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Connecticut Energy Efficiency Fund

2011 Commercial and Industrial Electric and Natural Gas Programs Free-ridership and Spillover Study

October 5, 2012

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Prepared for: Connecticut Energy Efficiency Fund

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1. EXECUTIVE SUMMARY

This executive summary summarizes the findings of the Free-ridership and Spillover Study conducted for the Connecticut Energy Efficiency Board (EEB) for Connecticut Light & Power's (CL&P) and United Illuminating's (UI) 2011 Commercial and Industrial (C&I) electric and natural gas programs.

1.1 STUDY OBJECTIVES

The EEB manages and directs all evaluation activities and advises and assists the utility distribution companies in the development and implementation of comprehensive and cost-effective energy conservation and market transformation plans. The EEB is made up of representatives of CL&P and United Illuminating (the Companies), environmental organizations, organizations representing the interests of residential, commercial, industrial and limited-income customer groups, and the Attorney General Office.

Per the EEB, the primary objective of the 2011 program year Free-ridership and Spillover Study was to assist the Connecticut Energy Efficiency Fund in quantifying the net impacts of their commercial and industrial electric and natural gas energy efficiency programs by estimating the extent of:

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

The programs evaluated for the Companies include the Energy Conscious Blueprint, Energy Opportunities, and Small Business Energy Advantage programs.

This executive summary first provides a summary of the study methodology for estimating free-ridership and spillover, and the data collection conducted to support that estimation. It also includes free-ridership estimates, participant spillover estimates, and nonparticipant spillover estimates at a statewide level by program and measure type. Detailed results by Company by program, detailed results at the measure level by program, and early indicators of participant "unlike" spillover are included the full report.

1.2 STUDY METHODOLOGY

This study used a tested, standardized net-to-gross (NTG) self-report approach (SRA) battery developed and implemented by the evaluation team for the Massachusetts Program Administrators[1] for use in situations where end-users are able to report on program impacts via self-report methods. The SRA involves asking one or more key decision makers a series of closed and open-ended questions about their motivations for installing the program-eligible equipment, about what they would have done in the absence of the program incentive and other services, as well as questions that attempt to rule out rival explanations for the installation. The

[1] *Cross-Cutting C&I Free-Ridership and Spillover Methodology Study Final Report,* prepared for the Massachusetts Program Administrators by Tetra Tech, KEMA, and NMR, May 20, 2011.

SRA approach included not only interviews with end-use customers but also vendors who were influential in the decision to participate in the program.

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[2] 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 equipment 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 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.

For programs that offer monetary incentives for multiple measure categories (E.g., lighting, HVAC), it is important to estimate free-ridership by specific measure type. Category-specific estimates produce feedback on the program at the level at which it actually operates and allows for cost-effectiveness testing by measure category. 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 installations within that measure type—the fewer installations, the less reliable the estimate.

1.2.2 Participant spillover methodology

Free-ridership is only one element of the NTG factor. To gain a full net-savings picture, Tetra Tech needed to also capture participant spillover through the SRA survey. Spillover refers to additional energy-efficient equipment 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 equipment through the program, and then installed additional equipment of the same type due to program influences. Participant "unlike" spillover is where the customer installs other program-eligible energy-efficient equipment than what they installed through the program, but are influenced by the program to do so.

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 2011) of any additional energy-efficient equipment that were made without any additional technical or financial assistance from the Companies. Surveying customers not long after

[2] 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.

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 of their participation in a Company program. These early "unlike" spillover estimates are included in the full report.

a. 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 positive experience with the program.

One of the issues with attempting to quantify spillover savings is how to value the savings of equipment 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 the equipment installed outside the program that were of exactly the same type and efficiency as the ones installed through the program. This conservative approach allows customers (and the evaluator) to be more certain about whether the equipment they installed outside the program was the same type as the program equipment. This, in turn, makes it possible for the evaluator to use the estimated program savings for that measure type to calculate the customer's "like" spillover savings. Program-eligible equipment that was installed by the participant but was not of the same type as what was installed through the program is excluded from "like" spillover estimates. These measures would be included in any "unlike" spillover analysis (see discussion below).

b. 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. Unlike-spillover has a number of limitations including the fact that it is difficult via telephone surveys to verify that the equipment installed is actually program-qualifying or high efficiency. Given the difficulties in estimating savings for these installations, we present only indicators of "unlike" spillover and not savings estimates.

1.2.3 Nonparticipant spillover methodology

Free-drivers, or nonparticipant spillover, refers to energy-efficient equipment 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 may have induced nonparticipants to implement energy-efficient equipment. Nonparticipant "like" spillover refers to additional equipment of the same type as offered through the program that is adopted due to the program's influence.

The data for this type of analysis could be collected from nonparticipants directly or from the design professionals and vendors who recommended, sold, and/or installed qualifying high efficiency equipment. Based on our experience, Tetra Tech prefers to survey the design professionals and/or vendors because they can typically provide much more accurate information about the efficiency level of installed equipment than nonparticipating customers can. Our experience has shown that customers cannot provide enough data about the new equipment they have installed to allow for accurate determinations 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 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 determine nonparticipant spillover is that Tetra Tech can use data in the program tracking system database to attach kWh or ccf savings to nonparticipant spillover.

To determine nonparticipant spillover, design professionals and equipment vendors were asked (by measure type they installed through the program in 2011) what percent of their sales were program-eligible and what percent 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.

It is important to note that nonparticipant spillover was analyzed at statewide level 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), there was only a small amount of nonparticipant spillover savings found.

1.3 DATA COLLECTION

To accomplish the study's objective, telephone surveys were conducted with 2011 program participants in each of the C&I electric and natural gas programs and with design professionals and equipment vendors involved in these 2011 installations. The program participant sample consisted of unique accounts[3], 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 the purposes of this study, a customer or participant is defined as a unique account[4].

The majority of the telephone interviews were completed with program participants between May 7 and June 27, 2012. The duration of interviews with program participants averaged 16 minutes. All participating customers were mailed a letter on Company letterhead prior to the first telephone attempt. This letter explained the purpose of the call, informed customers that someone from Tetra Tech would be calling them in the next couple of weeks to ask them some questions about their experiences with the programs, and thanked them for their cooperation in advance. This letter and repeated call attempts (an average of over 10 call attempts was made to reach sampled customers during the calling period) resulted in an overall cooperation rate of 55 percent.

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

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

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. Surveys were completed with 49 influential vendors.

- 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. Results incorporate the 46 surveys completed with vendors.

1.4 STATEWIDE RESULTS BY PROGRAM AND MEASURE TYPE

This section summarizes the statewide free-ridership and participant spillover rates for each program by fuel type, followed by statewide figures by measure type and fuel type. Section 3 of this report provides more detailed results for each measure type within each program. Section 3 (Table 3-1) also presents more detail on how specific equipment was grouped by measure type.

Table 1-1 and Table 1-2 present statewide free-ridership and spillover rates for each program for the two Companies for electric and natural gas measure types. The statewide electric free-ridership rate was 10.4 percent, while the participant "like" spillover and nonparticipant spillover rates were 4.2 percent and 0.1 percent respectively. This results in an overall NTG rate of 93.9 percent. Free-ridership was lowest within the Small Business Energy Advantage program at 3.7 percent and highest for the Energy Conscious Blueprint program (18.2 percent).

Table 1-1. 2011 Statewide C&I Electric Free-ridership and Spillover Results by Program

Program	Surveyed	Population	Population Savings (kWh)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate[5]
Energy Conscious Blueprint	143	468	19,039,634	18.2%	4.4%	6.7%	2.9%	0.4%	88.9%
Energy Opportunities	151	784	57,067,186	11.5%	3.8%	4.5%	2.5%	0.0%	92.9%
Small Business Energy Advantage	347	1,924	32,079,624	3.7%	1.5%	2.2%	1.2%	0.0%	98.5%
Total*	**641**	**3,176**	**108,186,444**	**10.4%**	**1.8%**	**4.2%**	**1.2%**	**0.1%**	**93.9%**

* Precision of ± 1.8 % for free-ridership and ± 1.2% for participant like spillover at the state level

The statewide gas programs had a higher free-ridership rate than the electric programs (26.5 percent) and therefore a lower NTG rate (88.9 percent). It is typical that gas program have

[5] Net-to-Gross Rate is calculated as (1-Free-ridership Rate) + Participant "Like" Spillover Rate

higher free-ridership rates which results in a lower overall NTG rate. Spillover is slightly higher with the gas programs driven by the Energy Opportunities program.

Table 1-2. 2011 Statewide C&I Natural Gas Free-ridership and Spillover Results by Program

Program	Surveyed	Population	Population Savings (ccf)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Energy Conscious Blueprint	34	91	346,912	23.8%	9.5%	8.7%	6.3%	0.8%	85.7%
Energy Opportunities	5	31	253,994	30.0%	30.9%	20.6%	27.2%	10.4%	100.9%
Total*	**39**	**122**	**600,906**	**26.5%**	**9.6%**	**13.9%**	**7.5%**	**1.6%**	**88.9%**

* Precision of ± 9.6 % for free-ridership and ± 7.5% for participant like spillover at the state level

Across the different programs, measure type was assigned based on the specific type of equipment installed (see Section 3 for more details).

Table 1-3 and Table 1-4 present the statewide free-ridership and spillover rates for each electric and gas measure type across the two Companies. The controls, other, and refrigeration electric measure types have the lowest level of free-ridership (less than three percent), while the cooling and custom measure types have the highest free-ridership rate (around 22 percent).

Table 1-3. 2011 Statewide C&I Electric Free-ridership and Spillover Results by Measure Type

Measure Type	Surveyed	Population	Population Savings (kWh)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Building envelope	0	1	20	NA	NA	NA	NA	NA	NA
Controls	1	1	75	0.0%	0.0%	0.0%	0.0%	NA	100.0%
Cooling	99	341	10,071,505	22.3%	5.8%	2.6%	2.2%	3.6%	84.0%
Custom	10	49	3,059,631	22.1%	19.3%	7.7%	12.3%	0.0%	85.5%
Heating	28	101	2,594,978	16.2%	9.7%	5.1%	5.8%	0.0%	88.8%
HVAC	0	1	6	NA	NA	NA	NA	NA	NA
Lighting	338	2,186	68,903,274	8.4%	2.3%	4.5%	1.7%	0.0%	96.2%
Motors	0	11	79,451	NA	NA	NA	NA	NA	NA
Other	24	53	2,212,378	1.6%	3.2%	0.1%	0.8%	0.0%	98.5%

Measure Type	Surveyed	Population	Population Savings (kWh)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Process	61	127	13,852,986	13.1%	5.1%	2.1%	2.2%	0.0%	89.0%
Refrigeration	80	303	7,214,557	2.7%	2.6%	6.7%	4.0%	0.0%	104.0%
VFDs	0	2	197,583	NA	NA	NA	NA	NA	NA

The building envelope and process gas measure types have the lowest free-ridership rates (12.5 and 12.9 percent respectively), although these were based on only a few responses. The controls measure type had the highest participation and has a free-ridership rate of 31.3 percent.

Table 1-4. 2011 Statewide C&I Natural Gas Free-ridership and Spillover Results by Measure Type

Measure Type	Surveyed	Population	Population Savings (ccf)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Building envelope	1	3	11,437	12.5%	44.4%	0.0%	0.0%	NA	87.5%
Controls	1	21	187,264	31.3%	74.4%	0.0%	0.0%	NA	68.8%
Custom	0	1	28,901	NA	NA	NA	NA	NA	NA
HVAC	33	76	309,153	24.5%	9.3%	11.0%	6.7%	0.0%	86.5%
Other	0	1	772	NA	NA	NA	NA	NA	NA
Process	3	9	48,025	12.9%	26.0%	91.7%	21.4%	NA	178.8%
Water Heating	1	11	15,354	100.0%	0.0%	0.0%	0.0%	33.3%	33.3%

2. INTRODUCTION

This report summarizes the findings of the free-ridership and spillover study conducted for Connecticut Light & Power's (CL&P) and United Illuminating's (UI) 2011 Commercial and Industrial (C&I) electric and natural gas programs offered in Connecticut. The purpose of this study was to assess program free-ridership and spillover for the Energy Conscious Blueprint, Energy Opportunities, and Small Business Energy Advantage programs.

One important concept affecting the interpretation of the free-ridership and spillover estimates is the ability to generalize the results. The results of this study can only be generalized to the population of 2011 program year participants, and the design professionals and equipment vendors who were active in the 2011 program year. The results cannot be used to predict the actions of any future program participants or program vendors. Essentially, the current study is a performance audit of the year 2011 programs using survey research methods to estimate the free-ridership and spillover rates.

2.1 ORGANIZATION OF THIS REPORT

In this introductory chapter of the report, we review the study's objectives and methodology. In Chapter 3, we present the free-ridership and spillover results at the state level, as well as at the individual Company level. We also include the following appendices:

- Appendix A summarizes the survey questions used to identify the key decision-maker, the questions designed to serve as project review for the respondent, the questions and approach used to estimate the extent of participant free-ridership, participant "like" and "unlike" spillover
- Appendix B presents the questions and approach used to estimate free-ridership using influential vendor responses, as well as questions used to estimate nonparticipant "like" spillover
- Appendix C details the sampling plan for the participant surveys for each Company
- Appendix D documents the weighting methodology used to produce the participant free-ridership and "like" spillover estimates
- Appendix E contains the survey instruments
- Appendix F details the survey response rate and program savings coverage
- Appendix G contains an example of the Vendor nonparticipant spillover calculation
- Appendix H charts how the free-ridership and spillover scoring was done.

2.2 STUDY OBJECTIVES

The EEB manages and directs all evaluation activities and advises and assists the utility distribution companies in the development and implementation of comprehensive and cost-effective energy conservation and market transformation plans. The EEB is made up of representatives of the Companies, environmental organizations, organizations representing the interests of residential, commercial, industrial and limited-income customer groups, and the Attorney General Office.

Per the EEB, the primary objective of the 2011 program year Free-ridership and Spillover Study was to assist the Connecticut Energy Efficiency Fund in quantifying the net impacts of their commercial and industrial electric and natural gas energy efficiency programs by estimating the extent of:

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

At this point, it is helpful to define free-ridership and spillover. 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 equipment[6] 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 equipment. Consequently, none or only some of the energy savings from the energy-efficient equipment taken by this group of customers should be credited 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 equipment at that time in the absence of the program. Partial free riders (1–99 percent) are those customers who would have adopted some equipment 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 equipment (within a specified period of time) absent the program services.

In contrast, spillover adds benefits to the program, increasing the program benefits and benefit–cost ratio. *Spillover* refers to additional energy-efficient equipment 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 equipment through the program, and then installed additional equipment of the same type due to program influences. *Participant "unlike" spillover* is where the customer installs energy-efficient equipment different from those offered through the program, but are influenced by the program to do so.

Free-drivers, or nonparticipant spillover, refers to energy-efficient equipment 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 take energy-efficient equipment. *Nonparticipant "like" spillover* refers to additional equipment of the same type as offered through the program that are adopted due to the program's influence.

To accomplish the study objectives of the EEB, telephone surveys were conducted with samples of 2011 program participants in three C&I electric and natural gas programs and with equipment

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

vendors involved in these 2011 installations. The following C&I programs were included in the 2011 study for both Companies:

- Energy Conscious Blueprint
- Energy Opportunities
- Small Business Energy Advantage.

2.3 STUDY METHODOLOGY

The methodology used for this year's study follows the standardized methodology developed in 2010 and 2011 for the Massachusetts Program Administrators[7] for use in situations where end-users are able to report on program impacts via self-report methods. The objectives of that study were to develop preliminary guidelines for estimating net program impacts. The study included a comprehensive literature review of methods being used across the country for estimating net-to-gross; a discussion of the advantages and disadvantages of alternative methods for estimating net savings; the development of a decision framework for selecting appropriate methodologies; a discussion of best practice elements for survey design, data collection, and analytic methods; the results of a survey pretest; and final recommendations for the design and implementation of self-report approach (SRA) survey instruments.

Net-to-gross (NTG)[8] values can be heavily debated. The methods employed to calculate net savings need to be robust as well as sufficiently transparent so that stakeholders can understand and feel confident in the calculations and results. Below we provide an overview of the methodologies used to estimate free-ridership, participant spillover, and nonparticipant spillover. Additional detail on the specific survey questions used can be found in Appendices A and B, while the algorithm for calculating the NTG values can be found in Appendix H.

The literature identifies a number of key issues with the SRA approach to NTG research. Several of the more prominently discussed issues are documented below, along with our approach for mitigating the risks inherent within the issues.

- Self-report bias: customers report what they think the interviewer, utility, or program staff want to hear, or what makes them look good (e.g., they said would have done it anyway because they think that makes them appear more knowledgeable or more green). The survey batteries Tetra Tech employed addressed NTG from varying perspectives (timing, efficiency, quantity), and included multiple consistency check questions and open-ended questions to gain the most accurate picture of the decision-making process as possible.

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[7] *Cross-Cutting C&I Free-Ridership and Spillover Methodology Study Final Report*, prepared for the Massachusetts Program Administrators by Tetra Tech, KEMA, and NMR, May 20, 2011.

[8] The net-to-gross (NTG) ratio (also commonly referred to as NTG factor) is the ratio of net program-attributable savings over program gross savings. The ratio calculated includes determinations of program free-riders and program-induced spillover as follows:

NTG ratio = (1 – free rider rate) + spillover rate.

- Timing and potential for recall bias: Timing of the interviews for estimating both free-ridership and spillover is often a concern. First, there is the potential for recall bias, and the inability for customers to recollect their intentions. Second, the decision-maker may no longer be available if the survey is conducted too long after the project. Tetra Tech conducted the survey with the most recent program year of participants (2011) in order to reduce potential recall bias.
- Inability to disentangle trade ally or utility influences: Certain program designs rely on trade allies as an influential party to encourage customers to install program-qualifying equipment. Excluding the perceptions and activities of these trade allies does not provide a representative look at the program. The evaluation team included influential trade ally surveys for all program designs where trades were potential points of influence.

2.3.1 Participant free-ridership methodology

The SRA approach for determining free-ridership involves asking one or more key decision makers a series of closed and open-ended questions about their motivations for installing the program-eligible equipment, about what they would have done in the absence of the program incentive and other services, as well as questions that attempt to rule out rival explanations for the installation. This method walks survey respondents through their decision process with the objective of helping them recall the program's impact upon all aspects of project decision-making. To improve the reliability of the NTG determination, Tetra Tech also asked questions that serve as consistency checks for prior responses. Finally, Tetra Tech asked about the influence of past participation in other Company energy efficiency programs on their decision to participate in the program in 2011. Past program participation may have had a positive impact on a customer's decision to install equipment through the program again. The SRA approach included not only interviews with end-use customers but also vendors who were identified by customers as being influential in the decision to participate in the program. Depending on the responses to this series of questions, a free-ridership score is calculated.

For programs that offer monetary incentives for multiple measure categories (E.g., lighting, HVAC), it is important to estimate free-ridership by specific measure type. Category-specific estimates produce feedback on the program at the level at which it actually operates and allows for cost-effectiveness testing by measure category. 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 installations within that measure type—the fewer installations, the less reliable the estimate.

Table 2-1 details how program-eligible equipment was assigned to a measure type classification.

Table 2-1. Breakdown of Equipment into Measure Type Categories

Measure Type	Equipment
Building envelope	Windows, Low-e glazing
Controls	EMC, BMS, Hot water reset, Boiler controls
Cooling	AC units, RTU's, Chillers, Heat pumps, HVAC units, VFDs
Cooling - Other	Chiller, Custom cooling unit, Heat pump
Cooling Unitary	Unitary and split system
Custom	EMS, Envelope, Process, Refrigeration, HVAC
Heating	VFD, ECM motor, EMS, Heat pump, Hot water pump, Programmable thermostat
HVAC	Boilers (condensing, gas, gas fired), Condensing furnace, Energy recovery unit, Infrared heater
Lighting	LED, Induction flood lights, CFLs, T8, T5, Occupancy sensor
Motors	Motors, Hot water pump, Exhaust fan
Other	EC motors, EMS, Chiller economizer, Heat controls, EMS, Lighting, Insulation, Programmable thermostat, VFDs
Process	Air compressor, Convection oven, VFD, Dryer
Refrigeration	Motors, Door controls, Timers, Dehumidification units, Vending miser
VFDs	VFDs
Water Heating	Boiler, DHW Heater

Note that program total free-ridership (pure and partial) rates illustrated in the tables in Section 3 are weighted by measure type ccf or kWh savings. Weighting by savings ensures that overall measure type 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.

In addition to weighting by ccf or kWh savings, weighting by the disproportionate probability of being surveyed accounts for any oversampling of a specific measure type as part of our calling effort. When reviewing the measure type free-ridership rates it is important to consider the number of survey completions that the estimate is based upon.

2.3.2 Participant spillover methodology

Free-ridership is only one element of the NTG factor. To gain a full net savings picture, Tetra Tech needed to also capture participant spillover through the SRA survey. Spillover refers to additional energy-efficient equipment 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 equipment through the program, and then installed additional equipment of the same type due to program influences. Participant “unlike” spillover is where the customer installs other program-eligible energy-efficient equipment than what they installed through the program and are influenced by the program to do so.

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 2011) of any additional energy-efficient equipment that were made without any additional technical or financial assistance from the Companies. 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 of their participation in a Company program.

a. 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 positive experience with the program.

One of the issues with attempting to quantify spillover savings is how to value the savings of equipment 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 the equipment installed outside the program that were of exactly the same type and efficiency as the ones installed through the program. This conservative approach allows customers (and the evaluator) to be more certain about whether the equipment they installed outside the program was the same type as the program equipment. This, in turn, makes it possible for the evaluator to use the estimated program savings for that measure type to calculate the customer's "like" spillover savings. Program-eligible equipment that was 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 measure types would be included in any "unlike" spillover analysis (see discussion below).

Note that the "like" spillover rates illustrated in Section 3 are weighted by measure category ccf 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 on their own.

b. 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. Unlike-spillover has a number of limitations including the fact that it is difficult via telephone surveys to verify that the equipment installed is actually program-qualifying or high efficiency. Given the difficulties in estimating savings for these installations, we present only indicators of "unlike" spillover and not savings estimates in Section 3.

2.3.3 Nonparticipant spillover methodology

Free-drivers, or nonparticipant spillover, refers to energy-efficient equipment 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 may have induced nonparticipants to implement energy-efficient equipment. Nonparticipant "like" spillover

refers to additional equipment of the same type as offered through the program that are adopted due to the program's influence.

The data for this type of analysis could be collected from nonparticipants directly or from the design professionals and vendors who recommended, sold, and/or installed qualifying high efficiency equipment. Based on our experience, Tetra Tech prefers to survey the design professionals and/or vendors because they can typically provide much more accurate information about the efficiency level of installed equipment than nonparticipating customers can. Our experience has shown that customers cannot provide enough data about the new equipment they have installed to allow for accurate determinations 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 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 determine nonparticipant spillover is that Tetra Tech can use data in the program tracking system database to attach kWh or ccf savings to nonparticipant spillover.

To determine nonparticipant spillover, design professionals and equipment vendors were asked (by measure type they installed through the program in 2011) what percent of their sales were program-eligible and what percent 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.

The methodology for the 2011 study estimated only a portion of nonparticipant like spillover based on responses from design professionals and vendors participating in the Companies' programs. 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 specified and/or installed equipment through the program in 2011. 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 2010).

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 2011 programs. Thus, if a vendor installed program-eligible equipment in other measure type categories in the year 2011 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 2011.

It is important to note that nonparticipant spillover was analyzed at statewide level 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), there was only a small amount of nonparticipant spillover savings found.

2.4 DATA COLLECTION

2.4.1 Participant free-ridership and spillover survey and response rate

The program participant sample consisted of unique electric and natural gas *accounts*[9] for a given location, 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 the purposes of this study, a customer or participant is defined as a unique account[10] at a location. Table 2-2 presents the number of participant accounts sampled for the 2011 study, as well as the number of telephone surveys completed for each Company.

The majority of the telephone interviews were completed with program participants between May 7 and June 27, 2012. The duration of interviews with program participants averaged 16 minutes. All participating customers were mailed a letter on Company letterhead prior to the first telephone attempt. This letter explained the purpose of the call, informed customers that someone from Tetra Tech would be calling them in the next couple of weeks to ask them some questions about their experiences with the programs, and thanked them for their cooperation in advance. This letter and repeated call attempts (an average of over 10 call attempts was made to reach sampled customers during the calling period) resulted in an overall cooperation rate of 55 percent. Missing phone numbers, addresses, and contact names made interviewing the correct decision-maker difficult for some sampled projects. Over 10 percent of the telephone numbers were bad numbers[11], and five percent had no knowledgeable respondent. In order to ensure cost-effective and timely evaluation in the future, the Companies need to consistently track project contact information including name of the project contact, his or her phone number, and the address of the facility. In addition, contact information for contractors[12] that completed the study should also be tracked for each installed measure type.

[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.

[11] Bad phone numbers were initially much higher, totaling over 38 percent of original phone numbers. The vast majority of these were incomplete phone numbers that did not have area codes. The final total of 10 percent are the remaining phone number that could not be found using public directory services.

[12] CL&P tracking data included 18 contractors, most of which were responsible for over 1,000 records. The data provided only a company name and no contact information. Surveys with participants identified over 40 additional contractors who were highly influential in the customers' participation. United Illuminating tracking data included over 30 vendors including contact information, and participants only mentioned one additional vendor. CL&P should identify all major contractors involved with projects, and also collect contact information for these contractors.

Table 2-2. 2011 C&I Participant Free-ridership and Spillover Survey Cooperation and Response Rates

	CL&P	UI	Total
Total Sample	**1,026**	**183**	**1,209**
Bad phone number	116	14	130
Does not recall/No eligible respondent	41	10	51
Ineligible - other	6	8	14
Language barrier	7	1	8
Adjusted Sample	**845**	**148**	**993**
Refusals	112	27	139
Active	255	53	308
Complete	**478**	**68**	**546**
Cooperation Rate*	**57%**	**46%**	**55%**
Response Rate**	**47%**	**37%**	**45%**

* Cooperation Rate is defined as number of Completed surveys divided by Adjusted Sample

** Response Rate is defined as number of Completed surveys divided by Total Sample

The number of survey completions for some measure types is low because the number of installations within these measure categories for program year 2011 was small. Thus, 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. Interviews were completed with 49 of the 95 design professionals and equipment vendors mentioned by customers during the participant surveys as being influential in the decision to install the efficient measures. This effort resulted in a 52 percent response rate.

2.4.2 Nonparticipant spillover survey and response rate

In addition to the customer surveys, surveys were conducted with design professionals and equipment vendors who had installed equipment through the Companies' electric and natural gas C&I programs in 2011. This survey was used for estimating the extent of nonparticipant spillover for the programs.

Table 2-3 presents the number of designers/vendors in the population, the number 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 between May 31 and July 6, 2012.

Table 2-3. 2011 Cooperation and Response Rates to the Nonparticipant Spillover Survey

	CL&P	UI	Total
Total Sample	**50**	**25**	**75**
Bad phone number	0	4	4
Adjusted Sample	**50**	**21**	**71**
Refusals	4	1	5
Unavailable for Duration	2	0	2
Active	16	2	18
Complete	**28**	**18**	**46**
Cooperation Rate*	**56%**	**86%**	**65%**
Response Rate**	**56%**	**72%**	**61%**

* Cooperation Rate is defined as number of Completed surveys divided by Adjusted Sample

** Response Rate is defined as number of Completed surveys divided by Total Sample

3. FREE-RIDERSHIP AND SPILLOVER STUDY RESULTS

This section presents the detailed results of the 2011 electric and natural gas free-ridership and spillover study. First, we present summary tables that include statewide figures. Following the summary tables, we present detailed results for each program. The detailed results include free-ridership and spillover rates by measure type and by program, along with corresponding error margins. We then present indicators of participant "unlike" spillover.

Nonparticipant 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 were only able to attribute nonparticipant spillover savings for the cooling and lighting measure types for electric programs and the water heating and HVAC measure types for gas programs.

3.1 STATEWIDE RESULTS BY PROGRAM AND MEASURE TYPE

This section presents the results of the 2011 C&I electric and natural gas free-ridership and spillover study. First, we present summary tables that include statewide free-ridership and participant spillover rates for each program by fuel type, followed by statewide figures by measure and fuel type, and statewide figures by measure type and program. Following the summary tables, we present detailed results for each program by Company. The detailed results include free-ridership and spillover rates by program, along with corresponding error margins.

Table 3-1 and Table 3-2 present statewide free-ridership and spillover rates for each program for the two Companies for electric and natural gas programs. The statewide electric free-ridership rate was 10.4 percent, while the participant "like" spillover and nonparticipant spillover rates were 4.2 percent and 0.1 percent respectively. This results in an overall NTG rate of 93.9 percent. Free-ridership was lowest within the Small Business Energy Advantage program at 3.7 percent and highest for the Energy Conscious Blueprint program (18.2 percent).

Table 3-1. 2011 Statewide C&I Electric Free-ridership and Spillover Results by Program

Program	Surveyed	Population	Population Savings (kWh)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate[13]
Energy Conscious Blueprint	143	468	19,039,634	18.2%	4.4%	6.7%	2.9%	0.4%	88.9%
Energy Opportunities	151	784	57,067,186	11.5%	3.8%	4.5%	2.5%	0.0%	92.9%
Small Business Energy Advantage	347	1,924	32,079,624	3.7%	1.5%	2.2%	1.2%	0.0%	98.5%
Total*	**641**	**3,176**	**108,186,444**	**10.4%**	**1.8%**	**4.2%**	**1.2%**	**0.1%**	**93.9%**

* Precision of ± 1.8 % for free-ridership and ± 1.2% for participant like spillover at the state level

[13] Net-to-Gross Rate is calculated as (1-Free-ridership Rate) + Participant "Like" Spillover Rate

The statewide gas programs had a higher free-ridership rate than the electric programs (26.5 percent) and therefore a lower NTG rate (88.9 percent). It is typical that gas program have higher free-ridership rates which results in a lower overall NTG rate. Spillover is slightly higher with the gas programs driven by the Energy Opportunities program.

Table 3-2. 2011 Statewide C&I Natural Gas Free-ridership and Spillover Results by Program

Program	Surveyed	Population	Population Savings (ccf)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Energy Conscious Blueprint	34	91	346,912	23.8%	9.5%	8.7%	6.3%	0.8%	85.7%
Energy Opportunities	5	31	253,994	30.0%	30.9%	20.6%	27.2%	10.4%	100.9%
Total*	**39**	**122**	**600,906**	**26.5%**	**9.6%**	**13.9%**	**7.5%**	**1.6%**	**88.9%**

* Precision of ± 9.6 % for free-ridership and ± 7.5% for participant like spillover at the state level

Across the different programs, measure type was assigned based on the specific type of equipment installed. Table 3-3 and Table 3-4 present the statewide free-ridership and spillover rates for each electric and gas measure type across the two Companies. The controls, other, and refrigeration electric measure types have the lowest level of free-ridership (less than three percent), while the cooling and custom measure types have the highest free-ridership rate (around 22 percent).

Table 3-3. 2011 Statewide C&I Electric Free-ridership and Spillover Results by Measure Type

Measure Type	Surveyed	Population	Population Savings (kWh)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Building envelope	0	1	20	NA	NA	NA	NA	NA	NA
Controls	1	1	75	0.0%	0.0%	0.0%	0.0%	NA	100.0%
Cooling	99	341	10,071,505	22.3%	5.8%	2.6%	2.2%	3.6%	84.0%
Custom	10	49	3,059,631	22.1%	19.3%	7.7%	12.3%	0.0%	85.5%
Heating	28	101	2,594,978	16.2%	9.7%	5.1%	5.8%	0.0%	88.8%
HVAC	0	1	6	NA	NA	NA	NA	NA	NA
Lighting	338	2,186	68,903,274	8.4%	2.3%	4.5%	1.7%	0.0%	96.2%
Motors	0	11	79,451	NA	NA	NA	NA	NA	NA
Other	24	53	2,212,378	1.6%	3.2%	0.1%	0.8%	0.0%	98.5%
Process	61	127	13,852,986	13.1%	5.1%	2.1%	2.2%	0.0%	89.0%
Refrigeration	80	303	7,214,557	2.7%	2.6%	6.7%	4.0%	0.0%	104.0%
VFDs	0	2	197,583	NA	NA	NA	NA	NA	NA

The building envelope and process gas measure types have the lowest free-ridership rates (12.5 and 12.9 percent respectively), although these were based on only a few responses. The controls measure type had the highest participation and has a free-ridership rate of 31.3 percent.

Table 3-4. 2011 Statewide C&I Natural Gas Free-ridership and Spillover Results by Measure Type

Measure Type	Surveyed	Population	Population Savings (ccf)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Building envelope	1	3	11,437	12.5%	44.4%	0.0%	0.0%	NA	87.5%
Controls	1	21	187,264	31.3%	74.4%	0.0%	0.0%	NA	68.8%
Custom	0	1	28,901	NA	NA	NA	NA	NA	NA
HVAC	33	76	309,153	24.5%	9.3%	11.0%	6.7%	0.0%	86.5%
Other	0	1	772	NA	NA	NA	NA	NA	NA
Process	3	9	48,025	12.9%	26.0%	91.7%	21.4%	NA	178.8%
Water Heating	1	11	15,354	100.0%	0.0%	0.0%	0.0%	33.3%	33.3%

Below we present more detailed findings for each Company by program for electric and natural gas measure types.

3.2 DETAILED MEASURE RESULTS BY PROGRAM

Electric results within the Energy Conscious Blueprint program show the cooling measure type category had the highest free-ridership rate (29.5 percent). The heating electric measure type in Energy Conscious Blueprint had the highest participant like spillover (28.0 percent), which when combined with the 23.7 percent free-ridership rate, resulted in a NTG rate of 104.3 percent. In the Energy Opportunities electric program, the custom measure type had the highest free-ridership rate (25.9 percent). Cooling measures in the Small Business Energy Advantage program had the highest free-ridership rate (15.3 percent).

Table 3-5. 2011 Statewide C&I Electric Free-ridership and Spillover Results by Program and Measure Type

Program	Measure Type	Surveyed	Population	Population Savings (kWh)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Energy Conscious Blueprint	Building envelope	0	1	20	NA	NA	NA	NA	NA	NA
	Cooling	66	224	2,697,465	29.5%	7.8%	9.7%	5.0%	2.7%	82.9%
	Custom	4	12	1,215,081	22.5%	28.1%	16.9%	25.2%	0.0%	94.4%
	Heating	7	41	470,427	23.7%	24.1%	28.0%	25.4%	0.0%	104.3%
	HVAC	0	1	6	NA	NA	NA	NA	NA	NA
	Lighting	15	71	4,412,653	16.7%	14.1%	2.4%	5.8%	0.0%	85.7%
	Motors	0	8	37,516	NA	NA	NA	NA	NA	NA
	Other	0	2	15,755	NA	NA	NA	NA	NA	NA
	Process	48	97	8,010,025	17.6%	6.4%	0.9%	1.6%	0.0%	83.3%
	Refrigeration	3	9	1,983,103	3.6%	14.5%	25.9%	34.0%	0.0%	122.3%
	VFDs	0	2	197,583	NA	NA	NA	NA	NA	NA
	Total	**143**	**468**	**19,039,634**	**18.2%**	**4.4%**	**6.7%**	**2.9%**	**0.4%**	**88.9%**
Energy Opportunities	Controls	1	1	75	0.0%	0.0%	0.0%	0.0%	NA	100.0%
	Cooling	12	58	6,802,351	20.0%	16.9%	0.0%	0.0%	0.0%	80.0%
	Custom	4	27	1,554,649	25.9%	33.3%	1.8%	10.2%	0.0%	75.9%
	Heating	14	42	2,088,170	14.8%	12.8%	0.0%	0.0%	0.0%	85.2%
	Lighting	102	590	36,715,065	10.8%	4.6%	6.3%	3.6%	0.0%	95.5%
	Motors	0	3	41,935	NA	NA	NA	NA	NA	NA
	Other	2	4	1,296,899	2.6%	13.0%	0.0%	0.0%	0.0%	97.4%
	Process	13	30	5,842,961	6.9%	8.7%	3.7%	6.5%	0.0%	96.8%
	Refrigeration	3	29	2,725,081	3.2%	15.9%	0.0%	0.0%	0.0%	96.8%
	Total	**151**	**784**	**57,067,186**	**11.5%**	**3.8%**	**4.5%**	**2.5%**	**0.0%**	**92.9%**
Small Business Energy Advantage	Cooling	21	59	571,689	15.3%	10.4%	0.2%	1.3%	0.0%	84.9%
	Custom	2	10	289,901	0.3%	5.5%	0.0%	0.0%	0.0%	99.7%
	Heating	7	18	36,381	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	Lighting	221	1,525	27,775,556	3.8%	2.0%	2.5%	1.6%	0.0%	98.7%
	Other	22	47	899,724	0.5%	1.8%	0.2%	1.2%	0.0%	99.8%
	Refrigeration	74	265	2,506,373	1.4%	1.9%	0.0%	0.0%	0.0%	98.6%
	Total	**347**	**1,924**	**32,079,624**	**3.7%**	**1.5%**	**2.2%**	**1.2%**	**0.0%**	**98.5%**
Total		**641**	**3,176**	**108,186,444**	**10.4%**	**1.8%**	**4.2%**	**1.2%**	**0.1%**	**93.9%**

For gas measure types in the Energy Conscious Blueprint program, the water heating measure type had the highest free-ridership rate (100 percent) although this is based on only one data point. The HVAC measure type in the Energy Opportunities program had the highest free-ridership rate (64.3 percent). When looking at these results, care should be taken at the measure level due to the low number of surveys and participation levels.

Table 3-6. 2011 Statewide C&I Natural Gas Free-ridership and Spillover Results by Program and Measure Type

Program	Measure Type	Surveyed	Population	Population Savings (ccf)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Energy Conscious Blueprint	Building envelope	1	3	11,437	12.5%	44.4%	0.0%	0.0%	NA	87.5%
	Controls	0	1	741	NA	NA	NA	NA	NA	NA
	Custom	0	1	28,901	NA	NA	NA	NA	NA	NA
	HVAC	30	69	291,949	22.2%	9.4%	8.8%	6.4%	0.0%	86.7%
	Other	0	1	772	NA	NA	NA	NA	NA	NA
	Process	2	7	5,537	29.9%	45.0%	28.0%	44.2%	NA	98.1%
	Water Heating	1	9	7,575	100.0%	0.0%	0.0%	0.0%	33.3%	33.3%
	Total	**34**	**91**	**346,912**	**23.8%**	**9.5%**	**8.7%**	**6.3%**	**0.8%**	**85.7%**
Energy Opportunities	Controls	1	20	186,523	31.3%	74.3%	0.0%	0.0%	NA	68.8%
	HVAC	3	7	17,204	64.3%	34.4%	47.6%	35.9%	0.0%	83.3%
	Process	1	2	42,488	10.7%	36.0%	100.0%	0.0%	NA	189.3%
	Water Heating	0	2	7,779	NA	NA	NA	NA	NA	NA
	Total	**5**	**31**	**253,994**	**30.0%**	**30.9%**	**20.6%**	**27.2%**	**10.4%**	**100.9%**
Total		**39**	**122**	**600,906**	**26.5%**	**9.6%**	**13.9%**	**7.5%**	**1.6%**	**88.9%**

3.3 DETAILED RESULTS BY COMPANY

Results for each Company are presented for each program.

3.3.1 CL&P results

Table 3-7 presents CL&P's free-ridership and spillover rates for each electric program, while Table 3-8 presents this same information for gas programs. The overall NTG rate for CL&P's electric programs is 94.0 percent. The Small Business Energy Advantage program had the highest participation and has the lowest free-ridership rate at 3.6 percent. This finding is consistent with other NTG research conducted for small business direct install programs in other parts of the country—they consistently have one of the lowest free-ridership rates.

Table 3-7. CL&P C&I Electric Free-ridership and Spillover Results by Program

Program	Surveyed	Population	Population Savings (kWh)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Energy Conscious Blueprint	126	410	15,778,093	16.9%	4.6%	5.5%	2.8%	0.0%	88.5%
Energy Opportunities	138	699	52,026,687	11.8%	4.0%	4.8%	2.7%	0.0%	93.0%
Small Business Energy Advantage	297	1,722	29,311,209	3.6%	1.6%	2.4%	1.3%	0.0%	98.8%
Total*	**561**	**2,831**	**97,115,989**	**10.1%**	**1.9%**	**4.2%**	**1.2%**	**0.0%**	**94.0%**

* Precision of ± 1.9 % for free-ridership and ± 1.2% for participant like spillover for CL&P electric programs

The overall NTG rate for gas measure types for CL&P programs was 88.9 percent. Caution should be used given the small number of participating customers and survey respondents.

Table 3-8. CL&P C&I Natural Gas Free-ridership and Spillover Results by Program

Program	Surveyed	Population	Population Savings (ccf)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Energy Conscious Blueprint	34	90	318,011	23.8%	9.5%	8.7%	6.3%	0.8%	85.7%
Energy Opportunities	5	31	253,994	30.0%	30.9%	20.6%	27.2%	10.4%	100.9%
Total*	**39**	**121**	**572,005**	**26.5%**	**9.6%**	**13.9%**	**7.5%**	**1.6%**	**88.9%**

* Precision of ± 9.6 % for free-ridership and ± 7.5% for participant like spillover for CL&P gas programs

3.3.2 United Illuminating results

Table 3-9 presents United Illuminating's free-ridership and spillover rates for each electric. The overall NTG rate for electric programs for United Illuminating is 92.7 percent. Again, the free-ridership rate is lowest for the Small Business Energy Advantage program. Overall installation of electric measures for United Illuminating's programs is low, so care should be taken when using these numbers.

Table 3-9. United Illuminating C&I Electric Free-ridership and Spillover Results by Program

Program	Surveyed	Population	Population Savings (kWh)	Free-ridership Rate	Level of Precision at the 90% Confidence Interval (±)	Participant "Like" Spillover Rate	Level of Precision at the 90% Confidence Interval (±)	Nonparticipant Spillover Rate	Net-to-Gross Rate
Energy Conscious Blueprint	17	58	3,261,541	25.1%	14.5%	13.5%	11.5%	2.4%	90.8%
Energy Opportunities	13	85	5,040,499	8.7%	11.9%	1.2%	4.6%	0.0%	92.5%
Small Business Energy Advantage	50	202	2,768,415	5.0%	4.4%	0.0%	0.0%	0.0%	95.0%
Total*	**80**	**345**	**11,070,455**	**12.3%**	**5.3%**	**4.3%**	**3.3%**	**0.7%**	**92.7%**

* Precision of ± 5.3 % for free-ridership and ± 3.3% for participant like spillover for UI electric programs

There was only one participant that installed a gas measure type for United Illuminating under the Energy Conscious Blueprint program. We were unable to complete the survey with the respondent after multiple attempts and are therefore unable to provide free-ridership and NTG estimates for the gas programs.

3.4 "UNLIKE" SPILLOVER INDICATORS

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 using regular telephone interviewers, we present only indicators of "unlike" spillover and not savings estimates.

3.4.1 CL&P

Ten CL&P respondents reported that they have installed energy-efficient equipment outside of a CL&P program and that CL&P's programs were influential in their decision to make the installation. Below we list out the different types of equipment identified and any additional information provided about the equipment.

- One outdoor lighting fixture that was possibly 6-watt LED
- Four high efficiency boilers and 4 high efficiency pumps
- One ice machine and two coolers
- 18 8-watt LEDs in one section of the dining room where CFLs were initially placed
- Replaced "quite a bit" of refrigeration cases, motors and lighting
- 12 3-phase motor sensors and three 7 ½ hp high efficiency motors
- Spent $10-15 million dollars total cost on building controls and lights, VFDs for motors, efficient lights and light fixtures
- Other AC electrical units and a change of light fixtures to upgrade to LED and T8's

- Approximately six VFD replacement motors (one 15 hp, one 5 hp and a couple 5 hp) of 480 volt. They motors are air make-up system and a couple pump systems for pumping water.
- Five hot water controls for domestic hot water, four energy-efficient motors (between 7.5 and 15 hp), upgraded 15 or so pump fluorescent lights, replaced five old light fixtures with fluorescent and LED (27 watt light bulbs, 18 watt LEDs), replaced two refrigerators with energy star ratings, domestic 300 feet of hot water and heating pipes insulation and 27 cubic feed chest freezers.

3.4.2 United Illuminating

Only three customers indicated installing energy-efficient equipment outside of the program and that United Illuminating was influential for the installation. Below is the information the customers were able to provide about the equipment.

- Three motors (1 10hp motor and 2 were 5 hp), three timers for lights, and 24 motion sensors for lighting.
- Additional lighting in the customer's shop and offices
- Four motion detectors that fit into a small switch box (2 x 3).

APPENDIX A: PARTICIPANT SURVEY QUESTIONS

This chapter summarizes the survey questions used to identify the primary decision maker and 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 (which are dependent upon the response to one or more questions) are complex. To simplify discussion of the questions, we have only shown the questions and not the potential response categories or skip patterns. Appendix E of this document contains the detailed free-ridership survey questions for participants. Appendix E also contains 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.

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

A.1 FORMAT

The surveys for free-ridership (and spillover) contain a number of 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, participation date) into the appropriate questions.

The survey averaged 16 minutes in length depending on the customer surveyed and number of measure types installed. Many customers, especially the smaller ones, skipped directly to the consistency questions because they were initially zero percent free-riders. Others skipped questions if they had not had a significant technical assessment study done or if they had not participated in the programs in previous years.

Given that the same survey instrument was used for the different programs, the survey instrument contains a number of areas where fills were used to customize the instrument. These fills are listed and explained in the table below:

Table A-1. Survey Fills and Explanations

Fill	Explanation
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
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 a study funded by the program
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

A.2 SUMMARY OF THE 2011 SURVEY QUESTIONS

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

- Identification of key decision maker(s)
- Project and decision-making review
- 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.

A.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 by asking if participants were involved in the decision to purchase the incentivized equipment and asking about the roles of others within or outside the organization that may have been involved.

If the listed contact person was not the primary decision-maker, information is collected on the person within or 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 the Companies.

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

I1 Are you the person who was most involved in making the decision to get <ALL ASSISTANCE> through the <PROGRAM> in <DATE> at <ADDRESS> in <CITY>?

I1A Who was primarily responsible for making the decision to get <ALL ASSISTANCE> through the <PROGRAM> in 2011?

I2 Are you employed by <CUSTOMER> or are you a contractor who provides design and/or installation services for <CUSTOMER>?

R1a Were you involved in the decision-making process when the [EFFICIENCY IS APPLICABLE: energy efficient] <MEASURE CATEGORY 1> or <MEASURE CATEGORY 2> was being considered for this facility?

R1b Aside from yourself, who else within your company or outside your company was involved in the decision of whether or not to purchase the [EFFICIENCY IS APPLICABLE: energy efficient] <MEASURE CATEGORY 1> or <MEASURE CATEGORY 2> through the <PROGRAM>?

A.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.

R3 Does your company have any corporate policies related to energy efficiency standards that you need to consider when purchasing new equipment or making improvements to this facility?

R4 Which of the following best describes this policy: purchase energy efficient measures regardless of cost, purchase energy efficient measures if it meets payback or return on investment criteria, purchase standard efficiency measures that meet code, or something else?

FR0 Please think back to the time when you were considering implementing the specific <MEASURE CATEGORY 1 and MEASURE CATEGORY 2> projects in <YEAR>. What factors motivated your business to consider implementing new <MEASURE CATEGORY 1 and MEASURE CATEGORY 2> equipment? What other factors did you consider?

A.2.3 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. Please note that these questions are measure-specific and are repeated for up to two measure categories.

FR5 According to our records, <COMPANY> paid about <INCENTIVE> of the total cost of the [IF EFFICIENCY APPLIES: energy efficient] <MEASURE CATEGORY> project implemented through the program.

[14] The instrument is designed to handle both rebated equipment (e.g., HVAC equipment) and rebated services (e.g. boiler tune-ups). However, as this study only addresses equipment, the memo does not include any references to rebated services.

[IF NO <STUDY>: You may have also received some technical assistance from a <COMPANY> rep, engineer, or equipment vendor.]

[IF <STUDY>: As I previously mentioned, <COMPANY> also conducted a <STUDY TYPE> to identify whether the project was cost effective.]

[IF <FINANCE> = Yes] <PROGRAM> also provided interest-free or low-cost financing for your portion of the project costs.

If <COMPANY> had not paid a portion of the implementation cost for <MEASURE CATEGORY> OR provided any technical assistance or education [IF <FINANCE> = Yes: OR provided interest-free or lost-cost financing], would your business have implemented any type of <MEASURE CATEGORY> project at the same time?

FR6A Would you have implemented the <MEASURE CATEGORY> project earlier than you did, at a later date, or never?

FR6B How much [EARLIER/LATER] would you have implemented the <MEASURE CATEGORY> project?

FR7A Without the program incentive and technical assistance or financing, would your business have implemented the exact same quantity of <MEASURE CATEGORY> equipment [IF FR5=YES OR DK: at that same time; IF FR5=2: within (TIMEFRAME IN FR6B)]?

FR7B Compared to the amount of <MEASURE CATEGORY> that you implemented through the program, what percent of the project do you think your business would have purchased on its own during that timeframe?

FR8A You said your business would have installed [IF FR7A=YES: all; IF FR7A= NO: (FILL WITH FR7B %)] of the equipment on its own if the program had not been available.

Thinking about the <MEASURE CATEGORY> equipment you would have installed on your own, what percent of this equipment would have been of the same high efficiency as what was installed through the program?

FR8B (What percent would have been of) lower efficiency than what was purchased but higher than standard efficiency or code?

FR8C[15] And of standard efficiency or code?

RVL1[16] Thinking about the insulation project you would have implemented on your own if the program had not been available, would it have been of the same R Value as what was installed through the program?

[15] For measure types where quantity is not applicable but efficiency levels do vary, this question is combined into one item: FR8D.

[16] RVL1 and RVL2 were added for insulation projects.

RVL2 Compared to what you installed through the program, what R Value or amount would you have installed? (PROBE: “For example, would it have been 50% as much as what was installed through the program?”)

A.2.4 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.

FR1 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 VARIES: quantity and] [IF EFFICIENCY APPLIES: efficiency of] <MEASURE CATEGORY> at that same time if the <COMPANY> had not provided the <ALL ASSISTANCE>?

C3 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 <INC> you received from <COMPANY> have on your decision to implement the [IF EFFICIENCY APPLIES: high efficiency] <MEASURE CATEGORY> project?

C4A Now I want to focus on what it would have cost your business to install this equipment on its own without the program. 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 paid the additional <INC> on top of the amount you already paid, to implement the same quantity and efficiency of <MEASURE CATEGORY> equipment at that same time?

C8 [ASK IF FR1 > 3 AND FR6b >24/48 MONTHS OR NEVER] Earlier in the interview, you said there was a [FR1 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 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?

C9 I'd like to better understand your purchase decision. In your own words, please describe what impact, if any, all the assistance you received through the program had on your decision to install the 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 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 the savings for those measures. Multiplying these two scores together gives the percent of the incentivized savings that would have occurred without the program. This percentage is the raw free-ridership estimate. Table A-2 details these calculations.

Table A-2. Quantity and Efficiency Scores

Score	Responses	Result
Quantity Score (FR_QTY)	If would have installed same quantity without program (FR7A = YES)	FR_QTY = 1
	If would have installed fewer quantity without program (FR7A = NO)	FR_QTY = FR7B
	If never would have installed (FR6A = never)	FR_QTY = 0
Efficiency Score (FR_EFF)	If would have installed at least some equipment on their own	FR_EFF = FR8A + (FR8B*.50)
	If never would have installed (FR6A = never)	FR_EFF = 0
	If insulation and would not have installed same R value	FR_EFF = RVL2
Initial Free-ridership Score	The percentage of the rebated savings that would have occurred without the program.	FR_EFF * FR_QTY

The product of these two scores is then adjusted by a timing factor. 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[17]. The degree of the adjustment depends on the program. As the equipment planning schedule for small businesses is likely shorter than the planning 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. This adjustment is detailed in Table A-3 and visualized in Figure A-1.

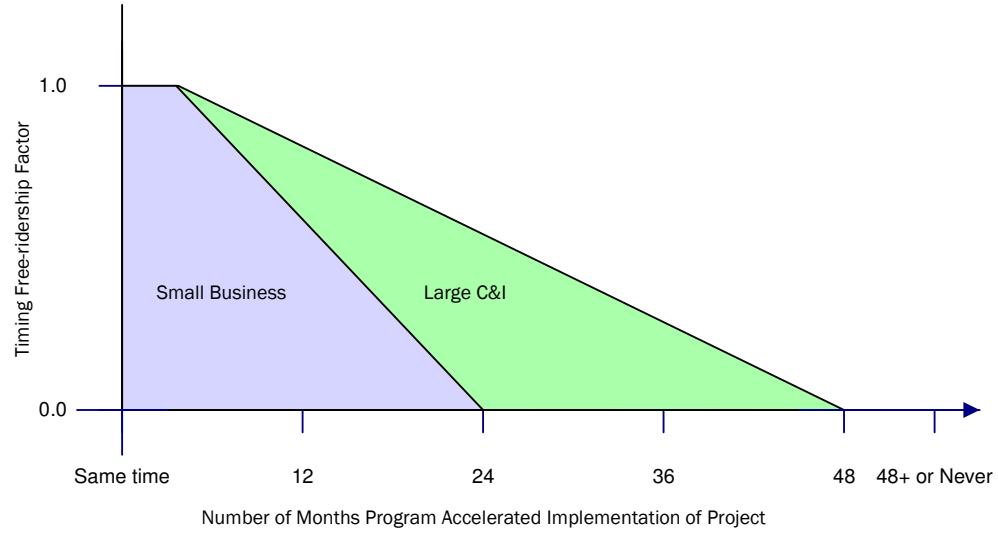
Table A-3. Timing Factor Adjustment

Score	Responses	*Result*
Timing Factor—Small Business Programs (FR_TIMING)	Would have installed at the same time without the program (FR5 = Yes)	*FR_TIMING = 1*
	Would have installed within six months of when participant actually did without the program (FR6b <= 6 months)	*FR_TIMING = 1*
	Would have installed sometime between 7 and 24 months of when participant actually did without the program (FR6b > 6 months & < 24 months)	*FR_TIMING = 1-((FR6B-6) * .056)*
	Would have installed sometime after 24 months of when participant actually did without the program (FR6b > 24 months)	*FR_TIMING = 0*

[17] 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.

Score	Responses	*Result*
	Would have never installed without the program (FR6A = Never)	*FR_TIMING = 0*
Timing Factor—Large Business Programs (FR_TIMING)	Would have installed at the same time without the program (FR5 = Yes)	*FR_TIMING = 1*
	Would have installed within six months of when participant actually did without the program (FR6b ≤ 6 months)	*FR_TIMING = 1*
	Would have installed sometime between 7 and 48 months of when participant actually did without the program (FR6b > 6 months & < 48 months)	*FR_TIMING = 1-((FR6B-6 * .024)*
	Would have installed sometime after 48 months of when participant actually did without the program (FR6b > 48 months)	*FR_TIMING = 0*
	Would have never installed without the program (FR6A = 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*

Figure A-1. Timing Free-ridership Factor by Number of Months the Program Accelerated Implementation



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 FR4 and C1 (below) are used to assess vendor influence. Details regarding the influential vendor survey are discussed in the next section.

FR4 Who was MOST responsible for actually recommending or specifying the [IF EFFICIENCY IS APPLICABLE: energy efficient] <MEASURE CATEGORY> project that was implemented through the <PROGRAM>?

C1 On a scale of 0 to 10, with 0 being no influence and 10 being a great deal of influence, how much influence did (FR4 response) have on your company's decision to implement the [IF EFFICIENCY IS APPLICABLE; energy efficient] <MEASURE CATEGORY> project so that it would qualify for the program?

A.2.5 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.

C2 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 <STUDY> have on your decision to implement the [IF EFFICIENCY IS APPLICABLE*:* high efficiency] <MEASURE CATEGORY> project at that time?

A.2.6 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 decision – 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 the <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 A-4 details these adjustments.

Table A-4. Adjustments for the Influence of Technical Assessments, Electric Project, 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 (C2 ≤ 6)	No adjustment
	Participant **would not** have performed assessment, audit, or study without program assistance and it was influential (C2 > 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 H of this report.

A.2.7 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. The following questions, in conjunction with the savings assigned to that same equipment by the program, are used to estimate possible spillover savings:

S1A Now I'd like you to think of the time since you participated in the <PROGRAM> in <DATE>. Has your company implemented any <MEASURE CATEGORY> projects for this or other facilities in Connecticut **on your own,** that is without a rebate from <COMPANY>?

S1B Was this equipment of the same efficiency level or a higher level of efficiency as the equipment you installed through the program?

S1C Was this equipment more energy efficient than standard efficiency or code equipment?

S2A Thinking of the <MEASURE CATEGORY> equipment that you installed on your own, how does the quantity compare to what you installed through the program? Did you install more, less or the same amount of <MEASURE CATEGORY>?

For respondents that answer "Yes" to S1A and S1B, spillover savings are calculated as the measure-specific savings identified by the program multiplied by the quantity identified in S2A. For

respondents that answer “Yes” to S1A and S1C, spillover savings are calculated as 50 percent the measure-specific savings identified by the program multiplied by the quantity identified in S2A. If the respondent answers “No” to S1A or S1C, there are no identifiable “like” spillover savings.

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

S3A Did a recommendation by the contractor, engineer, or designer who you worked with under the <PROGRAM> influence your decision to implement some or all of this [IF EFF = 1: efficient] <MEASURE CATEGORY> equipment on your own?

S3B Did your experience with the energy efficient projects implemented through the <PROGRAM> influence your decision to implement some or all of this [IF EFF = 1: efficient] <MEASURE CATEGORY> equipment on your own?

S3C Did your participation in any past program offered by <COMPANY> influence your decision to implement some or all of this [IF EFF = 1: efficient] <MEASURE CATEGORY> equipment on your own?

S3D 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 <COMPANY> program have on your decision to install this equipment without an incentive?

S4a Why didn’t you implement this <MEASURE CATEGORY> project through a <COMPANY> program?

S4b [IF THE EQUIPMENT WOULD NOT QUALITY] 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 (S3A=yes AND (S3B = no AND S3C = no)), spillover rate = 50%.

If (S3B=yes OR S3C = yes), spillover rate = 100%.

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

A.2.8 Participant “unlike” spillover

In addition to “like” spillover, the 2011 study also measured “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.

S5 Since participating in the <PROGRAM>, had your company purchased, installed, or implemented any other type of energy efficient equipment on your own, that is without a rebate from <COMPANY>?

S6 What did you install (RECORD TYPE, QUANTITY, SIZE, and CAPACITY)?

S7A Would this project have qualified for an incentive through the <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:

S7B Did a recommendation by the contractor, engineer, or designer who you worked with under the <PROGRAM> influence your decision to implement some or this equipment on your own?

S7C Did your experience with the energy efficient projects implemented through the <PROGRAM> influence your decision to implement some or this equipment on your own?

S7D Did your participation in any past program offered by <COMPANY> 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 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 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 indicators of "unlike" spillover and not savings estimates.

APPENDIX B: VENDOR/DESIGN PROFESSIONAL SURVEY QUESTIONS

B.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 electric and natural gas saving measures through the program (Questions FR4 and C1 discussed above). A separate survey tailored to these designers/vendors was administered for the purposes of estimating free-ridership (see Appendix E).

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 if attempts to survey the designer/vendor failed, the customer's responses were used to estimate free-ridership.

B.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 (V1a > 6). The questions are shown below:

Table B-1. Design Professional/Vendor's Identification of Decision-maker

Item	Text
V1A	First I'd like to ask you about your decisions to recommend <MEASURE CATEGORY> through the <PROGRAM>. Were you involved in the decision-making process at the design stage when the <MEASURE CATEGORY> equipment 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 <MEASURE CATEGORY> so that it would qualify for the program?

B.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.

B.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 have an influence on 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 the quantification of 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 make a determination about its program eligibility.

Thus, it was decided to survey design professionals and equipment vendors who were more knowledgeable about 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 data 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 participating in the nonparticipant component of the study 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 with in 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:

1. For each design professional/vendor, the survey determined the percentage of all program-eligible equipment sold/installed outside the program in utilities' territories.
2. 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).
3. For each design professional/vendor, savings associated with this "nonparticipant spillover" equipment were determined by examining the participant database and quantities installed.
4. 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.

B.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 installed, and how that equipment fit into measure categories. For measure categories they installed through the program, design professionals/vendors were asked what percent of the equipment would have been eligible for the programs and what percent of that eligible equipment did not receive an incentive through the programs. Those who said some of the eligible equipment did not receive an incentive through the programs 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 2011 through the <PROGRAM>. This includes equipment such as <DETAILED DESCRIPTION>. Is that correct?

VNP2 Please think about all the program-eligible <MEASURE CATEGORY> you specified, sold and/or installed for <COMPANY> customers in 2011. Did you specify, sell, and/or install any of this program-eligible <MEASURE CATEGORY> to customers of <COMPANY> ***without*** the customer participating in a <COMPANY> program?

VNP3 (IF VNP2 = Yes) Approximately what percent of all of this program-eligible <MEASURE CATEGORY> you specified, sold and/or installed for <COMPANY> customers in 2011 did not receive an incentive through a <COMPANY> program?

B.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 electric or natural gas 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 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 what we learned through working with <COMPANY>.

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 what we learned through working with <COMPANY>.

Based on these responses, we calculated a preliminary nonparticipant "like" spillover rate, as shown in the table below.

Table B-2. Preliminary Nonparticipant "Like" Spillover Rate

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

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

VNP4 In 2011, you mentioned that about [VNP3] of the <MEASURE CATEGORY> you specified, and/or installed would have been eligible for an incentive through a <COMPANY> program, but did not receive an incentive.

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

VNP8 Please describe what impact, if any, the <PROGRAM> had on your decision to specify or install energy efficient <MEASURE CATEGORY> outside of the program.

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 provide the response "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. If the response to the last question contradicted the other responses, the adjusted nonparticipant spillover rate was reduced by one-half or doubled. 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.

B.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 type for each respondent.[18]

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 motors were sold outside the program, the potential nonparticipant spillover savings would be (2,000 therm * 0.25/(1–0.25) = 667 therms). If this vendor was assigned (in Step 2) a nonparticipant spillover rate of 100 percent for motors, 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 motors, 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 measurement of participant spillover, the participating customer survey and analysis included calculations of "like" spillover. "Like" spillover was defined as equipment exactly like the participant's equipment 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 influenced their decision. To avoid double-counting the spillover for the same measure types 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 was based on the assumption that the same design professional or vendor was involved in the participant's "like" spillover project.

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[18] 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).

B.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 from 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 a total of 857,814 therms in measure category savings and the surveyed nonparticipant spillover totals 62,221 therms for that measure category, 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.

APPENDIX C: PARTICIPANT SAMPLING PLAN

This appendix presents our sample plan submitted to the Companies for the 2011 electric and natural gas free-ridership and spillover study.

MEMORANDUM

TO: Kim Oswald

FROM: Carrie Koenig and Pam Rathbun

SUBJECT: 2012 Connecticut Cross Sector Free-ridership and Spillover Study Proposed Sample Plan

DATE: April 16, 2012

This memorandum presents our revised sample plan for Connecticut's 2012 Cross Sector C&I free-ridership and spillover study, which includes only 2011 participants.

The data files transferred to us by CL&P and UI provide information for participants in the Energy Opportunities, Energy Conscious Blueprint and Small Business Energy Advantage programs.[19] As some of the files contained data regarding rebates dating back to 2009, only records installed[20] in 2011 (install_d, install_project_date, pmt_authzn_dt) were included in the sampling. In addition, 2,675 measures with zero or no savings information were removed from the sample (electric: 29% UI and 5% CL&P; natural gas: 93% UI and 5% CL&P).

Each record in the data represents a measure installed through a program for a particular account, and one account may have multiple measures categories. 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[21].

In this document we discuss the steps used in:

- 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.

[19] For CL&P, programs were selected using the variable "wo_no" and values ECBP, EEST, EGST, ENOPP and ESST. All municipal files provided from both UI and CL&P were excluded from the sample. For CL&P, the variable state_afltd_ind was used. We excluded values of "M" and "S".

[20] For CL&P, we looked at only completed projects using variable proj_stat_cd (dropping cancelled, in progress and on hold record).

[21] An account is defined as a unique Account Number (uiacctnum, c2_bill_account, acct_no). Where account number was missing or not available, project number was used (proj_no).

This is followed by:

- Characterization of the proposed sample plan

The current sample plan estimates 606 completed surveys at the measure level (both electric and gas) and 508 completed surveys at the account level (some accounts represent multiple measures). We will only bill for the actual number of surveys completed at the account level.

C.1 PREPARATION OF THE DATA FILE AND AGGREGATION OF THE PARTICIPANT DATA

1) **Identify program and measure category participation**. The study estimates free-ridership at the measure category level. The first step in sample preparation is to assign measures to a measure category. The measure categories for electric equipment are the end-use categories contained in the C&I realization rate tables in Appendix 3 of the 2012 CT Program Savings Documentation[22]. The gas saving measure categories were reviewed with EEB evaluation consultant. Using the information provided in the data files[23], we identify the following measure categories within the following programs:

    a. Energy Conscious Blueprint program consists of the following measure categories for CL&P: building envelope, controls, cooling, heating, HVAC, lighting, motors, other, process, refrigeration and water heating measures. UI measure categories consist of building envelope, cooling-other, cooling unitary, custom, HVAC, lighting, motors, process, refrigeration, and VFDs

    b. Energy Opportunities program consists of the measure categories: building envelope, controls, cooling, heating, HVAC, lighting, motors, other, process, refrigeration, water heating for CL&P. UI measure categories include: controls, custom, lighting and other

    c. Small Business Energy Advantage program consists of the following measure categories for CL&P: cooling, heating, lighting, other and refrigeration. UI measures categories include: custom, lighting and refrigeration.

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 for each fuel type. As we do the aggregation, we sum the kWh/ccf savings, quantity of measures installed, the measure cost and authorized incentive[24] so that the values are represented at an account level. The detailed measure descriptions are retained. These descriptions are used when describing to customers what equipment is included in a measure category.

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[22] http://www.ctenergyinfo.com/2012%20CT%20Program%20Savings%20Documentation%20FINAL.pdf

[23] The fields used to identify measure categories was “proddesc,” “measure_description” and “meas_dsc” in combination with end use (“faciluse,” “category” and “bnft_type_cd”). In some cases the field “equipment_after” was also used in combination with the “measure_description” field. In one case each, “eqp_desc” and ”proj_phase_txt” was used.

[24] We used “prodqty,” “number_units_installed” and “units_instld_qty” for quantity; “custcost,” “total_customer_cost” and “cust_cost_amt” for project cost; “tot_inc,” “incentive_amount” and “pmt_amt” for incentive amounts; and “kWh,” “annual_savings,” “cusccfcus” and “annl_bnft_qty” to identify total savings associated with that measure respectively.

C.2 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 CL&P, we will pull a census of all accounts for each program with the exception of the two areas (Energy Opportunities-lighting, and Small Business Energy Advantage-lighting). For these measure types we randomly selected accounts to participate in the study. For UI, we will pull a census of all accounts for each program.

In the interviews, we will 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 10 percentile of savings for that specific program and measure type ("priority" category).
    a. When more than 2 measure types were within the top 10 percent, we selected rare measure types (measure types with fewer records).
2) Select rare measure types, defined as the measure type with the least number of records.
3) When deciding between non-priority measure types:
    a. Select rarer measure types (one with fewer accounts in the program)
    b. Choose measure types with higher savings.

These prioritization steps resulted in the removal of 106 measures that were included in the sample frame as part of the measure category census.

C.3 PREPARATION OF SAMPLE FOR DATA COLLECTION

The next step is to restructure the sample file so that one 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 savings and detailed descriptions are represented in associated columns (e.g., savings1, savings2).

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

C.4 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:

- 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.

C.5 CHARACTERIZATION OF THE PROPOSED SAMPLE PLAN AND SAMPLE

Table C-1 outlines the sampling plan Connecticut's 2011 Cross Sector study by Company. This table also presents the sample details in terms of savings, number of projects and expected number of survey completes by measure type.

Table C-1: CT Cross Sector Proposed Sample Plan

Utility	Program Name	Measure Type	Population of Measures	Sample of Measures	Population Electric Savings	Population Gas Savings	Sampled Electric Savings	Sampled Gas Savings	Expected Completed Measures from Survey**	+/- 90% Confidence Interval at Measures Level***
CL&P	Energy Conscious Blueprint	Building envelope	3	3		11,437		11,437	1	NA
		Controls	1	1		741		741	0	NA
		Cooling	205	195	1,920,541		1,845,530		68	NA
		Heating	41	40	470,427		412,018		14	NA
		HVAC	69	69		291,949		291,949	24	NA
		Lighting	57	52	3,611,685		3,231,242		18	NA
		Motors	5	4	16,735		7,221		1	NA
		Other	3	3	15,755	772	15,755	772	1	NA
		Process	100	99	7,901,435	5,537	7,780,930	5,537	35	NA
		Refrigeration	7	7	1,841,515		1,841,515		2	NA
		Water Heating	9	9		7,575		7,575	3	NA
		Total	**500**	**482**	**15,778,093**	**318,011**	**15,134,211**	**318,011**	**169**	
	Energy Opportunities	Building envelope	-	-					-	NA
		Controls	20	20		186,523		186,523	7	NA
		Cooling	58	51	6,802,351		6,348,193		18	NA
		Heating	42	39	2,088,170		1,901,516		14	NA
		HVAC	7	6		17,204		7,330	2	NA
		Lighting	534	195	33,366,716		22,578,434		68	9.30%
		Motors	3	2	41,935		34,839		1	NA
		Other	3	3	1,159,473		1,159,473		1	NA

Utility	Program Name	Measure Type	Population of Measures	Sample of Measures	Population Electric Savings	Population Gas Savings	Sampled Electric Savings	Sampled Gas Savings	Expected Completed Measures from Survey**	+/- 90% Confidence Interval at Measures Level***
		Process	32	32	5,842,961	42,488	5,842,961	42,488	11	NA
		Refrigeration	29	28	2,725,081		2,721,881		10	NA
		Water Heating	2	2		7,779		7,779	1	NA
		Total	**730**	**378**	**52,026,687**	**253,994**	**40,587,297**	**244,120**	**132**	
	Small Business Energy Advantage	Cooling	59	57	571,689		548,973		20	NA
		Heating	18	15	36,381		13,629		5	NA
		Lighting	1,361	199	25,427,531		12,445,529		70	9.60%
		Other	47	47	899,724		899,724		16	NA
		Refrigeration	237	222	2,375,884		2,221,750		78	NA
		Total	**1,722**	**540**	**29,311,209**	**-**	**16,129,605**	**-**	**189**	
UI	Energy Conscious Blueprint	Building envelope	1	1	20		20		0	NA
		Cooling - Other	6	4	527,278		267,670		1	NA
		Cooling Unitary	13	11	249,646		217,256		4	NA
		Custom	12	12	1,215,081	28,901	1,215,081	28,901	4	NA
		HVAC	1	1	6		6		0	NA
		Lighting	14	13	800,968		740,487		5	NA
		Motors	3	2	20,781		13,795		1	NA
		Process	4	4	108,590		108,590		1	NA
		Refrigeration	2	2	141,588		141,588		1	NA
		VFDs	2	1	197,583		117,511		0	NA
		Total	**58**	**51**	**3,261,541**	**28,901**	**2,822,004**	**28,901**	**18**	
	Energy Opportunities	Controls	1	1	75		75		0	NA
		Custom	27	27	1,554,649		1,554,649		9	NA
		Lighting	56	55	3,348,349		3,266,786		19	NA
		Other	1	1	137,426		137,426		0	NA
		Total	**85**	**84**	**5,040,499**	**-**	**4,958,936**	**-**	**29**	
	Small Business Energy Advantage	Custom	10	9	289,901		267,208		3	NA
		Lighting	164	163	2,348,025		2,319,909		57	NA
		Refrigeration	28	25	130,489		109,376		9	NA
		Total	**202**	**197**	**2,768,415**	**-**	**2,696,493**	**-**	**69**	
Grand Total			**3,297**	**1,732**	**108,186,444**	**600,906**	**82,328,546**	**591,032**	**606**	

** Assumes a 35 percent response rate. We will strive for a higher response rate, but given our experience last year with the gas sample have chosen to be conservative in our estimate.

*** When you take a census of the population, confidence intervals do not apply.

APPENDIX D: 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 nonresponse 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[25]. 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 D-1: Examples of Weighting Calculations Using Three Measure Categories

	Strata (priority / non-priority)	Population of savings	Surveyed savings	Measure weight
Cooling	Census	571,689	180,900	3.16
Lighting	Non-priority	13,786,770	1,480,452	9.31
	Priority	11,640,761	3,619,949	3.22
Heating	Census	36,381	8,008	4.54

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.

[25] 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.

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 gas or electric savings per account surveyed. The data are then analyzed taking into account the electric or gas 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 savings (electric or gas) for each individual account. The free-ridership and spillover rates would be skewed if the savings were not taken into account 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 1,000 kwh	Recorded a savings of 100 kwh
Step 1: Compute measure weight (discussed in prior section)	
Measure weight = 3.22	Measure weight =9.31
Step 2: Compute measure category-weighted kwh	
Adjusted kwh =1,000*3.22 = 3,220	Adjusted kwh = 100*9.31 = 931
Step 3: Calculate kwh associated with the free-ridership based on the measure category weighted kwh, calculated in Step 1	
FR savings = 3,220*.75 = 2,415	FR savings = 931 *.25 = 232.75

Step 4: Sum the free-ridership attributed savings and population savings.

Total FR attributed savings: 2,415 + 232.75 = 2,647.75 kwh
Population savings: 3,220 + 931 = 4,151 kwh

Step 5: Divide the Total FR attributed savings by population savings to determine free-ridership rate.

Net free-ridership rate = 2,647.75 / 4,151 = 63.8 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 kWh associated with that measure and account.

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 E: SURVEY INSTRUMENTS

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

Variable List

<INTERVIEWER> = Interviewer Name
<CONTACT> = Customer Contact Name
<PROGRAM> = Program Name
<COMPANY> = Company Name
<COMPANY CONTACT INFORMATION> = Company Contact Name and Phone Number.
<CUST> = Customer/Facility Name
<DATE> = Date of participation
<YEAR> = 2011
<FUEL> = electric or natural gas
<ADDR> = Service address where measure was installed
<MEASCAT1, MEASCAT2> = End-use Category (i.e. lighting)
<QTY1, QTY2>
0 = quantity is not applicable for this measure category (measure count = 1)
1 = quantity greater than 1
<EFF1, EFF2>
0 = efficiency is not applicable for this measure category (e.g., insulation, VFD, 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
<INSUL> = 1 if wall, attic or roof insulation
<**MEAS1a-MEAS1h**>, <**MEAS2a-MEAS2h**> = detailed measure descriptions
<STUDY> = 0 if not technical assessment study or audit, 1=technical assessment or audit
<STUDY TYPE> = Technical Assessment Study or Audit
<TOINC> = Total incentive
<INC1, INC2> = Incentive for specific measure categories
<ALL ASSISTANCE> = Description of all technical assistance, financing, and rebates for measures installed through program
<FINANCE> = project received interest-free financing

NOTE:
For all questions, "DON'T KNOW" and "REFUSED" will be coded if offered as a response. Interviewers will probe as needed to minimize the amount of missing data.

For any case where the interview terminates early, respondent doesn't recall measures, measures are not installed, or the contact no longer works at the company and we cannot locate a knowledgeable respondent, the case will be pulled and sent to the Company for review.

Introduction

Hello, my name is <INTERVIEWER>, and I'm calling on behalf of <COMPANY> regarding your firm's participation in their <PROGRAM>. May I please speak with <CONTACT>?

1 Yes
2 No [ATTEMPT TO CONVERT. MENTION ADVANCE LETTER THEY SHOULD HAVE RECEIVED REGARDING THE CALL.]

I1 Are you the person who was most involved in making the decision to get <ALL ASSISTANCE> through the <PROGRAM> in <DATE> at <ADDR> in <CITY>?

1 Yes [SKIP TO I2]
2 No [SKIP TO I1A]
D (DK) [PROBE TO IDENTIFY SOMEONE RESPONSIBLE FOR MAKING DECISIONS ABOUT ENERGY USING EQUIPMENT AT THAT FACILITY; IF DK, THANK AND TERMINATE]
R (REFUSED) [THANK AND TERMINATE]

I1a Who was primarily responsible for making the decision to get <ALL ASSISTANCE> through the <PROGRAM> in 2011?

[RECORD NAME AND DISPOSITION]

1 Transfers you
2 Can only give contact information [RECORD CONTACT INFO; THANK AND TERMINATE]
D (DK) [THANK AND TERMINATE]
R (REFUSED) [THANK AND TERMINATE]

I2 Are you employed by <CUST> or are you a contractor who provides design and/or installation services for <CUST>?
(INTERVIEWER NOTE: CODE UNPAID MEMBERS OF AN ADVISORY BOARD OR COMMITTEE AS EMPLOYEES)

1 Work directly for company/Employee/Volunteer
2 Vendor/Contractor [TERMINATE and USE VENDOR SURVEY]

INTRO1

I'm with Tetra Tech, an independent research firm. On behalf of <COMPANY> and the Connecticut Energy Efficiency Fund, we are following up with customers who participated in the <PROGRAM> in <YEAR> to learn about their experiences. You or someone at your facility may have received a letter from <COMPANY> and the Connecticut Energy Efficiency Fund letting you know to expect this call. I'm not selling anything; I'd just like to ask about the energy efficiency project you implemented through this program at <ADDR>. Your individual responses will be kept confidential by Tetra Tech. This should take about 15 minutes.

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

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 this program. Your responses will be kept confidential by our firm. If you would like to talk with someone from <COMPANY>, you can call <COMPANY CONTACT INFORMATION>.)

(Who is doing this study: <COMPANY> and the Connecticut Energy Efficiency Fund has hired our firm to evaluate the program. As part of the evaluation, we're talking with customers that participated in the program to better understand their experiences with the program.)

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

(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.)

Decision Making

INTRO2

In the remainder of this interview, I'd like to focus on the <MEASCAT1, MEASCAT2> you implemented through the <PROGRAM> in <YEAR>.

REPEAT R1A THROUGH R1D FOR MEASCAT1 AND MEASCAT2.

R1a According to our records, the [EFFICIENCY IS APPLICABLE (IF EFF1, EFF2 = 1): energy efficient] <MEASCAT1, MEASCAT2> project you implemented through the program included <MEAS1a-MEAS1h, MEAS2a-MEAS2h>.

Were you involved in the decision-making process when the [EFFICIENCY IS APPLICABLE (IF EFF1, EFF2 = 1): energy efficient] <MEASCAT1, MEASCAT2> was being considered for this facility?

1 Yes
2 No
D (DK)
R (REFUSED)

R1b Aside from yourself, who else within your company or outside your company was involved in the decision of whether or not to purchase the [EFFICIENCY IS APPLICABLE (IF EFF1, EFF2 = 1): energy efficient] <MEASCAT1, MEASCAT2> through the <PROGRAM>?

(PROBE: IF MORE THAN ONE DECISION MAKER, ASK R WHO WAS RESPONSIBLE FOR MAKING THE ULTIMATE DECISION)

1 No one else
2 (SPECIFY):

Name	Title	Phone number	Probe for role:

R1c Is this <MEASCAT1, MEASCAT2> equipment still at least partially installed [IF INSTALLED MEASURE IS OPERATIONAL; (IF EQUIP1, EQUIP2=1): and operating] at this facility?

1 Yes [SKIP TO NEXT MEASURE]
2 No
D (DK)
R (REFUSED)

R1d Why is the <MEASCAT1, MEASCAT2> equipment no longer installed [IF INSTALLED MEASURE IS OPERATIONAL; (IF EQUIP1, EQUIP2=1): or no longer operating] at this facility?

(RECORD VERBATIM RESPONSE)

(IF RESPONDENT WAS MOST INVOLVED IN THE DECISION AND MEASURE IS STILL OPERATING, ASK FREE RIDERSHIP QUESTIONS RELATED TO MEASCAT1, MEASCAT2)

(IF NOT PRIMARY DECISION MAKER FOR EITHER MEASURE, SKIP TO I1 AND DIAL THE MAIN DECISION MAKER IN R1b)

R3 Does your company have a corporate policy related to energy efficiency standards that you need to consider when purchasing new equipment or making improvements to this facility?

1	Yes	
2	No	[SKIP TO R6i]
D	(DK)	[SKIP TO R6i]
R	(REFUSED)	[SKIP TO R6i]

R4 Which of the following best describes this policy? (READ LIST)

1	Purchase energy efficient measures regardless of cost
2	Purchase energy efficient measures if it meets payback or return on investment criteria
3	Purchase standard efficiency measures that meet code
4	Something else (SPECIFY)
D	(DK)
R	(REFUSED)

R6i (ASK IF CL&P EO, ECB Did your company receive a technical assessment or audit as part of your participation in the <PROGRAM>?

1	Yes [STUDY = Yes, STUDYTYPE = “technical assessment study or audit”]
2	No
D	(DK)
R	(REFUSED)

[IF NO <STUDY>, SKIP TO R9]

R6 <COMPANY> conducted a <STUDY> at your facility to determine the cost-effectiveness of installing energy efficient <MEASCAT1 and MEASCAT2> equipment.

If <COMPANY> had not conducted this study, would your company have paid to have a similar <STUDY> done at that same time?

1	Yes	[SKIP TO R9]
2	No	
D	(DK)	[SKIP TO R9]
R	(REFUSED)	[SKIP TO R9]

R7 Would you have paid to have the study done at that same time, at a later date, or never?

1	Same time (REPEAT R6)
2	Later
3	Never
D	(DK)
R	(REFUSED)

R8 [IF R7 = LATER (IF R7 = 2)] How much later would you have had the study done?

___ YEARS (AND/OR) ___ MONTHS

D DK
R (REFUSED)

C2 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 <STUDY> have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; *IF EFF1, EFF2 = 1:* high efficiency] <MEASCAT1,MEASCAT2> project at that time? (REPEAT FOR EACH MEASURE)

_____ (ENTER INFLUENCE RANKING)
D (DK)
R (REFUSED)

R9 [IF FINANCE = YES] According to our records, your firm received interest-free or low cost financing through the <PROGRAM> to help pay for your share of the project cost. Is this correct?

[IF FINANCE FLAG IS MISSING] Did you receive interest-free or low cost financing through the <PROGRAM> which allowed you to pay for your portion of the project cost over time?

1 Yes
2 No [SKIP TO FR0]
D DK [SKIP TO FR0]

C2B [IF FINANCE OR R9=YES] 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 availability of the interest-free or low cost financing provided by the <PROGRAM> have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; *IF EFF1, EFF2 = 1:* high efficiency] <MEASCAT1,MEASCAT2> project at that time? (REPEAT FOR EACH MEASURE)

_____ (ENTER INFLUENCE RANKING)
D (DK)
R (REFUSED)

Free-Ridership

FR0 Please think back to the time when you were considering implementing the specific <MEASCAT1 and MEASCAT2> projects in <YEAR>.

What factors motivated your business to consider implementing new <MEASCAT1 and MEASCAT2> equipment? (PROBE: What other factors did you consider?)

DO NOT READ LIST. PLEASE CHOOSE ALL THAT APPLY.

1 (Old equipment failed)
2 (Old equipment working poorly)
3 (Old equipment scheduled for replacement)
4 (Wanted to reduce maintenance costs)
5 (The incentive being offered through the program)
6 (The technical assistance offered through the program)
7 (Wanted to reduce energy bills)
8 (Wanted to save energy)
9 (Recommendation of third party contractor/engineer/design professional)
10 (Recommendation of <COMPANY> staff)
11 (Recommendation of internal staff)
12 (Past experience with the program)
13 (Other - specify)
D (DK)
R (REFUSED)

START OF MEASURE LOOP
FR1-C9 will be asked of each measure category recalled that are still installed and operating - up to TWO measure categories.

INTRO3a
Now, I'd like to ask you about your decision to implement the <MEASCAT1> project. [IF THERE IS ALSO A SECOND MEASURE: Then, I'll repeat these questions for <MEASCAT2>].

INTRO3b
[IF SECOND MEASURE] Now I'd like to review the <MEASCAT2> project you implemented.

FR1 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 QTY1, QTY2 = 1): quantity] [IF EFFICIENCY IS APPLICABLE (IF EFF1, EFF2 = 1): and efficiency of] <MEASCAT1, MEASCAT2> at that same time if the <COMPANY> had not provided the <ALL ASSISTANCE>?

___ (0 TO 10)
D (DK)
R (REFUSED)

FR2 Did your company have any funds allocated to implement the <MEASCAT1, MEASCAT2> project before you talked with anyone about the program?

1	Yes	
2	No	[SKIP TO FR4]
D	(DK)	[SKIP TO FR4]
R	(REFUSED)	[SKIP TO FR4]

FR3a Was it necessary to change the timing of the implementation, [IF QUANTITY IS GREATER THAN 1 (if QTY1, QTY2 = 1): the quantity of equipment] [IF EFFICIENCY IS APPLICABLE (IF EFF1, EFF2 = 1): or the efficiency level] of the <MEASCAT1, MEASCAT2> in order to qualify for the <PROGRAM>?

1	Yes	
2	No	[SKIP TO FR4]
D	(DK)	[SKIP TO FR4]
R	(REFUSED)	[SKIP TO FR4]

FR3b What changes were necessary? [DO NOT READ; SELECT ALL THAT APPLY]

1	(Installation occurred SOONER than planned)
2	(Installation occurred LATER than planned)
3	(Installed MORE equipment than planned)
4	(Installed LESS equipment than planned)
5	(Equipment was MORE efficient than planned)
6	(Equipment was LESS efficient than planned)
7	(Removed MORE equipment than planned)
8	(Removed LESS equipment than planned)
9	(Other) (SPECIFY)
D	(DK)
R	(REFUSED)

FR4 Who was MOST responsible for actually recommending or specifying the [IF EFFICIENCY IS APPLICABLE (IF EFF1, EFF2 = 1): energy efficient] <MEASCAT1, MEASCAT2> project that was implemented through the <PROGRAM>?

DO NOT READ LIST, RECORD ONLY ONE

1	Respondent
2	Someone else in company (SPECIFY AND PROBE TO SEE IF SHOULD BE SPEAKING WITH THIS R)
3	Third-party design professional
4	Third-party engineer
5	Contractor
6	Manufacturer's representative
7	<COMPANY> account manager
8	Someone else (SPECIFY)
D	(DK)
R	(REFUSED)

C1 [IF FR4= THIRD-PARTY DESIGN PROFESSIONAL, THIRD-PARTY ENGINEER, CONTRACTOR MANUFACTURER'S REPRESENTATIVE, OR <COMPANY> ACCOUNT MANAGER (IF FR4=3, 4, 5, 6 OR 7)]

On a scale of 0 to 10, with 0 being no influence and 10 being a great deal of influence, how much influence did (FR4 response) have on your company's decision to implement the [IF EFFICIENCY IS APPLICABLE; *IF EFF1, EFF2 = 1:* energy efficient] <MEASCAT1,MEASCAT2> project so that it would qualify for the program?

_____ (ENTER INFLUENCE RANKING)
D (DK)
R (REFUSED)

FR5 I'd like to go over all the assistance you received from <COMPANY>.

According to our records, <COMPANY> paid about <INC1, INC2> of the total cost of the [IF EFFICIENCY IS APPLICABLE; *IF EFF1, EFF2 = 1:* energy efficient] <MEASCAT1, MEASCAT2> project implemented through the program.

[IF NO <STUDY>: You may have also received some technical assistance from a <COMPANY> rep, engineer, or equipment vendor.]

[IF <STUDY>: As I previously mentioned, <COMPANY> also conducted a <STUDY TYPE> to identify whether the project was cost effective.]

[IF <FINANCE> = Yes] <PROGRAM> also provided interest-free or low-cost financing for your portion of the project costs.

If <COMPANY> had not paid a portion of the cost for <MEASCAT1, MEASCAT2>, OR provided any technical assistance or education [IF <FINANCE> = Yes: OR provided interest-free or low-cost financing], would your business have implemented <u>any</u> <u>type</u> of <MEASCAT1, MEASCAT2> project <u>at the same time</u>?

1	Yes	[SKIP TO FR7a]
2	No	
D	(DK)	
R	(REFUSED)	

FR6a Would you have implemented the <MEASCAT1, MEASCAT2> project earlier than you did, at a later date, or never?

1	Earlier	
2	Same time	[REPEAT FR5]
3	Later	
4	Never	[SKIP TO C3]
D	(DK)	[SKIP TO C3]
R	(REFUSED)	[SKIP TO C3]

FR6b How much [earlier/later] would you have implemented the <MEASCAT1, MEASCAT2> project?

___ YEARS
___ MONTHS
D DK
R (REFUSED)

[IF QUANTITY IS NOT APPLICABLE FOR THIS MEASURE CATEGORY (IF QTY1, QTY2 = 0), SKIP TO FR8D]

FR7a Without the program incentive, technical assistance, or financing, would your business have implemented the exact same quantity of <MEASCAT1, MEASCAT2> equipment [IF FR5=YES or DK: at that same time; IF FR5=2: within (TIMEFRAME IN FR6b)]?

1	Yes	[SKIP TO FR8]
2	No	
D	(DK)	[SKIP TO FR8]
R	(REFUSED)	[SKIP TO FR8]

FR7b Compared to the amount of <MEASCAT1, MEASCAT2> that you implemented through the program, what percent of the project do you think your business would have purchased on its own during that timeframe?

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

____ (ENTER PERCENTAGE: 1-99%)
D (DK)
R (REFUSED)

[IF EFFICIENCY IS NOT APPLICABLE FOR THIS MEASURE CATEGORY (IF EFF1, EFF2 = 0), SKIP TO C3] [IF QTY1, QTY2=0, SKIP TO FR8d]

FR8 [IF FR7A NE DON'T KNOW OR REFUSE] You said your business would have installed [IF FR7A=YES: all; IF FR7A= NO: (FILL WITH FR7B %)] of the equipment on its own if the program had not been available.

[ALL] Thinking about the <MEASCAT1, MEASCAT2> equipment you would have installed on your own, what percent of this equipment would have been . . . ?

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

a. of the same high efficiency as what was installed through the program?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

b. lower efficiency than what was purchased but higher than standard efficiency or code?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

c. standard efficiency or code

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

(CHECK THAT THE THREE % SUM TO 100%; PROBE TO CLARIFY).

FR8d [IF QTY1, QTY2=0] Thinking about the <MEASCAT1, MEASCAT2> project you would have implemented on your own if the program had not been available, would it have been of the same high efficiency as what was installed through the program, lower efficiency than what was purchased but higher than standard efficiency, or standard efficiency or code?

1 Of the same high efficiency as what was installed through the program?
2 Lower efficiency than what was purchased but higher than standard efficiency
3 Standard efficiency or code
D (DK)
R (REFUSED)

RVL1 [IF INSUL = 1] Thinking about the insulation project you would have implemented on your own if the program had not been available, would it have been of the same R Value or amount as what was installed through the program?

1 Yes [SKIP TO C3]
2 No
D (DK)
R (REFUSED)

RVL2 [IF INSUL = 1] Compared to what you installed through the program, what R Value or amount would you have installed? (PROBE: "For example, would it have been 50% as much as what was installed through the program?")

__ [1-99%]
D (DK)
R (REFUSED)

C3 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 <INC1,INC2> you received from <COMPANY> have on your decision to implement the [IF EFFICIENCY IS APPLICABLE; *IF EFF1, EFF2 = 1:* high efficiency] <MEASCAT1,MEASCAT2> project?

_____ (ENTER INFLUENCE RANKING)
D (DK)
R (REFUSED)

Consistency Check Prompts

100% Free Ridership Consistency Check
[IF WOULD HAVE PURCHASED AT THE SAME TIME, IN THE SAME QUANTITY, AND OF THE SAME EFFICIENCY LEVEL; *IF FR5=1 AND FR7a=1 AND (FR8a=100% or FR8d = 1), ASK C4a-C7c*, ELSE SKIP TO C8]

C4a Now I want to focus on what it would have cost your business to install this equipment on its own without the program. 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 paid the additional <INC1,INC2> on top of the amount you already paid, to implement the same quantity and efficiency of <MEASCAT1,MEASCAT2> equipment at that same time?

___ (0 TO 10)
D (DK)
R (REFUSED)

C4b (ASK IF C4a < 8) You said that you would have installed the same quantity and efficiency of equipment at that same time, but you also just said that there was a (FILL WITH C4a SCORE) in 10 likelihood of you paying the additional incentive provided by the <COMPANY> program. Which of these is more accurate?

1 Installed same quantity & efficiency at same time [SKIP TO C9]
2 Likelihood of installing this without the program assistance was (C4a SCORE)
3 Something else (SPECIFY)

C5 How would your project have changed if <PROGRAM> had not contributed to the cost of the <MEASCAT1, MEASCAT2>? (INDICATE ALL THAT APPLY) (DO NOT READ)

1 (Would not have changed) [SKIP TO C9]
2 (Would have postponed the project) (SPECIFY # MONTHS)
3 (Would have cancelled the project altogether)
4 (Would have repaired existing equipment)
5 (Kept using existing equipment)
6 (Purchased less efficient equipment) (ASK C7)
7 (Purchased fewer quantity) (ASK C6)
8 (Installed DIFFERENT type of equipment than planned) (SPECIFY)
9 (Other) (SPECIFY)
D (DK)
R (REFUSED)

C6 [IF C5=PURCHASED FEWER QUANTITY; *IF C5=7*) Compared to the amount of <MEASCAT1, MEASCAT2> that you implemented through the program, what percent do you think your business would have purchased on its 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: 1-99%)
D (DK)
R (REFUSED)

C7 [IF C5=PURCHASED LESS EFFICIENT EQUIPMENT; *IF C5=6*) Thinking about the equipment you would have implemented on your own, what percent of this equipment would have been . . . ?

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

a. of the same high efficiency as what was installed through the program?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

b. lower efficiency than what was purchased but higher than standard efficiency or code?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

c. standard efficiency or code

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

(CHECK THAT THE THREE % SUM TO 100%; PROBE TO CLARIFY).

0% Free Ridership Consistency Check

C8 (IF SBEA - ASK IF AT LEAST SOMEWHAT LIKELY TO HAVE INSTALLED THE MEASURE WITHOUT THE PROGRAM BUT LATER STATES THAT WOULD HAVE WAITED AT LEAST TWO YEARS (FR1 > 3 AND FR6b > **24** MONTHS OR NEVER)

(IF MED/LARGE C&I - ASK IF AT LEAST SOMEWHAT LIKELY TO HAVE INSTALLED THE MEASURE WITHOUT THE PROGRAM BUT LATER STATES THAT WOULD HAVE WAITED AT LEAST FOUR YEARS (FR1 > 3 AND FR6b > **48** MONTHS OR NEVER) Earlier in the interview, you said there was a (FR1 SCORE) in 10 likelihood that you would have implemented the same quantity and efficiency of <MEASCAT1, MEASCAT2>equipment at that same time in the absence of the program assistance. But you also said you would not have implemented the <MEASCAT1, MEASCAT2> project within <2/4> years of when you did. Which of these is more accurate?

1 The likelihood of installing this without the program assistance was (FR1 SCORE)
2 Would not have installed anything within 2/4 years
3 Something else (SPECIFY)
D (DK)
R (REFUSED)

Additional Consistency Check

C9 (IF 100% FREE-RIDER; *IF FR5=1 AND FR7a=1 AND (FR8a=100% or FR8d = 1) AND C4b = 1 AND (C2 > 6 OR C3 > 6*)) **PROMPT**: "Previously you stated that you would have installed the exact same equipment at the same time without the program. But, you also stated that the …

(IF C2 > 6 FILL: program-sponsored study)
(IF C3 > 6 FILL: program incentive)
(IF C2b > 6: FILL: availability of financing)

… was influential in your decision.)

(IF 0% FREE-RIDER: *IF FR6a = NEVER OR DK AND (C2 < 5 OR C3 < 5)* **PROMPT**: "Previously you stated that you would not have installed any equipment without the program. You also stated that the …

(IF C2 < 5 FILL: program-sponsored study)
(IF C3 < 5 FILL: program incentive and financing options)
(IF C2b < 5: FILL: availability of financing)

… was not influential in your decision.)

(ASK OF ALL) I'd like to better understand your purchase decision. In your own words, please describe what impact, if any, all the assistance you received through the program had on your decision to install the amount of energy efficient <MEASCAT1, MEASCAT2> equipment at the time you did?

(RECORD VERBATIM RESPONSE)

SKIP1

(REPEATS QUESTIONS BEGINNING FROM INTRO3B FOR SECOND MEASURE – IF NO OTHER MEASURES – CONTINUE)

[IF MEAS2 = 1 GO TO INTRO3B]
[IF MEAS2 = 0 GO TO PP1]

Impact of Previous Program Participation

[IF NEVER WOULD HAVE INSTALLED OR ALL EQUIPMENT WOULD HAVE BEEN OF STANDARD EFFICIENCY AND UNLIKELY TO HAVE PURCHASED WITHOUT PROGRAM ((IF FR6A = NEVER OR FR8A = 0% OR FR8D <> 1) AND FR1 < 4) SKIP TO COM]

PP1 Had your business participated in <COMPANY>'s <PROGRAM> before you implemented the energy efficient project in <DATE>?

1	Yes	
2	No	[SKIP TO S1a]
D	(DK)	[SKIP TO S1a]
R	(REFUSED)	[SKIP TO S1a]

PP2 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 <COMPANY> program when making the decision to implement the <MEASCAT1, MEASCAT2> project at this facility around <DATE>?

___ 0 – 10
D (DK)

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. (REPEAT IF NECESSARY)

1 Agree
2 Disagree
D (DK)
R (REFUSED)

Our previous experience implementing energy efficient projects through the <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

Like Spillover[26]

START OF MEASURE LOOP
S1a-S4b will be asked of <MEAS1, MEAS2> - up to TWO measure categories.

S1a Now I'd like you to think of the time since you participated in the <PROGRAM> in <DATE>.

Has your company implemented any <MEASCAT1, MEASCAT2> projects for this or other facilities in Connecticut **on your own,** that is without a rebate from <COMPANY>?

1 Yes
2 No [SKIP TO SKIP2]
D (DK) [SKIP TO SKIP2]

[IF EFFICIENCY IS NOT APPLICABLE; *IF EFF1, EFF2 = 0, SKIP TO S2a*]

S1b Was this equipment of **the same efficiency level or a higher level of efficiency** as the equipment you installed through the program?

1 Yes [SKIP TO S2a]
2 No
D (DK)

[26] As these surveys are being conducted within a year after implementation, estimates of like and unlike spillover are likely to be limited as participants have not had adequate time to install additional equipment.

S1c Was this equipment more energy efficient than standard efficiency or code equipment?

1 Yes
2 No [SKIP TO SKIP2]
D (DK) [SKIP TO SKIP2]

S2a Thinking of the <MEASCAT 1, MEASCAT 2> equipment that you installed on your own, how does the quantity compare to what you installed through the program? Did you install more, less or the same amount of <MEASCAT 1, MEASCAT 2>?

(PROBE: We're looking for a percent compared to the amount installed through the program. For example, was it about one- fourth of what you installed through the program, one-half of what you installed through the program, the same (100%) amount as you installed through the program, twice as much as what you installed through the program (200%) or some other amount?)

1 More (How much more? Enter percentage: 0-100%)
2 Less (How much less? Enter percentage: 0-100%)
3 Same
D (DK)

S2b [IF S2a <> SAME AMOUNT OF <MEASCAT 1, MEASCAT 2>; *IF S2a <> 3*] So the additional energy efficient equipment you bought on your own was <percentage from S2a> as much as you got through the program?

1 Yes
2 No [correct S2a]

S3a Did a recommendation by the contractor, engineer, or designer who you worked with under the <PROGRAM> influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; (IF EFF1, EFF2 = 1): efficient] <MEASCAT1, MEASCAT2> equipment on your own?

1 Yes
2 No
D (DK)
R (REFUSED)

S3b Did your experience with the energy efficient projects implemented through the <PROGRAM> influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; (IF EFF1, EFF2 = 1): efficient] <MEASCAT1, MEASCAT2> equipment on your own?

1 Yes
2 No
D (DK)
R (REFUSED)

S3c Did your participation in any past program offered by <COMPANY> influence your decision to implement some or all of this [IF EFFICIENCY IS APPLICABLE; (IF EFF1, EFF2 = 1): efficient] <MEASCAT1, MEASCAT2> equipment on your own?

1 Yes
2 No
D (DK)
R (REFUSED)

S3d 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 <COMPANY> program have on your decision to install this equipment without an incentive?

__ 0-10 rating
D (DK)

S4a Why didn't you implement this <MEASCAT1, MEASCAT2> project through a <COMPANY> program?

[DO NOT READ - SELECT ALL THAT APPLY]

1 (Too much paperwork)
2 (Cost savings not worth the effort of applying)
3 (Takes too long for approval)
4 (The equipment would not qualify)
5 (Vendor does not participate in program)
6 (Outside <COMPANY>’s service territory)
7 (No time - needed equipment immediately)
8 (Thought the program ended)
9 (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)
D (DK)

S4b [IF S4a = THE EQUIPMENT WOULD NOT QUALIFY; *IF S4a = 4*) Why wouldn't the equipment qualify?

(RECORD VERBATIM RESPONSE)

SKIP2 (REPEAT LIKE SPILLOVER QUESTIONS FOR SECOND MEASURE – IF NO OTHER MEASURES – CONTINUE)

[IF MEAS2 = 1 GO TO S1A]
[IF MEAS2 = 0 GO TO S5]

Unlike Spillover

S5 Since participating in <PROGRAM>, has your company purchased, installed, or implemented any other type of energy efficient equipment **on your own,** that is without a rebate from <COMPANY>?

1	Yes	
2	No	[SKIP TO NE1]
D	(DK)	[SKIP TO NE1]

S6 What did you install?

Record type: _____
Record quantity: _____
Record size or capacity: _____

S7a Would this project have qualified for an incentive through the <PROGRAM>?

1	Yes	
2	Yes, implemented through a program	[SKIP TO COM]
3	No	[SKIP TO COM]
D	(DK)	[SKIP TO COM]

S7b Did a recommendation by the contractor, engineer, or designer who you worked with under the <PROGRAM> influence your decision to implement some or all of this equipment on your own?

1	Yes
2	No
D	(DK)
R	(REFUSED)

S7c Did your experience with the energy efficient projects implemented through the <PROGRAM> influence your decision to implement some or all of this equipment on your own?

1	Yes
2	No
D	(DK)
R	(REFUSED)

S7d Did your participation in any past program offered by <COMPANY> influence your decision to implement some or all of this equipment on your own?

1	Yes
2	No
D	(DK)
R	(REFUSED)

S7e 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 <COMPANY> program have on your decision to install this equipment without an incentive?

__ 0-10 rating
D (DK)

S8a Why didn't you implement this project through a <COMPANY> program?

DO NOT READ - SELECT ALL THAT APPLY

1 (Too much paperwork)
2 (Cost savings not worth the effort of applying)
3 (Takes too long for approval)
4 (The equipment would not qualify)
5 (Vendor does not participate in program)
6 (Outside <COMPANY>’s service territory)
7 (No time - needed equipment immediately)
8 (Thought the program ended)
9 (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)
D (DK)

S8b [IF S8a = EQUIPMENT WOULD NOT QUALIFY (IF S8a = 4)] Why wouldn't the project qualify?

(RECORD VERBATIM RESPONSE)

Wrap-up

COM Do you have any comments or suggestions for the program?

(RECORD VERBATIM RESPONSE)

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

(RECORD VERBATIM RESPONSE)

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

1 Yes
2 No

A4 [ASK IF C1 > 6]
We would like to talk to the person who was most influential in recommending or specifying the efficient <MEASCAT1, MEASCAT2> equipment to install through the program. Earlier you mentioned that this was [FILL WITH FR4 RESPONSE]. Could you give me the name and telephone number of this person?

1 Yes (Record contact information)
2 No, REFUSED to give this information
3 No, no outside advisor involved
4 [IF SECOND MEASURE] (SAME CONTACT INFO AS PREVIOUS MEASURE)
D (DK)

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

E.2 INFLUENTIAL DESIGN PROFESSIONAL/VENDOR FREE-RIDERSHIP SURVEY

Variable List	
<CONTACT>	Customer Contact Name
<CUST>	Customer/Facility Name
<ADDR>	Service address where equipment was installed
<MEASCAT1, MEASCAT2>	End-use Category (i.e. lighting)
<MEASCAT1a-MEASCAT1h>	Detailed measure descriptions
<MEASCAT2a-MEASCAT2h>	Detailed measure descriptions
<STUDY>	"1" if a Technical Assessment Study/Audit was conducted, else "0"
<STUDY TYPE>	Technical Assessment Study or Audit
<INC1, INC2>	Company incentive for Measure categories
<QTY1, QTY2>	0=quantity is not applicable for this measure category (measure qty = 1 or quantity is not relevant), 1=quantity greater than 1
<EFF1, EFF2>	0=efficiency is not applicable for this measure category (e.g., insulation, VFD), 1=efficiency is applicable
<EQUIP1, EQUIP2>	0 if installed measure isn't equipment that is operational (e.g., insulation), 1=if installed measure is operational
<PROGRAM>	Utility/sponsor programs the vendor has been involved with
<COMPANY>	Utility/company name
<FINANCE>	1=Customer indicated they received interest-free or low-cost financing, else 0

Procedure

The customer-identified influential vendors will be exported based on customer responses to the self-report survey and combined into a single sample file. This file will be checked for missing contact information and we will fill in phone numbers where possible. Cases will then be sorted by company, contact, and phone number to identify "multiples". Cases with the same contact names will be called together and the contact will be alerted that they have been referred by more than one customer. This set of sample cases will receive the free rider questions in this survey, as well as the nonparticipant spillover questions.

Introduction

INTRO
Hello, my name is __, and I am calling on behalf of <**COMPANY** >. We are talking with some of the design professionals and contactors who were involved with the <**PROGRAM**> in 2011. 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 this/these program(s) in 2011.

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

(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. If you would like to talk with someone from there, you can call [CONTACT NAME AND PHONE NUMBER FOR SPONSORS INCLUDED IN THIS CALL].

Free-Ridership Questions

INTRO2
I'd like to review the <**MEASCAT1**, **MEASCAT2**> you recommended or specified through the <**PROGRAM**> for <COMPANY>.

VR1 Do you recall recommending <**MEASCAT1**>, which included <**DESC1**> for <**CUST**> at <**ADDR**> through the <**PROGRAM**> in 2011?

1 Yes [SKIP TO V1a]
2 No
3 This equipment was never installed [IF NUMBER OF MEASURE CATEGORIES=2, SKIP TO VR2; ELSE SKIP TO END]
D (DK)
R (Refused)

VR1a Is there someone else at your firm who would be more familiar with this equipment?

1 Yes - Continue [ENTER CONTACT INFO & TRANSFER. GO THROUGH INTERVIEW WITH OTHER CONTACT IF AVAILABLE, OTHERWISE SET CALLBACK AND UPDATE CONTACT INFORMATION.]
2 Yes – Not available [ENTER CONTACT INFO & EXIT]
3 No [SKIP TO NEXT MEASURE]

V1a First I'd like to ask you about your decisions to recommend <**MEASCAT1**> through the <**PROGRAM**>. Were you involved in the decision-making process at the design stage when the <**MEASCAT1**> equipment was specified and agreed upon for this facility?

1 Yes [IF # OF MEASURE CATEGORIES = 2, SKIP TO VR2, ELSE SKIP TO VP0a]
2 No
D (DK)

V1b At what point in the process did you become involved?

(RECORD VERBATIM RESPONSE)
(DK)
(REFUSED)

V1c What was your role?

(RECORD VERBATIM RESPONSE)
(DK)
(REFUSED)

[IF NO SECOND MEASURE, SKIP TO VP0a]

VR2 Do you recall recommending <**MEASCAT2**> which included <**DESC2**> for <**CUST**> at <**ADDR**> through the <**PROGRAM**> in 2011?

1 Yes [SKIP TO V2a]
2 No
3 This equipment was never installed [SKIP TO VP0a IF INSTALLED MEASURE CATEGORY 1; ELSE SKIP TO END]
D (DK)

VR2a Is there someone else at your firm who would be more familiar with this equipment?

1 Yes - Continue [ENTER CONTACT INFO & TRANSFER IF NOT CONTACT FOR MEASURE 1]
2 Yes – Not available [ENTER CONTACT INFO & EXIT IF NOT CONTACT FOR MEASURE 1]
3 No – Continue
4 Contact no longer with the company

[IF DIDN'T RECALL MEASURES 1 AND 2, MEASURES 1 AND 2 WERE NOT INSTALLED, OR R WAS NOT THE CONTACT FOR MEASURES 1 AND 2, SKIP TO SPILLOVER; ELSE SKIP TO VP0a AND ONLY ASK QUESTIONS FOR MEASURE 1]

V2a Were you involved in the decision-making process at the design stage when the <**MEASCAT2**> equipment was specified and agreed upon for this facility?

1 Yes
2 No
D (DK)

V2b At what point in the process did you become involved?

(RECORD VERBATIM RESPONSE)
(DK)
(REFUSED)

V2c What was your role?

(RECORD VERBATIM RESPONSE)
(DK)
(REFUSED)

[IF STUDY=0 SKIP TO VC9]

VP0a According to **<CUST>**, <COMPANY> paid a portion of the cost to conduct a <**STUDY TYPE**> for <**CUST**> to determine the cost-effectiveness of installing <**MEASCAT1**, **MEASCAT2**> equipment.

If <COMPANY> had not paid a portion of the cost, do you think <**CUST**> would have paid to have a similar <**STUDY TYPE**> done at the same time?

1 Yes
2 No
D (DK)

VC2 [IF VP0a = No, DK] 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 <**STUDY TYPE**> have on your decision to recommend the [IF **EFF1**, **EFF2** = 1: high efficiency] <**MEASCAT1**,**MEASCAT2**> project?

_____ (ENTER INFLUENCE RANKING)
D (DK)
R (REFUSED)

[IF FINANCE=0 SKIP TO VA1]

VC9 <CUSTOMER> mentioned that they received interest-free or low-cost financing from <COMPANY> which allowed them to pay for their portion of the project cost over time? Is that correct?

1 Yes
2 No

VC9a [IF VR9=1] 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 interest-free or low-cost financing have on your decision to recommend the [IF **EFF1**, **EFF2** = 1: high efficiency] <**MEASCAT1**,**MEASCAT2**> project?

_____ (ENTER INFLUENCE RANKING)
D (DK)
R (REFUSED)

[INTERVIEWER: START OF MEASURE LOOPS. VA1 THROUGH VF9 WILL BE ASKED OF EACH MEASURE CATEGORY RECALLED - UP TO TWO MEASURES.]

INTRO3a [FIRST MEASURE]
Now, I'd like to ask you some questions about your decision to recommend <**MEASCAT1**> equipment. [IF THERE IS ALSO A SECOND MEASURE: Then, I'll repeat these questions for <**MEASCAT2**> equipment.]

INTRO3b [IF SECOND MEASURE]
Now I'd like to review the <**MEASCAT2**> equipment you recommended.

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 <**MEASCAT1, MEASCAT2**> so that it would qualify for the program?

__ (0-10)
D (DK)

(IF VA1 < 7 AND NO OTHER MEASURE, SKIP TO END; IF VA1<7 AND ANOTHER MEASURE CATEGORY, REASK VA1 OF SECOND MEASURE CATEGORY; ELSE SKIP TO VP1a)

FR The next set of questions ask about <**CUST**>'s planning and installation decisions through <**PROGRAM**> in 2011.

VP1a As far as you know, did <**CUST**> have funds allocated to install any of this equipment before you talked with them about the program?

1 Yes
2 Yes, but don't remember specifics [SKIP TO ATXT3]
3 No [SKIP TO ATXT3]
D (DK) [SKIP TO ATXT3]
R (Refused) [SKIP TO ATXT3]

VP1b (IF YES) What plans existed?

(RECORD VERBATIM RESPONSE)
(DK)
(REFUSED)

VP2a Was it necessary to change the timing of the installation, the quantity of equipment installed or the efficiency level of the <**MEASCAT1**, **MEASCAT2**> equipment installed in order to qualify for the <**PROGRAM**>?

1	Yes	
2	Yes, but don't remember specifics	[SKIP TO ATXT3]
3	No	[SKIP TO ATXT3]
D	(DK)	[SKIP TO ATXT3]
R	(Refused)	[SKIP TO ATXT3]

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

1	(Installation occurred SOONER than planned)
2	(Installation occurred LATER than planned)
3	(Installed MORE equipment than planned)
4	(Installed LESS equipment than planned)
5	(Equipment was MORE efficient than planned)
6	(Equipment was LESS efficient than planned)
7	(Other - specify)
D	(Don't know)
R	(Refused)

ATXT3
According to our records, <COMPANY> paid about <**INC1**, **INC2**> of the total cost of the <**MEASCAT1**, **MEASCAT2**>.

<**CUST**> may have also received [IF STUDY TYPE=1: some technical assistance] [IF FINANCE=1: interest-free or low-cost financing] through the program.

VF1 If <COMPANY> had not paid a portion of the implementation cost, would your company have recommended or specified any type of <**MEASCAT1**, **MEASCAT2**> equipment to <**CUST**> at the same time?

1	Yes	
2	No	[SKIP TO VC3]
D	(DK)	[SKIP TO VC3]

[IF QTY1, QTY2 = 0, SKIP TO VF3d]

VF2a Without the program incentive, technical assistance, or education, would your company have recommended or specified the exact same quantity of <**MEASCAT1**, **MEASCAT2**> for <**CUST**> at the same time?

1	Yes	[SKIP TO VF3]
2	No	
D	(DK)	

VF2b Compared to the amount that you recommended through the program, what percentage of the overall quantity of <**MEASCAT1**, **MEASCAT2**> equipment do you think your company would have recommended or specified without assistance from <COMPANY>?

(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%, 998=DK)

[IF VF2b = 0, SKIP TO VC3
[IF EFF1, EFF2 = 0, SKIP TO VC3]

VF3 You said you would have recommended or specified [IF VF2a=1: all the] [IF VF2a=2 OR D SHOW: at least some] <**MEASCAT1**, **MEASCAT2**> for <**CUST**> if the program had not been available.

What percent of the equipment that you would have recommended would have been…

a. of the same high efficiency as what was installed through the program?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

b. lower efficiency than what was purchased but higher than standard efficiency or code?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

c. standard efficiency or code?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

[IF QTY1, QTY2 = 1, SKIP TO VC3]
[IF EFF1, EFF2 = 0, SKIP TO VC3]

VF3d Thinking about the <**MEASCAT1**, **MEASCAT2**> equipment you would have recommended if the program had not been available, would it have been of the same high efficiency as what was installed through the program, lower efficiency than what was purchased but higher than standard efficiency, or standard efficiency or code?

1 Of the same high efficiency as what was installed through the program?
2 Lower efficiency than what was purchased but higher than standard efficiency
3 Standard efficiency or code
D (DK)
R (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 <**INC1**,**INC2**> <**CUST**> received from <COMPANY> have on your decision to recommend the [IF **EFF1**, **EFF2** = 1:high efficiency] <**MEASCAT1**,**MEASCAT2**> project?

_____ (ENTER INFLUENCE RANKING)
D (DK)
R (REFUSED)

(IF VF1=1 AND VF2a=1 AND VF3a=100%, ASK VF4-VF7; ELSE SKIP TO VF8)

VF4 Now I want to focus on what it would have cost <**CUST**> to install this equipment on its own without the program. 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 <**INC1**,**INC2**> on top of the amount they already paid, to implement the same quantity and efficiency of <**MEASCAT1**, **MEASCAT2**> equipment at that same time?

___ (0 TO 10)
D (DK)
R (REFUSED)

(IF VF4 > 7 SKIP TO VF8)

VF5 How would their project have changed if <**PROGRAM**> had not contributed to the cost of the <**MEASCAT1**, **MEASCAT2**>?
(INDICATE ALL THAT APPLY) (DO NOT READ)

1 Would not have changed [SKIP TO VF8]
2 (Would have postponed the project) (SPECIFY # MONTHS)
3 (Would have cancelled the project altogether)
4 (Would have repaired existing equipment)
5 (Kept using existing equipment)
6 (Purchased less efficient equipment) (ASK VF7)
7 (Purchased fewer quantity) (ASK VF6)
8 (Installed DIFFERENT type of equipment than planned) (SPECIFY)
9 (Other) (SPECIFY)
D (DK)
R (REFUSED)

VF6 (IF VF5=7) Compared to the amount of <**MEASCAT1**, **MEASCAT2**> that <**CUST**> 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%)
D (DK)
R (REFUSED)

[IF VF6 = 0 SKIP TO VF8]
[IF QTY1, QTY2 = 0 SKIP TO VF8]

VF7 (IF VF5=6) Thinking about the equipment <**CUST**> would have implemented on their own, what percent of this equipment would have been . . . ?

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

a. of the same high efficiency as what was installed through the program?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

b. lower efficiency than what was purchased but higher than standard efficiency or code?

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

c. standard efficiency or code

____ (ENTER PERCENTAGE: 0-100%)
D (DK)

(CHECK THAT THE THREE % SUM TO 100%; PROBE TO CLARIFY).

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 <COMPANY> program when making the decision to recommend or install <**MEASCAT1**, **MEASCAT2**>for this customer?

_____
D (DK)
N NA – No previous program experience

VF9 (IF VF1=1 AND VF2a=1 AND (VF3a=100% or VF3d = 1) AND VF5 = 1 AND (VC2 > 6 OR VC3 > 6) PROMPT: "Previously you stated that you would have recommended the exact same equipment at the same time without the program. But, you also stated that the …

(IF VC2 > 6 FILL: program-sponsored study)
(IF VC3 > 6 FILL: program incentive)
(IF VC9a > 6 FILL: program financing)

… was influential in your decision to make the recommendations that you did.)

(IF VF1 = NO OR DK AND (VC2 < 5 OR VC3 < 5) PROMPT: "Previously you stated that <**CUST**> would not have installed any equipment without the program. You also stated that the …
(IF VC2 < 5 FILL: program-sponsored study)
(IF VC3 < 5 FILL: program incentive)
(IF VC9a < 5 FILL: program financing)

… was not influential in their decision.)

I'd like to better understand <**CUST**>'s purchase decision. Please describe what impact, if any, the program had <**CUST**>'s decision to install the energy efficient <**MEASCAT1**,**MEASCAT2**> equipment at the time they did?

(RECORD VERBATIM RESPONSE)
(DK)
(REFUSED)

Nonparticipant Like Spillover

[VNP1a-VNP8 WILL BE ASKED FOR EACH TYPE OF EQUIPMENT CATEGORY SOLD THROUGH THE PROGRAMS.]

VNP1a Our records show that your firm specified, sold, and/or installed <**MEx**> to commercial and industrial customers in 2011 through the <**PROGRAM**>. This includes equipment such as <**DESC**>.

Is that correct?
[INTERVIEWER: PLEASE VERIFY EACH TYPE OF EQUIPMENT THAT SHOWS FOR THE VENDOR]

1 Yes
2 No
D Don't know
R Refused

ME1-MEx= SPECIFIC EQUIPMENT

Note: The equipment categories listed above will closely match equipment categories as defined in the customer sample. When asking vendors about each equipment category, we will reference the specific measure-level descriptions noted in the database.

VNP1b Prior to participating in the <COMPANY> program, in what percentage of your commercial projects did you install high efficiency <**MEx**>?

___ ENTER PERCENTAGE
D DON'T KNOW
R REFUSED

VNP1c And since January 2011, in what percentage of your commercial projects did you install high efficiency <**MEx**>?

___ ENTER PERCENTAGE
D DON'T KNOW
R REFUSED

VNP2 Please think about all the program-eligible <**MEx**> you specified, sold and/or installed for <COMPANY> customers in 2011.
Did you specify, sell and/or install any of this program-eligible <**MEx**> to customers of <COMPANY> without the customer participating in a <COMPANY> program?

1 Yes
2 No [SKIP TO NEXT CATEGORY]
D Don't know [SKIP TO NEXT CATEGORY]
R Refused [SKIP TO NEXT CATEGORY]

VNP3 (IF VNP2 = Yes) Approximately what percent of all of this program-eligible <**MEx**> you specified, sold and/or installed for <COMPANY> customers in 2011 did not receive an incentive through a <COMPANY> program?

___%
D Don't know
R Refused

(ASK VNP4-VNP8 OF EACH MEASURE WHERE VNP3 > 1%)

VNP4 In 2011, you mentioned that about [___%] of the <**MEx**> you specified and/or installed would have been eligible for an incentive through a <COMPANY> program, but did not receive an incentive.
What are the main reasons why your firm did not request a customer incentive for this energy saving equipment you specified/installed?
(DO NOT READ—INDICATE ALL THAT APPLY; PROBE, WHAT ELSE?)

1 Not worth the paperwork for our firm to help the customer apply for the incentive
2 Customer did not want the hassle of applying for the incentive
3 Takes too long for approval
4 Reached the maximum amount I could install through the program
5 The equipment would not qualify→ [Why not? *(SPECIFY)*]
6 Vendor does not participate in program
7 Outside [COMPANY] service territory
8 No time – needed equipment immediately
9 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)*
14 Don't know

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 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 what we learned through working with <COMPANY>.

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 what we learned through working with <COMPANY>.

0 Agree
1 Disagree

VNP8 Please describe what impact, if any, the <**PROGRAM**> had on your decision to specify or install energy efficient <**MEx**> outside of the program.

(RECORD VERBATIM RESPONSE)

END We are almost finished calling customers about their experience with the program. If another customer identifies you as being influential in their decision to install energy efficient equipment, would it be alright for us to call you back for just a couple of questions?

1 YES
2 NO

VRNAME

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

(RECORD VERBATIM RESPONSE)

COMMENTS

That is all the questions I have for you. Thank you for your participation. Do you have any comments?

(RECORD VERBATIM RESPONSE)

E.3 DESIGN PROFESSIONAL/VENDOR NONPARTICIPANT SPILLOVER SURVEY

Variable List

<COMPANY>	Companies the vendor has worked with on energy efficiency projects
<PROGRAM>	Company programs the vendor has been involved with
<ME1-MEx>	Types of equipment specified/sold as part of spillover questions

Procedure

All participating vendors identified in the Companies' databases will be asked the nonparticipant spillover questions to estimate 'like' spillover.

Introduction

INTRO4

Hello, my name is _____, and I am calling from Tetra Tech on behalf of <COMPANY>. We are talking with some of the design professionals and contactors who were involved with the <**PROGRAM**> in 2011. 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 this/these program(s) in 2011.

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

(Timing: This survey will take less than 10-15 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. If you would like to talk with someone from there, you can call [CONTACT NAME AND PHONE NUMBER FOR COMPANIES INCLUDED IN THIS CALL].

[VNP1a-VNP8 WILL BE ASKED FOR EACH TYPE OF EQUIPMENT CATEGORY].

VNP1a Our records show that your firm specified, sold, and/or installed <**MEx**> to commercial and industrial customers in 2011 through the <**PROGRAM**>. This includes equipment such as <**DESC**>.

Is that correct?
[INTERVIEWER: PLEASE VERIFY EACH TYPE OF EQUIPMENT THAT SHOWS FOR THE VENDOR]

1 Yes
2 No
D Don't know
R Refused

ME1-MEx= SPECIFIC EQUIPMENT

Note: The equipment categories listed above will closely match equipment categories as defined in the customer sample. When asking vendors about each equipment category, we will reference the specific measure-level descriptions noted in the database.

VNP1b Prior to participating in the <COMPANY> program, in what percentage of your commercial projects did you install high efficiency <**MEx**>?

___ ENTER PERCENTAGE
D DON'T KNOW
R REFUSED

VNP1c And since January 2011, in what percentage of your commercial projects did you install high efficiency <**MEx**>?

___ ENTER PERCENTAGE
D DON'T KNOW
R REFUSED

VNP2 Please think about all the program-eligible <**MEx**> you specified, sold and/or installed for <COMPANY> customers in 2011.

Did you specify, sell and/or install any of this program-eligible <**MEx**> to customers of <COMPANY> without the customer participating in a <COMPANY> program?

1 Yes
2 No [SKIP TO NEXT CATEGORY]
D Don't know [SKIP TO NEXT CATEGORY]
R Refused [SKIP TO NEXT CATEGORY]

VNP3 (IF VNP2 = Yes) Approximately what percent of all of this program-eligible <**MEx**> you specified, sold and/or installed for <COMPANY> customers in 2011 did not receive an incentive through a <COMPANY> program?

___%
D Don't know
R Refused

(ASK VNP4-VNP8 OF EACH MEASURE WHERE VNP3 > 1%)

VNP4 In 2011, you mentioned that about [___%] of the <**MEx**> you specified and/or installed would have been eligible for an incentive through a <COMPANY> program, but did not receive an incentive.
What are the main reasons why your firm did not request a customer incentive for this energy saving equipment you specified/installed?
(DO NOT READ—INDICATE ALL THAT APPLY; PROBE, WHAT ELSE?)

1 Not worth the paperwork for our firm to help the customer apply for the incentive
2 Customer did not want the hassle of applying for the incentive
3 Takes too long for approval
4 Reached the maximum amount I could install through the program
5 The equipment would not qualify→ [Why not? *(SPECIFY)*]
6 Vendor does not participate in program
7 Outside [COMPANY] service territory
8 No time – needed equipment immediately
9 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)*
14 Don't know

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 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 what we learned through working with <COMPANY>.

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 what we learned through working with <COMPANY>.

0 Agree
1 Disagree

VNP8 Please describe what impact, if any, the <**PROGRAM**> had on your decision to specify or install energy efficient <**MEx**> outside of the program.

(RECORD VERBATIM RESPONSE)

END We are almost finished calling customers about their experience with the program. If a customer identifies you as being influential in their decision to install energy efficient equipment, would it be alright for us to call you back for just a couple of questions?

1 YES
2 NO

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

COMMENTS
Those are all the questions I have for you. Thank you for your participation. Do you have any comments?

APPENDIX F: CUSTOMER ACCOUNT AND PROGRAM SAVINGS COVERAGE

F.1 DETAILED RESPONSE RATE

Table F-1. Participant Survey Cooperation and Response Rate

	CL&P				UI				Total			
	Energy Conscious Blueprint	Energy Opportunities	Small Business Energy Advantage	Total	Energy Conscious Blueprint	Energy Opportunities	Small Business Energy Advantage	Total	Energy Conscious Blueprint	Energy Opportunities	Small Business Energy Advantage	Total
Total Sample	**369**	**264**	**393**	**1,026**	**34**	**39**	**110**	**183**	**403**	**303**	**503**	**1,209**
Bad phone number	71	27	18	116	4	3	7	14	75	30	25	130
Does not recall/No eligible respondent	13	10	18	41	0	1	9	10	13	11	27	51
Ineligible - other	2	0	4	6	1	4	3	8	3	4	7	14
Language barrier	0	0	7	7	0	0	1	1	0	0	8	8
Adjusted Sample	**278**	**225**	**342**	**845**	**29**	**30**	**89**	**148**	**307**	**255**	**431**	**993**
Refusals	33	29	50	112	1	5	21	27	34	34	71	139
Active	94	66	95	255	16	13	23	53	110	79	119	308
Complete	**151**	**130**	**197**	**478**	**12**	**12**	**45**	**68**	**163**	**142**	**241**	**546**
Cooperation Rate*	**54%**	**58%**	**58%**	**57%**	**41%**	**40%**	**51%**	**46%**	**53%**	**56%**	**56%**	**55%**
Response Rate**	**41%**	**49%**	**50%**	**47%**	**35%**	**31%**	**41%**	**37%**	**40%**	**47%**	**48%**	**45%**

* Cooperation Rate is defined as number of Completed surveys divided by Adjusted Sample

** Response Rate is defined as number of Completed surveys divided by Total Sample

F.2 DETAILED SAVINGS COVERAGE

Table F-2. Participant Survey Savings Coverage

Utility	Program Name	Measure Type	Population of Measures	Population of electric savings	Population of gas savings	Surveyed Measures	Surveyed electric savings	Surveyed gas savings
CL&P	Energy Conscious Blueprint	Building envelope	3	0	11,437	1	0	7,288
		Controls	1	0	741	0	0	0
		Cooling	205	1,920,541	0	59	468,039	0
		Heating	41	470,427	0	7	100,408	0
		HVAC	69	0	291,949	30	0	101,518
		Lighting	57	3,611,685	0	12	690,427	0
		Motors	5	16,735	0	0	0	0
		Other	3	15,755	772	0	0	0
		Process	100	7,901,435	5,537	48	2,145,244	1,417
		Refrigeration	7	1,841,515	0	3	474,597	0
		Water Heating	9	0	7,575	1	0	170
		Total	**500**	**15,778,093**	**318,011**	**161**	**3,878,715**	**110,393**
	Energy Opportunities	Building envelope	-	0	0	0	0	0
		Controls	20	0	186,523	1	0	5,084
		Cooling	58	6,802,351	0	12	533,835	0
		Heating	42	2,088,170	0	14	283,870	0
		HVAC	7	0	17,204	3	0	1,340
		Lighting	534	33,366,716	0	94	8,193,293	0
		Motors	3	41,935	0	0	0	0
		Other	3	1,159,473	0	2	964,712	0
		Process	32	5,842,961	42,488	14	2,832,212	5,211
		Refrigeration	29	2,725,081	0	4	634,959	0
		Water Heating	2	0	7,779	0	0	0
		Total	**730**	**52,026,687**	**253,994**	**144**	**13,442,881**	**11,635**
	Small Business Energy Advantage	Cooling	59	571,689	0	21	180,900	0
		Heating	18	36,381	0	8	8,248	0
		Lighting	1,361	25,427,531	0	177	5,179,704	0
		Other	47	899,724	0	24	657,336	0
		Refrigeration	237	2,375,884	0	79	905,146	0
		Total	**1,722**	**29,311,209**	**0**	**309**	**6,931,334**	**0**

Utility	Program Name	Measure Type	Population of Measures	Population of electric savings	Population of gas savings	Surveyed Measures	Surveyed electric savings	Surveyed gas savings
UI	Energy Conscious Blueprint	Building envelope	1	20	0	0	0	0
		Cooling - Other	6	527,278	0	3	95,816	0
		Cooling Unitary	13	249,646	0	5	68,405	0
		Custom	12	1,215,081	28,901	4	226,497	0
		HVAC	1	6	0	0	0	0
		Lighting	14	800,968	0	3	207,471	0
		Motors	3	20,781	0	0	0	0
		Process	4	108,590	0	2	35,203	0
		Refrigeration	2	141,588	0	0	0	0
		VFDs	2	197,583	0	0	0	0
		Total	**58**	**3,261,541**	**28,901**	**17**	**633,392**	**0**
	Energy Opportunities	Controls	1	75	0	1	75	0
		Custom	27	1,554,649	0	4	381,403	0
		Lighting	56	3,348,349	0	8	686,159	0
		Other	1	137,426	0	0	0	0
		Total	**85**	**5,040,499**	**0**	**13**	**1,067,637**	**0**
	Small Business Energy Advantage	Custom	10	289,901	0	2	26,319	0
		Lighting	164	2,348,025	0	45	554,250	.
		Refrigeration	28	130,489	0	4	23,468	0
		Total	**202**	**2,768,415**	**0**	**51**	**604,037**	**0**
Grand Total			**3,297**	**108,186,444**	**600,906**	**695**	**26,557,996**	**122,028**

* Assumes a 35 percent response rate. We will strive for a higher response rate, but given our experience last year with the gas sample have chosen to be conservative in our estimate.
** Completes are at the measure level. Because sites may have received more than one measure, program totals will not match the program-level response rate.

APPENDIX G: DESIGN PROFESSIONAL AND VENDOR SPILLOVER CALCULATION

As an example, assume a vendor had 2,000 therm savings in the program tracking system database attributable to HVAC equipment. If that vendor said that 25 percent of all their energy efficiency HVAC equipment were sold outside the program, the potential nonparticipant spillover savings would be (2,000 therms * 0.25/(1–0.25) = 667 therms). If this vendor was assigned a nonparticipant spillover rate of 100 percent for HVAC equipment, the nonparticipant spillover therm savings for that vendor was 667 therms. If that same vendor was assigned a nonparticipant spillover rate of only 50 percent for HVAC equipment, the nonparticipant spillover therm savings for that vendor was 667 * 0.5 = 334 therms. 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 G-1. Nonparticipant HVAC Spillover Rate Calculation Example

% Sold Outside Program (A)	Savings from program tracking system database (B)	Assigned Spillover Rate (C)
25%	2,000	50%

Potential nonparticipant spillover savings = B * A/(1 – A)

= 2,000 therms *0.25/(1–0.25)

= 667 therms

Nonparticipant spillover savings = potential savings * C

= 667 * 0.5

= 334 therms

APPENDIX H: SCORING FLOWCHARTS

Figure H-1. 2012 Free-Ridership Scoring

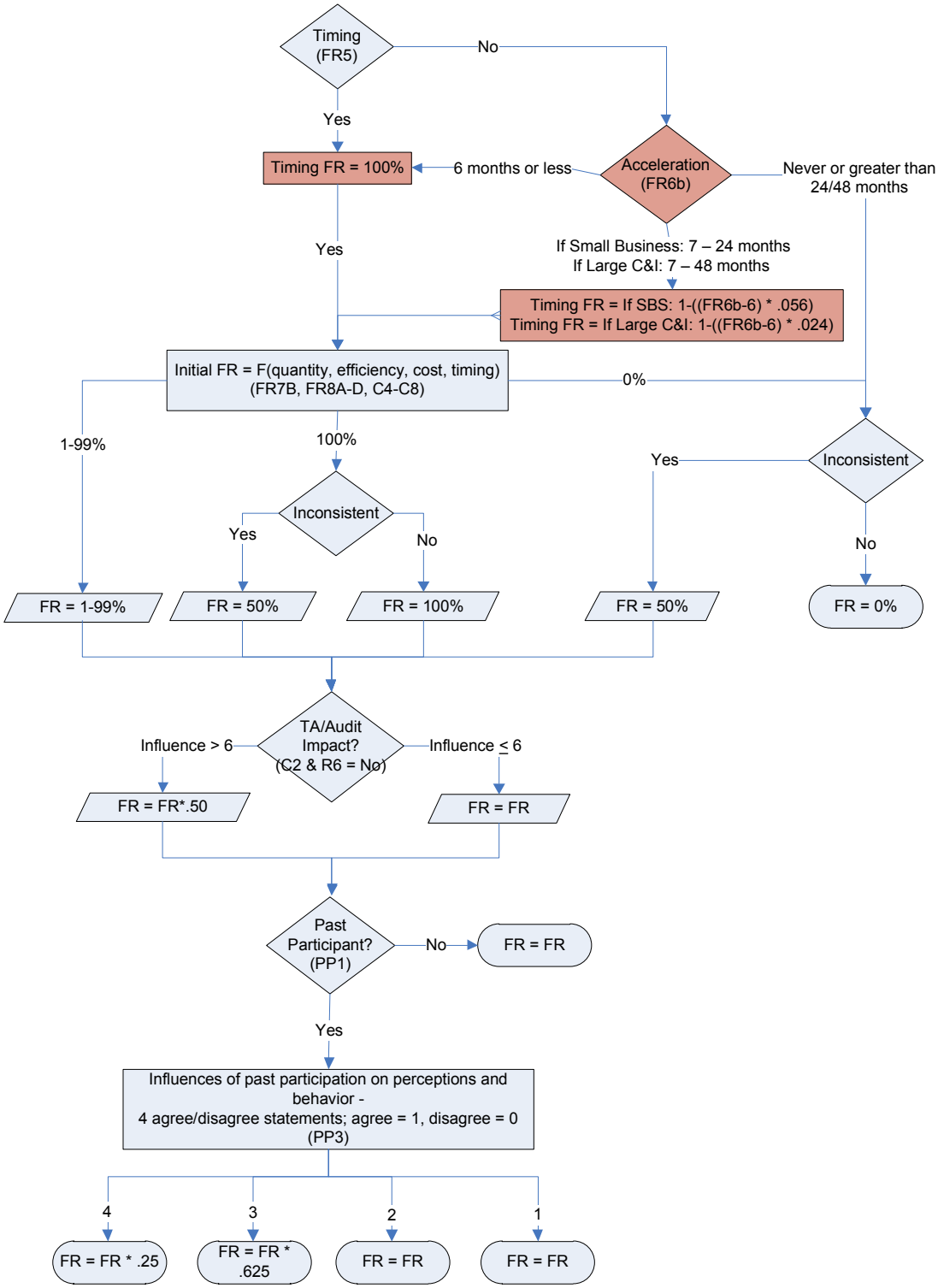

Figure H-2. 2010 Free-Ridership Consistency Checks

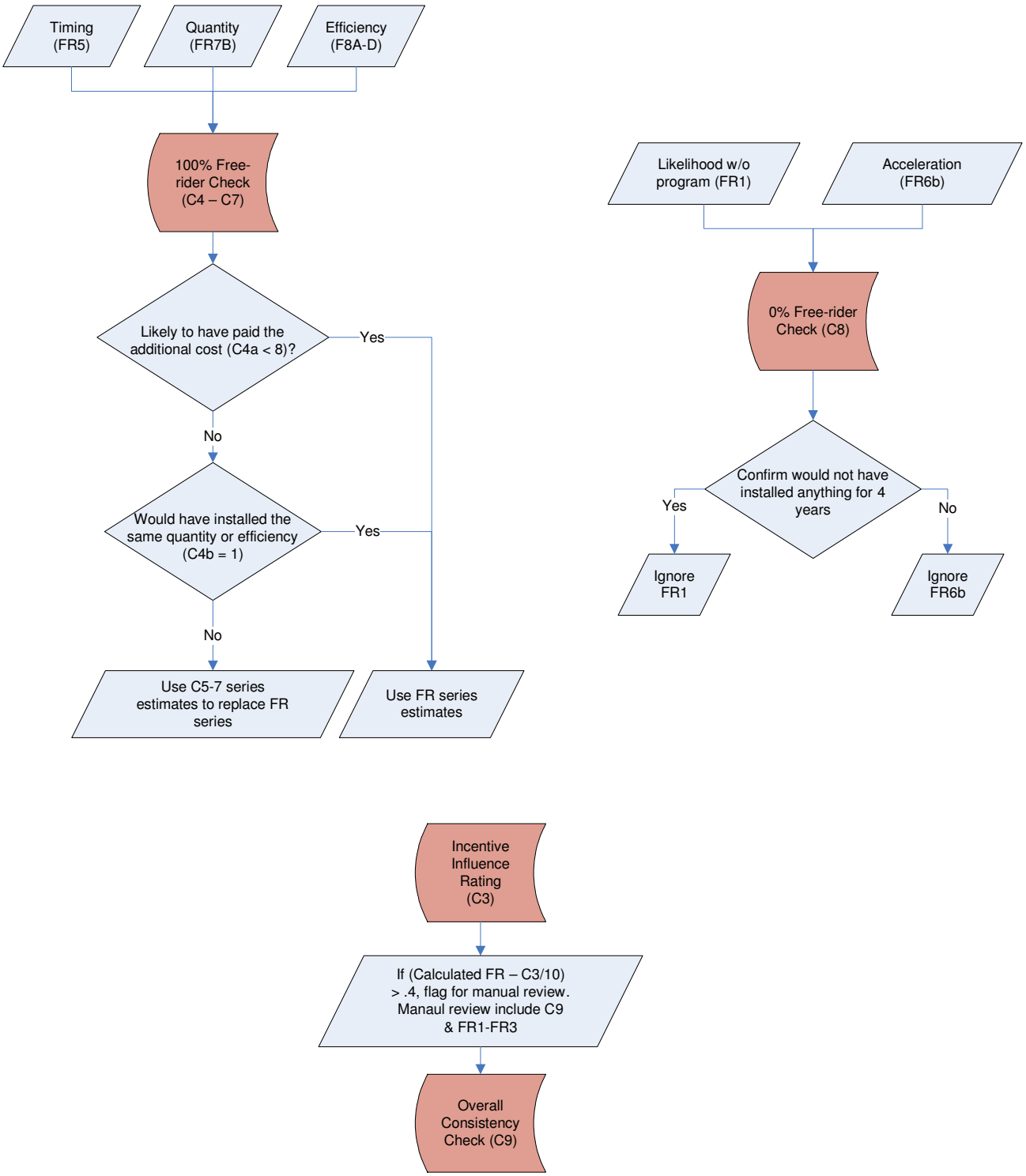

Figure H-3. Vendor Trigger for Free-Ridership Survey

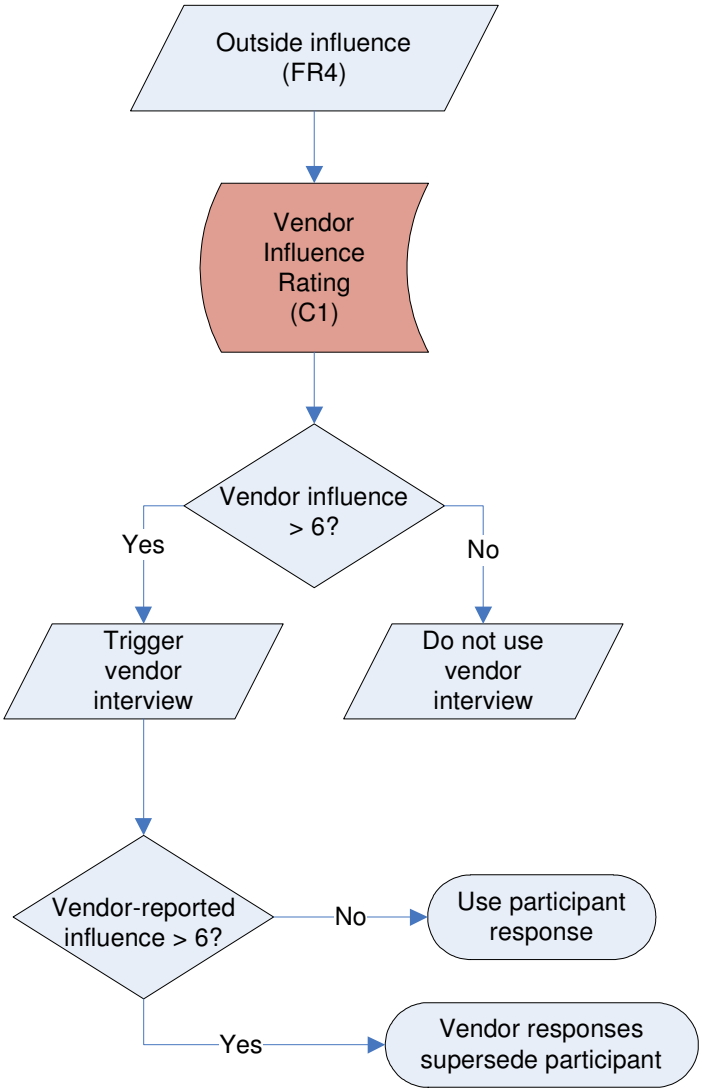

Figure H-4. Nonparticipant Spillover Scoring