence did your participation in a <PA> Rhode Island program have on your decision to install this equipment without an incentive?

__ RECORD INFLUENCE [0-10 rating]
88 Don't know

US10 Why didn't you implement this project through a <PA> Rhode Island program?

[DO NOT READ; SELECT ALL THAT APPLY]

01 Too much paperwork
02 Cost savings not worth the effort of applying
03 Takes too long for approval
04 The equipment would not qualify
05 Vendor does not participate in program
06 Outside <PA>'s service territory
07 No time - needed equipment immediately
08 Thought the program ended
09 Didn't know the equipment qualified under another program
10 Just didn't think of it
11 Unable to get rebate--unsure why
12 Other [SPECIFY]
88 Don't know
99 Refused

US11 [IF US10= EQUIPMENT WOULD NOT QUALIFY (ASK IF US10=4)] Why wouldn't the project qualify?

[RECORD VERBATIM RESPONSE]

Impact of Previous Program Participation

PP1 Had your business participated in an energy efficiency program offered by National Grid in Rhode Island before you implemented the energy efficient project(s) around <DATE>?

01	Yes	
02	No	[SKIP TO NEXT SECTION]
88	Don't know	[SKIP TO NEXT SECTION]
99	Refused	[SKIP TO NEXT SECTION]

PP2R1 On a scale of 0 to 10, with 0 being 'not at all important and 10 being 'very important', how important was your previous experience with a <PA> Rhode Island program when making the decision to implement the <MEASCAT1> project at this facility around <DATE1>?

__	RECORD IMPORTANCE [0 – 10]
88	Don't know
99	Refused

PP2R2 [ASK IF TOTMEAS=2] On a scale of 0 to 10, with 0 being 'not at all important and 10 being 'very important', how important was your previous experience with a <PA> Rhode Island program when making the decision to implement the <MEASCAT2> project at this facility around <DATE2>?

__	RECORD IMPORTANCE [0 – 10]
88	Don't know
99	Refused

PP3 [SKIP TO NEXT SECTION IF MULTCHK=2] I'm going to read you several statements. For each statement, please tell me whether you agree or disagree that this statement applies to your business. There are no right or wrong answers; we just want your honest opinion. [REPEAT IF NECESSARY]

Our previous experience implementing energy efficient projects through a <PA> Rhode Island program …

FOR PP3a through PP3d
01 Agree
02 Disagree
88 Don't know
99 Refused

PP3a Has made our firm more likely to consider energy efficient equipment
PP3b Has made our firm more likely to install energy efficient equipment
PP3c Has given us more confidence in the financial benefits of energy efficient equipment
PP3d Has given us more confidence in the nonfinancial benefits of energy efficient equipment

Wrap-up

WU1 What is the main business activity at <ADDRESS> in <CITY>?

01 Office / Professional
02 Warehouse or distribution center
03 Food sales
04 Food service
05 Retail (other than mall)
06 Mercantile (enclosed or strip malls)
07 Education
08 Religious worship
09 Public assembly
10 Health care
11 Lodging
12 Public order and safety
13 Industrial/manufacturing [SPECIFY]
14 Agricultural [SPECIFY]
15 Vacant (majority of floor space is unused)
16 Other [SPECIFY]
88 Don't know

C_MULT_SKIP3 [SKIP TO A4 IF MULTCHK=02]

WU2 Are your company's budget decisions made locally, regionally, nationally, worldwide, or some other way?

01 Locally
02 Regionally
03 Nationally
04 Worldwide
05 Some other way (SPECIFY)
88 [DO NOT READ] Don't know

WU2a Has your organization faced any recent cutbacks to budgets or staffing?

01 Yes
02 No
88 Don't know
99 Refused

WU4 For verification purposes, would you spell your first and last name for me?

[RECORD VERBATIM RESPONSE]
99 Refused

WU5 [ASK IF WU4=99] And can I get your title?

[RECORD VERBATIM RESPONSE]
99 Refused

WU6 If we would need to clarify some of the information I asked you, would it be alright if we called you back?

01 Yes
02 No

A4R1 [ASK IF FR7R1=5,6,7,8,9 AND FR8R1=7,8,9,10] We would like to talk to the person who was most influential in recommending or specifying the efficient <MEASCAT1> equipment to install through the program. Earlier you mentioned that this was the <FR7R1 RESPONSE>. Could you give me the name and telephone number of this person?

01 Yes [Record contact information]
02 No, no outside advisor involved
88 Don't know / Doesn't have
99 No, REFUSED to give this information

[ASK IF A4R1=1]
A4_COMPANYR1
A4_NAMER1
A4_PHONER1

A4R2 [ASK IF TOTMEAS=2 AND FR7R2=5,6,7,8,9 AND FR8R2=7,8,9,10] We would like to talk to the person who was most influential in recommending or specifying the efficient <MEASCAT2> equipment to install through the program. Earlier you mentioned that this was the <FR7R2 RESPONSE>. Could you give me the name and telephone number of this person?

01 Yes [Record contact information]
02 No, no outside advisor involved
03 Same contact info as previous measure
88 Don't know / Doesn't have
99 No, REFUSED to give this information

[ASK IF A4R2=1]
A4_COMPANYR2
A4_NAMER2
A4_PHONER2

COM [SKIP IF MULTCHK=2] Do you have any comments or suggestions for the program?

01 Yes [SPECIFY VERBATIM RESPONSE]
02 No / None
88 Don't know

INT99 [SKIP IF MULTCHK=02] Those are all the questions I have for you. I'd like to thank you for your time with this important evaluation

CP Completed [END]

INT98 Those are all the questions I have for you. I'd like to thank you for your time with this important evaluation

CM Completed – subsequent case [END]

C.2 INFLUENTIAL VENDOR FREE-RIDERSHIP AND VENDOR NONPARTICIPANT SURVEY

Variable List

VCASEID Vendor case identification number

VEND_CONTACT Vendor Name

SAMPLE_PHONE

VEND_ADDR, VEND_CITY, VEND_STATE, VEND_ZIP
Vendor Address

VEND_COMPANY Vendor company name

VEND_EMAIL Vendor email

MULTFLAG case is part of a multiple
0 Not a multiple
1 Multiple

MULTID

PRIMARY Primary case for multiples, also flagged for all single records
0 Not a primary case
1 Primary case

VENDORTYPE Influ/Nonp

INF_VEND1 Flag if vendor was identified as an influential vendor for first measure (from the customer survey)
0 not an influential vendor
1 influential vendor

INF_VEND2 Flag if vendor was identified as an influential vendor for second measure (from the customer survey)
0 not an influential vendor
1 influential vendor

ME1-ME24 Types of equipment specified/sold as part of spillover questions (showed in NonPart section)

0 Not sold
1 Sold

ME01 Upstream Lighting Equipment
ME02 Compressed Air Equipment
ME03 Energy Efficiency Controls
ME04 Custom Projects
ME05 Energy Efficient Food Service Equipment
ME06 Energy Efficient Heating or Cooling Equipment
ME07 Energy Efficient Heating or Cooling Equipment (Distribution)
ME08 Energy Efficient Heating or Cooling Equipment (Plant)
ME09 Energy Efficient Heating or Cooling Equipment (Non-unitary)
ME10 High Efficiency Rated Insulation
ME11 Energy Efficient Lighting
ME12 Energy Efficient Non-Lighting Equipment
ME13 Custom Projects (Other)
ME14 Variable Speed Drives
ME15 Water Heating Equipment
ME20 (Upstream) Lighting – fixture
ME21 (Upstream) Lighting – fixture with controls
ME22 (Upstream) Lighting - LED retrofit kits
ME23 (Upstream) Lighting - screw-ins
ME24 (Upstream) Lighting - TLEDs

GAS01 – GAS15 Gas savings associated with nonparticipant vendors

ELEC01 – ELEC15 Electric savings associated with nonparticipant vendors

PROG1 – PROG7

TOP10 gas

TOP10elec

Customer Variables

CUST_CASEID Customer case identification number

CUST_NAME Customer Contact First Name

CUST_COMPANY Customer/Facility Name

PREMISE_ADDR, PREMISE_CITY, PREMISE_ST, PREMISE_ZIP
Service address where equipment was installed

UTILITY Program administrator
1 National Grid

PROGRAM1, PROGRAM2 (STRING) Utility/sponsor programs the vendor has been involved with

ProgramType1, ProgramType2 Type of program
Prescriptive
Custom

PROGRAMCODE1, PROGRAMCODE2 Utility/sponsor programs the vendor has been involved with
1 Bright Opportunities program
2 Large Commercial New Construction program
3 Large Commercial Retrofit program
4 Small Business Direct Install program
5 Design 2000 program
6 Energy Initiative program

STUDY Flag if customer received a technical assessment
0 did not receive technical assessment
1 received technical assessment
2 Unknown if customer received a technical assessment

ROF [computed in participant survey] Flag if customer indicated the equipment was replaced on failure
0 Not replaced on failure
1 Replaced on failure

NC [computed in participant survey] Flag if customer indicated the equipment was part of a new construction project
0 Not new construction
1 New construction

TOTMEAS Total number of measures customer said influential for (1 or 2)

MEASCAT1, MEASCAT2 Customer-specific end-use category (i.e. lighting)

1 (Upstream) Lighting
2 Compressed Air
3 Controls
4 Custom
5 Food Service
6 HVAC
7 HVAC - Distribution
8 HVAC - Plant
9 HVAC Non-unitary
10 Insulation
11 Lighting
12 Non-lighting
13 Other
14 VSD
15 Water Heating
20 (Upstream) Lighting - fixture
21 (Upstream) Lighting – fixture with controls
22 (Upstream) Lighting - LED retrofit kits
23 (Upstream) Lighting - screw-ins
24 (Upstream) Lighting – TLEDs

MEASDESC1, MEASDESC2 [from participant survey sample] Measure descriptions

INC1, INC2 Utility/sponsor incentive for Measure categories

QTY1, QTY2

QTYFLAG1, QTYFLAG2 Flag for quantity greater than 1
0 quantity is not applicable for this measure category (measure count 1 or quantity is not relevant as in delamping, recycling)
1 quantity greater than 1

INTEFF1, INTEFF2 [from participant survey sample] Flag as to whether intermediate efficiencies applies
1 Yes there is intermediate efficiency
2 No intermediate efficiencies available

EFF1, EFF2 [from participant survey sample] Flag for if efficiency applies
0 efficiency is not applicable for this measure category (e.g., insulation, VFD, delamping, occupancy sensors)
1 efficiency is applicable

EQUIP1, EQUIP2 Flag for if rebated equipment is operational
0 if installed measure is not equipment that is operational (e.g., insulation)
1 if installed measure is operational

KWH1, KWH2 Gross kWh savings for first sampled NTG measure, second sampled NTG measure

THERM1, THERM2 Gross therms savings for first sampled NTG measure, second sampled NTG measure

REP

Introduction

INT01 Hello, my name is _____, and I am calling on behalf of **<UTILITY>**. We are talking with some of the design professionals and contractors who were involved with energy efficiency programs offered by **<UTILITY>** Rhode Island in 2019.
I'm not selling anything; I'd just like to ask you about the types of equipment that your firm recommended, sold, or installed through these programs in 2019.

Before we start, I would like to inform you that for quality control purposes, this call will be recorded and monitored.

[IF NEEDED: May I speak with <VEND_CONTACT> or the person who specified or sold equipment through a **<UTILITY>** program?]

FAQ [Read if needed:
(Timing: This survey will take less than 15 minutes of your time. IF NOT A GOOD TIME, SET UP CALL BACK APPOINTMENT OR OFFER TO LET THEM CALL US BACK AT 1-800-454-5070)

(Sales concern: I am not selling anything. Your responses will be kept confidential by our firm and **<UTILITY>**. If you would like to talk with someone from there, you can call [CONTACT NAME AND PHONE NUMBER FOR SPONSORS INCLUDED IN THIS CALL].

MULTCHK [ASK IF MULTFLAG=1]
[INTERVIEWER: Is the first case of a multiple?]

1 Yes, first case of a multiple
2 No, subsequent case of a multiple

Confirmation

C_VNP_SKIP1 [IF INF_VEND1 = 0, SKIP TO C_VNP_SKIP2]

VR_INTRO
I'd like to review the <**MEASCAT1>** [IF TOTMEAS=2 SHOW: "and **<MEASCAT2>**"] project(s) you recommended or specified through the program for **<UTILITY>** Rhode Island.

01 Continue

VR1_1 Do you recall recommending the <**MEASCAT1**> project for **<CUST_COMPANY>** at **<PREMISE_ADDR>** in **<PREMISE_CITY>** through the <**PROGRAM1**> in 2019?

01	Yes, does recall	[SKIP TO V1a_1]
02	No, does not recall	[OTHER_R_1]
03	This equipment was never installed	[SKIP TO C_KNOWLEDG_1]
88	Don't know	[OTHER_R_1]
99	Refused	[OTHER_R_1]

OTHER_R_1 Is there someone else at your firm who would be more familiar with this project?

01	Yes	[RECORD CONTACT INFO FOR CALL NOTES]
02	No	[SKIP TO C_KNOWLEDG_1]
88	Don't know	[SKIP TO C_KNOWLEDG_1]
99	Refused	[INT91 – REFUSAL]

AVAIL_R_1 May I please speak with that person?

01	Yes, currently available	[SKIP TO INT01]
02	Yes, but R is not currently available	[INT15 – CALLBACK]
03	No	[INT91 – REFUSAL]
88	Don’t know	[INT81 – INELIGIBLE]
99	Refused	[INT91 – REFUSAL]

V1a_1 Were you involved in the decision-making process at the design stage when the <**MEASCAT1**> project was specified and agreed upon for this facility?

01	Yes	[SKIP TO C_KNOWLEDG_1]
02	No	
88	Don't know	

V1b_1 At what point in the process did you become involved?

[RECORD RESPONSE VERBATIM]
88 Don’t know
99 Refused

V1c_1 What was your role?

[RECORD RESPONSE VERBATIM]
88 Don’t know
99 Refused

C_KNOWLEDG_1 [SET TO 0 IF VR1_1 = 3 OR OTHER_R_1 = 2, -8 OR V1a_1=2,88 OTHERWISE SET TO 1]

0 Respondent is not valid for Free-ridership section
1 Respondent is valid for Free-ridership section

C_VNP_SKIP2 [IF Inf_Vend2 = 0, SKIP TO NEXT SECTION]

VR1_2 [SKIP TO NEXT SECTION IF TOTMEAS<>2] Do you recall recommending the <**MEASCAT2**> project for **<CUST_COMPANY>** at **<PREMISE_ADDR>** in **<PREMISE_CITY>** through the program in 2019?

01	Yes	[SKIP TO V1a_2]
02	No	
03	This equipment was never installed	[SKIP TO C_KNOWLEDG_2
88	Don't know	
99	Refused	

OTHER_R_2 Is there someone else at your firm who would be more familiar with this project?

01	Yes – Continue	[RECORD CONTACT INFO FOR CALL NOTES]]
02	No	[SKIP TO C_KNOWLEDG_2]
88	Don't know	[SKIP TO C_KNOWLEDG_2]
99	Refused	[INT91 – REFUSAL]

AVAIL_R_2 May I please speak with that person?

01	Yes, currently available	[SKIP TO INT01]
02	Yes, but R is not currently available	[INT15 – CALLBACK]
03	No	[INT91 – REFUSAL]
88	Don’t know	[INT81 – INELIGIBLE]
99	Refused	[INT91 – REFUSAL]

V1a_2 Were you involved in the decision-making process at the design stage when the <**MEASCAT2**> project was specified and agreed upon for this facility?

01	Yes	[SKIP TO C_KNOWLEDGE_2]
02	No	
88	Don't know	

V1b_2 At what point in the process did you become involved?

[RECORD VERBATIM]
88 Don’t know
99 Refused

V1c_2 What was your role?

[RECORD VERBATIM]
88 Don't know
99 Refused

C_KNOWLEDG_2 [SET TO 0 IF VR1_2 = 3 OR OTHER_R_2 = 2, -8 OR V1a_2=2,88 OTHERWISE SET TO 1]

0 Respondent is not valid for Free ridership section
1 Respondent is valid for Free ridership section

Free-Ridership – Influential Vendors

[START OF FREE-RIDERSHIP LOOP. ASK VP0a THROUGH VF9 FOR EACH MEASURE CATEGORY (MEASCAT) RECALLED (UP TO TWO MEASURES).]
*R1 for MEASCAT1, EFF1, INTEFF1, QTYFLAG1, INC1, C_KNOWLEDG_1

*R2 for MEASCAT2, EFF2, INTEFF2, QTYFLAG2, INC2, C_KNOWLEDG_2

C_FR_SKIP0 [SKIP TO NEXT MEASURE IF C_KNOWLEDG =0]

VP0a [IF STUDY<>1 SKIP TO VR9] According to our records, **<UTILITY>** paid a portion of the cost to conduct a technical assessment for **<CUST_COMPANY>** to determine the cost-effectiveness of installing the **<MEASCAT>** equipment.

If **<UTILITY>** had not paid a portion of the cost, do you think **<CUST_COMPANY>** would have paid that portion of the cost to have a similar [IF STUDY=1 SHOW "technical assessment"] done at the same time?

01 Yes
02 No
88 Don't know

VC2 [ASK IF VP0a = 2,88] On a scale of 0 to 10, with 0 being no influence and 10 being a great deal of influence, how much influence did the information provided by the technical assessment have on your decision to recommend the [IF EFF = 1 SHOW "high efficiency"] <MEASCAT> project?

__ (ENTER INFLUENCE RANKING)
88 Don't know
99 Refused

VR9 To the best of your knowledge, did **<CUST_COMPANY>** receive interest-free financing or repayment assistance from **<UTILITY>** which allowed them to pay for their portion of the project cost over time?

01 Yes
02 No
88 Don't know

FR_INTRO3a [READ IF FIRST MEASURE] Now I'd like to ask you some questions about your decision to recommend the <**MEASCAT1**> project. [IF THERE IS ALSO A SECOND MEASURE: Then, I'll repeat these questions for the <**MEASCAT2**> project.]

01 Continue

FR_INTRO3b [READ IF SECOND MEASURE]
Now I'd like to review the <**MEASCAT2**> project you recommended.

01 Continue

VA1 On a scale of 0 to 10, with 0 being no influence and 10 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of the <MEASCAT> project so that it would qualify for **<UTILITY>** assistance?

__ (0-10) [IF VA1 = 0,1,2,3,4,5,6 SKIP TO NEXT MEASURE/SECTION]
88 Don't know [SKIP TO NEXT MEASURE/SECTION]

FR_INTRO The next set of questions ask about **<CUST_COMPANY>**'s planning and installation decisions through the program in 2019.

01 Continue

VP1a As far as you know, did **<CUST_COMPANY>** have funds allocated to install any part of this project <u>before</u> you talked with them about the program?

01	Yes	
02	Yes, but don't remember specifics	[SKIP TO VF1]
03	No	[SKIP TO VF1]
88	Don't know	[SKIP TO VF1]
99	Refused	[SKIP TO VF1]

VP1b What equipment was **<CUST_COMPANY>** planning to install with the allocated funds?

[RECORD VERBATIM]
88 Don't know
99 Refused

VP2a Was it necessary to change the timing of the installation, the quantity of equipment installed or the efficiency level of the <MEASCAT> project installed in order to qualify for the program?

01	Yes	
02	Yes, but don't remember specifics	[SKIP TO VF1]
03	No	[SKIP TO VF1]
88	Don't know	[SKIP TO VF1]
99	Refused	[SKIP TO VF1]

VP2b What changes were necessary? [SELECT ALL THAT APPLY]

01 Installation occurred SOONER than planned
02 Installation occurred LATER than planned
03 Installed MORE equipment than planned
04 Installed LESS equipment than planned
05 Equipment was MORE efficient than planned
06 Equipment was LESS efficient than planned
07 Other [SPECIFY]
88 Don't know
99 Refused

VF1 [SKIP IF customer indicated equipment was for a newly constructed building or replace on failure; SKIP IF ROF = 1 or NC = 1]
[IF INC > 0 SHOW "**<UTILITY>** paid about $<INCENTIVE> of the total cost of the <MEASCAT> project." ELSE IF INC=0 SHOW "**<UTILITY>** paid a portion of the total cost of the <MEASCAT> project."
<CUST_COMPANY> may have also received some technical assistance from **<UTILITY>** or a contribution toward the cost of a technical assessment study.

If **<UTILITY>** had not paid a portion of the project cost, would your company have recommended or specified any type of <MEASCAT> equipment to **<CUST_COMPANY>** at the same time?

01 Yes
02 No
88 Don't know

VF2a [ASK IF QTYFLAG1, QTYFLAG2=1]
Without the program incentive, technical assistance, or education, would your company have recommended or specified the exact same quantity of <MEASCAT> for **<CUST_COMPANY>** at the same time?

01 Yes
02 No
88 Don't know

VF2ab [ASK IF efficiency applies EFF= 1] Without the program incentive, technical assistance, or education, would your company have recommended or specified the exact same efficiency of <MEASCAT> for **<CUST_COMPANY>** at the same time?

01 Yes
02 No
88 Don’t know

VF2b [ASK IF QTYFLAG=1 and if VF2a <> 1] Compared to the amount that you recommended through the program, what percentage of the overall quantity of <MEASCAT> project do you think your company would have recommended or specified without assistance from **<UTILITY>**?

(PROBE: Would you have recommended/specified about one-fourth (25%), one-half (50%), three fourths (75%) of what was installed through the program?)

___ ENTER PERCENTAGE (0-100%)
888 Don't know
[IF 0 SKIP TO VC3]

C_FR_SKIP2 [IF EFF = 0, SKIP TO VRVL1]

C_FR_SKIP3 [IF VF2ab =1, SKIP TO C_FR_SKIP4]

VF3c [ASK IF EFF=1 and if VF2ab <> 1] You said you would have recommended or specified [IF VF2a=1 SHOW "all the" ELSE SHOW "at least some"] <MEASCAT> for **<CUST_COMPANY>** if the assistance from **<UTILITY>** had not been available.

What percent of the equipment that you would have recommended would have been standard efficiency or minimum code?

(PROBE: For example, would about one-fourth (25%), one-half (50%), three-fourths (75%) been of equal efficiency?)

___ (ENTER PERCENTAGE: 0-100%)
888 Don’t know
777 Not applicable

VF3b [SKIP IF INTEFF= 0]
and what percent would have been between standard efficiency and what was installed through the program?

___ (ENTER PERCENTAGE: 0-100%)
888 Don't know
777 Not applicable

C_VEF_SKIP1 [SKIP TO C_FR_SKIP4 IF VF3c OR VF3b = 777 OR 888]

vEFb (between percent) IF VF2ab=1 vEFb=0 ELSE SET EQUAL TO VF3b
vEFc (standard eff percent) IF VF2ab=1 vEFc=0 ELSE SET EQUAL TO VF3c
vEFa (high eff percent) IF VF2ab=1 vEFb=100 ELSE SET EQUAL TO vEFa = 100-vEFb-vEFc]

C_FR_SKIP4 [IF QTYFLAG = 1, SKIP TO VC3]

VF3bc [ASK IF (VF3b <> 0 AND <>888 AND <>777) OR (VF3c <> 0 AND <>888 AND <>777)]
What specific efficiency levels would you have recommended?

[RECORD VERBATIM]
88 Don't know
99 Refused

VF3d [IF EFF = 0, SKIP TO VRVL1]
[IF VF2ab =1, SKIP TO VRVL1]
[IF IntEff = 0, SKIP TO VRVL1]
Thinking about the <MEASCAT> equipment you would have recommended if the **<UTILITY>** assistance had not been available, would it have been of standard efficiency or minimum code; or between standard efficiency and what you installed through the program?

01 Standard efficiency or minimum code
02 Between standard efficiency and what was installed through the program
77 Not applicable
88 Don't know
99 Refused

VF3d2 [ASK IF (VF3d = 1 or 2) OR IF (VF3b <> 0 AND <>777, 888 or VF3c <> 0 and <>777, 888)] What specific efficiency levels would you have recommended?

[RECORD VERBATIM]
88 Don't know
99 Refused

VRVL1 [IF EFF=0 SKIP TO VC3] Thinking about the energy saving project you would have recommended if the **<PA>** assistance had not been available, would you have recommended the same improvements as what was done through the program?

01 Yes [SKIP TO VC3]
02 No
88 Don't know
99 Refused

VRVL2 Compared to what you recommended through the program, how much of the energy saving project would you have recommended?
(PROBE: "Would about one-fourth (25%), one-half (50%), three-fourths (75%) been of equal efficiency?")

___ [1-99%]
888 Don't know
999 Refused

VC3 On a scale of 0 to 10, with 0 being no influence and 10 being a great deal of influence, how much influence did the [IF INC=0 SHOW "rebate that" ELSE SHOW $<INCENTIVE>] **<CUST_COMPANY>** received from **<UTILITY>** have on your decision to recommend the [IF **EFF** = 1 SHOW "high efficiency"] <MEASCAT> project?

__ (ENTER INFLUENCE RANKING)
88 Don't know
99 Refused

VF4 [ASK VF4-VF7 IF (VF1=1 OR ROF=1 OR NC=1) AND (VF2a=1 OR VF2b=100%) AND (VEFA=100% OR VF2AB=1), ELSE SKIP TO VF8]
Now I want to focus on what it would have cost **<CUST_COMPANY>** to install this equipment on its own without the assistance from **<UTILTY>**. On a scale of 0 to 10, with 0 being not at all likely and 10 being very likely, how likely would they have been to pay the additional [IF INC=0 SHOW "cost", ELSE $<INCENTIVE>] on top of the cost they already paid, to implement the same quantity and efficiency of <MEASCAT> equipment at that same time?

__ (0 TO 10)
88 Don't know
99 Refused

VF5 [IF VF4 =8,9,10 SKIP TO VF8] How would their project have changed if the program had not contributed to the cost of the <MEASCAT>?
(SELECT ALL THAT APPLY) (DO NOT READ)

01 Would not have changed [SKIP TO VF8]
02 Would have postponed the project
03 Would have cancelled the project altogether
04 Would have repaired existing equipment
05 Kept using existing equipment
06 Purchased less efficient equipment
07 Purchased fewer quantity
08 Installed DIFFERENT type of equipment than planned (SPECIFY)
09 Other (SPECIFY)
88 Don't know
99 Refused

VF5C02O [ASK IF VF5=2] How many months would you have postponed the project?

__ Specify months 0-75
88 Don't know
99 Refused

VF5C08O [ASK IF VF5=8] Please specify the different type of equipment installed.

VF5C09O [ASK IF VF5=9] Other project change specified.

VF6 [ASK IF VF5=7] Compared to the amount of <MEASCAT> that **<CUST_COMPANY>** implemented through the program, what percent do you think they would have purchased on their own at that same time?

(PROBE: Would you have purchased about one- fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

___ (ENTER PERCENTAGE: 0-99%)
0 [SKIP TO VF8]
888 Don't know
999 Refused

C_FR_SKIP5 [IF QTYFLAG = 0 SKIP TO VF8]

VF7c [ASK IF VF5=6 ELSE SKIP TO VF8] Thinking about the equipment **<CUST_COMPANY>** would have implemented on their own, what percent of this equipment would have been standard efficiency or minimum code?

(PROBE: For example, would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

___ (ENTER PERCENTAGE: 0-100%)
888 Don't know
777 Not applicable

VF7b [IF IntEff = 0, SKIP TO VF8]
and what percent would have been between standard efficiency and what was installed through the program?

___ (ENTER PERCENTAGE: 0-100%)
888 Don't know
777 Not applicable

C_CVEF_SKIP1 [SKIP TO VF8 IF VF7c OR VF7b = 777 OR 888]

cvEFb (between percent) SET EQUAL TO VF7b
cvEFc (standard eff percent) SET EQUAL TO VF7c
cvEFa (high eff percent) SET EQUAL TO 100-cvEFb-cvEFc]

VF7bc [ASK IF VF7b <>0,777,888 OR VF7c <>0,777,888] What specific efficiency levels would they have likely installed?

[RECORD VERBATIM]
88 Don't know
99 Refused

VF8 On a scale of 0 to 10, with 0 being 'not at all important and 10 being 'very important', how important was your previous experience with a **<UTILITY>** program when making the decision to recommend or install the <MEASCAT> project for this customer?

__ Record importance [0-10]
77 NA – No previous program experience
88 Don't know
99 Refused

VF9 (IF VF1=1 AND VF2a=1 AND (VF3a=100% or VF3d = 1) AND VF5 = 1 AND VC3 > 6 SHOW: “Previously you stated that you would have recommended the exact same equipment at the same time without the assistance from **<PA>**. But, you also stated that the **<PA>** incentive was influential in your decision to make the recommendations that you did.")

(IF VF1 = 2 OR -8 AND VC3 = 4,3,2,1,0 SHOW: “Previously you stated that **<CUST_COMPANY>** would not have installed any equipment without the assistance from **<PA>**. You also stated that the **<PA>** incentive was not influential in their decision.")

I’d like to better understand **<CUST_COMPANY>**’s purchase decision. Please describe what impact, if any, the **<UTILITY>** assistance had on **<CUST_COMPANY>**’s decision to install the energy efficient <MEASCAT> equipment at the time they did?

[RECORD VERBATIM]
88 Don’t know
99 Refused

[END FREE-RIDERSHIP LOOP]

Vendor Nonparticipant Questions

C_MULT_SKIP [SKIP TO END IF MULTCHK=2]

[SKIP TO NEXT SECTION IF NONE OF THE MEx VARIABLES =1]

VNP_INTRO This first set of questions ask about all the types of equipment that your firm recommended, sold, or installed through **<UTILITY>**'s commercial programs in 2019.

01 Continue

[START OF NONPARTICIPANT LOOP. ASK VNP1a THROUGH VNP8 FOR EACH MEASURE SOLD (ME01, ME02, ME03… UP TO ME24 OR 20 MEASURES).]

MEx [SET TO LOOP NUMBER]

01 energy efficient lighting equipment
02 compressed air equipment
03 energy efficiency controls
04 custom projects
05 energy efficient food service equipment
06 energy efficient heating or cooling equipment
07 energy efficient heating or cooling equipment (Distribution)
08 energy efficient heating or cooling equipment (Plant)
09 energy efficient heating or cooling equipment (Non-unitary)
10 high efficiency rated insulation
11 energy efficient lighting
12 energy efficient non-lighting equipment
13 custom projects (Other)
14 variable speed drives
15 water heating equipment
16 energy efficient lighting (Upstream – fixture)
17 energy efficient lighting (Upstream – fixture with controls)
18 energy efficient lighting (Upstream - LED retrofit kits)
19 energy efficient lighting (Upstream - screw-ins)
20 energy efficient lighting (Upstream – TLEDs)

VNP1a Our records show that your firm specified, sold, and/or installed <**MEx**> to commercial and industrial customers in 2019 through the <**UTILITY**> offerings.

Is that correct?

01 Yes
02 No [SKIP TO NEXT CATEGORY]
88 Don't know [SKIP TO NEXT CATEGORY]
99 Refused [SKIP TO NEXT CATEGORY]

VNP1b Prior to participating in the **<UTILITY>** program, in what percentage of your commercial projects did you install <**MEx**>?

___	[ENTER PERCENTAGE 0-100]
888	Don't know
999	Refused

VNP1c And during the past year, in what percentage of your commercial projects did you install <**MEx**>?

___	[ENTER PERCENTAGE 1-100]
888	Don't know
999	Refused

VNP2 Please think about all the program-eligible <**MEx**> you specified, sold, and/or installed for **<UTILITY>** customers in 2019.

Did you specify, sell and/or install any of this program-eligible <**MEx**> to customers of **<UTILITY>** <u>without</u> the customer receiving assistance from **<UTILITY>**?

01	Yes	
02	No	[SKIP TO NEXT CATEGORY]
88	Don't know	[SKIP TO NEXT CATEGORY]
99	Refused	[SKIP TO NEXT CATEGORY]

VNP3 Again, thinking about all the program-eligible <**MEx**> you specified, sold, and/or installed for **<UTILITY>** customers in 2019, what percent did <u>not</u> receive an incentive through **<UTILITY>**?

___	[ENTER PERCENTAGE 0-100]	
0		[SKIP TO NEXT CATEGORY]
888	Don't know	[SKIP TO NEXT CATEGORY]
999	Refused	[SKIP TO NEXT CATEGORY]

VNP4 In 2019, you mentioned that about <VNP3> of the <**MEx**> you specified and/or installed would have been eligible for an incentive through **<UTILITY>**, but did not receive an incentive.

What are the main reasons why your firm or the customer did not request a customer incentive for this energy saving equipment you specified/installed?
(DO NOT READ—SELECT ALL THAT APPLY; PROBE, WHAT ELSE?)

01 Not worth the paperwork for our firm to help the customer apply for the incentive
02 Customer did not want the hassle of applying for the incentive
03 Takes too long for approval
04 Reached the maximum amount I could install through the program
05 The equipment would not qualify
06 Vendor does not participate in program
07 Outside <UTILITY> service territory
08 No time – needed equipment immediately
09 Thought the program ended
10 Didn't know the equipment qualified under another program
11 Just didn't think of it
12 Unable to get rebate (unsure why)
13 Other (SPECIFY)
88 Don't know
99 Refused

VNP4C05O [ASK IF VNP4C05=1] Why did the equipment not qualify?

[RECORD VERBATIM]

VNP5 I'm going to read you 3 statements. For each statement, please tell me whether you agree or disagree that this statement applies to your company. There are no right or wrong answers; we just want your honest opinion.

"Our past experience specifying or installing <**MEx**> through energy efficiency programs and offerings has convinced us that this equipment is cost effective or beneficial even without a program incentive."

0 Agree
1 Disagree

VNP6 "We are better able to identify opportunities to improve energy efficiency by using high efficiency <**MEx**> because of our previous experience with the performance of energy efficient equipment installed through energy efficiency programs and offerings, and what we learned through working with **<UTILITY>**."

0 Agree
1 Disagree

VNP7 "We are more likely to discuss energy efficient options with all of our customers when developing project plans for <**MEx**> because of our previous experience with the performance of energy efficient equipment installed through energy efficiency programs and offerings, and what we learned through working with **<UTILITY>**."

0 Agree
1 Disagree

VNP8 Please describe what impact, if any, the <**UTILTY**> offerings had on your decision to specify or install <**MEx**> outside of the <**UTILITY**> programs and offerings.

[PROBE IF NECESSARY: "Can you please elaborate on that?", "What do you mean by...", "Anything else?"]

[RECORD VERBATIM]

[END OF NONPARTICIPANT LOOP]

Closing

VRNAME Thank you for your participation. For verification purposes, would you spell your first and last name for me?

[RECORD VERBATIM]
99 Refused

COM Do you have any comments or suggestions for the program?

01 Yes (RECORD RESPONSE VERBATIM)
02 No

COMO [ASK IF COM=1] Respondent comments.

INT99 [SKIP IF MULTCHK=2] Those are all the questions I have for you. I'd like to thank you for your time with this important evaluation.

CP Completed

INT98 Those are all the questions I have for you. I'd like to thank you for your time with this important evaluation.

CM Completed

C.3 UPSTREAM LIGHTING DISTRIBUTOR SURVEY

Distributor Name: <Final_Vendor_Name>
Distributor Phone: <Final_Vendor_Phone>

I1 Hi, my name is _____ and I am calling from Tetra Tech on behalf of National Grid regarding the Rhode Island Upstream Lighting initiative, also known as Bright Opportunities. Bright Opportunities provides buydowns to distributors for LED lamps and fixtures, including retrofit kits.

According to our records, your company has been selling lighting products as part of Bright Opportunities initiative. **[If needed, name some recent projects that used the program discounts].** We would like to ask you some questions about your participation in this program. Who would be most familiar with your participation?

[If respondent is not familiar with the program, ask for someone who may be familiar and repeat I1.]

[IF NEEDED] The objective of this interview is to help us understand if or how the Bright Opportunities initiative impacts the types of lighting you sell.

[IF ASKED] We anticipate this interview will take about 15 minutes. Any information you provide will be treated as confidential.

[IF ASKED] Tetra Tech is an independent research firm hired to do this study. You can verify the legitimacy of this research by calling Michael Strom of National Grid at 781-675-0319.

Caseid: <V_ID> **Distributor Name**: <Final_Vendor_Name>

Customer: <CustomerName>
<CustomerContact>
<SVC_Street> <SVC_City>, <SVC_State> <SVC_Zip>

[For Distributors who made sales to multiple customers, customers were randomly selected. Distributors who had more than 3 customers are only asked about 3 randomly selected customers]

PI0 According to our records you sold some lighting products that were discounted by the Bright Opportunities initiative to <CustomerName> in 2019. Do you recall this sale? **[If they do not recall sale, skip to the next customer. If they do not recall any sales, SKIP TO PI1]**

PI1 According to our records you sold the following lighting products to <CustomerName> in 2019. **[READ LIST]**

Table 37. Customer-Specific Quantity

	Type	Quantity from Tracking Data A.	Revisions to quantities? B.
70	1x4 LED Troffer -Premium		
71	1x4 LED Troffer Retrofit Kit - Premium		
72	1x4 LED Troffer Retrofit Kit - Standard		
73	1x4 LED Troffer -Standard		
74	1x4 LED Troffer w/Control -Premium		
75	2x2 LED Troffer -Premium		
76	2x2 LED Troffer Retrofit Kit - Premium		
77	2x2 LED Troffer Retrofit Kit - Standard		
78	2x2 LED Troffer -Standard		
79	2x2 LED Troffer w/Control -Premium		
80	2x2 LED Troffer w/Control -Standard		
81	2x4 LED Troffer -Premium		
82	2x4 LED Troffer Retrofit Kit - Premium		
83	2x4 LED Troffer Retrofit Kit - Standard		
84	2x4 LED Troffer -Standard		
85	2x4 LED Troffer w/Control -Standard		
86	A-line, 40/60W		
87	A-line, 75/100W		
88	Decoratives		
89	Exterior LED >= 200W		
90	Exterior LED 100-199W		
91	Exterior LED 20-99W		

	Type	Quantity from Tracking Data A.	Revisions to quantities? B.
92	G23 LED		
93	G24 LED		
94	High/Low Bay >= 200W		
95	High/Low Bay 100-199W		
96	High/Low Bay 20-99W		
97	High/Low Bay LED, 100-199W w/controls		
98	High/Low Bay LED, 20-99W w/controls		
99	LED Retrofit Kit, <25W		
100	LED Retrofit Kit, >25W		
101	LED Strip/Wrap		
102	LED Tubes, 3ft Type A		
103	Mogul Exterior 175W equivalent		
104	Mogul Exterior 250W equivalent		
105	Mogul Exterior 400W equivalent		
106	Mogul Interior High Bay		
107	MR16		
108	PAR20		
109	PAR30		
110	PAR38		
111	Parking Garage & Canopy, 100-199W - Standard		
112	Parking Garage & Canopy, 20-99W - Premium		
113	Parking Garage & Canopy, 20-99W - Standard		
114	Stairwell Kit, Low-Output w/sensor		
115	Stairwell Kit, Mid-Output w/sensor		
116	T5 LED		
117	TLED, 2ft		
118	TLED, 4ft		
119	U-Bend LED		

PI2 Do these sales quantities sound about right to you?

1 Yes
2 No, **[make note of any difference in column B above]**

Caseid: <V_ID> **Distributor Name**: <Final_Vendor_Name>

PI3 According to our records you sold the <A: TYPE> bulbs/lamps at a <B: PROMOTIONAL PRICE> which was <C: BUYDOWN AMOUNT> less than your normal retail price for a discount of <D: DISCOUNT> percent. If this discount had not been available, do you think you would have sold any of these types of bulbs/lamps to this customer in 2019?

PI4 **[IF RESPONSE TO PI3 <> "NO"]** If this discount of <DISCOUNT> percent had not been available, would your sales of these <TYPE> bulbs/lamps to <CustomerName> been the same, lower, or higher?

PI4A **[IF SAME OR HIGHER]** Why do you say this?

P14B **[IF LOWER]** By what percentage do you estimate your sales of these <TYPE> bulbs/lamps to <CustomerName> to be lower in absence of the discount?

[REPEAT PI3 AND PI4 FOR EACH LIGHTING TYPE LISTED IN THE TABLE BELOW]

Table 38. Customer-Specific Discount

	Type	Retail Price per Bulb/ Lamp ($) A.	Promo Price per Bulb/Lamp ($) B.	Buydown Amount ($) C.	Discount (%) D.	Sold Any? (Y/ N/ DK) PI3	Impact on sales? (Same/ Higher/ Lower) PI4	% Change in Sales in Absence of Discounts (%) PI4b
70	1x4 LED Troffer - Premium							
71	1x4 LED Troffer Retrofit Kit -Premium							
72	1x4 LED Troffer Retrofit Kit -Standard							
73	1x4 LED Troffer - Standard							
74	1x4 LED Troffer w/Control -Premium							
75	2x2 LED Troffer - Premium							
76	2x2 LED Troffer Retrofit Kit -Premium							
77	2x2 LED Troffer Retrofit Kit -Standard							
78	2x2 LED Troffer - Standard							
79	2x2 LED Troffer w/Control -Premium							
80	2x2 LED Troffer w/Control -Standard							
81	2x4 LED Troffer - Premium							
82	2x4 LED Troffer Retrofit Kit -Premium							

	Type	Retail Price per Bulb/ Lamp ($) A.	Promo Price per Bulb/Lamp ($) B.	Buydown Amount ($) C.	Discount (%) D.	Sold Any? (Y/ N/ DK) PI3	Impact on sales? (Same/ Higher/ Lower) PI4	% Change in Sales in Absence of Discounts (%) PI4b
83	2x4 LED Troffer Retrofit Kit -Standard							
84	2x4 LED Troffer - Standard							
85	2x4 LED Troffer w/Control -Standard							
86	A-line, 40/60W							
87	A-line, 75/100W							
88	Decoratives							
89	Exterior LED >= 200W							
90	Exterior LED 100-199W							
91	Exterior LED 20-99W							
92	G23 LED							
93	G24 LED							
94	High/Low Bay >= 200W							
95	High/Low Bay 100-199W							
96	High/Low Bay 20-99W							
97	High/Low Bay LED, 100-199W w/controls							
98	High/Low Bay LED, 20-99W w/controls							
99	LED Retrofit Kit, <25W							
100	LED Retrofit Kit, >25W							
101	LED Strip/Wrap							
102	LED Tubes, 3ft Type A							
103	Mogul Exterior 175W equivalent							
104	Mogul Exterior 250W equivalent							
105	Mogul Exterior 400W equivalent							
106	Mogul Interior High Bay							
107	MR16							
108	PAR20							
109	PAR30							
110	PAR38							

	Type	Retail Price per Bulb/ Lamp ($) A.	Promo Price per Bulb/Lamp ($) B.	Buydown Amount ($) C.	Discount (%) D.	Sold Any? (Y/ N/ DK) PI3	Impact on sales? (Same/ Higher/ Lower) PI4	% Change in Sales in Absence of Discounts (%) PI4b
111	Parking Garage & Canopy, 100-199W - Standard							
112	Parking Garage & Canopy, 20-99W - Premium							
113	Parking Garage & Canopy, 20-99W - Standard							
114	Stairwell Kit, Low-Output w/sensor							
115	Stairwell Kit, Mid-Output w/sensor							
116	T5 LED							
117	TLED, 2ft							
118	TLED, 4ft							
119	U-Bend LED							

APPENDIX D: RESPONSE RATE AND PROGRAM SAVINGS COVERAGE

D.1 DETAILED RESPONSE RATE

Table 39. Response Rate by Program

	Bright Opportunities	Large Commercial and Industrial New Construction (gas)	Large Commercial Retrofit (gas)	Small Business Direct Install	Large Commercial and Industrial New Construction (electric)	Large Commercial Retrofit (electric)	Overall
Sample	**1,149**	**338**	**107**	**541**	**201**	**356**	**2,692**
Residential line	4	9	0	4	0	0	17
Adjusted sample	**1,145**	**329**	**107**	**537**	**201**	**356**	**2,675**
Does not recall participating	75	36	4	20	7	15	157
Respondent can only be reached by email	16	8	2	10	6	2	44
Ineligible - vendor / contractor	15	2	0	2	0	1	20
Refusal	60	25	5	42	35	5	172
Incompletes (partial surveys)	6	2	0	3	0	1	12
Language Barrier	1	12	0	2	2	0	17
Bad Number	32	29	2	16	6	6	91
Attempted by not completed	814	158	83	328	119	273	1,775
Completed	126	57	11	114	26	53	387
Response Rate							
Response Rate (Completed / Adjusted Sample)	**11.0%**	**17.3%**	**10.3%**	**21.2%**	**12.9%**	**14.9%**	**14.5%**

D.2 DETAILED SAVINGS COVERAGE

Table 40. Detailed Savings Coverage by Program – Electric

Program Pathway	Program	Measure Type	Sampled Measures	Population of Measures	Population kWh Savings	kWh Savings from the completed surveys	Percent of kWh Savings Sampled*	Expected Completed Measures from Survey **	Completed Measures from Survey	+/- 90% Confidence Interval at Measure Level ***
Custom	Large Commercial and Industrial New Construction	Custom	76	76	11,253,874	962,134	9%	27	9	NA
		Total	**76**	**76**	**11,253,874**	**962,134**	**9%**	**27**	**9**	**NA**
	Large Commercial Retrofit	Custom	130	130	26,066,973	1,155,436	4%	46	16	NA
		Total	**130**	**130**	**26,066,973**	**1,155,436**	**4%**	**46**	**16**	**NA**
	Total		**206**	**206**	**37,320,847**	**2,117,570**	**6%**	**72**	**25**	**NA**
Prescriptive	Bright Opportunities	Lighting - fixture, fixture with controls, LED retrofit kits	228	2,642	16,909,798	1,064,755	6%	80	91	5.1%
		Lighting - screw-ins	96	711	6,389,077	500,453	8%	34	34	8.3%
		Lighting - TLEDs	97	791	4,672,299	365,867	8%	34	28	9.2%
		Total	**421**	**4,144**	**27,971,174**	**1,931,075**	**7%**	**147**	**153**	**3.9%**
	Large Commercial and Industrial New Construction	Compressed Air	21	22	358,959	56,112	16%	7	6	NA
		Food service	60	60	503,856	12,598	3%	21	6	NA
		HVAC Non-unitary	5	5	328,220	60,026	18%	2	1	NA
		Lighting	45	46	3,657,323	826,373	23%	16	4	NA
		Other	2	2	820	-	0%	1	0	NA
		VSD	5	5	173,930	41,197	24%	2	1	NA
		Total	**138**	**140**	**5,023,108**	**996,305**	**20%**	**48**	**18**	**NA**
	Large Commercial Retrofit	Custom	3	3	1,200,115	-	0%	1	0	NA
		HVAC	18	18	800,818	135,542	17%	6	1	NA
		Lighting	100	311	29,793,677	2,473,180	8%	35	35	7.9%

Program Pathway	Program	Measure Type	Sampled Measures	Population of Measures	Population kWh Savings	kWh Savings from the completed surveys	Percent of kWh Savings Sampled*	Expected Completed Measures from Survey **	Completed Measures from Survey	+/- 90% Confidence Interval at Measure Level ***
		VSD	28	29	2,652,783	174,663	7%	10	5	NA
		Total	**149**	**361**	**34,447,393**	**2,783,385**	**8%**	**52**	**41**	**7.3%**
	Small Business Direct Install	Lighting	100	640	10,206,033	945,613	9%	35	71	5.5%
		Non-lighting	265	339	1,978,580	256,112	13%	93	42	7.1%
		Total	**365**	**979**	**12,184,614**	**1,201,725**	**10%**	**128**	**113**	**4.4%**
	Total		**1,073**	**5,624**	**79,626,289**	**6,912,490**	**9%**	**376**	**325**	**2.7%**
Total Electric			**1,279**	**5,830**	**116,947,136**	**9,030,060**	**8%**	**448**	**350**	**2.6%**

*Sampled kWh savings divided by the population of kWh savings.

** Assumes a 35 percent response rate of sampled measures.

*** When a census of the population is sampled, confidence intervals cannot be estimated.

Table 41. Detailed Savings Coverage by Program - Gas

Program Pathway	Program	Measure Type	Population of Measures	Sampled Measures	Population Therm Savings	Therm Savings from the completed surveys	Percent of Therm Savings Completed*	Expected Completed Measures from Survey **	Completed Measures from Survey	+/- 90% Confidence Interval at Measure Level ***
Custom	Large Commercial and Industrial New Construction – Custom	Controls	9	9	34,546	-	0.0%	3	0	NA
		Food service	3	3	12,017	9,546	79.4%	1	1	NA
		HVAC	3	3	21,267	20,754	97.6%	1	2	NA
		HVAC – Distribution	3	3	72,497	-	0.0%	1	0	NA
		HVAC – Plant	3	3	21,737	-	0.0%	1	0	NA
		Insulation	4	4	33,175	10,032	30.2%	1	1	NA
		Other	10	10	82,333	15,409	18.7%	4	2	NA
		Water heating	1	1	3,640	-	0.0%	0	0	NA
		Total	**36**	**36**	**281,212**	**55,741**	**19.8%**	**13**	**6**	**NA**
	Large Commercial Retrofit – Custom	Controls	36	35	227,664	4,592	2.0%	12	2	NA
		HVAC	40	40	481,331	29,295	6.1%	14	5	NA
		HVAC – Distribution	5	4	35,632	-	0.0%	1	0	NA
		HVAC – Plant	4	3	48,005	-	0.0%	1	0	NA
		Insulation	15	13	125,199	51,126	40.8%	5	5	NA
		Other	16	12	662,531	6,564	1.0%	4	1	NA
		Water heating	6	5	27,611	6,495	23.5%	2	2	NA
		Total	**122**	**112**	**1,607,973**	**98,073**	**6.1%**	**39**	**15**	**NA**
	Small Business Direct Install	Controls	4	4	418	-	0.0%	1	0	NA
		Custom	14	14	2,091	105	5.0%	5	1	NA
		Insulation	1	1	105	-	0.0%	0	0	NA
		Other	11	11	1,285	105	8.1%	4	1	NA
		Water heating	10	10	1,516	-	0.0%	4	0	NA
		Total	**40**	**40**	**5,415**	**209**	**3.9%**	**14**	**2**	**NA**
	Total		**198**	**188**	**1,894,601**	**154,023**	**8.1%**	**52**	**23**	**NA**

Program Pathway	Program	Measure Type	Population of Measures	Sampled Measures	Population Therm Savings	Therm Savings from the completed surveys	Percent of Therm Savings Completed*	Expected Completed Measures from Survey **	Completed Measures from Survey	+/- 90% Confidence Interval at Measure Level ***
Prescriptive	Large Commercial and Industrial New Construction - Prescriptive	Food service	172	172	120,223	22,329	18.6%	60	38	NA
		HVAC	5	5	7,469	3,072	41.1%	2	5	NA
		HVAC - Plant	27	27	18,045	-	0.0%	9	0	NA
		Other	1	1	4,300	4,300	100.0%	0	1	NA
		Water heating	116	115	47,213	3,076	6.5%	40	5	NA
		Total	**321**	**320**	**197,251**	**32,777**	**16.6%**	**112**	**49**	**NA**
	Large Commercial Retrofit - Prescriptive	Controls	10	10	2,122	-	0.0%	4	0	NA
		Other	1	1	6,669	-	0.0%	0	0	NA
		Water heating	4	4	1,374	-	0.0%	1	0	NA
		Total	**15**	**15**	**10,165**	**-**	**0.0%**	**5**	**0**	**NA**
	Small Business Direct Install	Controls	26	26	3,480	1,296	37.2%	9	9	NA
		Insulation	3	3	2,345	1,810	77.2%	1	1	NA
		Water heating	62	62	18,139	1,564	8.6%	22	6	NA
		Total	**91**	**91**	**23,963**	**4,669**	**19.5%**	**32**	**16**	**NA**
	Total		**427**	**426**	**231,379**	**37,446**	**16.2%**	**149**	**65**	**NA**
Total Gas			**625**	**614**	**2,125,979**	**191,470**	**9.0%**	**215**	**88**	**NA**

*Surveyed therm/kWh savings divided by the population therm/kWh saving

** When a census of the population is sampled, confidence intervals cannot be estimated.

APPENDIX E: DESIGN PROFESSIONAL AND VENDOR SPILLOVER CALCULATION

As an example, assume a vendor had 1,000 kwh savings in the program tracking system database attributable to lighting equipment. If that vendor said that 25 percent of all their energy efficiency lighting equipment were sold outside the program, the potential nonparticipant spillover savings would be (1,000 kwh * 0.25/(1–0.25) = 333 kwh). If this vendor was assigned a nonparticipant spillover rate of 100 percent for lighting equipment, the nonparticipant spillover kwh savings for that vendor was 333 kwh. If that same vendor was assigned a nonparticipant spillover rate of only 50 percent for lighting equipment, the nonparticipant spillover kwh savings for that vendor was 333 * 0.5 = 167 kwh. This type of calculation was made for each design professional and equipment vendor (by measure category) who had a nonparticipant spillover rate of more than 0 percent.

Table 42. Nonparticipant HVAC Spillover Rate Calculation

% Sold Outside Program (A)	Savings from program tracking system database (B)	Assigned Spillover Rate (C)
25%	1,000	50%

Potential nonparticipant spillover savings = B * A/(1—A)

= 1,000 kwh *0.25/(1–0.25)

= 333 kwh

Nonparticipant spillover savings = potential savings * C

= 333 * 0.5

= 167 kwh

APPENDIX F: SCORING FLOWCHARTS

Figure 2. Event Type Identification Algorithm

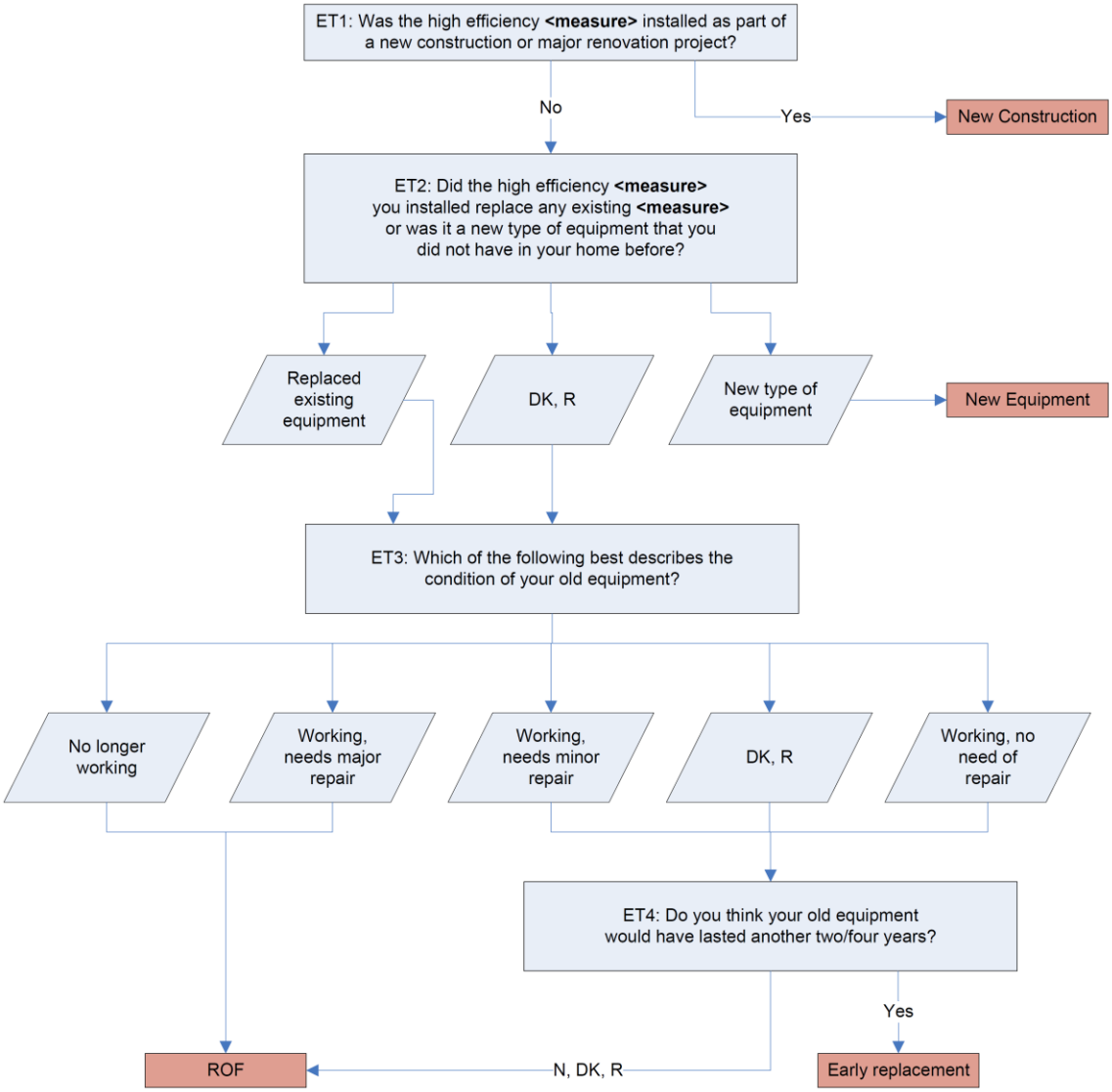

Figure 3. Free-Ridership Scoring Algorithm

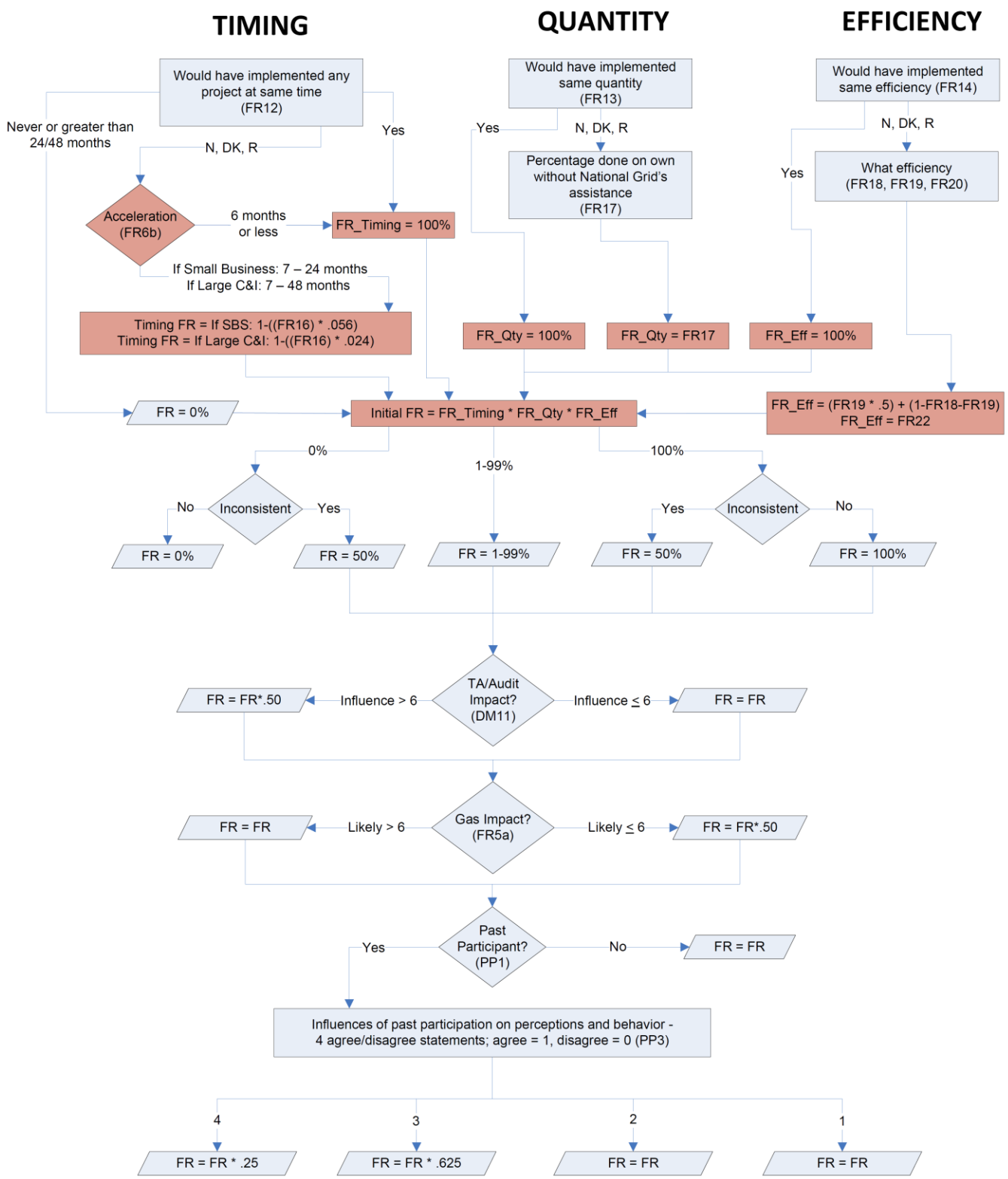

Figure 4. Free-Ridership Consistency Checks

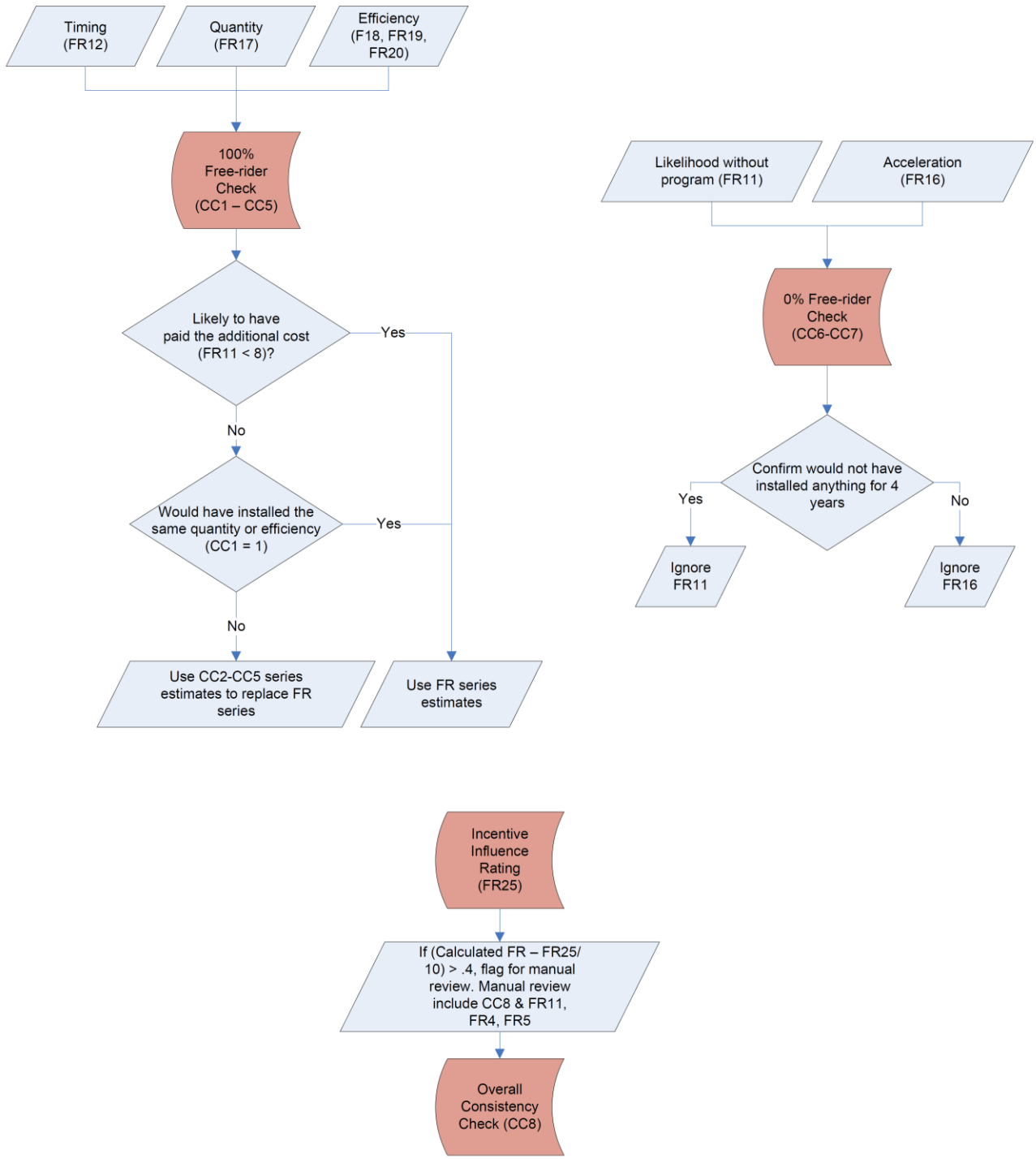

Figure 5. Vendor Trigger for Free-Ridership Survey

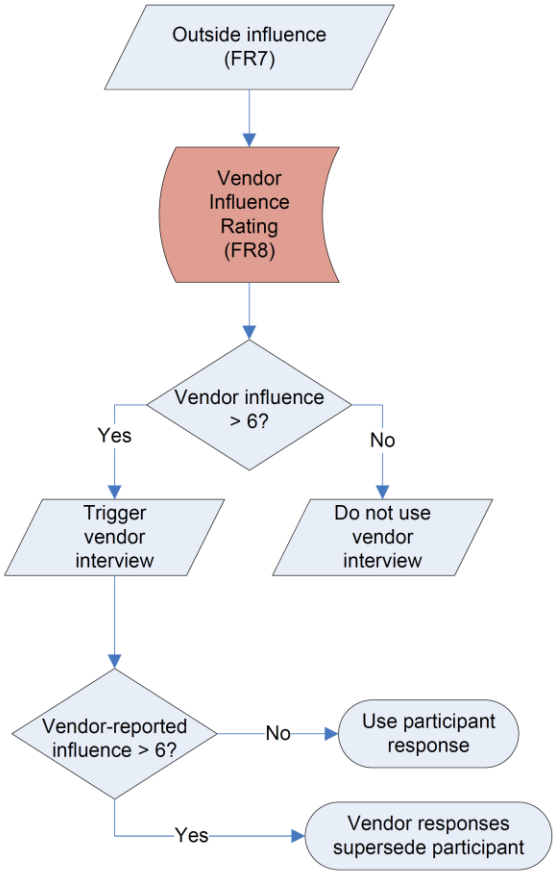
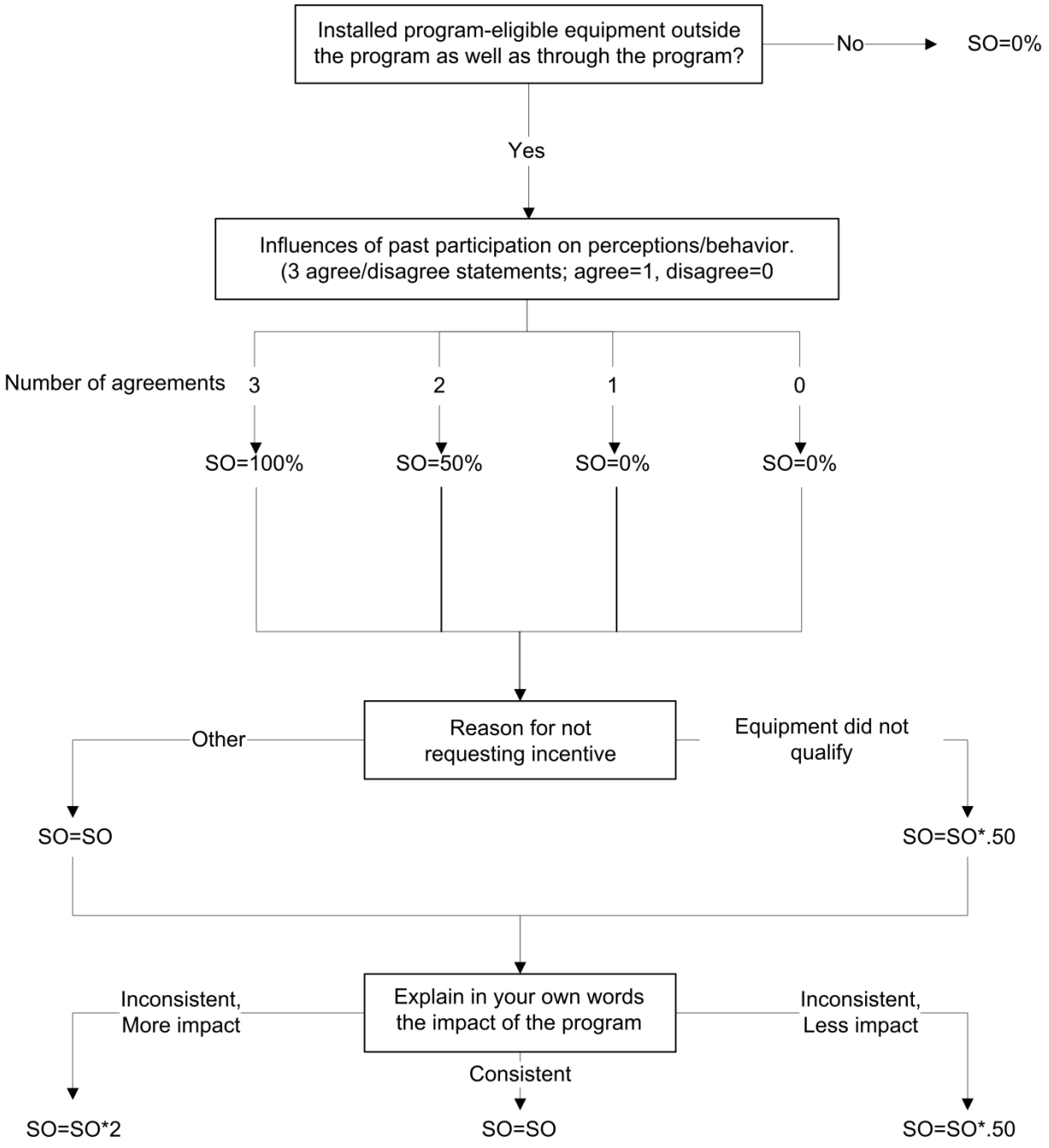
Figure 6. Nonparticipant Spillover Scoring