2004 Commercial and Industrial Programs Free-Ridership and Spillover Study

Final Report – March 2006

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EXECUTIVE SUMMARY

This report summarizes the findings from the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study for each of the sponsors' commercial and industrial (C&I) programs. The purpose of this study was to assess program free-ridership, participant spillover and non-participant spillover for these programs using the *Standardized Methods for Free Ridership and Spillover Evaluation* (referred to as the Standardized Method) as developed by PA Consulting under contract to the Massachusetts energy efficiency program sponsors as finalized on June 16, 2003.

This joint sponsor study was conducted for six New England sponsors including National Grid, Unitil (Fitchburg Gas & Electric), Cape Light Compact (CLC), Western Massachusetts Electric Company (WMECo), Connecticut Light & Power (CL&P), and United Illuminating.

ES.1 STUDY OBJECTIVES

The primary objective of the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study was to assist the sponsors in quantifying the net-to-gross energy and demand savings ratio of their commercial and industrial programs based upon surveys with 2004 program participants and their associated vendors and design professionals. Megdal & Associates along with Opinion Dynamics Corporation (ODC) was hired to adapt and utilize the *Standardized Methods for Free Ridership and Spillover Evaluation* (referred to as the Standardized Method). This provided a common consistent method across these sponsors' territories in Massachusetts, Rhode Island, New Hampshire, and Connecticut for the estimation of a net-to-gross ratio based upon estimating the extent of:

- **Program free-ridership (FR)** - The percentage of program participants (proportion of expected savings) deemed to be free-riders where a free-rider refers to a customer who received an incentive through an energy efficiency program who would have installed the same or smaller quantity of the same high efficiency measure on their own within one year 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 equipment purchase decision.
- **Participant "like" spillover (PS)** - Refers to the situation where a customer installed equipment through the program in the past year and then installed additional equipment of the same type due to program influences but without program support (technical assistance or incentives).
- **Non-participant "like" spillover (NPS)** - Refers to energy efficient measures installed by program non-participants due to the program's influence.

ES.2 STUDY METHDOLOGY FOR PROGRAM NET IMPACT RATIOS

The Standardized Method is based upon conducting telephone surveys with program participants to derive participant free-ridership and participant "like" spillover estimates. In cases where program participants indicate that a design professional or equipment vendor was the primary decision maker for the project, surveys are conducted with the design professional or equipment vendor to produce these estimates. To estimate non-participant

"like" spillover attributable to 2004 program activities, the Standardized Method employs interviews with participating design professionals and equipment vendors. We conducted the participant and design professional surveys used to estimate free-ridership and spillover attributable to the sponsors' programs between May and August of 2005.

This study was designed to obtain estimates for these net impact elements at the program and measure group level based on the application of the Standardized Method. Individual Sponsors determined the total number of measure groups associated with each sponsor program. For each program this determination was made based on the number of measure types offered through the program, the manner in which each program categorized each measure type, and the need for consistency in reporting and analysis of each Sponsor. The number of measure groups per program varied from two to eight across all programs included in the study. The largest number of measure groups was eight for National Grid's Design 2000*plus* (commercial new construction) program. The most common two measure groups were lighting and non-lighting which were part of most small business, municipal, and request for proposal (RFP) programs. Other common measure groups were motors, HVAC, refrigeration, variable speed drives (VSDs), and custom measures.

For commercial and industrial customers there can be multiple account numbers at a single address or physical location. As the sponsor's tracking database associates program applications and installed measures to specific account numbers, there can be cases where a single contact person may be the decision-maker for measures associated with multiple account numbers. At the same time, there can be one decision-maker for multiple sites such as for chain stores, multi-site industrial firms, school districts, etc. The participant survey is conducted with the primary decision-maker responsible for selecting the equipment installed through the program. The survey is designed to ascertain how decision-makers made their decisions to install the high efficiency equipment and the effect of the program on those decisions. To ensure that we obtained all of the information regarding all measures installed through the programs from each decision-maker interviewed and that none were contacted for surveying more than once, we conducted additional database efforts. This work included additional programming and manual data processing where necessary to identify likely cases where a single contact person was the primary decision-maker for program participation and measures installed across multiple sites or account numbers.

Where available, we used the customer contact name from the application as the first and most definitive means to identify multi-site decision-makers. Within a program and measure group we grouped applications with the same or different account numbers and/or facility addresses having the same contact name. When administering the survey we asked participants to respond to questions regarding as many as three measures installed across a sponsor's programs for which they were the primary decision-maker. We never combined two sites that had different contact names, including cases where the participants were obviously part of a chain.

If there was no contact name associated with a program participant in the database, then additional exams were made to identify potential multiple site decision-makers. The second exam was based on participant facility names that were identical across multiple locations or

schools within a single town. The third was based upon facility addresses that were identical across multiple account numbers and those with different suite numbers that appeared to be managed by one of the suite firms.[1] The application of these grouping schemes to the program tracking data provided a list of unique program, measure group, and decision maker or physical location combinations for purposes of survey administration.

The decision to apply the application grouping scheme to program data prior to developing samples for survey administration was made in consultation with the sponsors. Given the gaps in customer contact data found in many of the program databases used for this study, and the number of cases in which program measures were associated with different account numbers at the same physical location, it was believed that this approach would increase survey response rate to the degree necessary to provide Sponsors with the desired precision levels at the program measure group level. By aggregating applications by unique decision maker or location when appropriate, our interviewers could complete the required battery of free-ridership and spillover questions for multiple measures and multiple sites in one interview. In such cases, a single completed interview could account for multiple complete interviews at the program measure group level. Under a sampling scheme that does not seek opportunities to combine applications by common decision maker, locations, and business names, and simply relies on unique account numbers, separate interviews would be required. Such an approach would potentially increase customer burden by requiring multiple interviews with a single decision-maker.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover from May through August of 2005. All sampled customers were mailed a letter on sponsor letterhead in advance of the telephone call. This letter explained the purpose of the call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Sampling with stratified random sampling was planned for several program measure groups for all but one sponsor. [2] In practice, an attempted census of all participants was required to achieve the established survey quotas for most program measure groups. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups.

Per the Standardized Method, we weighted the free-ridership estimated for each individual decision-maker by the expected energy savings for that program measure group from that decision-maker to get the measure group free-ridership value.[3] In this way, the free ridership percentages can be directly applied to program savings to calculate the energy savings that

[1] In cases where applications were combined based on facility name or address we verified that the contact was the primary decision-maker for program participation and measures installed for each of the grouped applications.

[2] Unitil did not have a sufficient number of participants to require sampling for any program measure group. As such, census was attempted for each program measure group.

[3] In the case of SBS Lighting, the sampling strata weights as listed in Table 1 are also applied to ensure a proper representation for a program measure group estimate.

would have occurred without the program intervention. We weighted participant spillover estimates in the same manner.

We calculated the net impact estimates from the participant surveys for each program measure group as one minus the program measure group's weighted free ridership rate and plus the program measure group's weighted participant spillover rate (1-FR+PS). The non-participant spillover (NPS) rate is added to this equation to get the program net impact for Large Commercial and Industrial program measures (1-FR+PS+NPS). As the components are already weighted by the respondents' expected savings, this rate can be applied to the expected program measure group savings from either the program database or from an impact evaluation study of actual savings to obtain net savings.

ES.3 PARTICIPANT FREE-RIDERSHIP, SPILLOVER, AND NET IMPACT RATIOS

The free-ridership, participant like spillover percentages, and participant net impact factors by program measure group are provided separately by sponsor in tables within their respective chapters (chapter 5-10). The program level estimates are calculated as the sum of the measure group level estimates weighted (multiplied) by the proportion of the program savings represented by the measure group in the population. These program level estimates are also presented in these findings tables.

The program level free-ridership estimates vary from zero percent (0%) to 36.8%. Overall, for most sponsors the lowest free-ridership rates among their C&I programs, according to the Standardized Method, are for the small C&I programs. These ranged from 0.5% to 6.1%.

Some of the sponsors had separate municipal programs and others did not. They also varied in what type of municipal customers they served. These programs had free-ridership rates from 0% to 11.5%.

In general, the large C&I retrofit efforts had higher free-ridership rates than the small C&I programs. There was a significant amount of variance between sponsors in the free-ridership rate for the large C&I retrofit efforts and the C&I new construction efforts. Yet, the highest C&I free-ridership rates generally tended to be among the new construction programs.

Lighting free-ridership varies significantly across programs, from 0% to 83%. This may suggest that the type of customer or the program design plays a somewhat larger role in free-ridership than the measure itself. The higher new construction program free-ridership estimates were largely driven by having higher than average lighting free-ridership rates within their programs.

The sample sizes drop as we look at the other measure groups within programs, due to correspondingly lower population sizes. Free-ridership across HVAC groups varies from 0% to 64% with at least two sponsors (where this information was available) finding lower free-ridership among the unitary HVAC. This again could be due to the type of customers that

are most applicable to unitary HVAC versus non-unitary or the difference could be due to program design differences between unitary HVAC versus non-unitary.

Free-ridership across programs and sponsors for motors ranged from 12% to 55%. VSD/VFDs have the smallest sample sizes and the free-ridership ranges from 0% to 44%.

Participant like spillover as measured by the Standardized Method varied from 0% to 27%. The most common participant spillover estimate on a program measure group basis was 0% (the mode). Most of those with participant spillover had estimates of less than 10%. This made most of the program level participant spillover estimates occur between 0-5%.

The combination of free-ridership and participant like spillover created the participant net impact estimate as a factor that could be applied to savings estimates to derive net savings estimates. On a program basis, these ranged from 65% to 115%. Twenty-two of the 28 program measure groups (79%) analyzed showed participant net estimates of 85% or greater according to the Standardized Method.

ES.4 STUDY METHDOLOGY FOR NON-PARTICIPANT LIKE SPILLOVER

The program can influence vendors and design professionals by teaching them about and giving them experience with high efficiency equipment. It is possible that program vendors and design professionals may recommend and install high efficiency equipment for customers who chose not to participate in the program. It is also possible that customers who have been influenced by the program in some way would ask the vendor to install high efficiency equipment but chose not to participate in the program. Non-participant "like" spillover rates are used to adjust program savings to partially account for these circumstances. It is important to note that the Standardized Method is designed to measure only a portion of non-participant spillover. 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 non-participants to buy high efficiency products. This methodology is estimating non-participant like-measure spillover based on responses from design professionals and vendors participating in the programs during this particular year. It does not survey non-participating designers or vendors or non-participating customers.

We used the approach specified in the Standardized Method to estimate non-participant "like" spillover. The Standardized Method utilizes survey responses from the vendor survey to assign a measure-specific non-participant spillover percentage to design professionals or vendors that participated in a given energy efficiency program for that measure. The vendor survey includes questions designed to capture information on the proportion of equipment sold and/or installed by vendors that would meet program requirements for high efficiency equipment, the proportion of this equipment sold outside of the program, and the level of influence of the program on these sales. We estimated energy savings associated with non-participant spillover measures for each vendor using the appropriate spillover percentage and the kWh savings attributable to that vendor for a specific measure based on data presented in

the program tracking database. We then aggregated vendor specific non-participant spillover savings to the program and measure group level and extrapolated the savings to the program level. The non-participant like spillover percentage is calculated as non-participant spillover savings divided by expected program savings.

ES.5 NON-PARTICIPANT LIKE SPILLOVER FINDINGS

We completed interviews with a total of 36 of National Grid's vendors and design professionals, with one of these participating in two different program measures. We also completed interviews with 14 of CL&P's vendors and design professionals. Using the Standardized Method we calculated the non-participant like spillover percentages for these two sponsors.

The findings from this 2005 study provide a non-participant like spillover percentage of 159.8% (1.60) from National Grid's sample and 76.9% (0.77) from CL&P's sample. The prior National Grid study conducted in 2002 reported non-participant like spillover of 9.2% (0.092) for 2001 program data and 6.1% (0.061) for 2002 program data. Earlier studies had also found non-participant spillover in the range of that found in the 2002 study. Accepting the 2005 rates would have very large impacts on the final net estimates and the results would be many orders of magnitude from what has been found in the past (even though these estimates and those from prior years had used the same methodology). Given this, we are not recommending that the non-participant like spillover findings from this study be used. We recommend instead that prior non-participant spillover estimates be used until one is estimated in a study that appears defensible or is thoroughly investigated and confirmed with other methodologies.

ES.6 RECOMMENDATIONS TO CONSIDER FOR FUTURE IMPROVEMENTS

Conducting surveys during the summer months may have increased the difficulties in obtaining completed surveys. Prior studies for National Grid have had these surveys conducted in the spring; a much better time to obtain responses given potential vacation schedules and associated staffing issues. The spring surveys also allowed the interviews to occur somewhat closer to when the decision had been made. By fielding a survey in the spring to gather information regarding program participation that occurred the prior calendar year implies that most equipment decisions were made between 4 and 16 months prior, depending on when participation occurred. Fielding the survey in the summer extended this period to between 6 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten. We recommend that at a minimum the surveys be conducted to avoid the summer months (or winter holidays).

It is our understanding that the project to create the Standardized Method discussed the advantages and disadvantages for the length of time after program participation to conduct the survey. Earlier surveying might be able to obtain more accurate estimates of free-ridership before decision-maker turnover or a "hind-sight" perspective is developed. It

should also help reduce the more difficult to analyze responses of "Don't Know" and "Don't Recall". At the same time, an earlier survey would have less post-installation experience to influence and obtain participant spillover. A quantitative analysis of the post-installation time's affects on spillover could be designed and conducted. Similarly, a small study within the free-ridership study could be designed to examine the affect of time from installation to the occurrences of decision-maker turnover, "Don't Know", and "Don't Recall" responses. We hypothesize that more difficulties in response rate and obtaining definitive responses during this study could have been at least partially due to a greater time between installation and surveying. But without a specific study of this issue, it is impossible to be sure. Quantitatively knowing these trade-offs could be used to design the best survey timing and methodology (such as both spring and fall surveying for participants in the prior 6 months).

While working with National Grid on comparing methodologies and results from prior work, we discovered that for prior studies, National Grid account representatives played a role in providing improved or additional customer contact information in cases where accurate contact information were not available, the customer contact identified in the program database was unresponsive, or alternate contacts were necessary. Account representatives did not provide such support for the current study. The program databases provided by the Sponsors varied in terms of the quality and completeness of contact information for program participants. In some cases, no or partially complete contact information was provided, in other cases a primary and secondary contact names and telephone numbers were provided. Our team took extraordinary efforts to achieve the highest possible response rate from the available program data, including attempting to contact both primary and secondary contacts where available, conducting telephone number look-ups for wrong numbers or customers with no contact information, probing respondents for alternate contacts, and making significantly more attempts to reach unresponsive contacts than was specified in our proposal.[4] To improve response rates we recommend that utility account representatives review program databases to ensure that all relevant contact information regarding each project is current and complete prior to sample development. Such an effort will likely reduce dramatically the number of unresponsive and incorrect customer contacts that may have resulted from our efforts to develop more complete contact information for program participants and the application aggregation scheme described above.

Nevertheless, the sponsor programs should ensure that all participant applications clearly highlight that by participating and accepting incentive funds they agree to participate in evaluation efforts that may include one to two surveys and/or site visits a year. We recommend that the Sponsors use program implementers, program staff and account representatives to reinforce this message to customers throughout the program participation process and subsequent quality assurance contacts with customers. Such an approach makes customer responsibilities clear at the outset of program participation, helps encourage cooperation for evaluation efforts, ensures that evaluation notification letters are directed to

[4] Unresponsive contacts are defined as potential respondents who did not refuse to participate but either did not respond to voicemail requests to participate, were not available for scheduled interviews, repeatedly asked that we call back another time, or otherwise could not make time available to complete the survey during the study period.

appropriate contacts, and could be referred to in evaluation notification letters or survey introductions as need be.

The data requirements of the participant and vendor survey instruments specified in the Standardized Method requires that the sponsoring utilities mine program tracking databases in support of the survey effort. Due to limitations of program tracking databases a number of the sponsors had to conduct extensive database queries and manual record pulling in order to gather, compile and organize the data required in the Standardized Method. Despite these efforts several of the sponsors were lacking accurate contact information for customers and other key data elements required by the Standardized Method. As such, the participant and vendor survey instruments required adjustments and significant additional effort was required to identify appropriate survey respondents at participating customer organizations. If in the future the sponsors wish to make full use of the efficiencies afforded by the use of a standardized evaluation approach such as the Standardized Method, and to achieve response rates necessary to achieve the required levels of precision, it would prove useful for them to consider how they can better collect and maintain the required data through program implementation in electronic databases in a way that does not hamper program operation. We know that after the experience in working with this project several improvements for data provision in this area are already being contemplated by some of the sponsors.

We discovered that the Standardized Method report does not provide any clear directions for the handling of "Don't Know" or "Don't Recall" responses to some of the questions included in the participant and vendor survey instruments. These responses are normal occurrences for surveys, particularly with C&I efforts. Forcing interviewers to enter other actual responses could create bias into the estimates. The best path is a well thought out assignment procedure for these responses for each free-ridership or spillover question asked. Developing such a procedure, assessing its potential to introduce bias, and testing how to make it most accurate is worth consideration when the Standardized Method is examined for improvements.

Another area of some concern in our application of the Standardized Method was with how the consistency check and adjustments are made. Based on our experience, this has been one of the more difficult issues for this type of methodology in several jurisdictions. During the work conducted in this study, it appeared to us that the method currently used in the Standardized Method might be producing a downward bias in the estimates, given the use of the 0% free-ridership assumption. The extent of this can vary from year to year depending upon how open versus guided the "open-ended" responses are structured. Not "guiding" respondents to a specified list of responses in an open-ended question is a difficult subtlety in survey technique and requires experienced surveyors with training specifically on this point and periodic evaluation management monitoring. The Standardized Method report states that the consistency question is to be open-ended. It does not allow for guiding responses in order to minimize potential interviewer bias. This means that one would expect to see a vast array of responses and few repeats of similar responses. If the data collected shows very similar or near identical responses, it likely contains either guided responses or interviewer bias. The potential of bias from inconsistency adjustments can also vary year to year based

upon the proportion of respondents that provide inconsistent responses (as was found by Long Island Lighting Company and is further described in the report).

To address this potential downward bias, we tested using an assumption of 50%free-ridership. This assumption was found to upwardly bias the free-ridership estimates examined. A more thorough assessment and testing for development of a method to handle inconsistent responses in a way that minimizes potential bias or the loss of sample warrants further examination in any effort to make improvements to the Standardized Method.

This study made a large effort to ensure that decision-makers across projects, sites, and throughout an organization were identified. The database handling, collapsing, and modifications in survey wording to accommodate this within and across programs was extensive. Special efforts were also made to identify and conduct selected one-on-one interviews with key decision-makers that operated over many sites and across sponsors. This type of effort should be required for the Standardized Method whenever it is applicable. The Standardized Method should then be updated to describe in detail how this is to be accomplished and what is required. This will help provide more thorough guidance for quality work in this area and help serve to document the processes undertaken.

1 SAMPLING AND SAMPLE AGGREGATION PROCEDURES

1.1 SURVEY POPULATION

The Standardized Method is based upon conducting telephone surveys with program participants to derive participant free-ridership and participant "like" spillover estimates. In cases where program participants indicate that a design professional or equipment vendor was the primary decision maker for the project, surveys are conducted with the design professional or equipment vendor to produce these estimates. To estimate non-participant "like" spillover attributable to 2004 program activities, the Standardized Method employs interviews with participating design professionals and equipment vendors.

This study was designed to obtain estimates for these net impact elements at the program and measure group level based on the application of the Standardized Method. The number of measure groups for each of the sponsor programs was determined by the individual sponsors for consistency with their needed level of analysis and reporting and the dimensions of the programs themselves. The number varied from two for either targeted programs or programs where measures were divided into lighting and non-lighting categories to eight measure groups (in two different programs across two sponsors).

The number of program measure groups for these C&I programs, and in some cases the number of C&I programs, made the population sizes a small starting basis for sampling, particularly for the sponsors with smaller service territories. The starting sampling populations were also reduced by the nature of C&I accounts and decision-making.

For commercial and industrial customers there can be multiple account numbers at a single address or physical location. As the sponsor's tracking database associates program applications and installed measures to specific account numbers, there can be cases where a single contact person may be the decision-maker for measures associated with multiple account numbers. At the same time, there can be one decision-maker for multiple sites such as for chain stores, multi-site industrial firms, school districts, etc. The participant survey is conducted with the primary decision-maker responsible for selecting the equipment installed through the program. The survey is designed to ascertain how they made their decisions to install the high efficiency equipment and the effect of the program on those decisions. To ensure that we obtained all of the information regarding all measures installed through the programs from each decision-maker interviewed and that none were contacted for surveying more than once, we conducted additional database efforts. This work included additional programming and manual data processing where necessary to identify likely cases where a single contact person was the primary decision-maker for program participation and measures installed across multiple sites or account numbers.

Where available, we used the customer contact name from the application as the first and most definitive means to identify multi-site decision-makers. Within a program and measure group we grouped applications with the same or different account numbers and/or facility

addresses having the same contact name. When administering the survey we asked participants to respond to questions regarding as many as three measures installed across all programs for a particular sponsor for which they were the primary decision-maker. We never combined two sites that had different contact names, including cases where the participants were obviously part of a chain.

If there was no contact name in the database, then additional exams were made to identify potential multiple site decision-makers. The second exam was based on participant facility names that were identical across multiple locations or schools within a single town. The third was based upon facility addresses that were identical across multiple account numbers and those with different suite numbers but appeared to be managed by one of the suite firms.[5] The application of these grouping schemes to the program tracking data provided a list of unique program, measure group, and decision maker or physical location combinations for purposes of survey administration.

1.2 STANDARD DEVIATION ANALYSIS, PRECISION ISSUES, AND IMPLIED SAMPLE SIZE REQUIREMENTS

The free-ridership estimate is a percentage that represents the percentage of savings that probably would have occurred without the program. This percent/probability can vary from zero to 100. The percentage of free ridership savings is determined from an accumulation of assignment values for the answers to many questions. Based on their answers to survey questions, survey participants are assigned a calculated estimate of their degree of free-ridership. The overall program or measure group estimate is then determined as the weighted mean of those respondent estimates. That makes the free ridership estimate a point estimate. A confidence interval around a point estimate for this mean is the t value for the statistical significance level chosen for examination (reliability factor) times the standard deviation divided by an adjustment for the sample size. For a 90% confidence level and large sample size ((n > 100) which is also not a large proportion of its population)[6] this is:

$$\text{Confidence interval} = \text{Estimate} +/- 1.645 * [sd / (\sqrt{(n-1^{7})})]$$

The reliability factor (1.645) is also a function of the sample size and increases as the sample size becomes smaller.

This shows us that the two most important factors for deriving the confidence interval are the standard deviation and the sample size. Based on this formula the required sample size can be determined from how big you are willing to accept this confidence interval (the precision

[5] In cases where applications were combined based on facility name or address we verified that the contact was the primary decision-maker for program participation and measures installed for each of the grouped applications.

[6] In these cases the most efficient and appropriate estimate of the confidence interval includes having the sd multiplied by a finite population correction factor which is $\sqrt{(1- (n/N))}$.

[7] The square root of the sample size is used with a z-score and the population standard deviation. If a Student t-distribution is used for a t-test on the sampling distribution rather than the normal distribution (which is still required for the population distribution) then the denominator is n-1. With sufficiently large sample sizes this actually creates no real difference.

or error tolerance rate) and the standard deviation. This led to the examination of what information was available from a recent study that would lead to an approximation of the standard deviation for the free-ridership estimates to be obtained by the Standardized Method.

National Grid provided our team with information from their survey analysis conducted by PA Consulting using the Standardized Method for their 2002 program year. The first six columns of Table 1.1 presents a summary table of their results by program and measure group from the evaluation report, this provides sample sizes, the free-ridership estimate and the error bound (error margin).

The information provided included a column for the 90% confidence level error bound. This is the 90% confidence interval for the free-ridership estimate at the program and measure group level. For example, in the first row the Motors measure installed through the Energy Initiative program shows a 2002 free ridership estimate of 9.1% with a 90% confidence interval of 4.5% to 13.7%. The second to last column then provides a simplistic estimate of the standard deviation including use of the finite population correction factor.[8]

The original request for proposals (RFP) had asked for a 90% confidence level with a precision of 10% at a measure group level. The prior information provides the error bound but does not directly present the precision levels. These are simply the error bound divided by the estimate (the sample mean). We have added this information as the last column in Table 1.1.

The confidence level from the prior results show precision levels at the measure group level from 9% to 500%. Yet, a closer examination is needed to understand how precision varies and how this impacts the confidence we have in using the measure and program level free-ridership mean estimates.

The precision percentage is a percentage of the free-ridership estimate. It does not provide the number of free-ridership percentage points around the mean, as the error bound does. Table 1.1 shows two factors that appear correlated to the precision level achieved: the sample size and the magnitude of the free-ridership estimate. A large free-ridership estimate can have a large error bound (movement in its number of free-ridership percentage points) and still have a tight precision (low percentage) while the error bound must be quite small for a very small free-ridership estimate to maintain the same precision. For example, to achieve

[8] The simplistic estimate of sd from this is solving the confidence interval formula for sd. This makes sd = (error bound/1.645)*(√(n-1)). The sd estimate provided in Table 1.1 also includes the finite population correction factor. The formula then becomes sd = (error bound/(1.645*(√(1-(n/N))))* (√(n-1)). It is a simplistic estimate of sd as the error bound is likely derived based upon 1) a combination of census strata and sampling strata; and 2) the true standard deviation of the complicated set of questions that create free-ridership is not the standard deviation of the final estimate. In a much simpler case, the variance of the sum of two estimates/survey responses is not the sum of the variances. Its true variance is the sum of the variances plus two times the covariance between the two estimates/survey responses. (The actual sampling plan work tested various alternatives as it was "guessing" at unknown ways at which unknown variables were handled behind the estimates reported in the prior report, these could have included census strata or possible outlier removal. The final required sample estimate was a combination of examining these results across alternatives, across program and measure groups, and the team's prior experience with the Standardized Method for a large commercial program evaluation for NSTAR Electric & Gas Company.)

a 10% precision a 45% free-ridership estimate can move +/- 4.5% points (40.5% to 49.5%) while a 1% free-ridership estimate can only move +/- 0.1% points (0.9% to 1.1%).

Table 1.1 Precision Results for National Grid's 2002 Program Year at the 90% Confidence Level

Program	Measure group	Survey n	Pop. (N)	2002 Free Ridership	90% Error Bound	Approx. SD	Precision
Energy Initiative	Motors	31	44	9.1%	4.6%	0.28	51%
	VSD	9	15	0.5%	2.5%	0.07	500%
	HVAC	20	29	43.8%	10.2%	0.49	23%
	Custom	51	129	10.9%	5.6%	0.31	51%
	Lighting	187	636	14.5%	3.6%	0.36	25%
	Compressed Air	2	3	17.1%	25.3%	0.27	148%
	Overall	300	856	15.3%	2.8%	0.37	18%
Design 2000plus	Motor: New	64	99	40.1%	6.0%	0.49	15%
	Motor Failed	101	255	23.2%	5.4%	0.42	23%
	VSD	15	17	19.3%	5.8%	0.38	30%
	HVAC (Unitary)	68	213	40.0%	8.1%	0.49	20%
	HVAC	34	65	39.5%	9.5%	0.48	24%
	Custom	71	184	16.6%	5.7%	0.37	34%
	Lighting	100	319	36.3%	6.6%	0.48	18%
	Compressed Air	48	62	20.6%	4.6%	0.40	22%
	Overall	501	1,214	27.2%	2.5%	0.44	9%
Small Business	Lighting	321	1,794	1.0%	0.8%	0.10	80%
	Non-lighting	28	85	1.0%	2.5%	0.10	250%
	Overall	349	1,879	1.0%	0.8%	0.10	80%

The standard deviations seen and the nature of the free-ridership estimate make the original request for a 90% confidence level with a precision of 10% not possible in most cases at the program measure group level. Given the percentage of sample to population seen in Table 1.2 there are many cases where we believe that census attempts were made for those measure groups. The precision of these as reported, even with a census attempt, does not approach 10%. Yet given the plus/minus level of percentage points, these are still quite defensible free ridership estimates being produced with a 90% confidence level. Recognize also that sampling precision estimates are not actually relevant for an attempted census. (A census is completely precise (i.e., 0% precision). The true question for an attempted census is whether there is a selectivity bias with the obtained responses compared to what would have occurred in a complete census, which almost never actually occurs.)

The general standard often discussed for energy efficiency impact evaluation is 90% confidence level at a 10% precision level. This is often based upon estimating program realization rates, the percentage of the program tracking savings estimates that are being actually seen from the impact evaluation. If there is a systematic bias in the program estimate (such as a consistent 80% realization due to overestimating air-conditioner usage in swing months/temperatures), the program can generally institute improvements in the input data they use and their calculation methods and algorithms to improve the estimates and precision of their realization rates. The exceptions are the cases where the installed measures

are removed, destroyed, or bypassed. Yet, these generally are a very small proportion of cases. This means that a precision level of 10% can often be achieved, particularly with stratified sampling for the largest expected energy savers in a commercial/industrial program.

The nature of a free-ridership estimate, however, is quite different. The variance in the estimates is generally based on how different people make decisions and the difference in how important they think it is to invest in efficiency given all their other competing business costs, which can vary greatly among different types of businesses. This variance is normal given the type of estimate we are making. There may be customers that can make payroll but still are in relatively risky financial situations. There may be stable profitable firms whose facility engineer previously worked in the energy efficiency field. These two types of customers would be expected to have very different free-ridership estimates. There is little the sponsors can do to minimize this variance.

The error bounds shown from the prior work seem quite defensible when looking at the range of free-ridership that falls in the 90% confidence level (e.g., 4.5% to 13.7% for EI Motors and 0.2% to 1.8% for Small Business), particularly given the nature of free ridership estimates. Notice that even for the largest utility in the region, achieving a high degree of precision at the measure group level, with even a census attempt, is not possible.

Prior work we have performed at a program level basis (with a sampling plan stratified to include a census strata of the largest savers) for a large C/I program using the Standardized Method achieved a 90% confidence level with a 2% relative precision for a free ridership estimate of 28% based on 37 site visits across measures, and for lighting versus non-lighting measures. Yet, the census strata and complete census achievement for several measure types played a large role in achieving this precision. The standard error in this study would suggest a sample requirement of 45 measures (measures rather than customers, which can be fewer given multiple measures per customer) to achieve a 10% relative precision with 90% confidence.

As you can see from Table 1.1, the standard deviations vary significantly across the measure groups, and generally do not show a consistent pattern by type or program. Conducting an assessment of required sample sizes for a plus or minus one percentage point error bound around the free-ridership estimate suggested the need for around 30 – 50 sample points per measure group.[9]

The program-measure group level provides a lot of separate groups for estimates across the many different sponsors and commercial/industrial programs included in this study. This is an important factor for the overall framework for the sampling plans. The more measures put together into larger measure groups, the more groups will be treated as samples rather than a census attempts (since each group would be larger in size).

Given the above, initial analysis of some of the program databases, and the target 2000 total number of surveys, a sampling plan for a targeted number of 42 completes for those groups

[9] This is based upon a desiring a free-ridership estimate +/- 1% point (not 1%), such as 14-16%. It also incorporates finite population correction factors.

with more than 50 customers, or attempted census for each program measure group with 50 or fewer customers was selected.

The greatest precision occurs when the savings weighted estimates are based upon a stratified sampling for the largest expected savers. With sample sizes limited to 42 customer surveys and 40 sample groups, a large number of strata within the 42 does not make a lot of sense and significantly complicates the weighting process (particularly as it is done on a measure basis while surveying is done on a customer basis). There is also value in having consistency across the sponsors and the programs. (Consistency was the primary motivations behind the establishment of a Standardized Method for free ridership and spillover estimation in Massachusetts.) Therefore, each sampling group had a sampling plan to include a census attempt component for the largest expected savers in each sample group, and random survey stratification for all others. In general, 10-15 of the 42 sample points would be in the census attempt group.

Prior studies have often used much higher sample sizes. This could be done to provide more precision for those measure groups where high standard deviations are expected or for those where a large population and high level of savings are being achieved. The most common reason that sponsors have used high sample sizes in the past is for the comfort level of utility and program managers, either because of the savings involved or the higher level of free-ridership generally found for that program. All of these are valid reasons for increasing the sample size. National Grid and Connecticut Light & Power chose to purchase additional survey attempts to significantly increase the completed sample sizes of their largest program measure groups.

As discussed earlier, the primary determinants of precision are the standard deviation and the sample size. (Relative precision incorporates the mean of the estimate and is the most common display and use of precision.) The standard deviation varies greatly over the different programs and measure groups, as was shown in Tables 1.1 and 1.2. So the reliability of a sample and the degree to which there is significant standard deviation for program measure groups is difficult to pre-determine. With smaller population sizes, differences in the responses within census groups and differences from who responds or not to a census attempt can affect the stability and reliability of the estimates at the program measure group level across measure groups or over time.

Sampling with stratified random sampling was planned for several program measure groups for the larger sponsors. In practice, an attempted census of all participants was required to achieve the established survey quotas for most program measure groups.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover from May through August of 2005. All sampled customers were mailed a letter on sponsor letterhead in advance of the telephone call.[10] This letter explained the purpose of the

[10] In cases where a sample of participants was developed, advance letters were sent to all customers included in primary and back-up samples for each program and measure group. Two of the sponsors had advance letters sent to a census of all participants. Another two of the sponsors only provided contact information for those participants in the primary and back-up sample (as these had to be pulled by hand). There are a few program

call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Conducting surveys during the summer months, however, may have increased the difficulties in obtaining completed surveys. Prior studies for National Grid have had these surveys conducted in the spring; a much better time to obtain responses given potential vacation schedules and associated staffing issues. The spring surveys also allowed the interviews to occur somewhat closer to when the decision had been made. By fielding a survey in the spring to gather information regarding program participation that occurred the prior calendar year implies that the equipment decisions were made between 4 and 16 months prior, depending on when participation occurred. Fielding the survey in mid-summer extended this period to between 6 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten. This may have significantly affected our completion rates and final overall sample counts. Other factors that may have adversely affected survey completion rates include incomplete contact information included in program tracking databases provided by Sponsors and the application aggregation scheme used for sample development.[11] The number of unique participants (account numbers), starting sample sizes, number of survey completes, and percentage of starting sample and kWh represented by the completed surveys are provided at the program and measure group level by sponsor in the first table in each sponsor's findings chapter (labeled Tables 5.1, 6.1, etc.).

measure groups (where the number of participants were more than 100) at the other two sponsors that may have had participants called as part of an unanticipated census attempt where these customers did not receive advance letters.

[11] As noted above, aggregating participant applications by common contact name, business location, and business was expected to increase survey completion rates. However, in cases where applications were aggregated, a single unresponsive contact or refusal to participate could be counted multiple times at the program measure group level decreasing the survey completion rate. Aggregating by customer provides the most accurate method to obtain all possible responses with the greatest customer service. This method, however, does make its completion rates not comparable to prior methods that were based only upon applications.

2 SURVEY ADJUSTMENTS

2.1 SURVEY ADJUSTMENTS FOR THE PARTICIPANT SURVEYS

Using the participant survey across programs and gaps in available program participation data required us to revise the original participant survey instrument specified in Appendix A of the Standardized Method and included as Appendix A of this report. All sponsors required at least some modification to the participant survey instrument fielded with their customers. Most sponsors required only minor revisions to the participant survey including an abbreviation of the survey introduction and adjustments to sequence of questions designed to identify the primary decision-maker associated with each installed measure, particularly in cases where it was necessary to obtain information from multiple measures across multiple programs and/or sites. Others required more extensive revisions depending upon the availability of project-specific data. These revisions included changes to survey language to agree with read-ins of generic detailed measure descriptions developed in cases where these data were not available, revisions to questions designed to assess the influence of technical assessment studies on participant decision making, and revisions to free-ridership questions that refer to the total cost of installed measures and incentive amounts. Finally, all but one sponsor included a short series of questions designed to measure customer satisfaction with sponsor programs. Each of these revisions is described in more detail below along with the justification for making the modification.

Adjustment to the Identification of Primary Decision-Maker

The standardized method was originally designed to ask respondents questions about as many as two measures installed through the same program. Because ODC asked respondents to respond to questions regarding a maximum of three measures installed through as many as three different programs, we revised the sequence of questions used to confirm that interviewers are speaking to the appropriate decision maker for each measure. The original survey instrument is designed to identify the decision maker for each measure prior to completing the series of free-ridership and spillover questions for the first measure. Based on our experience fielding this survey instrument, and to accommodate situations where a participating facility may have installed multiple measures through different programs, we revised the survey design to identify the decision maker for the first measure and complete all pertinent questions relevant to that measure prior to identifying the decision maker for the second and third measures. The survey instrument included skip patterns designed to obtain contact information or responses to the series of free-ridership and spillover questions for each measure installed at each sampled facility.

Detailed Measure Descriptions

Per the syntax for the participant survey instrument included in the Standardized Method, respondents are asked if they recall installing an energy efficient measure through the program. The CATI programming of the survey instrument requires that the "measure description" included in program tracking data be read into the survey by the interviewer as a prompt to ensure that the respondent was the primary decision maker for the measure in question. In the majority of cases, however, the measure description included in the program tracking data provided by sponsors was limited to the name of the end-use category (i.e.

lighting, air compressor, custom, etc.) or did not provide sufficient detail to serve as an effective prompt to respondents. If the respondent indicates that they do not recall installing the measure, is uncertain, or needs any further clarification, the survey programming skips to a text window that provides a detailed description of the measure installed. Per the Final Standardized Method report, the survey instrument calls for a detailed description of the measure in cases where the respondent indicates that they do not recall installing the measure or do not know if the measure was installed, or in cases where more description of the measure is required, such as for custom measures. In cases where detailed measure descriptions were not available for a given measure from program tracking databases, we developed a generic detailed description for that measure based on readily available program data for that specific measure. For example, if the measure description available from a program database was limited to the measure group associated with an installed measure, say "Lighting", the detailed measure description used in fielding the survey could be: "Lighting equipment including fixtures and/or controls".

Revisions to Questions Regarding the Influence of Technical Assessments

The syntax for the participant survey instrument included in the Standardized Method specifies that participating customers identified through program records as having received a program-subsidized Technical Assessment (TA) study receive questions designed to assess the influence of the TA on the decision to install energy efficient measures. Several program databases lacked the data required to identify customers that received a TA study or a reliable accounting of the amount of the TA incentive. Further, some Sponsors could not provide a typical amount of a TA incentive paid to participants as in many cases these incentives could vary. For the sponsors with this data scenario we modified the participant survey instrument to include a question that asks respondents if they conducted a TA. Respondents answering "yes" are asked if they would have paid the full amount for the TA if the utility had not offered an incentive (assumed to be 50% of the total TA cost based on discussions with relevant Sponsors).[12]

Revisions to Free-ridership Questions Related to Cost of Installed Measures

The syntax for the participant survey instrument included in the Standardized Method includes questions that reference the total cost of installed measures where the total cost is equal to the customer cost plus any utility incentive. Specifically these questions refer to the total cost of the installed measured, and are designed to measure the influence of the utility incentive on the efficiency, quantity and timing of the installed measures. Several program databases only contained data on the incentive amount provided to the customer and thus lacked sufficient data to calculate the total cost for installed measures. In such cases we modified the wording of the free-ridership questions to refer to the amount of the utility incentive and not the total cost of the measure to account for this lack of data.[13]

ODC offered the option of adding a short series of general satisfaction questions (QPS1-PS4). Five of the six of the sponsors chose to add these questions to their surveys.

[12] This survey adjustment was used for five of the six sponsors.
[13] This survey adjustment was used for five of the six sponsors.

The specific revisions to the surveys fielded with customers of each of the sponsoring utilities are described and presented in Section 7 of the sponsor-specific chapters presenting the summary of findings for each sponsor.

2.2 SURVEY ADJUSTMENTS FOR THE VENDOR SURVEYS

A survey with vendors/design professionals selling or installing equipment to commercial and industrial participants is conducted within the Standardized Method to support the calculation of non-participant spillover. Minor revisions to the original vendor survey instrument included in Appendix A of the Standardized Method were made to accommodate the multi-program multi-utility nature of this study and the gaps in program data available from the sponsors. Three changes were made to the survey instrument and its procedures. The specific revisions and justifications for each of these are presented here.

Adjusted Survey Introduction

Four of the six sponsors could not provide contact information for vendors that installed energy efficient measures through their energy efficiency programs. As such, it was not possible to develop a separate sample of vendors for each utility. Nonetheless, it was possible that the list of vendors obtained from the sponsors' tracking databases included vendors that may have installed equipment in the service territory of more than one of the sponsoring utilities. To account for this circumstance and the general lack of available vendor data, we revised the introduction, question I2. Specifically, we asked respondents to indicate if they were the person at their firm most familiar with the work completed through the energy efficiency programs offered by the utilities in each state. In this way, we could ask each respondent about their sales and installation of qualifying equipment, rebates, and application behaviors in each state allowing the utilities in each state to use a common overall spillover rate for their state.

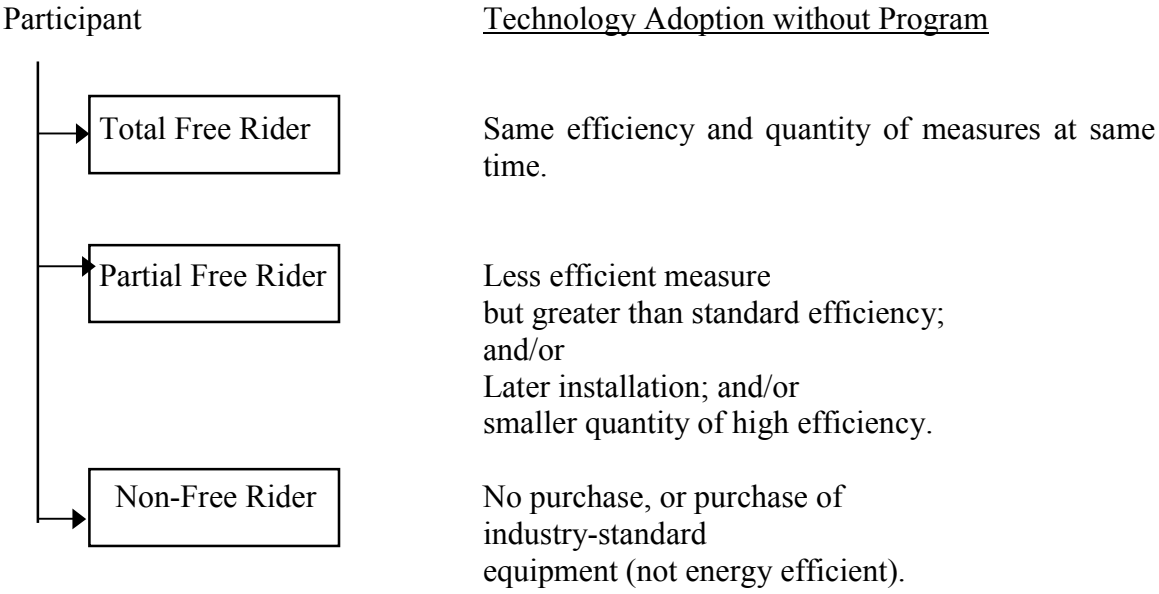
- Question NP2 in the original vendor survey instrument asks vendors to estimate, for each measure group for which they specified, sold or installed equipment, the percentage of all measures that they sold to/installed for the sponsor's customers that would have been eligible to receive an incentive through a specific program. Similarly, question NP3 asks vendors to estimate the percentage of the eligible measures that did not receive an incentive through a specific program. The responses to these questions are used to develop an initial non-participant spillover factor by program and measure group. Due to the lack of available vendor data noted above, the survey has been revised to ask vendors about their sales and installation of qualifying equipment, rebates, and application behaviors in each *state*, as opposed to each utility service territory. As such, we revised question NP2 to reference the percentage of the equipment they sold that would have been eligible for rebates through the energy efficiency programs offered by the utilities in each state in which they sold equipment. Similarly, we revised question NP3 to reference the percentage of the program-eligible equipment sold that did not receive an incentive through the energy efficiency programs offered by the utilities in each state in which they sold equipment.

Questions NP4 through NP8 in the original vendor survey instrument were also revised to reflect activity at the state level as opposed to the utility/program level.

3 PARTICIPANT ANALYSIS METHODOLOGY AND OVERVIEW OF FORMATS AND FINDINGS

Free-ridership is the proportion of savings that would have occurred without the program's influences due to decision-makers that would have taken the same actions without the program. Free-ridership can range from 100% (Total Free-Rider) to 0% (Non-Free-Rider). The program could have some influence on the decision such as when the efficient equipment is purchased. This is one example of a partial free-rider. This continuum is shown in Figure 1.

Figure 1. Continuum of Free Riders



Free-ridership is estimated for each program and measure group based on the algorithms specified in the Standardized Method. The participant survey specified in the Standardized Method includes multiple questions to assess partial free-ridership and a number of questions designed as consistency checks.

Participant "like" spillover is estimated from responses to survey questions included in the participant survey that inquire about similar measures participants have installed without program assistance as a result of their experience with the program measures.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover from May through August of 2005. All sampled and census group customers were mailed a letter on sponsor letterhead in advance of the telephone call. This letter explained the purpose of the call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in

advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Per the Standardized Method, we weighted the free-ridership estimated for each individual decision-maker by the expected energy savings for that program measure group from that decision-maker to get the measure group free-ridership value.[14] In this way, the free ridership percentages can be directly applied to measure group savings to calculate the energy savings that would have occurred without the program intervention. We weighted individual decision-maker participant spillover estimates in the same manner to obtain measure group participant spillover values.

Using the Standardized Method with this number of sponsors, programs, measure groups, and variety of sample responses provided a fuller test of its usage and opportunities for refinement. We discovered that the Standardized Method report does not provide any clear directions for the handling of "Don't Know" or "Don't Recall". We were informed that the application of the Standardized Method in the past assumed that "Don't Know" was the same as answering "No". This caused an initial free-ridership rate to be assumed at 0%. Therefore, we applied an initial free-ridership rate of 0% as was done in the past to measures when the respondent answered "don't know" to questions F1: "If [Sponsor] had not paid a portion of the equipment costs or provided any technical assistance or education through the program, would your company have purchased any [measure] within one year of when it was installed?" If the respondent answered "yes" to F1 but then answered 'don't know" to two questions about the quantity of the equipment that they would have installed, the measure was not assigned an initial free-ridership rate and was dropped from the free-ridership analysis. If the respondent answered "yes" to F1 and answered the questions about the quantity of equipment installed and then answered "don't know" when asked what percent of equipment would have been the same efficiency the measure was assigned an initial free-ridership rate of 0%. For measures where the respondent answered question F1, the quantity questions and the efficiency level question but then answered, "don't know" to the cost question an initial free-ridership rate of zero was assigned (prior to the application of the consistency questions).

"Don't know" and "Do not recall" responses are normal occurrences for surveys, particular with C&I efforts. Forcing interviewers to enter other actual responses, such as "no", could create bias into the estimates. The best path is a well thought out assignment procedure for these responses for each free-ridership or spillover question asked. This was done in the early 1990's when New York created their standardized survey-based free-ridership estimation method. Their work concluded that "Don't Know" was to be treated as an independent answer in the scale of responses and was not equivalent to either a "definitely not" or "probably not". Testing for potential bias should also be conducted.

Another area of some concern in our application of the Standardized Method was with how the consistency check and adjustments are made. This has been one of the more difficult issues for this type of methodology in several jurisdictions. The assumptions being made can

[14] In the case of NGRID's SBS Lighting and CL&P's SBEA Lighting, the sampling strata weights are also applied to ensure a proper representation for a program measure group estimate.

be quite influential to the final estimates. For example, the free-ridership method developed for the New York utilities by Cambridge Systematics, Inc. in 1994 used an assumption that those with inconsistent responses were set to 50% free-ridership. The method was used by several utilities over a few years before a problem with this procedure was discovered. Long Island Lighting Company (LILCo) had relatively similar free-ridership estimates from their C&I programs for several years. Then in 1997 the method was producing much higher estimates that did not seem reasonable given the program stability and prior stable estimates. Dr. Megdal was asked to examine the analysis. It was found that in this particular year the rate of inconsistent respondents was much higher. The method used for adjusting for inconsistent responses was found to have a centrality bias towards 50%. The inconsistent respondents were removed and the resulting free-ridership estimate was again very similar to that in prior years. Removal of inconsistent respondents became their refined method and the New York Public Service Commission approved this. Utilities in California have found the same issue and many of the survey-based methods used there in the late 1990's removed inconsistent respondents rather than adjust their results.

The Standardized Method used in this study has a procedure for adjusting free-ridership estimates for inconsistent respondents. If a measure's initial free-ridership rate is 0% or 100% the respondents' answers to the consistency questions are analyzed. For example, if the measure's initial free-ridership rate is 0% but the respondent says that the company did have plans set aside to install this equipment and did not have to modify its plans to participate in the program or that the technical information received was not a factor in the decision to install the equipment, the respondent was asked to describe in their own words what impact, if any, the program had on their decision to install energy efficient equipment. In contrast, if the measure's initial free-ridership rate is 100% but the respondent says that the company did not have plans set aside to install this equipment or it did have plans but they needed to be modify to qualify for the program or that the technical information received was a crucial factor in the decision to install the equipment, the respondent was asked the same open ended question. If the response to this question contradicted the initial free-ridership rate, the free-ridership rate was adjusted to 50% (from 0% or 100%).

This method for handling inconsistency within the Standardized Method was used in this study. We did, however, discover in the process that the method appears likely to be producing a downward bias in the estimates given the use of the 0% free-ridership assumption. The extent of this can vary from year to year depending upon how open versus guided the "open-ended" responses are structured. Not "guiding" respondents to a specified list of responses in an open-ended question is a difficult subtlety in survey technique and requires experienced surveyors with training specifically on this point and periodic evaluation management monitoring. The Standardized Method states that the consistency question is to be open-ended. It does not allow for guiding responses in order to minimize potential interviewer bias. This means that one would expect to see a vast array of responses and few repeats of similar responses. If the data collected shows very similar or near identical responses, it likely contains either guided responses or interviewer bias. The potential of bias from inconsistency adjustments can also vary year to year based upon the proportion of respondents that provide inconsistent responses, as was found by Long Island Lighting Company as described above. At the same time, using an assumption of 50% was

tested and was found to upwardly bias the free-ridership estimates examined. This issue may warrant further examination in any attempt to make improvements to the Standardized Method.

We calculated the net impact estimates from the participant surveys for each program measure group as one minus the program measure group's weighted free ridership rate and plus the program measure group's weighted participant spillover rate (1-FR+PS). Non-participant spillover (NPS) rate is added to this equation to get the program net impact for Large Commercial and Industrial program measures (1-FR+PS+NPS). As the respondents' expected savings already weights the components, this rate can be applied to the expected program measure group savings from either the program database or from an impact evaluation study of actual savings to obtain net savings.

The free-ridership and participant like spillover percentages, and participant net impact factors by program measure group are presented in the second table in each of the sponsor chapters (chapters 5-10). The program level estimates are calculated by weighting (multiplying) the measure group level estimates by the proportion of the program savings represented by the measure group in the program population. These program level estimates are also presented in the second sponsor specific tables (Tables 5.2, 6.2, etc.).

Standard deviations are provided for the participant net impact factors for each program measure group and at the program level. The standard deviations are provided for all programs and program measure groups for consistency and to allow readers to see the standard deviations in results across the programs and measure groups (not for calculation purposes). There is no sampling error for those measure groups where an attempted census was conducted but there can be non-sampling error (such as response bias). The census program measure groups are identified in the first tables in the sponsor results chapters (Tables 5.1, 6.1, etc.). Those measure groups where sampling was done contain a census attempt strata and stratified random samples. Given the presence of a census attempt strata, calculation of the error bound is based upon the chaining of the effect on kWh and not through this standard deviation.

Error bounds are only presented for measures where sampling actually occurred. The sampling error bound provides the range around the estimate of participant net impact that says we are 90% confidence that the estimate from the whole population (or repeated samples) would be within this range. The 90% error bound was calculated as: the sum of 1.645 * standard deviation of the (participant net impact % for each sample point in a sampling strata times their expected kWh)/ the sum of the (participant net impact % for each sample point in a sampling strata times their expected kWh) for all sample participants in the sample strata and census strata, recognizing there is no sampling error in the census strata. The census attempt strata and census attempt measure groups significantly reduced the error bounds than if these strata were samples since they are not part of the numerator but are part of the denominator. The error bound for the participant net impact percentage for the two programs and program measure groups where sampling actually occurred are provided in these results tables. These are for National Grid's Small Business Services Lighting measure

group and the Small Business Services program and CL&P's Small Business Energy Advantage (SBEA) Lighting measure group and the SBEA program.

Among all the sponsors' programs, the program level free-ridership estimates vary from zero percent (0%) to 36.8%. Overall, for most sponsors the lowest free-ridership rates among their C&I programs, according to the Standardized Method, are for the small C&I programs. These ranged from 0.5% to 6.1%.

Some of the sponsors had separate municipal programs and others did not. They also varied in what type of municipal customers they served. These programs had free-ridership rates from 0% to 11.5%.

In general, the large C&I retrofit efforts had higher free-ridership rates than the smaller C&I programs. There was a significant amount of variance among sponsors in the free-ridership rate for the large C&I retrofit efforts and the C&I new construction efforts. Yet, the highest C&I free-ridership rates generally tended to be among the new construction programs.

Lighting free-ridership varies significantly across programs, from 0% to 83%. This may suggest that the type of customer or program design plays a somewhat larger role in free-ridership than the measure itself. The higher new construction program free-ridership estimates were largely driven by having higher than average lighting free-ridership rates within their programs.

The number of completed surveys drops as we look at the other measure groups within programs, due to correspondingly lower population sizes.

Free-ridership across HVAC groups varies from 0% to 64% with at least two sponsors finding lower free-ridership among the unitary HVAC (where this information was available). This again could likely be due to the type of customers that are most applicable to unitary HVAC versus non-unitary or the difference could be due to program design differences between unitary HVAC versus non-unitary.

Free-ridership across programs and sponsors for motors ranged from 12% to 55%. VSD/VFDs have small sample sizes and the free-ridership ranges from 0% to 44%.

Participant like spillover as measured by the Standardized Method varied from 0% to 27%. The most common participant spillover estimate on a program measure group basis was 0% (the mode). Most of those with participant spillover had estimates of less than 10%. This made most of the program level participant spillover estimates occur between 0-5%.

Free-ridership and participant spillover effects are combined to create the participant net impact estimate as a factor that could be applied to savings estimates to derive net savings estimates according to the following formula:

$$\text{Participant Net Impact} = 1 - \text{free-ridership} + \text{participant spillover}$$

On a program basis, these ranged from 65% to 115%. Twenty-two of the 28 program measure groups (79%) analyzed showed participant net estimates of 85% or greater according to the Standardized Method.

After providing this overview of findings, we need to add a caution about comparing results among programs and among sponsors. Obtaining results by program measure group with sometimes small sample populations, often more than a year after the decision was made, and surveying during the summer may significantly contribute to sampling, non-sampling errors, and differences seen across sponsors. Most of the program measure groups ended up being attempted censuses without achieving complete census. Small sample size and potentially non-response bias could be the reason for differences in results. It is also possible that the same program design can obtain very different free-ridership rates depending on how customer recruitment is conducted. A program can help lower its free-ridership rate by aggressively marketing and selling itself to those customers that are more likely "fence sitters" or wouldn't take these actions without a real push and incentive. Marketing to green firms, easy sells, or not really selling and recruiting (just taking who comes in the door), alternatively, is likely to result in high free-ridership. A program can also purposefully avoid marketing to firms they know are already going to take these types of actions. This study did not include a non-response bias study design. Nor did it investigate the program marketing efforts. So we cannot ascertain if a much lower participant net impact rate for any one program measure group is an artifact of the sampling error, non-sampling error or is an accurate representation of the net rates based upon the marketing efforts of the program.

4 NON-PARTICIPANT LIKE SPILLOVER METHODOLOGY AND IMPLEMENTATION

The program can influence vendors and design professionals by teaching them about and giving them experience with high efficiency equipment. It is possible that due to the program, vendors and design professionals may more often recommend and install high efficiency equipment for customers who chose not to participate in the program. It is also possible that customers who have been influenced by the program in some way would ask the vendor to install high efficiency equipment but chose not to participate in the program. Non-participant "like" spillover rates adjust program savings to partially account for these circumstances. It is important to note that the Standardized Method is designed to measure only a portion of non-participant spillover. 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 non-participants to buy high efficiency products. This methodology estimates non-participant like-measure spillover based on responses from design professionals and vendors participating in the programs during this particular year. It does not survey non-participating designers or vendors, or non-participating customers.

We used the approach specified in the Standardized Method to estimate non-participant "like" spillover. The Standardized Method utilizes survey responses from the vendor survey to assign a measure-specific non-participant spillover percentage to design professionals or vendors that participated in a given energy efficiency program for that measure. The vendor survey includes questions designed to capture information on proportion of equipment sold and/or installed by vendors that would meet program requirements for high efficiency equipment, the proportion of this equipment sold outside of the program, and the level of influence of the program on these sales. We estimated energy savings associated with non-participant spillover measures for each vendor using the appropriate spillover percentage and the kWh savings attributable to that vendor for a specific measure based on data presented in the program tracking database. We then aggregated vendor specific non-participant spillover savings to the measure group level and extrapolated the savings to a single overall non-participant spillover number to be used by all sponsors in a state. The non-participant like spillover percentage is calculated as non-participant spillover savings divided by expected savings.

Two of the six sponsors had adequate data concerning the vendors with links of these vendors to identifiable program participants and kWh savings to be able to utilize the Standardized Method for estimating non-participant like spillover. These are National Grid and Connecticut Light & Power (with considerable work by hand required to make this available). With one sponsor with adequate data per state the planned methodology was to use the percentage of non-participant like spillover by measure group (across programs) derived from these complete assessments for assigning the non-participant spillover by measure group for those sponsors with incomplete vendor information in the same state as the sponsor with vendor survey analysis. This would assume that vendor behaviors are similar across sponsors/utilities and what is found in one territory can be used as a proxy for

what is likely occurring in another. No evidence had been seen that would show this assumption to be invalid or unlikely.

The proposed approach called for a total of 200 completed surveys with vendors. Due to limitations in vendor data available from sponsors, it was not possible to obtain the proposed number of completed surveys. As such, we attempted to complete an interview with as many vendors as possible from the available sample.

Program data provided by National Grid included 373 unique vendors for which kWh savings data were available. Complete contact information was provided for 149 of these vendors. We developed contact information for another 19 vendors for a total working sample of 168 vendors working with National Grid's 2004 C&I programs. We completed interviews with a total of 36 vendors and design professionals for which program tracking databases contained the kWh savings data required to estimate non-participant like spillover per the Standardized Method (36/168 = 21%). Table 4.1 below presents the number of surveys completed by measure group.[15] Column D shows the surveyed kWh included in the analysis. Column F presents the program expected spillover savings for these measure groups for the surveyed vendors/design professionals in the program database. We used these expected savings to obtain measure-specific estimates of non-participant spillover. The ratio of these two savings estimates provides the non-participant like spillover percentage.

Table 4.1 National Grid 2004 Program Large Commercial and Industrial Non-Participant Like Spillover Results

A	B	C	D	E	F	G
Survey Categories	**Program kWh Savings[1]**	**Number of Firms Surveyed with kWh Savings/Number of Firms in Program with kWh Savings**	**Surveyed kWh Savings[2]**	**Surveyed Savings Coverage Rate (D/B)**	**Non-Participant Spillover from Surveyed Firms (kWh)[3]**	**Estimated Spillover Percent (F/D)**
Compressed Air	3,125,430	1/17	314,362	10.1%	314,362	100.0%
Custom	35,788,125	0/66	0	0.0%	0	0.0%
HVAC	7,146,372	23/113	250,070	3.5%	589,690	235.8%
Light	37,138,798	0/151	0	0.0%	0	0.0%
Motor	475,949	13/61	68,796	14.5%	108,053	157.1%
VSD	774,191	0/3	0	0.0%	0	0.0%
TOTAL	**84,448,865**	**36/373**	**633,228**	**0.7%**	**1,012,104**	**159.8%**

1 The total program kWh represents the total savings for all measures for the Design 2000*plus* and Energy Initiative programs.

2 The total surveyed kWh represents the total savings for all surveyed design professionals and surveyed vendors in the program tracking system database whose names suggested they were actual vendors, not participants.

3 Net of "like" spillover for the customers associated with the surveyed design professionals/vendors, as identified from the participating customer survey.

4 Some firms specified or sold more than one type of equipment as such the total number of firms with program savings does not equal the sum of firms across all survey categories.

[15] The number of completed interviews for each end-use category is equal to the number of vendors that completed a survey, indicated that they installed or sold the specific measure in 2004, and for which program databases included kWh savings data for the end-use category.

Program data provided by CL&P included 181 unique vendors for which kWh savings data were available. Complete contact information was provided for 80 of these vendors. We completed interviews with a total of 14 vendors and design professionals working with CL&P's 2004 C&I programs (14/80 = 18%). Table 4.2 below presents the number of surveys completed by measure group for which program tracking databases contained the kWh savings data required to estimate non-participant like spillover per the Standardized Method.[16] Column D shows the surveyed kWh included in the analysis. Column F presents the program expected spillover savings for these measure groups for the surveyed vendors/design professionals in the program database. We used these expected savings to obtain measure-specific estimates of non-participant spillover. The ratio of these two savings estimates provides the non-participant like spillover percentage.

Table 4.2 CL&P 2004 Program Large Commercial and Industrial Non-Participant Like Spillover Results

A	B	C	D	E	F	G
Survey Categories	**Program kWh Savings**	**Number of Firms Surveyed with kWh Savings/Number of Firms in Program with kWh Savings**	**Surveyed kWh Savings[1]**	**Surveyed Savings Coverage Rate (D/B)**	**Non-Participant Spillover from Surveyed Firms (kWh)[2]**	**Estimated Spillover Percent (F/D)**
Light	62,915,261	3/92	1,463,430	2.3%	0	0.0%
HVAC	13,884,612	1/42	67,621	0.5%	67,621	100.0%
Motor	85,170	3/10	1,391,345	1633.6%	7,859	0.6%
Other	28,043,030	7/58	2,107,243	7.5%	3,790,470	179.9%
TOTAL	**104,928,073**	**14/181**	**5,029,639**	**4.8%**	**3,865,950**	**76.9%**

[1] The total surveyed kWh represents the total savings for all surveyed design professionals and surveyed vendors in the program tracking system database whose names suggested they were actual vendors, not participants.

[2] Net of "like" spillover for the customers associated with the surveyed design professionals/vendors, as identified from the participating customer survey.

3 Some firms specified or sold more than one type of equipment as such the total number of firms with program savings does not equal the sum of firms across all survey categories.

The findings from the 2005 study for National Grid provide a non-participant like spillover percentage of 159.8% (1.60). The prior study for National Grid conducted in 2002 reported non-participant like spillover of 9.2% (0.092) for 2001 program data and 6.1% (0.061) for 2002 program data. Earlier studies had also found non-participant spillover in the range of that found in the 2002 study.

The findings from the CL&P 2005 study provide a non-participant like spillover percentage of 76.9% (0.77).

[16] The number of completed interviews for each end-use category is equal to the number of vendors that completed a survey, indicated that they installed or sold the specific measure in 2004, and for which program databases included kWh savings data for the end-use category. More interviews were completed than are included in the total count of 14.

The very large differences between the 2005 estimates and the earlier studies along with the overwhelming impact using a non-participant spillover estimate of 160% or even 77% would have on final savings estimates are such that doing so is not recommended without further study or other confirming research. Given this, we are not recommending that the findings from this study be used. We recommend instead that prior non-participant spillover estimates be used until one is estimated in a study that appears defensible or is thoroughly investigated and confirmed with other methodologies.

5 SUMMARY OF FINDINGS FOR NATIONAL GRID

5.1 EXECUTIVE SUMMARY

Sections 5.1 through 5.6 of this chapter constitute the Executive Summary for this study as provided by National Grid in their 2004 Energy Efficiency Annual Report filing. In order to be consistent with the material provided for the filing, the wording in these sections has not been modified, except in the case of section and table numbering for consistency and to differentiate the tables across chapters.

This report summarizes the findings from the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study for each of National Grid's (NGRID) commercial and industrial (C&I) programs. The purpose of this study was to assess program free-ridership, participant spillover and non-participant spillover for NGRID's Energy Initiative, Design 2000plus, and Small Business Services programs and the C&I programs of the other sponsors.

This joint sponsor study was conducted for six New England sponsors including National Grid. This year's study covers results for energy efficiency programs offered to National Grid customers in Massachusetts, Rhode Island, and New Hampshire. Other sponsors include Unitil (Fitchburg Gas & Electric), Cape Light Compact (CLC), Western Massachusetts Electric Company (WMECo), Connecticut Light & Power (CL&P), and United Illuminating.

5.2 STUDY OBJECTIVES

The primary objective of the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study was to assist the sponsors in quantifying the net-to-gross energy and demand savings ratio of their commercial and industrial programs based upon surveys with 2004 program participants and their associated vendors and design professionals. Megdal & Associates along with Opinion Dynamics Corporation (ODC) was hired to adapt and utilize the *Standardized Methods for Free Ridership and Spillover Evaluation* (referred to as the Standardized Method) as developed by PA Consulting under contract to the Massachusetts energy efficiency program sponsors as finalized on June 16, 2003. This provided a common consistent method across Massachusetts for the estimation of a net-to-gross ratio based upon estimating the extent of:

- **Program free-ridership (FR)** - The percentage of program participants (proportion of expected savings) deemed to be free-rider where a free-rider refers to a customer who received an incentive through an energy efficiency program who would have installed the same or smaller quantity of the same high efficiency measure on their own within one year 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 equipment purchase decision.
- **Participant "like" spillover (PS)** - Refers to the situation where a customer installed equipment through the program in the past year and then installed additional equipment of the same type due to program influences but without program support (technical assistance or incentives).

- **Non-participant "like" spillover (NPS)** - Refers to energy efficient measures installed by program non-participants due to the program's influence.

5.3 STUDY METHDOLOGY FOR PROGRAM NET IMPACT RATIOS

The Standardized Method is based upon conducting telephone surveys with program participants to derive participant free-ridership and participant "like" spillover estimates. In cases where program participants indicate that a design professional or equipment vendor was the primary decision maker for the project, surveys are conducted with the design professional or equipment vendor to produce these estimates. To estimate non-participant "like" spillover attributable to 2004 program activities, the Standardized Method employs interviews with participating design professionals and equipment vendors. We conducted the participant and design professional surveys used to estimate free-ridership and spillover attributable to the sponsors' programs between May and August of 2005.

This study was designed to obtain estimates for these net impact elements at the program and measure group level based on the application of the Standardized Method. For National Grid the programs examined in the study were the Design 2000 Plus, Energy Initiative, and Small Business Services programs. The measure groups examined within these programs are listed in Table 5.1 below.

National Grid provided the 2004 program databases containing all relevant program participation data for each application received for each program in 2004. These data were prepared for sample development by first aggregating applications by utility account number to determine the unique number of program participants (account numbers) for each program and measure group.[17]

For commercial and industrial customers there can be multiple account numbers at a single address or physical location. As National Grid's tracking database associates program applications and installed measures to specific account numbers, there can be cases where a single contact person may be the decision-maker for measures associated with multiple account numbers. At the same time, there can be one decision-maker for multiple sites such as for chain stores, multi-site industrial firms, school districts, etc. The participant survey is conducted with the primary decision-maker responsible for selecting the equipment installed through the program. The survey is designed to ascertain how they made their decisions to install the high efficiency equipment and the effect of the program on those decisions. To ensure that we obtained all of the information regarding all measures installed through the programs from each decision-maker interviewed and that none were contacted for surveying more than once, we conducted additional database efforts. This work included additional programming and manual data processing where necessary to identify likely cases where a single contact person was the primary decision-maker for program participation and measures installed across multiple sites or account numbers.

[17] Unique Participants as presented in Table 5.1 refers to the unique number of utility account numbers which could represent multiple applications for the same measure group in the same program.

Where available, we used the customer contact name from the application as the first and most definitive means to identify multi-site decision-makers. Within a program and measure group we grouped applications with the same or different account numbers and/or facility addresses having the same contact name. When administering the survey we asked participants to respond to questions regarding as many as three measures installed across all National Grid programs for which they were the primary decision-maker. We never combined two sites that had different contact names, including cases where the participants were obviously part of a chain.

If there was no contact name in the database, then additional exams were made to identify potential multiple site decision-makers. The second exam was based on participant facility names that were identical across multiple locations or schools within a single town. The third was based upon facility addresses that were identical across multiple account numbers and those with different suite numbers but appeared to be managed by one of the suite firms.[18] The application of these grouping schemes to the program tracking data provided a list of unique program, measure group, and decision maker or physical location combinations for purposes of survey administration. This starting sample count is presented by program and measure group in Table 5.1 below.

The number of completed surveys presented in Table 5.1 represents the unique number of program, measure group, and decision maker or physical location combinations for which survey responses were gathered.[19] Note that one completed interview could account for more than one unique combination of program, measure group, and location.

Table 5.1 below presents the total number of unique participants, the starting sample, the number of completed surveys and associated kWh savings by National Grid program and measure group.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover attributable to National Grid's C&I programs in July and August of 2005. All sampled customers were mailed a letter on utility letterhead in advance of the telephone call. This letter explained the purpose of the call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Conducting surveys during the summer months, however, may have increased the difficulties in obtaining completed surveys. Prior studies for National Grid have had these surveys conducted in the spring; a much better time to obtain responses given potential vacation

[18] In cases where applications were combined based on facility name or address we verified that the contact was the primary decision-maker for program participation and measures installed for each of the grouped applications.

[19] Note that the number and percentage of completed surveys does not equate to a survey response rate. Response rate is calculated as the number of completed surveys divided by the adjusted starting sample where the adjusted started sample is equal to the starting sample less any invalid sample points (no working number, language barrier, no installed measures, no valid decision maker available). A complete survey disposition report is provided in the appendices to the full report.

schedules and associated staffing issues. The spring surveys also allowed the interviews to occur somewhat closer to when the decision had been made. By fielding a survey in the spring to gather information regarding program participation that occurred the prior calendar year implies that the equipment decisions were made between 4 and 16 months prior, depending on when participation occurred. Fielding the survey in mid-summer extended this period to between 8 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten.

Table 5.1 National Grid Unique Participants, Surveys Completed, Program and Sample kWh, and Sample Weights (where applicable)

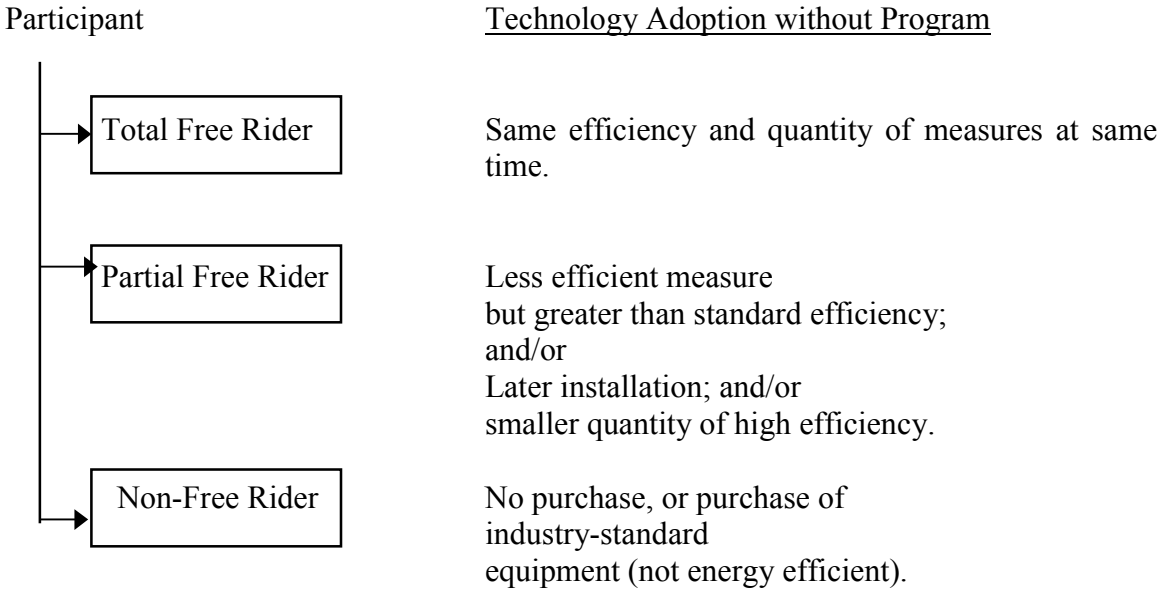
Program	Measure Group	Strata/ Attempted Census	Unique Participants	Starting Sample	Total kWh	Completed Surveys	Surveyed kWh	% Surveyed	% kWh Surveyed	Sample Weight
Energy Initiative	Comp. Air	Attempted Census	30	27	1,306,243	10	497,877	37.0%	38.1%	
	Custom	Attempted Census	127	86	17,455,511	24	4,250,194	27.9%	24.3%	
	HVAC	Attempted Census	21	13	4,171,764	5	2,116,986	38.5%	50.7%	
	Lighting	Attempted Census	440	323	30,657,144	144	11,346,918	44.6%	37.0%	
	Motors	Attempted Census	28	22	254,591	5	28,910	22.7%	11.4%	
	VSD	Attempted Census	5	4	500,631	3	311,353	75.0%	62.2%	
Small Business Services	SBS - Lighting	Census	59	43	2,469,668	6	373,218	14.0%	15.1%	1.021
		Strata 2	288	211	4,580,440	39	808,300	18.5%	17.6%	0.874
		Strata 3	912	668	3,518,037	115	448,965	17.2%	12.8%	1.209
	Other	Attempted Census	222	133	1,997,166	30	226,485	22.6%	11.3%	
Design 2000 Plus	Comp. Air	Attempted Census	108	102	1,819,187	33	714,916	32.4%	39.3%	
	Custom	Attempted Census	103	81	18,332,614	41	7,491,779	50.6%	40.9%	
	HVAC unitary	Attempted Census	195	111	1,156,038	47	186,220	42.3%	16.1%	
	HVAC non-unit	Attempted Census	90	65	1,818,570	16	705,701	24.6%	38.8%	
	Lighting	Attempted Census	157	106	6,481,654	43	3,357,948	40.6%	51.8%	
	Motors (new)	Attempted Census	63	50	97,080	11	38,979	22.0%	40.2%	
	Motors (failed)	Attempted Census	97	75	124,278	20	19,386	26.7%	15.6%	
	VSD	Attempted Census	7	7	273,560	2	129,045	28.6%	47.2%	

Sampling with stratified random sampling was planned for several program measure groups. In practice, an attempted census of all participants was required to achieve the established survey quotas for some program measure groups. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups. Larger sample sizes were sought for the two largest program measure groups, Energy Initiative Lighting and Small Business Services Lighting, where quotas of 150 completed surveys were sought.

Only the Small Business Services surveying employed the planned stratified random sampling methodology for the lighting measure group. Almost all commercial/industrial (C/I) programs are heterogeneous in their expected savings across participants. This means that the most efficient sampling design to achieve higher precision levels with lower sample sizes uses this fact to more heavily sample from the larger expected savers in the program database. We developed three sampling strata: a certainty strata (census attempt of the largest expected savers), strata 2, and strata 3. Table 5.1 above provides the number of unique participants, starting sample, completes, and the sampling weights for these strata based upon their completion statistics.

Free-ridership is the proportion of savings that would have occurred without the program's influences due to decision-makers that would have taken the same actions without the program. Free-ridership can range from 100% (Total Free-Rider) to 0% (Non-Free-Rider). The program could have some influence on the decision such as when the efficient equipment is purchased. This is one example of a partial free-rider. This continuum is shown in Figure 1.

Figure 1. Continuum of Free Riders



Free-ridership is estimated for each program and measure group based on the algorithms specified in the Standardized Method. The participant survey specified in the Standardized Method includes multiple questions to assess partial free-ridership and a number of questions designed as consistency checks.

Participant "like" spillover is estimated from responses to survey questions included in the participant survey that inquire about similar measures participants have installed without program assistance as a result of their experience with the program measures.

Per the Standardized Method, we weighted the free-ridership estimated for each individual decision-maker by the expected energy savings for that program measure group from that decision-maker to get the measure group free-ridership value.[20] In this way, the free ridership percentages can be directly applied to program savings to calculate the energy savings that would have occurred without the program intervention. We weighted participant spillover estimates in the same manner.

We calculated the net impact estimates from the participant surveys for each program measure group as one minus the program measure group's weighted free ridership rate and plus the program measure group's weighted participant spillover rate (1-FR+PS). Non-participant spillover (NPS) rate is added to this equation to get the program net impact for Large Commercial and Industrial program measures (1-FR+PS+NPS). As the components are already weighted by the respondents' expected savings, this rate can be applied to the expected program measure group savings from either the program database or from an impact evaluation study of actual savings to obtain net savings.

5.4 PARTICIPANT FREE-RIDERSHIP, SPILLOVER, AND NET IMPACT RATIOS

The free-ridership, participant like spillover percentages, and participant net impact factors by program measure group are presented in Table 5.2. The program level estimates are calculated as the sum of the measure group level estimates weighted (multiplied) by the proportion of the program savings represented by the measure group in the population. These program level estimates are also presented in Table 5.2.

Standard deviations for each program measure group and at the program level are provided for the participant net impact factors. There is no sampling error for those measures where an attempted census was conducted. Those measure groups where sampling was done contain a census attempt strata and stratified random samples. Given the presence of a census attempt strata, calculation of the error bound is based upon the chaining the effect on kWh and not through this standard deviation. It is only provided here for consistency and to allow readers to see the standard deviations in responses across the programs and measure groups.

[20] In the case of SBS Lighting, the sampling strata weights as listed in Table 5.1 are also applied to ensure a proper representation for a program measure group estimate.

Table 5.2 National Grid Net-to-Gross Rates by Program and Measure Group

Program	Measure Group	Unique Participants	Completed Surveys*	Free-Ridership (%)	Participant Spillover (%)	Participant Net Impact Estimate (%)**	Standard Deviation	Absolute Error Bound (+/- on Participant Net)
Energy Initiative	Comp. Air	30	10	26.4%	0.0%	73.6%	39.1	
	Custom	127	24	5.5%	0.7%	95.3%	23.1	
	HVAC	21	5	0.3%	27.0%	126.7%	34.9	
	Lighting	440	144	7.5%	0.4%	92.9%	25.4	
	Motors	28	5	15.2%	0.0%	84.8%	25.0	
	VSD	5	3	0.1%	16.2%	116.1%	54.2	
	Overall Program	**612**	**165**	**6.7%**	**2.7%**	**96.0%**	**27.4**	
Small Business Services	Lighting	1,259	160	1.0%	0.5%	99.5%	15.0	6.62
	Other	222	30	1.3%	0.3%	99.1%	24.5	
	Overall Program	**1,404**	**176**	**1.0%**	**0.4%**	**99.4%**	**16.7**	**1.37**
Design 2000 Plus	Comp. Air	108	33	17.6%	1.0%	83.3%	46.2	
	Custom	103	41	2.4%	1.8%	99.3%	9.8	
	HVAC (unit)	195	47	5.3%	2.5%	97.2%	27.8	
	HVAC (non-unit)	90	16	64.0%	1.4%	37.5%	53.0	
	Lighting	157	43	50.6%	0.3%	49.7%	41.1	
	Motors (new)	63	11	15.5%	2.4%	86.9%	49.5	
	Motors (failed)	97	20	21.8%	3.4%	81.6%	36.2	
	VSD	7	2	43.5%	N/A	43.5%	N/A	
	Overall Program	**647**	**169**	**18.1%**	**1.4%**	**83.4%**	**37.5**	

* Completed surveys indicate the number of unique Program/Measure/Contact or Measure location combinations about which survey responses were provided. Note that program databases were aggregated to the level of common facility address and/or contact person for purposes of survey administration. As such, one completed interview may provide survey responses for more than one Program/Measure/Contact or Measure location.

** Participant net impact estimates are calculated as 1-FR+PS.

Sampling statistics for precision, such as error bounds and relative precision are not meaningful for populations where an attempted census occurred. They have no sampling error. Therefore, error bounds are only presented for measures where sampling actually occurred. The error bound provides the range around the estimate for sampling precision that says we are 90% confidence that the estimate from the whole population (or repeated samples) would be within this range. The 90% error bound was calculated as: the sum of 1.645 * standard deviation (participant net impact % for each sample point in a sampling strata times their expected kWh)/ the sum of the (participant net impact % for each sample point in a sampling strata times their expected kWh) for all sample participants in the sample strata and census strata, recognizing there is no sampling error in the census strata. The error bounds are significantly reduced by the census attempt strata and census attempt measure groups. The error bound for the participant net impact percentage for the Small Business Services Lighting measure group and the Small Business Services program are presented in Table 5.2.

5.5 STUDY METHDOLOGY FOR NON-PARTICIPANT LIKE SPILLOVER

The program can influence vendors and design professionals by teaching them about and giving them experience with high efficiency equipment. It is possible that due to the program vendors and design professionals may more often recommend and install high efficiency equipment for customers who chose not to participate in the program. It is also possible that customers who have been influenced by the program in some way would ask the vendor to install high efficiency equipment but chose not to participate in the program. Non-participant "like" spillover rates adjust program savings to partially account for these circumstances. It is important to note that the Standardized Method is designed to measure only a portion of non-participant spillover. 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 non-participants to buy high efficiency products. This methodology is estimating non-participant like-measure spillover based on responses from design professionals and vendors participating in the programs during this particular year. It does not survey non-participating designers or vendors or non-participating customers.

We used the approach specified in the Standardized Method to estimate non-participant "like" spillover. The Standardized Method utilizes survey responses from the vendor survey to assign a measure-specific non-participant spillover percentage to design professionals or vendors that participated in a given energy efficiency program for that measure. The vendor survey includes questions designed to capture information on proportion of equipment sold and/or installed by vendors that would meet program requirements for high efficiency equipment, the proportion of this equipment sold outside of the program, and the level of influence of the program on these sales. We estimated energy savings associated with non-participant spillover measures for each vendor using the appropriate spillover percentage and the kWh savings attributable to that vendor for a specific measure based on data presented in the program tracking database. We then aggregated vendor specific non-participant spillover savings to the program and measure group level and extrapolated the savings to the program

level. The non-participant like spillover percentage is calculated as non-participant spillover savings divided by expected program savings.

5.6 NON-PARTICIPANT LIKE SPILLOVER FINDINGS

We completed interviews with a total of 36 vendors and design professionals, with one of these participating in two different program measures. Table 5.3 below presents the number of surveys completed by measure group. Column D shows the surveyed kWh included in the analysis. Column F presents the program expected spillover savings for these measure groups for the surveyed vendors/design professionals in the program database. We used these expected savings to obtain vendor and measure-specific estimates of non-participant spillover for each surveyed vendor. The sum of these estimates by measure group is shown in Table 5.3. The ratio of these two savings estimates provides the non-participant like spillover percentage.

The findings from the 2005 study provide a non-participant like spillover percentage of 159.8% (1.60). The prior study conducted in 2002 reported non-participant like spillover of 9.2% (0.092) for 2001 program data and 6.1% (0.061) for 2002 program data. Earlier studies had also found non-participant spillover in the range of that found in the 2002 study. Given this and the low number of completed surveys, we are not recommending that the non-participant spillover findings from this study be used. We recommend instead that prior non-participant spillover estimates be used until one is estimated in a study that appears defensible or is thoroughly investigated and confirmed with other methodologies.

Table 5.3 National Grid 2004 Program Large Commercial and Industrial Non-Participant Like Spillover Results

A	B	C	D	E	F	G
Survey Categories	**Program kWh Savings[1]**	**Number of Firms Surveyed with kWh Savings/Number of Firms in Program with kWh Savings**	**Surveyed kWh Savings[2]**	**Surveyed Savings Coverage Rate (D/B)**	**Non-Participant Spillover from Surveyed Firms (kWh)[3]**	**Estimated Spillover Percent (F/D)**
Compressed Air	3,125,430	1/17	314,362	10.1%	314,362	100.0%
Custom	35,788,125	0/66	0	0.0%	0	0.0%
HVAC	7,146,372	23/113	250,070	3.5%	589,690	235.8%
Light	37,138,798	0/151	0	0.0%	0	0.0%
Motor	475,949	13/61	68,796	14.5%	108,053	157.1%
VSD	774,191	0/3	0	0.0%	0	0.0%
TOTAL	**84,448,865**	**36/373**	**633,228**	**0.7%**	**1,012,104**	**159.8%**

[1] The total program kWh represents the total savings for all measures for the Design 2000*plus* and Energy Initiative programs.

[2] The total surveyed kWh represents the total savings for all surveyed design professionals and surveyed vendors in the program tracking system database whose names suggested they were actual vendors, not participants.

[3] Net of "like" spillover for the customers associated with the surveyed design professionals/vendors, as identified from the participating customer survey.

5.7 REVISIONS TO THE SURVEY INSTRUMENT MEMO

This section presents the text of the memorandum outlining revisions made to the original participant survey instrument included in Appendix A of the Standardized Method prior to fielding it with National Grid customers. The memorandum presented below was developed and provided to National Grid for approval prior to commencing the participant survey effort.

This memorandum presents the proposed draft participant survey instrument to be fielded with National Grid customers for the purposes of calculating free-ridership and spillover rates based on the standardized method. The draft survey instrument is presented below. Minor revisions were made to the original survey instrument included in Appendix A of the Standardized Method. The specific revisions and justifications for those changes are presented below.

1. **Identification of decision maker (QR1-R3) was adjusted** – The standardized method was originally designed to ask respondents questions about as many as two measures installed through the same program. Because ODC will be asking respondents to respond to questions regarding a maximum of three measures installed through as many as three different National Grid program, we have revised the sequence of questions used to confirm that we are speaking to the appropriate decision maker for each measure. The original survey instrument is designed to identify the decision maker for each measure prior to completing the series of free-ridership and spillover questions for the first measure. Based on our experience fielding this survey instrument, and to accommodate situations where a participating facility may have installed multiple measures through different programs, we have revised the survey design to identify the decision maker for the first measure and complete all pertinent questions relevant to that measure prior to identifying the decision maker for the second and third measures. The survey instrument includes skip patterns designed to obtain contact information or responses to the series of free-ridership and spillover questions for each measure installed at each sampled facility.

VARIABLE LIST

<CONTACT> = Customer Contact Name
<COMP> = Sponsor = Appropriate NGRID company
<PROGRAM> = Program Name
<YEAR> = Program Year
<SNAME> = Customer/Facility Name
<ADD> = Service address where equipment was installed
<MEAS1> = Measure Description (i.e. lighting)
<DESC1> = Detailed Measure Description
<TA> = 1 If a Technical Assessment Study was conducted
<TA %> = Percentage of TA cost paid for by utility
<TACOST> = Total cost of TA study
<COST1> = Utility incentive for Measure 1
<TOTCOST1> = Total cost for Measure 1
<PERC1> = Percentage of total cost paid by utility (=COST1 / TOTCOST1)

<DATE1> = Month/Year of Measure 1 installation

Draft Participant Survey Instrument

Hello, my name is __, and I'm calling on behalf of your electric company <COMP>, a National Grid company. May I speak with <NAM>? Are you the person at your firm/facility who was most involved in making the decision to install equipment through the <PROGRAM> in <YEAR> at <ADD>?

1. Yes [SKIP TO I2]
2. No [SKIP TO I1A]
3. (DK/Refused) [THANK AND TERMINATE]

I1a. Who at your company/facility did make the decision to install this equipment through the program?

Enter contact information [THANK AND TERMINATE]
(Don't know) [THANK AND TERMINATE]
(Refused) [THANK AND TERMINATE]

I2. Do you work directly for <SNAME> or are you a contractor who provides design and/or installation services for <SNAME>?

1. Work directly for company/Employee
2. Vendor/Contractor [SKIP TO VR1]
3. (Don't know)

I'm with Opinion Dynamics, an independent research firm. On behalf of <COMP>, we are following up with customers who participated in its <PROGRAM> to learn about their experiences. You or someone at your facility may have received a letter letting you know about this call. I'm not selling you anything, I'd just like to ask about the equipment you installed at <ADD>. Your responses will be confidential, and this should take about 15 minutes.

R1. Do you recall installing <MEAS1> equipment through the <PROGRAM> in <YEAR>?

1. Yes [SKIP TO A1]
2. No
3. (This equipment was never installed) [SKIP TO MEAS2 ELSE THANK / TERMINATE]
4. (Don't know/Refused)

R1a. The <MEAS1> equipment included <DESC1>. Is there someone else at your facility who would be more familiar with this equipment?

00=Respondent remembers -continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW
99=REFUSED

A1. Were you involved in the decision-making process at the design stage when the <MEAS1> equipment was specified and agreed upon for this facility?

1. Yes [SKIP TO A2]
2. No
3. (Don't know)

1a. At what point in the process did you become involved?

(Open end)
(Don't know)
(Refused)

1b. What was your role?

(Open end)
(Don't know)
(Refused)

READ LIST, RECORD ALL THAT APPLY

A2. Some companies/facilities work with a design professional, project architect, engineer, equipment contractor, or a utility account manager as part of the project design phase. Which individuals were responsible for recommending or specifying the exact type of high efficiency <MEAS1> equipment to install through the <PROGRAM>?

1. Someone within my firm [SKIP TO A4]
2. Design professional
3. Contractor
4. Manufacturer's representative
5. Utility account manager
6. Someone else
7. (Don't know)
8. (Refused)

A3. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did this person have on your company's/facility's decision to install high efficiency equipment so that it would qualify for the program?

1. No influence at all [SKIP TO AP1]
2. 2 [SKIP TO AP1]
3. 3 [SKIP TO AP1]
4. 4
5. A very strong influence
6. (DK) [SKIP TO AP1]

A4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?

Yes Record contact information)
No, refused to give this information
No, no outside advisor involved

(Don't know)

[IF TA=0 SKIP TO AP2]
AP1. <COMP> paid <TA%> of the <TACOST> to conduct a Technical Assessment Study at your facility to determine the cost-effectiveness of installing <MEAS1> equipment. If the utility had not paid a portion of the cost, would your company/facility have paid about <TACOST> to have a similar Technical Assessment Study done within one year of when the study took place? [NOTE: A TECHNICAL ASSESSMENT IS A SIGNIFICANT STUDY OF SPECIFIC MEASURES IT IS MORE INVOLVED THAN A FACILITY AUDIT]

1. Yes
2. No
3. Don't know

AP2. What factors motivated your firm/facility to install this <MEAS1> equipment through the <PROGRAM> in <YEAR>?
DO NOT READ LIST. PLEASE CHOOSE ALL THAT APPLY.

1. (To reduce maintenance costs)
2. (To reduce initial purchase costs)
3. (The program incentive)
4. (The technical assistance offered)
5. (To reduce energy bills/save money)
6. (To improve efficiency/save energy)
7. (Took the advice of my installer/designer/contractor/utility rep)
8. (Because of my past program participation)
9. (Other - specify)
10. (Don't know)
11. (Refused)

AP3. Did your firm/facility have specific plans to install any of this equipment before you talked with anyone about the program?

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

AP4. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of the <MEAS1> equipment in order to qualify for the <PROGRAM>?

1. Yes
2. Yes, but don't remember specifics [SKIP TO ATXT3]
3. No [SKIP TO ATXT3]
4. Don't know [SKIP TO ATXT3]
5. Refused [SKIP TO ATXT3]

AP4A. What changes were necessary?

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)
8. (Don't know)
9. (Refused)

ATXT3
According to our records, the total cost for all <MEAS1> equipment installed was about <TOTCOST1>. <COMP> paid about <COST1> of the total cost of the installed equipment. You may have also received some technical assistance from an <COMP> rep, engineer, or equipment vendor. The program also may have contributed toward the cost of a technical assessment study.

AF1. If <COMP> had not paid a portion of the equipment cost OR provided any technical assistance or education through the <PROGRAM>, would your company/facility have purchased any <MEAS1> equipment within one year of when it was installed?

1. Yes
2. No [SKIP TO AF8]
3. (DK) [SKIP TO AF8]

AF2. Without the program incentive, technical assistance, or education, would your company/facility have purchased the EXACT SAME QUANTITY of <MEAS1> equipment within one year?

1. Yes [SKIP TO AF3]
2. No
3. (DK)

AF2a. What percent of this <MEAS1> equipment do you think your company/facility would have purchased on its own within one year? (PROBE: Would you have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)
ENTER PERCENTAGE 0-100%, 998=DK/REF

AF3. You said your company/facility would have installed at least some <MEAS1> equipment on its own if the program had not been available. What percent of this equipment would have been of the same efficiency or higher efficiency as what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)
ENTER PERCENTAGE 0-100%, 998=DK/REF

GO TO AF5 if AF2=2,3 OR (AF3<100 OR AF3=998)
AF4. Now I want to focus on what it would have cost your company/facility to install this equipment on its own without the program. Do you think your company/facility would have paid the additional <COST1> on top of the amount you already paid, to install the same quantity and efficiency of <MEAS1> equipment within one year?

1. Yes [SKIP TO AF8]
2. No
3. (DK)

GO TO AF6 if AF2=2,3 OR (AF3<100 OR AF3=998)
AF5. How would you have adjusted your purchase to accommodate the fact that you wouldn't have paid all of the costs? Would you have purchased less equipment, lower efficiency equipment, or done something else?

1. Purchased less equipment
2. Purchased lower efficiency of equipment [SKIP TO AF7]
3. (Done something else, specify) [SKIP TO AF10]
4. (Don't know) [SKIP TO AF10]

GO TO AF7 if AF2=2,3 OR (AF3<100 OR AF3=998)
AF6. What percent of the <MEAS1> equipment do you think your company/facility 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 0-100%, 998=DK/REF

GO TO AF8 if AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=01
AF7. What percent of the <MEAS1> that your company/facility would have purchased on its own would have been of a lower efficiency than what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)
ENTER PERCENTAGE 0-100%, 998=DK/REF

GO TO AF9 if AF1=1 AND AF4=2,3
AF8. Was the information or advice you received from a contractor, design team, utility rep, or an engineer a crucial factor in your decision to install this high efficiency equipment through the program at the time you did?

1. No information received
2. Yes
3. No
4. (DK)

COMF9
=> * if IF((AF1=2,3 AND (AP4=3 OR AF8=2)),1,0)
computes for qf9
get qf9 1
do not get qf9 0

CO2F9
=> * if IF((AF2=1 AND (AF3<100 OR AF3=998) AND AF4=1),1,0)
get qf9 1
do not get qf9 0

GO TO AF10 if COMF9=0 AND CO2F9=0

AF9. I'd like to better understand your purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on your decision to install the energy efficient <MEAS1> equipment at the time you did?

Open text window
(Don't know)
(Refused)

AF10. Did your company/facility participate in any of <COMP>'s energy efficiency programs before you installed energy efficient equipment in <YEAR>?

1. Yes
2. No [SKIP TO AS1]
3. (DK) [SKIP TO AS1]

ASK3
=> AS1 else => +1 if CNT2=1 OR CNT3=1

F11. 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/facility. There are no right or wrong answers; we just want your honest opinion. (REPEAT IF NECESSARY)

Disagree=1, Agree=2, (DK)=3

A. The energy savings performance of equipment installed through the <PROGRAM> in earlier years was a primary reason why we decided to install energy efficient <DESC1> through the program in <DATE1 >. Do you agree or disagree with this statement?

B. Because of our previous experience with the performance of energy efficient equipment installed through the <PROGRAM>, and what we learned by participating in the program we asked our contractor to look into energy efficient options for <DESC1> when developing project plans in <DATE1 >. Do you agree or disagree with this statement?

C. Because of our previous experience with the performance of energy efficient equipment installed through the <PROGRAM> and what we learned by participating in the program we took into account the cost-effectiveness of energy efficient <DESC1> when evaluating different options in <DATE1 >. Do you agree or disagree with this statement?

AS1. Now I'd like you to think of the time since you participated in the <PROGRAM> in <YEAR>. Has your company/facility purchased and installed any <MEAS1> equipment on its own for this or other facilities served by <COMP>?

1. Yes
2. No [SKIP TO SKIP1]
3. (DK) [SKIP TO SKIP1]

AS1a. Was this equipment of THE SAME EFFICIENCY LEVEL OR A HIGHER LEVEL OF EFFICIENCY as the equipment you installed through the program?

1. Yes
2. No [SKIP TO SKIP1]
3. (DK) [SKIP TO SKIP1]

AS2. About how much energy efficient <MEAS1> equipment did your company/facility purchase on its own since participating in this program in <YEAR>? (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 amount as you installed through the program, twice as much as what you installed through the program
or some other amount?)

ENTER PERCENTAGE 0-100%, 998=DK/REF

AS3a. Did a recommendation by the contractor or designer who you worked with under the <PROGRAM> influence your decision to install some or all this efficient <MEAS1> equipment on your own?

1. Yes
2. No
3. (DK)

AS3b. Did your experience with the energy efficient equipment installed through the <PROGRAM> influence your decision to install some or all this efficient <MEAS1> equipment on your own?

1. Yes
2. No
3. (DK)

AS3c. Did your participation in any past program offered by <COMP> influence your decision to install some or all this efficient <MEAS1> equipment on your own?

1. Yes
2. No
3. (DK)

AS4. Why didn't you purchase this <MEAS1> equipment through an <COMP> program?

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 <COMP> 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)
13. (Don't know)

GO TO SKIP1 if AS4 NOT=04

AS4a. Why wouldn't the equipment qualify?
Open text window
(Don't know)
(Refused)

SKIP1
=> END else => +1 if CNT2=0
[REPEATS QUESTIONS BEGINNING FROM I1 FOR SECOND MEASURE]

IDENTIFICATION OF DECISION MAKER FOR SUBSEQUENT MEASURES

BI1. Are you the person at your firm/facility who was most involved in making the decision to install equipment through the <PROGRAM2> in <YEAR2> at <ADD2>?
1. Yes
2. No [SKIP TO BI1A]
3. (DK/Refused) [THANK SKIP TO END]

BR1C. Do you recall installing <MEAS2> equipment through <PROGRAM2> in 2004 at <ADD2> <CITY2>?
1. Yes [SKIP TO B1]
2. No
3. (This equipment was never installed) [SKIP TO MEAS3 ELSE THANK /SKIP TO END]
4. (Don't know/Refused)

BR1A. The <MEAS2> equipment included <DESC2>. Is there someone else at your facility who would be more familiar with this equipment?
00=Respondent remembers [SKIP TO B1]
01=YES (ENTER CONTACT INFO)
02=NO [SKIP TO END]
98=DON'T KNOW [SKIP TO END]
99=REFUSED [SKIP TO END]

BI1A. Who at your company/facility did make the decision to install this equipment through the program?
Enter contact information [THANK SKIP TO END]
(Don't know) [THANK SKIP TO END]
(Refused) [THANK SKIP TO END]

[REPEATS QUESTIONS A1 THROUGH AS4 FOR EACH SUSEQUENT MEASURE]

VR1

I'm with Opinion Dynamics, an independent research firm. We have been hired to talk with some of the design professionals and contractors who were involved with the <PROGRAM> in <YEAR>. I'm <u>not</u> selling anything; I'd just like to ask you about the types of equipment that

have been recommended, sold, or installed by your firm through this program in <YEAR>.

I'd also like to assure you that your responses will be kept confidential by <COMP> and that this should take less than 15 minutes.

Do you recall recommending or specifying <MEAS1> for <SNAME> at <ADD> through the <PROGRAM> in <YEAR>?

1 Yes
2 No
3 This equipment was never installed [IF CNT2=0 SKIP TO END, REPEAT FOR MEAS2]
-8 DON'T KNOW

VR1A. The <MEAS1> equipment included <DESC1>. Is there someone else at your company who would be more familiar with this equipment?

00=Respondent remembers - continue
01=YES (ENTER CONTACT INFO)
02=NO [SKIP TO END]
98=DON'T KNOW [SKIP TO END]
99=REFUSED [SKIP TO END]

VA1. First I'd like to ask you about your decisions to recommend/specify <MEAS1> through the <PROGRAM>. Were you involved in the decision-making process at the design stage when the <MEAS1> equipment was specified and agreed upon for this facility?

1. Yes [SKIP TO VA2]
2. No
3. (Don't know) [SKIP TO VA2]

1a. At what point in the process did you become involved?

(Open end)
(Don't know)
(Refused)

1b. What was your role?

(Open end)
(Don't know)
(Refused)

VA2. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of <MEAS1> so that it would qualify for the program? _____

(NOTE: IF VA2 < 4 AND NO OTHER MEASURE, SKIP TO NON-PARTICIPANT SPILLOVER; ELSE SKIP TO VAP1)

The next set of questions ask about what you think your company would have recommended or specified for <COMP> if the utility had not offered the <PROGRAM> in <YEAR>.

[IF TA=0 SKIP TO VAP2]
VAP1. <COMP> paid <TA%> of the <TACOST> to conduct a Technical Assessment Study at your facility to determine the cost-effectiveness of installing <MEAS1> equipment. If the utility had not paid a portion of the cost, do you think <S_NAME> would have paid about <TACOST> to have a similar Technical Assessment Study done within one year of when the study took place? [NOTE: THIS IS A SIGNIFICANT STUDY OF SPECIFIC MEASURES AND MORE INVOLVED THAN A FACILITY AUDIT]

1. Yes
2. No
3. Don't know

VAP2. As far as you know, did <S_NAME> have specific plans to install this equipment before they learned about the program?

1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. (DK) [SKIP TO VATXT3]
5. (Refused) [SKIP TO VATXT3]

VAP3. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of the <MEAS1> equipment in order to qualify for the <PROGRAM>?

1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. Don't know [SKIP TO VATXT3]
5. Refused [SKIP TO VATXT3]

VAP3A. What changes were necessary?

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)
8. (Don't know)
9. (Refused)

VATXT3
According to our records, the total cost for all <MEAS1> equipment installed was about <TOTCOST1>. <COMP> paid about <COST1> of the total cost of the installed equipment.

<S_NAME> may have also received some technical assistance from an <COMP> or a contribution toward the cost of a technical assessment study.

VF1 Would your company have recommended or specified any <MEAS1> equipment to <S_NAME> within one year of when it was installed if they had not been able to receive this utility contribution or any technical assistance or education through the [program]?

1 Yes
2 No *(SKIP TO VF8)*
-8 DON'T KNOW *(SKIP TO VF8)*

VF2 Without the program contribution, technical assistance or education, would your company have recommended or specified the exact same quantity of <MEAS1> equipment for <S_NAME> within one year?

1 Yes *(SKIP TO VF3)*
2 No
-8 DON'T KNOW

VF2b What percent of this <MEAS1> equipment do you think your company would have recommended/specified? (*PROBE:* Would you have recommended/specified about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

_____%
-8 DON'T KNOW

VF3 You said you would have recommended/specified at least some <MEAS1> equipment for <S_NAME> if the program had not been available. What percent of this equipment that you would have recommended/specified would have been of the same efficiency or higher efficiency as what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

_____% *(IF RESPONSE NE 100% OR F2 NE 1 SKIP TO F10)*
-8 DON'T KNOW

(NOTE: IF VF1=1 AND VF2=1 AND VF3=100%, ASK VF4-VF7)

VF4 Now I want to focus on what it would have cost <S_NAME> to install this equipment on its own without the program. Do you think <S_NAME> would have paid the additional <COST1>, on top of the amount they already paid, to install the same quantity and efficiency of <MEAS1> equipment within one year?

1 Yes *(SKIP TO VF8)*
2 No
-8 DON'T KNOW

VF5 How do you think <S_NAME> would have adjusted their purchase to accommodate the fact that they wouldn't have paid all of the costs? Would they have purchased less equipment, lower efficiency equipment, or done something else? *(INDICATE ALL THAT APPLY—ASK <u>BOTH</u> VF7 AND VF8 IF APPROPRIATE)*

1 Purchased less equipment *(ASK VF6)*
2 Purchased lower efficiency of equipment *(ASK VF7)*
3 Done something else *(SPECIFY AND SKIP TO VF10)*
8 Don't Know

VF6 What percent of the <MEAS1> equipment do you think <S_NAME> would have purchased on its own at that same time? (*PROBE:* Would they have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what they installed through the program?)

_____% *(IF F5=2, SKIP TO VF7; ELSE SKIP TO VF10)*
-8 DON'T KNOW

VF7 What percent of the <MEAS1> equipment that <S_NAME> would have purchased on its own would have been of a lower efficiency than what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)
_____% *(SKIP TO VF10)*
-8 DON'T KNOW *(SKIP TO VF10)*

(NOTE: ASK VF8 IF (VF1=2 OR VF1=-8) OR IF (VF1=1 AND VF2=1 AND VF3=100% AND VF4=1); ELSE SKIP TO VF10)

VF8 Was the technical assistance or advice you or another designer/vendor provided to <S_NAME> a crucial factor in their decision to install this high efficiency equipment through the program at the time they did?
0 NA, none received
1 Yes
2 No
-8 DON'T KNOW

(NOTE: ASK VF9 IF ((VF1=2 OR VF1=-8) AND (VP4=3 OR VF8=2)) OR IF ((VF1=1 AND VF2=1 AND VF3=100% AND VF4=1) AND (VP4=1 OR VP4=2 OR VF8=1)); ELSE SKIP TO VF10)

VF9 I'd like to better understand <S_NAME>'s purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on the installation of energy efficient <MEAS1> equipment? *(RECORD VERBATIM THE CLARIFICATION—PROBE AS NEEDED TO UNDERSTAND REASON)*

VF10 On a scale of 1 to 5, with 1 being 'not at all important and 5 being 'very important', how important was your previous experience with a <COMP> program when making the decision to recommend or install <MEAS1> equipment for this customer?

_____
-8 DON'T KNOW
-9 NA – No previous program experience

[REPEAT QUESTIONS VR1 THROUGH VF10 FOR EACH SUBSEQUENT MEASURE]

[ASK VNP1 FOR EVERY MEASURE GROUP IN PROGRAM BEFORE ASKING VNP2-VNP8.]

5.8 SURVEY DISPOSITION

The tables below present the final disposition of the survey used for the participant survey effort by program and measure group. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups. In practice, an attempted census of all participants was required to achieve the established survey quotas for most program measure groups.

The tables below present the survey disposition by quota group developed per the original sampling plan. Survey quota groups were developed for each program measure group combination. Per the sampling plan, the quota group for each program measure group combination represented either a census attempt of all participants or a stratified random sample of participants, depending on the number of participants. To meet the precision requirements, it was deemed most important to ask respondents about measures for which the sample plan called for a census attempt first. As such, for each program, customers that installed a measure for which the sample plan called for an attempted census were assigned to the quota group for that program measure group. Data for that customer regarding the installation of other measures within the program, and participation in other programs, were aggregated such that our interviewers could gather as much data as possible in a single interview with the customer. In the tables below, the "Surveyed Measures" row reflects the number of unique *measure groups* about which respondents could be surveyed based on program tracking data. As customers may have installed more than one type of measure through a given program, the number of "Surveyed Measures" for each program measure group combination does not equate to the number of unique decision makers associated with that program measure group, but the total number of measure groups associated with those decision-makers.

A description of the counts presented in other rows of the disposition tables are presented below:

- Measure not Installed: The number of respondents indicating in their response to survey question R3 that the measure in question was not installed.
- No Knowledgeable Respondent: The number of respondents indicating that they were not familiar with the equipment in question and could not provide an alternate knowledgeable contact person for that measure.
- Unresponsive: The number of potential respondents who did not refuse to participate but did not respond to voicemail requests to participate, were not available for scheduled interviews, repeatedly asked that we call back another time, or otherwise could not make time available to complete the survey during the study period.
- Completed Surveys: The number of completed surveys in the specified program measure group.

Table 5.4 Survey Disposition – Design 2000plus Program

Design 2000plus	Comp. Air	Custom	HVAC unitary	HVAC non-unit	Lighting	Motors (new)	Motors (failed)	VSD
Surveyed Measures	**105**	**93**	**182**	**86**	**150**	**57**	**87**	**12**
Not Called	0	0	0	0	0	0	0	0
No Working Number	17	13	57	22	37	12	19	2
Measure Not Installed	1	1	8	3	3	2	4	0
No Knowledgeable Respondent	13	4	14	9	11	8	15	0
Adjusted Sample	**74**	**75**	**103**	**52**	**99**	**35**	**49**	**10**
Refusal/Mid Terminate	4	2	12	6	9	2	1	0
Language Barrier	0	0	0	0	0	0	0	0
Unresponsive	37	32	44	30	47	22	28	8
Completed Surveys	**33**	**41**	**47**	**16**	**43**	**11**	**20**	**2**
Completed Surveys as Percentage of Adjusted Sample	**45%**	**55%**	**46%**	**31%**	**43%**	**31%**	**41%**	**20%**

Table 5.5 Survey Disposition – Energy Initiative Program

Energy Initiative	Comp Air	Custom	HVAC	Lighting	Motors	VSD
Surveyed Measures	**31**	**72**	**15**	**453**	**27**	**12**
Not Called	0	0	0	0	0	0
No Working Number	5	12	3	82	**5**	2
Measure Not Installed	0	0	0	4	0	1
No Knowledgeable Respondent	1	7	2	38	2	0
Adjusted Sample	**25**	**53**	**10**	**329**	**20**	**9**
Refusal/Mid Terminate	1	3	2	25	3	1
Language Barrier	0	0	0	0	0	0
Unresponsive	14	26	3	160	12	5
Completed Surveys	**10**	**24**	**5**	**144**	**5**	**3**
Completed Surveys as a Percentage of Adjusted Sample	**40%**	**45%**	**50%**	**44%**	**25%**	**33%**

Table 5.6 Survey Disposition – Small Business Services Program

Small Business Services	Lighting	Other
Surveyed Measures	**916**	**167**
Not Called	119	0
No Working Number	116	41
Measure Not Installed	5	6
No Knowledgeable Respondent	37	16
Adjusted Sample	**639**	**104**
Refusal/Mid Terminate	25	10
Language Barrier	0	0
Unresponsive	454	64
Completed Surveys	**160**	**30**
Completed Surveys as a Percentage of Adjusted Sample	**25%**	**29%**

Table 5.7 Survey Disposition: NGRID Vendor Survey

	MA	NH	RI
Starting sample	**118**	**4**	**46**
Not called	0	0	0
No working number	13	3	4
Does not do work in state	1	0	1
Adjusted sample	**104**	**1**	**41**
Refusal	12	0	4
Language barrier	1	0	0
Unresponsive	64	0	29
Completed survey	**27**	**1**	**8**
Response Rate	**26%**	**100%**	**20%**

6. SUMMARY OF FINDINGS FOR FITCHBURG GAS & ELECTRIC COMPANY

6.1 EXECUTIVE SUMMARY

Sections 6.1 through 6.6 of this chapter constitute the Executive Summary for this study as provided by Fitchburg Gas & Electric Company in their 2004 Energy Efficiency Annual Report filing. In order to be consistent with the material provided for the filing, the wording in these sections has not been modified, except in the case of section and table numbering for consistency and to differentiate the tables across chapters.

This report summarizes the findings from the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study for each of Unitil's (for Fitchburg Gas & Electric Company's) commercial and industrial (C&I) programs. The purpose of this study was to assess program free-ridership, participant spillover and non-participant spillover for Unitil's Large C&I Retrofit, Large C&I New Construction, and Small C&I Retrofit programs and the C&I programs of the other sponsors.

This joint sponsor study was conducted for six New England sponsors including Unitil. Other sponsors include National Grid, Cape Light Compact (CLC), Western Massachusetts Electric Company (WMECo), Connecticut Light & Power (CL&P), and United Illuminating.

6.2 STUDY OBJECTIVES

The primary objective of the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study was to assist the sponsors in quantifying the net-to-gross energy and demand savings ratio of their commercial and industrial programs based upon surveys with 2004 program participants and their associated vendors and design professionals. Megdal & Associates along with Opinion Dynamics Corporation (ODC) was hired to adapt and utilize the *Standardized Methods for Free Ridership and Spillover Evaluation* (referred to as the Standardized Method) as developed by PA Consulting under contract to the Massachusetts energy efficiency program sponsors as finalized on June 16, 2003. This provided a common consistent method across Massachusetts for the estimation of a net-to-gross ratio based upon estimating the extent of:

- **Program free-ridership (FR)** - The percentage of program participants (proportion of expected savings) deemed to be free-rider where a free-rider refers to a customer who received an incentive through an energy efficiency program who would have installed the same or smaller quantity of the same high efficiency measure on their own within one year 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 equipment purchase decision.
- **Participant "like" spillover (PS)** - Refers to the situation where a customer installed equipment through the program in the past year and then installed additional equipment of the same type due to program influences but without program support (technical assistance or incentives).
- **Non-participant "like" spillover (NPS)** - Refers to energy efficient measures installed by program non-participants due to the program's influence.

6.3 STUDY METHDOLOGY FOR PROGRAM NET IMPACT RATIOS

The Standardized Method is based upon conducting telephone surveys with program participants to derive participant free-ridership and participant "like" spillover estimates. In cases where program participants indicate that a design professional or equipment vendor was the primary decision maker for the project, surveys are conducted with the design professional or equipment vendor to produce these estimates. To estimate non-participant "like" spillover attributable to 2004 program activities, the Standardized Method employs interviews with participating design professionals and equipment vendors. We conducted the participant and design professional surveys used to estimate free-ridership and spillover attributable to the sponsors' programs between May and August of 2005.

This study was designed to obtain estimates for these net impact elements at the program and measure group level based on the application of the Standardized Method. For Unitil the programs examined in the study were the Large C&I Retrofit, Large C&I New Construction, and Small C&I Retrofit programs. The measure groups examined within these programs are listed in Table 6.1 below.

Unitil provided the 2004 program databases containing all relevant program participation data for each application received for each program in 2004. These data were prepared for sample development by first aggregating applications by utility account number to determine the unique number of program participants (account numbers) for each program and measure group.[21]

For commercial and industrial customers there can be multiple account numbers at a single address or physical location. As Unitil's tracking database associates program applications and installed measures to specific account numbers, there can be cases where a single contact person may be the decision-maker for measures associated with multiple account numbers. At the same time, there can be one decision-maker for multiple sites such as for chain stores, multi-site industrial firms, school districts, etc. The participant survey is conducted with the primary decision-maker responsible for selecting the equipment installed through the program. The survey is designed to ascertain how they made their decisions to install the high efficiency equipment and the effect of the program on those decisions. To ensure that we obtained all of the information regarding all measures installed through the programs from each decision-maker interviewed and that none were contacted for surveying more than once, we conducted additional database efforts. This work included additional programming and manual data processing where necessary to identify likely cases where a single contact person was the primary decision-maker for program participation and measures installed across multiple sites or account numbers.

Where available, we used the customer contact name from the application as the first and most definitive means to identify multi-site decision-makers. Within a program and measure group we grouped applications with the same or different account numbers and/or facility

[21] Unique Participants as presented in Table 6.1 refers to the unique number of utility account numbers which could represent multiple applications for the same measure group in the same program.

addresses having the same contact name. When administering the survey we asked participants to respond to questions regarding as many as three measures installed across all Unitil programs for which they were the primary decision-maker. We never combined two sites that had different contact names, including cases where the participants were obviously part of a chain.

If there was no contact name in the database, then additional exams were made to identify potential multiple site decision-makers. The second exam was based on participant facility names that were identical across multiple locations or schools within a single town. The third was based upon facility addresses that were identical across multiple account numbers and those with different suite numbers but appeared to be managed by one of the suite firms.[22] The application of these grouping schemes to the program tracking data provided a list of unique program, measure group, and decision maker or physical location combinations for purposes of survey administration. This starting sample count is presented by program and measure group in Table 6.1 below.

The number of completed surveys presented in Table 6.1 represents the unique number of program, measure group, and decision maker or physical location combinations for which survey responses were gathered.[23] Note that one completed interview could account for more than one unique combination of program, measure group, and location.

Table 6.1 below presents the total number of unique participants, the starting sample, the number of completed surveys and associated kWh savings by Unitil program and measure group.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover attributable to Unitil's C&I programs in July and August of 2005. All sampled customers were mailed a letter on utility letterhead in advance of the telephone call. This letter explained the purpose of the call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Conducting surveys during the summer months, however, may have increased the difficulties in obtaining completed surveys. Prior studies to assess free riders and spillover have had these surveys conducted in the spring; a much better time to obtain responses given potential vacation schedules and associated staffing issues. The spring surveys also allowed the interviews to occur somewhat closer to when the decision had been made. By fielding a survey in the spring to gather information regarding program participation that occurred the

[22] In cases where applications were combined based on facility name or address we verified that the contact was the primary decision-maker for program participation and measures installed for each of the grouped applications.

[23] Note that the number and percentage of completed surveys does not equate to a survey response rate. Response rate is calculated as the number of completed surveys divided by the adjusted starting sample where the adjusted started sample is equal to the starting sample less any invalid sample points (no working number, language barrier, no installed measures, no valid decision maker available). A complete survey disposition report is provided in the appendices to the full report.

prior calendar year implies that the equipment decisions were made between 4 and 16 months prior, depending on when participation occurred. Fielding the survey in mid-summer extended this period to between 8 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten.

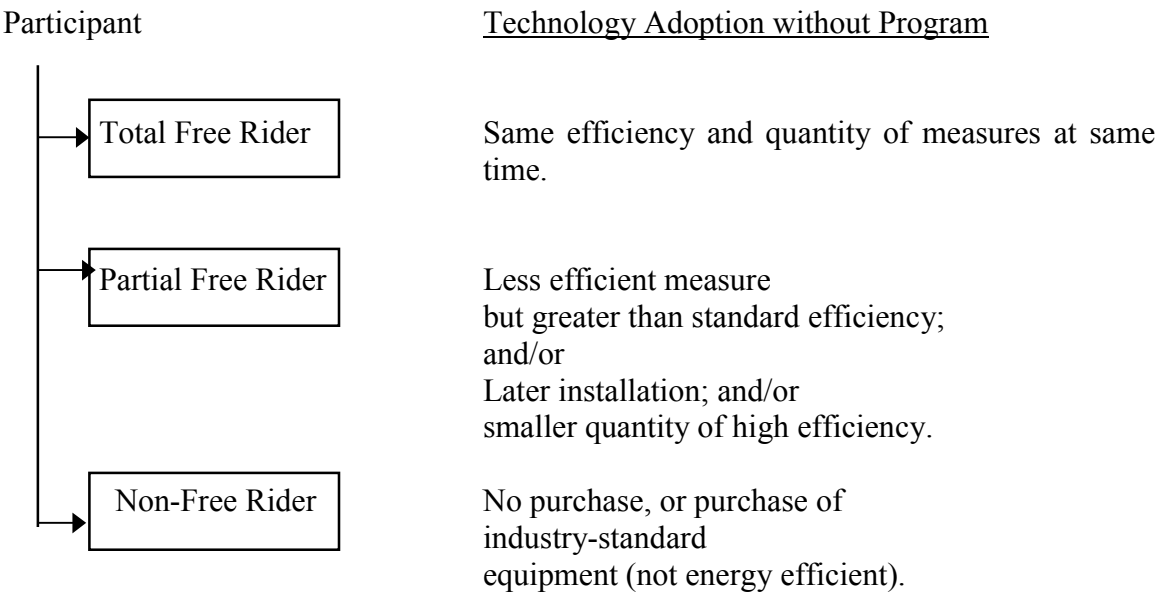
Table 6.1 Unitil Unique Participants, Surveys Completed, Program and Sample kWh, and Sample Weights (where applicable)

Program	Measure Group	Strata/ Attempted Census	Unique Participants	Starting Sample	Total kWh	Completed Surveys	Surveyed kWh	% Surveyed	% kWh Surveyed
Large C&I Retrofit	Comp. Air	Attempted Census	3	3	150,354	1	79,782	33.3%	53.1%
	Custom	Attempted Census	3	3	596,523	1	1,753	33.3%	0.3%
	Lighting	Attempted Census	2	2	36,595	0	0	0.0%	0.0%
	VSD/Motor	Attempted Census	3	3	1,443,825	1	672,591	33.3%	46.6%
Large C&I New Construction	Custom	Attempted Census	4	4	714,829	1	93,160	25.0%	13.0%
Small C&I Retrofit	Lighting	Attempted Census	13	13	741,389	6	378,399	46.2%	51.0%
	HVAC	Attempted Census	7	7	104,977	1	25,914	14.3%	24.7%

The sample plan specified stratified random sampling and a quota of 42 completed surveys for program measure groups with more than 50 participants and an attempted census for program measure groups with less than 50 participants. The small number of program participants necessitated that census attempts were made with all of Unitil's 2004 C&I participants.

Free-ridership is the proportion of savings that would have occurred without the program's influences due to decision-makers that would have taken the same actions without the program. Free-ridership can range from 100% (Total Free-Rider) to 0% (Non-Free-Rider). The program could have some influence on the decision such as when the efficient equipment is purchased. This is one example of a partial free-rider. This continuum is shown in Figure 1.

Figure 1. Continuum of Free Riders



Free-ridership is estimated for each program and measure group based on the algorithms specified in the Standardized Method. The participant survey specified in the Standardized Method includes multiple questions to assess partial free-ridership and a number of questions designed as consistency checks.

Participant "like" spillover is estimated from responses to survey questions included in the participant survey that inquire about similar measures participants have installed without program assistance as a result of their experience with the program measures.

Per the Standardized Method, we weighted the free-ridership estimated for each individual decision-maker by the expected energy savings for that program measure group from that decision-maker to get the measure group free-ridership value. In this way, the free ridership percentages can be directly applied to program savings to calculate the energy savings that

would have occurred without the program intervention. We weighted participant spillover estimates in the same manner.

We calculated the net impact estimates from the participant surveys for each program measure group as one minus the program measure group's weighted free ridership rate and plus the program measure group's weighted participant spillover rate (1-FR+PS). Non-participant spillover (NPS) rate is added to this equation to get the program net impact for Large Commercial and Industrial program measures (1-FR+PS+NPS). As the components are already weighted by the respondents' expected savings, this rate can be applied to the expected program measure group savings from either the program database or from an impact evaluation study of actual savings to obtain net savings.

6.4 PARTICIPANT FREE-RIDERSHIP, SPILLOVER, AND NET IMPACT RATIOS

The free-ridership, participant like spillover percentages, and participant net impact factors by program measure group are presented in Table 6.2. The program level estimates are calculated as the sum of the measure group level estimates weighted (multiplied) by the proportion of the program savings represented by the measure group in the population. These program level estimates are also presented in Table 6.2.

Standard deviations for each program measure group and at the program level are provided for the participant net impact factors. There is no sampling error for those measures where an attempted census was conducted. Sampling relative precision and error bounds statistics are, therefore, not meaningful for populations where an attempted census was conducted. The standard deviation is provided just to allow readers to see the differences in the variation in responses across the programs and measure groups.

As a small utility, Unitil had a very small number of C&I participants when examined at the measure group level. Given the small population of program participants there are a correspondingly low number of completed surveys. As such, there are many program measure groups for which there is only one completed survey. With just one completed survey there can then be no standard deviation in the estimates for these program measure groups.

There is one program measure group for Unitil where we could not obtain completed surveys, and that is the Large C&I Retrofit Lighting. We would recommend using the overall program estimates for this measure group.

Table 6.2 Unitil Net-to-Gross Rates by Program and Measure Group

Program	Measure Group	Unique Participants	Completed Surveys*	Free-Ridership (%)	Participant Spillover (%)	Participant Net Impact Estimate (%)**	Standard Deviation
Large C&I Retrofit	Comp. Air	3	1	18.8	0.0	81.3	NA
	Custom	3	1	14.1	0.0	85.9	NA
	Lighting	2	0	N/A	N/A	N/A	NA
	VSD/Motor	3	1	31.3	10.0	78.8	NA
	Overall Program	**10**	**2**	**25.3**	**6.5**	**81.2**	**1.8**
Large C&I New Construction	Custom	4	1	0.0	0.0	100.0	N/A
	Overall Program	**2**	**1**	**0.0**	**0.0**	**100.0**	**N/A**
Small C&I Retrofit	Lighting	13	6	4.9	0.0	95.1	21.8
	HVAC	7	1	0.0	0.0	100.0	N/A
	Overall Program	**18**	**7**	**4.3**	**0.0**	**95.7**	**20.5**

* Completed surveys indicate the number of unique Program/Measure/Contact or Measure location combinations about which survey responses were provided. Note that program databases were aggregated to the level of common facility address and/or contact person for purposes of survey administration. As such, one completed interview may provide survey responses for more than one Program/Measure/Contact or Measure location.

** Participant net impact estimates are calculated as 1-FR+PS.

6.5 STUDY METHDOLOGY FOR NON-PARTICIPANT LIKE SPILLOVER

The program can influence vendors and design professionals by teaching them about and giving them experience with high efficiency equipment. It is possible that due to the program vendors and design professionals may more often recommend and install high efficiency equipment for customers who chose not to participate in the program. It is also possible that customers who have been influenced by the program in some way would ask the vendor to install high efficiency equipment but chose not to participate in the program. Non-participant "like" spillover rates adjust program savings to partially account for these circumstances. It is important to note that the Standardized Method is designed to measure only a portion of non-participant spillover. 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 non-participants to buy high efficiency products. This methodology is estimating non-participant like-measure spillover based on responses from design professionals and vendors participating in the programs during this particular year. It does not survey non-participating designers or vendors or non-participating customers.

We used the approach specified in the Standardized Method to estimate non-participant "like" spillover. The Standardized Method utilizes survey responses from the vendor survey to assign a measure-specific non-participant spillover percentage to design professionals or vendors that participated in a given energy efficiency program for that measure. The vendor survey includes questions designed to capture information on proportion of equipment sold and/or installed by vendors that would meet program requirements for high efficiency equipment, the proportion of this equipment sold outside of the program, and the level of influence of the program on these sales. We estimated energy savings associated with non-participant spillover measures for each vendor using the appropriate spillover percentage and the kWh savings attributable to that vendor for a specific measure based on data presented in the program tracking database. We then aggregated vendor specific non-participant spillover savings to the program and measure group level and extrapolated the savings to the program level. The non-participant like spillover percentage is calculated as non-participant spillover savings divided by expected program savings.

None of the Massachusetts sponsors had sufficient vendor data to conduct the non-participant like spillover interviews except for National Grid. Prior to surveying, it was decided by the study sponsors and evaluation team to rely upon results from the survey of National Grid vendors to represent the expected non-participant like spillover for all of the sponsors in Massachusetts.

6.6 NON-PARTICIPANT LIKE SPILLOVER FINDINGS

We completed interviews with a total of 36 vendors and design professionals, with one of these participating in two different program measures. Table 6.3 below presents the number of surveys completed by measure group. Column D shows the surveyed kWh included in the

analysis. Column F presents the program expected spillover savings for these measure groups for the surveyed vendors/design professionals in the program database. We used these expected savings to obtain vendor and measure-specific estimates of non-participant spillover for each surveyed vendor. The sum of these estimates by measure group is shown in Table 6.3. The ratio of these two savings estimates provides the non-participant like spillover percentage.

The findings from the 2005 study provide a non-participant like spillover percentage of 159.8% (1.60). The prior study conducted in 2002 reported non-participant like spillover of 9.2% (0.092) for 2001 program data and 6.1% (0.061) for 2002 program data. Earlier studies had also found non-participant spillover in the range of that found in the 2002 study. Given this, we are not recommending that the findings from this study be used. We recommend instead that prior non-participant spillover estimates be used until one is estimated in a study that appears defensible or is thoroughly investigated and confirmed with other methodologies.

Table 6.3 National Grid 2004 Program Large Commercial and Industrial Non-Participant Like Spillover Results

A	B	C	D	E	F	G
Survey Categories	**Program kWh Savings[1]**	**Number of Firms Surveyed with kWh Savings/Number of Firms in Program with kWh Savings**	**Surveyed kWh Savings[2]**	**Surveyed Savings Coverage Rate (D/B)**	**Non-Participant Spillover from Surveyed Firms (kWh)[3]**	**Estimated Spillover Percent (F/D)**
Compressed Air	3,125,430	1/17	314,362	10.1%	314,362	100.0%
Custom	35,788,125	0/66	0	0.0%	0	0.0%
HVAC	7,146,372	23/113	250,070	3.5%	589,690	235.8%
Light	37,138,798	0/151	0	0.0%	0	0.0%
Motor	475,949	13/61	68,796	14.5%	108,053	157.1%
VSD	774,191	0/3	0	0.0%	0	0.0%
TOTAL	**84,448,865**	**36/373**	**633,228**	**0.7%**	**1,012,104**	**159.8%**

[1] The total program kWh represents the total savings for all measures for the Design 2000*plus* and Energy Initiative programs.

[2] The total surveyed kWh represents the total savings for all surveyed design professionals and surveyed vendors in the program tracking system database whose names suggested they were actual vendors, not participants.

[3] Net of "like" spillover for the customers associated with the surveyed design professionals/vendors, as identified from the participating customer survey.

6.7 REVISIONS TO THE SURVEY INSTRUMENT

This section presents the text of the memorandum outlining revisions made to the original participant survey instrument included in Appendix A of the Standardized Method prior to fielding it with Unitil customers. The memorandum presented below was developed and provided to Unitil for approval prior to commencing the participant survey effort.

This memorandum presents the proposed draft participant survey instrument to be fielded with Unitil customers for the purposes of calculating free-ridership and spillover rates based on the standardized method. The draft survey instrument is presented below. Minor revisions were made to the original survey instrument included in Appendix A of the Standardized Method. The specific revisions and justifications for those changes are presented below.

Introduction (QI2) was abbreviated – The introduction to the survey was revised slightly based on ODC's previous experience fielding this survey instrument. Each of the components of the original introduction is included in the revised survey (the sales concern, purpose of the survey, and timing) however we have abbreviated these components in an effort to maximize response rate. During training ODC interviewers are provided with the complete script included in the original survey to use as needed.

Identification of decision maker (QR1-R3) was adjusted – The standardized method was originally designed to ask respondents questions about as many as two measures installed through the same program. Because ODC will be asking respondents to respond to questions regarding a maximum of three measures installed through and of Unitil's programs, we have revised the sequence of questions used to confirm that we are speaking to the appropriate decision maker for each measure. The original survey instrument is designed to identify the decision maker for each measure prior to completing the series of free-ridership and spillover questions for the first measure. Based on our experience fielding this survey instrument, and to accommodate situations where a participating facility may have installed multiple measures through different programs, we have revised the survey design to identify the decision maker for the first measure and complete all pertinent questions relevant to that measure prior to identifying the decision maker for the second and third measures. The survey instrument includes skip patterns designed to obtain contact information or responses to the series of free-ridership and spillover questions for each measure installed at each sampled facility.

Technical Assessment questions revised (AP, AP1) – We have modified the survey to account for the lack of information in program databases that identifies customers that conducted Technical Assessments (TA) or specifies TA incentive amounts. The revised survey instrument includes a question that asks respondents if they conducted a TA. Respondents answering "yes" are asked if they would have paid the full amount for the TA if the utility had not offered an incentive (assumed to be 50% of the total TA cost).

Free ridership questions revised (ATXT3) – We have modified the wording of free ridership questions to account for the fact that data regarding the total cost of the installed measures (Customer Cost + Utility Incentive) is not consistently available for all customers and all programs.

Additional questions – ODC has included a short series of general satisfaction questions (QPS1-PS4). These questions are optional and were included as an example of the supplemental questions included in the survey instruments approved by other sponsors.

VARIABLE LIST

<CONTN> = Customer Contact Name
<COMP> = Sponsor
<PROGRAM> = Program Name
<YEAR> = Program Year
<SNAME> = Customer/Facility Name
<ADD> = Service address where equipment was installed
<MEAS1> = End-use Category (i.e. lighting)
<DESC1> = Detailed Measure Description
<COST1> = Utility incentive for Measure 1

START

IF NO NAME-ASK FOR EQUIPMENT INSTALLATION DECISION MAKER

Hello, my name is __, and I'm calling on behalf of <COMP >. May I speak with <CONTN >? Are you the person at your firm/facility who was most involved in making the decision to install equipment through the <PROG > program in 2004?

ALTERNATE PHONE: <PHONE2 >

(1/2326)

Yes	01	=> QI2
No	02	=> QI1A
(Don't know/Refused)	99	

INT18

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2328)

Would not disclose decision maker	18	D	=> END

I1a. Who at your company/facility did make the decision to install this equipment through the program?

TYPE '01' AND HIT ENTER TO TYPE IN CONTACT INFORMATION. 98= DON'T KNOW 99=REFUSED
ENTER HERE: @QI1A

NAME: @NM1

TITLE: @TT1

TELEPHONE NUMBER: @PH1

QI1A

CUSTOM SCREEN

(1/2330)

enter contact information	01
(Don't know)	98
(Refused)	99

INT19

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2442)

Not the decision maker	19	D	=> END

QI2

I2. Do you work directly for <SNAME > or are you a contractor who provides design and/or installation services for <SNAME >?

(1/2444)

Work directly for company/Employee	1	=> TXT1
Vendor/Contractor	2	=> VTXT1
(Don't know)	3	

INT20

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2445)

Don't know	20	D	=> END

I'm with Opinion Dynamics, an independent research firm. On behalf of <COMP>, we are following up with customers who participated in its <PROG > program to learn about their experiences. You or someone at your facility may have received a letter letting you know about this call. I'm not selling you anything, I'd just like to ask about the equipment you installed at <ADD >.
Your responses will be confidential, and this should take about 15 minutes.

@txt1
PRESS 'ENTER' TWICE TO CONTINUE

TXT1

PRESS ENTER TWICE TO CONTINUE

SCREEN

(1/2447)

CONTINUE	1	D

TXT2

PRESS ENTER TWICE TO CONTINUE

I'd like to review the equipment you installed through the <PROG > program.

(1/2448)

CONTINUE	1	D

AR1

R1. Do you recall installing <MEAS1 > equipment through the <PROG > program in 2004?

(1/2449)

Yes	1	=> A1
No	2	
(This equipment was never installed)	3	=> ASK4
(Don't know/Refused)	4	

R1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your facility that would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

ASK4

=> BR1 else => QPS1 if CNT2=1

skips those whose equipment was never installed for first measure to second measure, or to QPS1 if there isn't a second measure.

(1/2562)

A1

1. Were you involved in the decision-making process at the design stage when the <MEAS1 > equipment was specified and agreed upon for this facility?

(1/2563)

Yes	1	=> A2
No	2	
(Don't know)	3	

A1A

1a. At what point in the process did you become involved?

(1/2564 -2566 -2568)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A1B

1b. What was your role?

(1/2570 -2572 -2574)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A2

READ LIST, RECORD ALL THAT APPLY

2. Some companies/facilities work with an outside professional as part of the project design phase. Which individuals were responsible for recommending or specifying the exact type of high efficiency <MEAS1 > equipment to install through the <PROG > program?

(1/2576 -2577 -2578 -2579 -2580 -2581)

Someone within my firm	1
Design professional	2
Contractor	3
Manufacturer's representative	4
Utility account manager	5
Someone else	6
(Don't know)	7
(Refused)	8

A3

=> +1 if A2=1

3. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did this person have on your company's/facility's decision to install high efficiency equipment so that it would qualify for the program?

(1/2582)

-1- No influence at all	1	=> AP
-2-	2	=> AP
-3-	3	=> AP
-4-	4	
-5- A very strong influence	5	
Don't know	6	=> AP

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?
01=YES 02=NO/REFUSED 03=NO OUTSIDE ADVISOR INVOLVED 98=DK
ENTER HERE: @A4

NAME: @ANM3
TITLE: @ATT3
COMPANY: @ACP3
ADDRESS: @AADD3

PHONE NUMBER: @APH3

A4

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?

(1/2583)

Yes Record contact information)	01		
No, refused to give this information	02		=> AP
No, no outside advisor involved	03		=> AP
(Don't know)	98	X	=> AP

AP

P. Did your facility conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

(1/2825)

Yes	1	
No	2	=> AP2
(Not sure)	3	=> AP2

AP1

=> +1 if AP=2,3

P1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at your facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If <COMP > had not paid a portion of the cost, would your company/facility have paid about the entire amount to have a similar Technical Assessment Study done within one year of when the study took place?

(1/2826)

Yes	1
No	2
(Don't know)	3

AP2

DO NOT READ LIST. PLEASE CHOOSE ALL THAT APPLY.

P2. What factors motivated your firm/facility to install this <MEAS1 > equipment through the <PROG > program in 2004?

(1/2827 -2829 -2831 -2833 -2835 -2837 -2839 -2841 -2843)

(To reduce maintenance costs)	01	
(To reduce initial purchase costs)	02	
(The program incentive)	03	
(The technical assistance offered)	04	
(To reduce energy bills/save money)	05	
(To improve efficiency/save energy)	06	
(Took the advice of my installer/designer/contractor/utility rep)	07	
(Because of my past program participation)	08	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

AP3

P3. Did your firm/facility have specific plans set aside to install any of this equipment before you talked with anyone about the program?

(1/2845)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
(Don't know)	4	=> ATXT3
(Refused)	5	=> ATXT3

AP4

P4. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of equipment for the <MEAS1 > equipment in order to qualify for the <PROG > program?

(1/2846)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
Don't know	4	=> ATXT3
Refused	5	=> ATXT3

P4A. What changes were necessary? (Choose as many as apply)
(PROBE FOR TIMING, QUANTITY AND EFFICIENCY - SEE BELOW)

01 = Installation occurred SOONER than planned
02 = Installation occurred LATER than planned
03 = Installed MORE equipment than was planned
04 = Installed LESS equipment than was planned
05 = Equipment was MORE efficient than planned
06 = Equipment was LESS efficient than planned
00 = Other changes/comments (open text window)
98 = Don't know
99 = Refused

ENTER HERE:@AP4A

AP4A

P4A. What changes were necessary? (CUSTOM SCREEN)

(1/2847 -2849 -2851 -2853 -2855 -2857 -2859)

(Installation occurred SOONER than planned)	01	
(Installation occurred LATER than planned)	02	
(Installed MORE equipment than planned)	03	
(Installed LESS equipment than planned)	04	
(Equipment was MORE efficient than planned)	05	
(Equipment was LESS efficient than planned)	06	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

ATXT3

=> +1 if COST1==0

PRESS ENTER TWICE TO CONTINUE

According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. You may have also received some technical assistance from a <COMP > rep, engineer, or equipment vendor; if you did, the program also may have contributed toward the cost of a study.

(1/2861)

CONTINUE	1	D

AF1

F1. If <COMP > had not paid a portion of the equipment cost OR provided any technical assistance or education through the <PROG > program, would your company/facility have purchased any <MEAS1 > equipment within one year of when it was installed?

(1/2862)

Yes	1	
No	2	=> AF8
Don't know	3	=> AF8

AF2

F2. Without the program incentive, technical assistance, or education, would your company/facility have purchased the EXACT SAME QUANTITY of <MEAS1 > equipment within one year?

(1/2863)

Yes ..... 1 => AF3
No 2
Don't know 3

AF2A

ENTER PERCENTAGE 0-100%, 998=DK/REF

F2a. What percent of this <MEAS1 > equipment do you think your company/facility would have purchased on its own within one year? (PROBE: Would you have purchased about one- fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

(1/2864)

$E 0 100
(DK/REF) 998

AF3

ENTER PERCENTAGE 0-100%, 998=DK/REF

F3. You said your company/facility would have installed at least some <MEAS1 > equipment on its own if the program had not been available. What percent of this equipment would have been of the same efficiency or higher efficiency as what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

(1/2867)

$E 0 100
(DK/REF) 998

AF4

=> +1 if AF2=2,3 OR (AF3<100 OR AF3=998)

F4. Now I want to focus on what it would have cost your company/facility to install this equipment on its own without the program. Do you think your company/facility would have paid the additional cost that the utility paid on top of the amount you already paid, to install the same quantity and efficiency of <MEAS1 > equipment within one year?

(1/2870)

Yes ..... 1 => AF8
No 2
Don't know 3

AF5

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998)

SELECT ALL THAT APPLY

F5. How would you have adjusted your purchase to accommodate the fact that you wouldn't have paid all of the costs? Would you have purchased less equipment, lower efficiency equipment, or done something else?

(1/2871 -2873 -2875)

Purchased less equipment 01
Purchased lower efficiency of equipment 02
(Done something else, specify) ..... 00 O
(Don't know) ..... 98 X

AF6

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

ENTER PERCENTAGE 0-100%, 998=DK/REF

F6. What percent of the <MEAS1 > equipment do you think your company/facility 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?)

(1/2877)

$E 0 100
(Don't know/Refused) 998

AF7

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

F7. What percent of the <MEAS1 > equipment that your company/facility would have purchased on its own would have been of a lower efficiency than what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)

(1/2880)

$E 0 100
(Don't know/Refused) 998

AF8

=> +1 if	(AF1=1 AND AF4=2,3) AND (AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98)

F8. Was the information or advice you received from a contractor, design team, utility rep, or an engineer a crucial factor in your decision to install this high efficiency equipment through the program at the time you did?

(1/2883)

No information received 1
Yes 2
No 3
(Don't know) 4

COMF9

=> * if	IF((AF1=2,3 AND (AP4=3 OR AF8=2)),1,0)

computes for qf9

(1/2884)

get qf9 1
do not get qf9 0

CO2F9

=> * if	IF((AF2=1 AND (AF3<100 OR AF3=998) AND AF4=1),1,0)

(1/2885)

get qf9 1
do not get qf9 0

AF9

=> AF10 if	COMF9=0 AND CO2F9=0

PRESS 'ENTER' TO OPEN TEXT WINDOW

F9. I'd like to better understand your purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on your decision to install the energy efficient <MEAS1 > equipment at the time you did?

(1/2886 -2888 -2890)

Open text window ..... 00 DO
(Don't know) ..... 98 X
(Refused) ..... 99 X

AF10

F10. Did your company/facility participate in any of <COMP >'s energy efficiency programs before you installed energy efficient equipment in 2004?

(1/2892)

Yes 1
No ..... 2 => AS1
(Don't know) ..... 3 => AS1

ASK3

=> AS1 else => +1 if	CNT2=1 OR CNT3=1

(1/2893)

AF11

PRESS ENTER TWICE TO CONTINUE

F11. 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/facility. There are no right or wrong answers; we just want your honest opinion.

(1/2894)

CONTINUE ..... 1 D

AF11A

REPEAT IF NECESSARY

F11a. The energy savings performance of equipment installed through the <PROG > program in earlier years was a primary reason why we decided to install energy efficient <MEAS1 > through the program in 2004. Do you agree or disagree with this statement?

(1/2895)

Disagree 1
Agree 2
(Don't know) 3

AF11B

REPEAT IF NECESSARY

F11b. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > program, and what we learned by participating in the program we asked our contractor to look into energy efficient options for <MEAS1 > when developing project plans in 2004.

Do you agree or disagree with this statement?

(1/2896)

Disagree 1
Agree 2
(Don't know) 3

AF11C

REPEAT IF NECESSARY

F11c. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > Program and what we learned by participating in the program we took into account the cost-effectiveness of energy efficient <MEAS1 > equipment when evaluating different options in 2004. Do you agree or disagree with this statement?

(1/2897)

Disagree 1
Agree 2
(Don't know) 3

AS1

S1. Now I'd like you to think of the time since you participated in the <PROG > program in 2004. Has your company purchased and installed any <MEAS1 > equipment on its own for this or other facilities served by <COMP >?

(1/2898)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

AS1A

S1a. Was this equipment of THE SAME EFFICIENCY LEVEL OR A HIGHER LEVEL OF EFFICIENCY as the equipment you installed through the program?

(1/2899)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

S2. About how much energy efficient <MEAS1 > equipment did your company/facility purchase on its own since participating in this program in 2004?

(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 amount as you installed through the program, twice as much as what you installed through the program or some other amount?

@AS2
ENTER NUMBER, USE 998 FOR DON'T KNOW/REFUSED

AS2

SCREEN

(1/2900)

$E 0 100
(Don't know/Refused) 998

AS3A

S3a. Did a recommendation by the contractor or designer who you worked with under the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2903)

Yes 1
No 2
(Don't know) 3

AS3B

S3b. Did your experience with the energy efficient equipment installed through the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2904)

Yes 1
No 2
(Don't know) 3

AS3C

S3c. Did your participation in any past program offered by another company influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2905)

Yes 1
No 2
(Don't know) 3

AS4

S4. Why didn't you purchase this <MEAS1 > equipment through an <COMP > program?

(1/2906 -2908 -2910 -2912 -2914 -2916 -2918 -2920 -2922 -2924 -2926 -2928)

(Too much paperwork)	01	
(Cost savings not worth the effort of applying)	02	
(Takes too long for approval)	03	
(The equipment would not qualify)	04	
(Vendor does not participate in program)	05	
(Outside other company's service territory)	06	
(No time - needed equipment immediately)	07	
(Thought the program ended)	08	
(Didn't know the equipment qualified under another program)	09	
(Just didn't think of it)	10	
(Unable to get rebate--unsure why	11	
(Other - specify)	00	O
(Don't know)	13	

AS4A

=> +1 if AS4 NOT=04

S4a. Why wouldn't the equipment qualify?

(1/2930 -2932 -2934)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

SKIP1

=> QPS1 else => +1 if CNT2=0

SKIPS TO QPS1 IF NO SECOND MEASURE

(1/2936)

[REPEATS QUESTIONS BEGINNING FROM AR1 FOR SECOND MEASURE – IF NO OTHER MEASURES ASKS OPTIONAL GENERAL SATISFACTION QUESTIONS PS1 – PS4]

VTXT1

I'm with Opinion Dynamics, an independent research firm. We have been hired to talk with some of the design professionals and contractors who were involved with the <PROGRAM> in <YEAR>. I'm not selling anything; I'd just like to ask you about the types of equipment that have been recommended, sold, or installed by your firm through this program in <YEAR>.

I'd also like to assure you that your responses will be kept confidential by <COMP> and that this should take less than 15 minutes.

For the next set of questions, I'd like to review the equipment you recommended or specified through the <PROGRAM> for <COMP>.

VR1. Do you recall recommending or specifying <MEAS1> for <SNAME> at <ADD> through the <PROGRAM> in <YEAR>?

1	Yes	=> VA1
2	No	
3	This equipment was never installed	[IF CNT2=0 SKIP TO PS1, REPEAT FOR MEAS2]
-8	DON'T KNOW	

VR1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your firm who would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

INT 22

I'm sorry, we cannot include you in our study. Thank you for your time!

Don't Know =>END

VA1. First I'd like to ask you about your decisions to recommend/specify <MEAS1> through the <PROGRAM>. Were you involved in the decision-making process at the design stage when the <MEAS1> equipment was specified and agreed upon for this facility?

1. Yes [SKIP TO VA2]
2. No
3. (Don't know)

1a. At what point in the process did you become involved?
(Open end)
(Don't know)
(Refused)

1b. What was your role?
(Open end)
(Don't know)
(Refused)

VA2. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of <MEAS1> so that it would qualify for the program? _____
(NOTE: IF Q3 < 4 AND NO OTHER MEASURE, SKIP TO NON-PARTICIPANT SPILLOVER; ELSE SKIP TO P1)

The next set of questions ask about what you think your company would have recommended or specified for <COMP> if the utility had not offered the <PROGRAM> in <YEAR>.

VAP. To your knowledge, did <SNAME> conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

Yes..... 1
No ..... 2 => VAP2
(Not sure) 3 => AP2

VAP1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at <SNAME>'s facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If the utility had not paid a portion of the cost, do you think <S_NAME> would have paid about the full amount to have a similar Technical Assessment Study done within one year of when the study took place?
1. Yes
2. No
3. Don't know

VAP2. As far as you know, did <S_NAME> have specific plans set aside to install any of this equipment before you talked with anyone about the program?
1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. (DK) [SKIP TO VATXT3]
5. (Refused) [SKIP TO VATXT3]

AP3. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of the <MEAS1> equipment in order to qualify for the <PROGRAM>?
1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. Don't know [SKIP TO VATXT3]
5. Refused [SKIP TO VATXT3]

AP3A. What changes were necessary?

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)
8. (Don't know)
9. (Refused)

VATXT3
According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. <S_NAME> may have also received some technical assistance from an <COMP> representative or a contribution toward the cost of a technical assessment study.

VF1 Would your company have recommended or specified any <MEAS1> to <S_NAME> within one year of when it was installed if they had not been able to receive this utility [contribution/incentive/rebate] or any technical assistance or education through the [program]?

1 Yes
2 No *(SKIP TO VF8)*
-8 DON'T KNOW *(SKIP TO VF8)*

VF2 Without the program [contribution/incentive/rebate], technical assistance or education, would your company have recommended or specified the exact same quantity of <MEAS1> for <S_NAME> within one year?

1 Yes *(SKIP TO VF3)*
2 No
-8 DON'T KNOW

VF2b What percent of this <MEAS1> do you think your company would have recommended/specified? (*PROBE:* Would you have recommended/specified about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

_____%
-8 DON'T KNOW

VF3 You said you would have recommended/specified at least some <MEAS1> for <S_NAME> if the program had not been available. What percent of this equipment that you would have recommended/specified would have been of the same efficiency or higher efficiency as what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

_____% *(IF RESPONSE NE 100% OR F2 NE 1 SKIP TO F10)*
-8 DON'T KNOW

(NOTE: IF VF1=1 AND VF2=1 AND VF3=100%, ASK VF4-VF7)

VF4 Now I want to focus on what it would have cost <S_NAME> to install this equipment on its own without the program. Do you think <S_NAME> would have paid the additional <COST1>, on top of the amount they already paid, to install the same quantity and efficiency of <MEAS1> within one year?

1 Yes *(SKIP TO VF8)*
2 No
-8 DON'T KNOW

VF5 How do you think <S_NAME> would have adjusted their purchase to accommodate the fact that they wouldn't have paid all of the costs? Would they have purchased less equipment, lower efficiency equipment, or done something else? *(INDICATE ALL THAT APPLY—ASK BOTH VF7 AND VF8 IF APPROPRIATE)*

1 Purchased less equipment *(ASK VF6)*
2 Purchased lower efficiency of equipment *(ASK VF7)*
3 Done something else *(SPECIFY AND SKIP TO VF10)*
8 Don't Know

VF6 What percent of the <MEAS1> do you think <S_NAME> would have purchased on its own at that same time? (*PROBE:* Would they have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what they installed through the program?)
_____% *(IF F5=2, SKIP TO VF7; ELSE SKIP TO VF10)*
-8 DON'T KNOW

VF7 What percent of the <MEAS1> that <S_NAME> would have purchased on its own would have been of a lower efficiency than what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)
_____% *(SKIP TO VF10)*
-8 DON'T KNOW *(SKIP TO VF10)*

(NOTE: ASK VF8 IF (VF1=2 OR VF1=-8) OR IF (VF1=1 AND VF2=1 AND VF3=100% AND VF4=1); ELSE SKIP TO VF10)

VF8 Was the technical assistance or advice you or another designer/vendor provided to <S_NAME> a crucial factor in their decision to install this high efficiency equipment through the program at the time they did?
0 NA, none received
1 Yes
2 No
-8 DON'T KNOW

(NOTE: ASK VF9 IF ((VF1=2 OR VF1=-8) AND (VP4=3 OR VF8=2)) OR IF ((VF1=1 AND VF2=1 AND VF3=100% AND VF4=1) AND (VP4=1 OR VP4=2 OR VF8=1)); ELSE SKIP TO VF10)

VF9 I'd like to better understand <S_NAME>'s purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on the installation of energy efficient <MEAS1>? *(RECORD VERBATIM THE CLARIFICATION—PROBE AS NEEDED TO UNDERSTAND REASON)*

VF10 On a scale of 1 to 5, with 1 being 'not at all important and 5 being 'very important', how important was your previous experience with a <COMP> program when making the decision to recommend or install <MEAS1>for this customer?

_____
-8 DON'T KNOW
-9 NA – No previous program experience

[ASK VNP1 FOR EVERY MEASURE GROUP IN PROGRAM BEFORE ASKING VNP2-VNP8.]

PS1. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your satisfaction with <COMP>'s <PROGRAM>.

1. Not at all satisfied [SKIP TO PS2B]
2. 2 [SKIP TO PS2B]
3. 3 [SKIP TO PS2B]
4. 4
5. Extremely satisfied
6. (DK) [SKIP TO PS2B]

GO TO PS2B if QPS1=1,2,3

PS2a. Why are you satisfied with the program?

Open text window
(Don't know)
(Refused)

GO TO PS3 if QPS1=4,5

PS2b. Why are you NOT satisfied with the program?

Open text window
(Don't know)
(Refused)

PS3. Do you have any other comments or suggestions for the program?

Open text window
(Don't know)
(Refused)

PS4. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your overall satisfaction with <COMP>.

1. Not at all satisfied
2. 2
3. 3
4. 4
5. Extremely satisfied
6. (DK)

END

That is all the questions I have for you. Thank you for your participation.

6.8 PARTICIPANT SATISFACTION

Respondents were asked to rate their satisfaction with the program and the company on a 5-point scale where 1 is *not at all satisfied* and 5 is *extremely satisfied*. These were supplemental questions not related to the calculation of free-ridership and spillover and in the interest of minimizing respondent fatigue, we only asked the supplemental questions once. As such if a respondent participated in multiple programs they were only asked the questions regarding one program. Respondents who were design or installation contractors for the customer were not asked these questions.

Table 6.4 Program Satisfaction
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
Large C&I New Construction (n=1)	100%
Large C&I Retrofit (n=3)	100%
Small C&I Retrofit (n=7)	100%

Ten of the eleven customers (91%) rated their overall satisfaction of Unitil a 4 or 5. Table 6.5 shows how respondents in each program rated their satisfaction of Unitil.

Table 6.5 Satisfaction with Unitil
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
Large C&I New Construction (n=1)	100%
Large C&I Retrofit (n=3)	100%
Small C&I Retrofit (n=7)	86%

6.9 SURVEY DISPOSITION

Table 6.6 below present the final disposition of the survey used for the participant survey effort by program and measure group. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups. In practice, an attempted census of all participants was required to achieve the established survey quotas for most program measure groups.

The tables below present the survey disposition by quota group developed per the original sampling plan. Survey quota groups were developed for each program measure group combination. Per the sampling plan, the quota group for each program measure group combination represented either a census attempt of all participants or a stratified random sample of participants, depending on the number of participants. To meet the precision requirements, it was deemed most important to ask respondents about measures for which the sample plan called for a census attempt first. As such, for each program, customers that installed a measure for which the sample plan called for an attempted census were assigned to the quota group for that program measure group. Data for that customer regarding the installation of other measures within the program, and participation in other programs, were aggregated such that our interviewers could gather as much data as possible in a single

interview with the customer. In the tables below, the "Surveyed Measures" row reflects the number of unique *measure groups* about which respondents could be surveyed based on program tracking data. As customers may have installed more than one type of measure through a given program, the number of "Surveyed Measures" for each program measure group combination does not equate to the number of unique decision makers associated with that program measure group, but the total number of measure groups associated with those decision-makers.

A description of the counts presented in other rows of the disposition tables are presented below:

- Measure not Installed: The number of respondents indicating in their response to survey question R3 that the measure in question was not installed.
- No Knowledgeable Respondent: The number of respondents indicating that they were not familiar with the equipment in question and could not provide an alternate knowledgeable contact person for that measure.
- Unresponsive: The number of potential respondents who did not refuse to participate but did not respond to voicemail requests to participate, were not available for scheduled interviews, repeatedly asked that we call back another time, or otherwise could not make time available to complete the survey during the study period.
- Completed Surveys: The number of completed surveys in the specified program measure group.

Table 6.6 Survey Disposition by Program

	Large C&I Retrofit				Large C&I NC	Small C&I	
	CAIR	**Custom**	**Lighting**	**VSD**	**Custom**	**Lighting**	**HVAC**
Surveyed Measures	**3**	**3**	**2**	**3**	**4**	**13**	**7**
Not called	0	0	0	0	0	0	0
No working number	0	1	0	0	0	3	0
Measure Not installed	0	0	0	0	0	0	1
No knowledgeable respondent	1	0	1	1	0	1	2
Adjusted sample	**2**	**2**	**1**	**2**	**4**	**9**	**4**
Refusal	0	1	1	0	0	1	1
Language barrier	0	0	0	0	0	0	0
Unresponsive	1	0	0	1	3	2	2
Completed survey	**1**	**1**	**0**	**1**	**1**	**6**	**1**
Completed Surveys as a Percentage of Adjusted Sample	**50%**	**50%**	**0%**	**50%**	**25%**	**67%**	**25%**

Table 6.7 Survey Disposition: NGRID Vendor Survey

	MA	NH	RI
Starting sample	**118**	**4**	**46**
Not called	0	0	0
No working number	13	3	4
Does not do work in state	1	0	1
Adjusted sample	**104**	**1**	**41**
Refusal	12	0	4
Language barrier	1	0	0
Unresponsive	64	0	29
Completed survey	**27**	**1**	**8**
Response Rate	**26%**	**100%**	**20%**

7. SUMMARY OF FINDINGS FOR WESTERN MASSACHUSETTS ELECTRIC COMPANY

7.1 EXECUTIVE SUMMARY

Sections 7.1 through 7.6 of this chapter constitute the Executive Summary for this study as provided by Western Massachusetts Electric Company in their 2004 Energy Efficiency Annual Report filing. In order to be consistent with the material provided for the filing, the wording in these sections has not been modified, except in the case of section and table numbering for consistency and to differentiate the tables across chapters.

This report summarizes the findings from the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study for each of Western Massachusetts Electric Company's (WMECo) commercial and industrial (C&I) programs. The purpose of this study was to assess program free-ridership, participant spillover and non-participant spillover for WMECo's Custom Services, Energy Conscious Construction, Express Services, Municipal, RFP and Small Business Energy Advantage (SBEA) and the C&I programs of the other sponsors.

This joint sponsor study was conducted for six New England sponsors including WMECo. Other sponsors include Unitil (Fitchburg Gas & Electric), Cape Light Compact (CLC), National Grid, Connecticut Light & Power (CL&P), and United Illuminating (UI).

7.2 STUDY OBJECTIVES

The primary objective of the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study was to assist the sponsors in quantifying the net-to-gross energy and demand savings ratio of their commercial and industrial programs based upon surveys with 2004 program participants and their associated vendors and design professionals. Megdal & Associates along with Opinion Dynamics Corporation (ODC) was hired to adapt and utilize the *Standardized Methods for Free Ridership and Spillover Evaluation* (referred to as the Standardized Method) as developed by PA Consulting under contract to the Massachusetts energy efficiency program sponsors as finalized on June 16, 2003. This provided a common consistent method across Massachusetts for the estimation of a net-to-gross ratio based upon estimating the extent of:

- **Program free-ridership (FR)** - The percentage of program participants (proportion of expected savings) deemed to be free-rider where a free-rider refers to a customer who received an incentive through an energy efficiency program who would have installed the same or smaller quantity of the same high efficiency measure on their own within one year 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 equipment purchase decision.
- **Participant "like" spillover (PS)** - Refers to the situation where a customer installed equipment through the program in the past year and then installed additional equipment of the same type due to program influences but without program support (technical assistance or incentives).

- **Non-participant "like" spillover (NPS)** - Refers to energy efficient measures installed by program non-participants due to the program's influence.

7.3 STUDY METHDOLOGY FOR PROGRAM NET IMPACT RATIOS

The Standardized Method is based upon conducting telephone surveys with program participants to derive participant free-ridership and participant "like" spillover estimates. In cases where program participants indicate that a design professional or equipment vendor was the primary decision maker for the project, surveys are conducted with the design professional or equipment vendor to produce these estimates. To estimate non-participant "like" spillover attributable to 2004 program activities, the Standardized Method employs interviews with participating design professionals and equipment vendors. We conducted the participant and design professional surveys used to estimate free-ridership and spillover attributable to the sponsors' programs between May and August of 2005.

This study was designed to obtain estimates for these net impact elements at the program and measure group level based on the application of the Standardized Method. For WMECo the programs examined in the study were the Custom Services, Energy Conscious Construction, Express Services, Municipal, RFP and Small Business Energy Advantage (SBEA) programs. The measure groups examined within these programs are listed in Table 7.1 below.

WMECo provided the 2004 program databases containing all relevant program participation data for each application received for each program in 2004. Significant manual data gathering on behalf of WMECo was required to gather the minimum level of program participation data necessary to conduct this study. Once compiled, these data were prepared for sample development by first aggregating applications by utility account number to determine the unique number of program participants (account numbers) for each program and measure group.[24]

For commercial and industrial customers there can be multiple account numbers at a single address or physical location. As WMECo's tracking database associates program applications and installed measures to specific account numbers, there can be cases where a single contact person may be the decision-maker for measures associated with multiple account numbers. At the same time, there can be one decision-maker for multiple sites such as for chain stores, multi-site industrial firms, school districts, etc. The participant survey is conducted with the primary decision-maker responsible for selecting the equipment installed through the program. The survey is designed to ascertain how they made their decisions to install the high efficiency equipment and the effect of the program on those decisions. To ensure that we obtained all of the information regarding all measures installed through the programs from each decision-maker interviewed and that none were contacted for surveying more than once, we conducted additional database efforts. This work included additional programming and manual data processing where necessary to identify likely cases where a single contact person was the primary decision-maker for program participation and measures installed across multiple sites or account numbers.

[24] Unique Participants as presented in Table 7.1 refers to the unique number of utility account numbers which could represent multiple applications for the same measure group in the same program.

Where available, we used the customer contact name from the application as the first and most definitive means to identify multi-site decision-makers. Within a program and measure group we grouped applications with the same or different account numbers and/or facility addresses having the same contact name. When administering the survey we asked participants to respond to questions regarding as many as three measures installed across all WMECo programs for which they were the primary decision-maker. We never combined two sites that had different contact names, including cases where the participants were obviously part of a chain.

If there was no contact name in the database, then additional exams were made to identify potential multiple site decision-makers. The second exam was based on participant facility names that were identical across multiple locations or schools within a single town. The third was based upon facility addresses that were identical across multiple account numbers and those with different suite numbers but appeared to be managed by one of the suite firms.[25] The application of these grouping schemes to the program tracking data provided a list of unique program, measure group, and decision maker or physical location combinations for purposes of survey administration. This starting sample count is presented by program and measure group in Table 7.1 below.

The number of completed surveys presented in Table 7.1 represents the unique number of program, measure group, and decision maker or physical location combinations for which survey responses were gathered.[26] Note that one completed interview could account for more than one unique combination of program, measure group, and location.

Table 7.1 below presents the total number of unique participants, the starting sample, the number of completed surveys and associated kWh savings by WMECo program and measure group.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover attributable to WMECo's C&I programs in July and August of 2005. All sampled customers were mailed a letter on utility letterhead in advance of the telephone call. This letter explained the purpose of the call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Conducting surveys during the summer months, however, may have increased the difficulties in obtaining completed surveys. Prior studies based on the Standardized Method have had

[25] In cases where applications were combined based on facility name or address we verified that the contact was the primary decision-maker for program participation and measures installed for each of the grouped applications.

[26] Note that the number and percentage of completed surveys does not equate to a survey response rate. Response rate is calculated as the number of completed surveys divided by the adjusted starting sample where the adjusted started sample is equal to the starting sample less any invalid sample points (no working number, language barrier, no installed measures, no valid decision maker available). A complete survey disposition report is provided in the appendices to the full report.

these surveys conducted in the spring; a much better time to obtain responses given potential vacation schedules and associated staffing issues. Fielding surveys in the spring also allows the interviews to occur somewhat closer to when the decision had been made. By fielding a survey in the spring to gather information regarding program participation that occurred the prior calendar year implies that the equipment decisions were made between 4 and 16 months prior, depending on when participation occurred. Fielding the survey in mid-summer extended this period to between 8 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten.

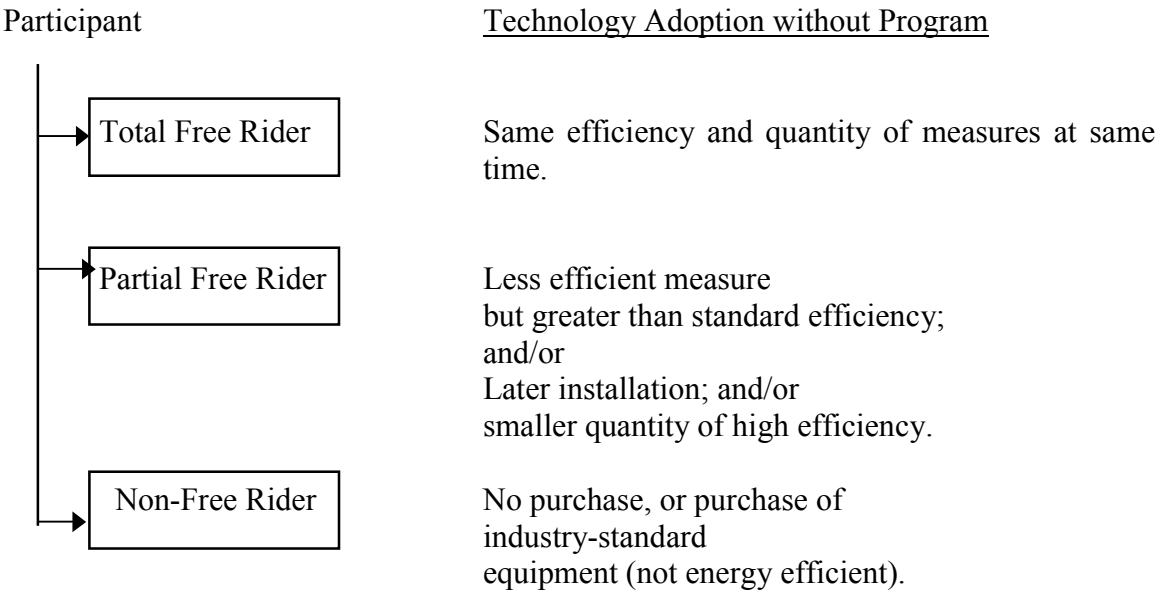
Table 7.1 WMECo Unique Participants, Surveys Completed, Program and Sample kWh, and Sample Weights (where applicable)

Program	Measure Group	Strata/ Attempted Census	Unique Participants	Starting Sample	Total kWh	Completed Surveys	Surveyed kWh	% Surveyed	% kWh Surveyed
Custom Services	Lighting	Attempted Census	19	19	3,145,712	8	1,800,069	42%	57%
	HVAC	Attempted Census	4	4	298,802	3	52,001	75%	17%
	Other	Attempted Census	15	16	3,331,888	5	3,012,778	31%	90%
	Process	Attempted Census	14	15	1,755,958	13	1,297,025	87%	74%
Energy Conscious Construction	Lighting	Attempted Census	17	17	1,330,927	6	645,136	35%	48%
	HVAC	Attempted Census	8	8	510,958	2	125,157	25%	24%
	Motor	Attempted Census	1	1	1,354	0	0	0%	0%
	Other	Attempted Census	1	1	1,072	0	0	0%	0%
	Refrigeration	Attempted Census	1	1	391,707	1	391,707	100%	100%
Express Services	Lighting	Attempted Census	13	13	3,420,516	5	27,845	38%	1%
	HVAC	Attempted Census	21	20	262,405	3	11,180	15%	4%
	Motor	Attempted Census	21	21	35,102	5	43,550	24%	124%
Municipal	Lighting	Attempted Census	17	17	951,947	3	682,516	18%	72%
	Other	Attempted Census	5	4	612,500	3	493,314	75%	81%
RFP	Lighting	Attempted Census	6	6	12,142,992	3	11,427,603	50%	94%
	Other (Refrigeration)	Attempted Census	1	1	173,633	1	173,633	100%	100%
Small Business Energy Advantage	Lighting	Attempted Census	110	107	4,075,185	44	1,482,901	41%	36%
	HVAC	Attempted Census	2	2	216,048	0	0	0%	0%
	Refrigeration	Attempted Census	20	20	706,863	5	123,238	25%	17%

The sample plan specified stratified random sampling and a quota of 42 completed surveys for program measure groups with more than 50 participants and an attempted census for program measure groups with less than 50 participants. Based on this sample plan, only the SBEA Lighting program measure group required sampling with stratified random sampling. In practice, an attempted census of all participants was required to achieve the established survey quotas for this program measure group. As such, sample weights were not required.

Free-ridership is the proportion of savings that would have occurred without the program's influences due to decision-makers that would have taken the same actions without the program. Free-ridership can range from 100% (Total Free-Rider) to 0% (Non-Free-Rider). The program could have some influence on the decision such as when the efficient equipment is purchased. This is one example of a partial free-rider. This continuum is shown in Figure 1.

Figure 1. Continuum of Free Riders



Free-ridership is estimated for each program and measure group based on the algorithms specified in the Standardized Method. The participant survey specified in the Standardized Method includes multiple questions to assess partial free-ridership and a number of questions designed as consistency checks.

Participant "like" spillover is estimated from responses to survey questions included in the participant survey that inquire about similar measures participants have installed without program assistance as a result of their experience with the program measures.

Per the Standardized Method, we weighted the free-ridership estimated for each individual decision-maker by the expected energy savings for that program measure group from that decision-maker to get the measure group free-ridership value. In this way, the free ridership

percentages can be directly applied to program savings to calculate the energy savings that would have occurred without the program intervention. We weighted participant spillover estimates in the same manner.

We calculated the net impact estimates from the participant surveys for each program measure group as one minus the program measure group's weighted free ridership rate and plus the program measure group's weighted participant spillover rate (1-FR+PS). Non-participant spillover (NPS) rate is added to this equation to get the program net impact for Large Commercial and Industrial program measures (1-FR+PS+NPS). As the components are already weighted by the respondents' expected savings, this rate can be applied to the expected program measure group savings from either the program database or from an impact evaluation study of actual savings to obtain net savings.

7.4 PARTICIPANT FREE-RIDERSHIP, SPILLOVER, AND NET IMPACT RATIOS

The free-ridership, participant like spillover percentages, and participant net impact factors by program measure group are presented in Table 7.2. The program level estimates are calculated as the sum of the measure group level estimates weighted (multiplied) by the proportion of the program savings represented by the measure group in the population. These program level estimates are also presented in Table 7.2.

Standard deviations for each program measure group and at the program level are provided for the participant net impact factors. There is no sampling error for those measures where an attempted census was conducted. Sampling relative precision and error bounds statistics are, therefore, not meaningful for populations where an attempted census was conducted. The standard deviation is provided just to allow readers to see the differences in the variation in responses across the programs and measure groups.

There are three program measure groups where the population was small and no surveys were completed. We recommend using participant net estimates similar to those obtained for that program in other measure groups. For the HVAC measures in Small Business Energy Advantage and the two such groups in Energy Conscious Construction we recommend using participant net impact estimates of 100%.

Table 7.2 WMECo Net-to-Gross Rates by Program and Measure Group

Program	Measure Group	Unique Participants	Completed Surveys*	Free-Ridership (%)	Participant Spillover (%)	Participant Net Impact Estimate (%)**	Standard Deviation
Custom Services	Lighting	19	8	13.3	10.7	97.4	49.6
	HVAC	4	3	10.0	0.0	90.0	
	Other	15	5	3.6	0.0	96.4	40.1
	Process	14	13	20.8	0.0	79.2	28.9
	Overall Program	**49**	**27**	**11.0**	**4.0**	**93.0**	**37.1**
Energy Conscious Construction	Lighting	17	6	0.0	0.0	100.0	0
	HVAC	8	2	0.0	0.0	100.0	0
	Motor	1	0	N/A	N/A	N/A	
	Other	1	0	N/A	N/A	N/A	
	Refrigeration	1	1	0.0	0.0	100.0	
	Overall Program	**20**	**7**	**0.0**	**0.0**	**100.0**	**0**
Express Services	Lighting	13	5	16.0	0.8	84.8	42.5
	HVAC	21	3	0.0	0.0	100.0	0
	Motor	21	5	55.3	27.5	72.2	50.0
	Overall Program	**54**	**13**	**15.2**	**1.0**	**85.8**	**43.6**
Municipal	Lighting	17	3	0.0	0.0	100.0	0
	Other	5	3	0.0	0.0	100.0	0
	Overall Program	**20**	**6**	**0.0**	**0.0**	**100.0**	**0**
RFP	Lighting	6	3	15.6	0.0	84.4	57.7
	Other (Refrigeration)	1	1	0.0	0.0	100.0	
	Overall Program	**6**	**3**	**15.4**	**0.0**	**84.6**	**50.0**
Small Business Energy Advantage	Lighting	110	44	0.7	0.1	99.4	5.4
	HVAC	2	0	N/A	N/A	N/A	
	Refrigeration	20	5	0.0	0.0	100.0	0
	Overall Program	**112**	**35**	**0.6**	**0.0**	**99.5**	**5.1**

* Completed surveys indicate the number of unique Program/Measure/Contact or Measure location combinations about which survey responses were provided. Note that program databases were aggregated to the level of common facility address and/or contact person for purposes of survey administration. As such, one completed interview may provide survey responses for more than one Program/Measure/Contact or Measure location.

** Participant net impact estimates are calculated as 1-FR+PS.

7.5 STUDY METHDOLOGY FOR NON-PARTICIPANT LIKE SPILLOVER

The program can influence vendors and design professionals by teaching them about and giving them experience with high efficiency equipment. It is possible that due to the program vendors and design professionals may more often recommend and install high efficiency equipment for customers who chose not to participate in the program. It is also possible that customers who have been influenced by the program in some way would ask the vendor to install high efficiency equipment but chose not to participate in the program. Non-participant "like" spillover rates adjust program savings to partially account for these circumstances. It is important to note that the Standardized Method is designed to measure only a portion of non-participant spillover. 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 non-participants to buy high efficiency products. This methodology is estimating non-participant like-measure spillover based on responses from design professionals and vendors participating in the programs during this particular year. It does not survey non-participating designers or vendors or non-participating customers.

We used the approach specified in the Standardized Method to estimate non-participant "like" spillover. The Standardized Method utilizes survey responses from the vendor survey to assign a measure-specific non-participant spillover percentage to design professionals or vendors that participated in a given energy efficiency program for that measure. The vendor survey includes questions designed to capture information on proportion of equipment sold and/or installed by vendors that would meet program requirements for high efficiency equipment, the proportion of this equipment sold outside of the program, and the level of influence of the program on these sales. We estimated energy savings associated with non-participant spillover measures for each vendor using the appropriate spillover percentage and the kWh savings attributable to that vendor for a specific measure based on data presented in the program tracking database. We then aggregated vendor specific non-participant spillover savings to the program and measure group level and extrapolated the savings to the program level. The non-participant like spillover percentage is calculated as non-participant spillover savings divided by expected program savings.

None of the Massachusetts sponsors had sufficient vendor data to conduct the non-participant like spillover interviews except for National Grid. Prior to surveying, it was decided by the study sponsors and evaluation team to rely upon results from the survey of National Grid vendors to represent the expected non-participant like spillover for all of the sponsors in Massachusetts.

7.6 NON-PARTICIPANT LIKE SPILLOVER FINDINGS

We completed interviews with a total of 36 vendors and design professionals, with one of these participating in two different program measures. Table 7.3 below presents the number of surveys completed by measure group. Column D shows the surveyed kWh included in the

analysis. Column F presents the program expected spillover savings for these measure groups for the surveyed vendors/design professionals in the program database. We used these expected savings to obtain vendor and measure-specific estimates of non-participant spillover for each surveyed vendor. The sum of these estimates by measure group is shown in Table 7.3. The ratio of these two savings estimates provides the non-participant like spillover percentage.

The findings from the 2005 study provide a non-participant like spillover percentage of 159.8% (1.60). The prior study conducted in 2002 reported non-participant like spillover of 9.2% (0.092) for 2001 program data and 6.1% (0.061) for 2002 program data. Earlier studies had also found non-participant spillover in the range of that found in the 2002 study. Given this, we are not recommending that the findings from this study be used. We recommend instead that prior non-participant spillover estimates be used until one is estimated in a study that appears defensible or is thoroughly investigated and confirmed with other methodologies.

Table 7.3 National Grid 2004 Program Large Commercial and Industrial Non-Participant Like Spillover Results

A	B	C	D	E	F	G
Survey Categories	**Program kWh Savings[1]**	**Number of Firms Surveyed with kWh Savings/Number of Firms in Program with kWh Savings**	**Surveyed kWh Savings[2]**	**Surveyed Savings Coverage Rate (D/B)**	**Non-Participant Spillover from Surveyed Firms (kWh)[3]**	**Estimated Spillover Percent (F/D)**
Compressed Air	3,125,430	1/17	314,362	10.1%	314,362	100.0%
Custom	35,788,125	0/66	0	0.0%	0	0.0%
HVAC	7,146,372	23/113	250,070	3.5%	589,690	235.8%
Light	37,138,798	0/151	0	0.0%	0	0.0%
Motor	475,949	13/61	68,796	14.5%	108,053	157.1%
VSD	774,191	0/3	0	0.0%	0	0.0%
TOTAL	**84,448,865**	**36/373**	**633,228**	**0.7%**	**1,012,104**	**159.8%**

[1] The total program kWh represents the total savings for all measures for the Design 2000*plus* and Energy Initiative programs.

[2] The total surveyed kWh represents the total savings for all surveyed design professionals and surveyed vendors in the program tracking system database whose names suggested they were actual vendors, not participants.

[3] Net of "like" spillover for the customers associated with the surveyed design professionals/vendors, as identified from the participating customer survey.

7.7 REVISIONS TO THE SURVEY INSTRUMENT

Minor revisions were made to the original survey participant instrument included in Appendix A of the Standardized Method prior to fielding the survey with WMECo customers. The specific revisions and justifications for those changes are presented below.

1. **Introduction (QI2) was abbreviated** – The introduction to the survey was revised slightly based on ODC's previous experience fielding this survey instrument. Each of the

components of the original introduction is included in the revised survey (the sales concern, purpose of the survey, and timing) however we have abbreviated these components in an effort to maximize response rate. During training ODC interviewers are provided with the complete script included in the original survey to use as needed.

2. **Identification of decision maker (QR1-R3) was adjusted** – The standardized method was originally designed to ask respondents questions about as many as two measures installed through the same program. Because ODC will be asking respondents to respond to questions regarding a maximum of three measures installed through as many as three different WMECo programs, we have revised the sequence of questions used to confirm that we are speaking to the appropriate decision maker for each measure. The original survey instrument is designed to identify the decision maker for each measure prior to completing the series of free-ridership and spillover questions for the first measure. Based on our experience fielding this survey instrument, and to accommodate situations where a participating facility may have installed multiple measures through different programs, we have revised the survey design to identify the decision maker for the first measure and complete all pertinent questions relevant to that measure prior to identifying the decision maker for the second and third measures. The survey instrument includes skip patterns designed to obtain contact information or responses to the series of free-ridership and spillover questions for each measure installed at each sampled facility.
3. **Technical Assessment questions revised (AP, AP1)** – We have modified the survey to account for the lack of information in program databases that identifies customers that conducted Technical Assessments (TA) or specifies TA incentive amounts. The revised survey instrument includes a question that asks respondents if they conducted a TA. Respondents answering "yes" are asked if they would have paid the full amount for the TA if the utility had not offered an incentive (assumed to be 50% of the total TA cost).
4. **Free ridership questions revised (ATXT3) –** We have modified the wording of free ridership questions to account for the fact that data regarding the total cost of the installed measures (Customer Cost + Utility Incentive) is not consistently available for all customers and all programs.
5. **Additional questions –** ODC has included a short series of general satisfaction questions (QPS1-PS4). These questions are optional and were included as an example of the supplemental questions included in the survey instruments approved by other sponsors.

The survey instrument fielded with WMECo customers is presented below.

VARIABLE LIST

<CONTN> = Customer Contact Name
<COMP> = Sponsor
<PROGRAM> = Program Name
<YEAR> = Program Year
<SNAME> = Customer/Facility Name
<ADD> = Service address where equipment was installed
<MEAS1> = End-use Category (i.e. lighting)
<DESC1> = Detailed Measure Description
<COST1> = Utility incentive for Measure 1

START

IF NO NAME-ASK FOR EQUIPMENT INSTALLATION DECISION MAKER

Hello, my name is __, and I'm calling on behalf of <COMP >. May I speak with <CONTN >? Are you the person at your firm/facility who was most involved in making the decision to install equipment through the <PROG > program in 2004?

ALTERNATE PHONE: <PHONE2 >

(1/2326)

Yes	01	=> QI2
No	02	=> QI1A
(Don't know/Refused)	99	

INT18

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2328)

Would not disclose decision maker	18	D	=> END

I1a. Who at your company/facility did make the decision to install this equipment through the program?

TYPE '01' AND HIT ENTER TO TYPE IN CONTACT INFORMATION. 98= DON'T KNOW 99=REFUSED

ENTER HERE: @QI1A

NAME: @NM1

TITLE: @TT1

TELEPHONE NUMBER: @PH1

QI1A

CUSTOM SCREEN

(1/2330)

enter contact information	01
(Don't know)	98
(Refused)	99

INT19

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2442)

Not the decision maker	19	D	=> END

QI2

I2. Do you work directly for <SNAME > or are you a contractor who provides design and/or installation services for <SNAME >?

(1/2444)

Work directly for company/Employee	1	=> TXT1
Vendor/Contractor	2	=> VTXT1
(Don't know)	3	

INT20

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2445)

Don't know ..... 20 D => END

I'm with Opinion Dynamics, an independent research firm. On behalf of <COMP>, we are following up with customers who participated in its <PROG > program to learn about their experiences. You or someone at your facility may have received a letter letting you know about this call. I'm not selling you anything, I'd just like to ask about the equipment you installed at <ADD >.
Your responses will be confidential, and this should take about 15 minutes.

@txt1
PRESS 'ENTER' TWICE TO CONTINUE

TXT1

PRESS ENTER TWICE TO CONTINUE

SCREEN

(1/2447)

CONTINUE..... 1 D

TXT2

PRESS ENTER TWICE TO CONTINUE

I'd like to review the equipment you installed through the <PROG > program.

(1/2448)

CONTINUE..... 1 D

AR1

R1. Do you recall installing <MEAS1 > equipment through the <PROG > program in 2004?

(1/2449)

Yes..... 1 => A1
No 2
(This equipment was never installed) ..... 3 => ASK4
(Don't know/Refused)..... 4

R1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your facility that would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

ASK4

=> BR1 else => QPS1 if CNT2=1

skips those whose equipment was never installed for first measure to second measure, or to QPS1 if there isn't a second measure.

(1/2562)

A1

1. Were you involved in the decision-making process at the design stage when the <MEAS1 > equipment was specified and agreed upon for this facility?

(1/2563)

Yes	1	=> A2
No	2	
(Don't know)	3	

A1A

1a. At what point in the process did you become involved?

(1/2564 -2566 -2568)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A1B

1b. What was your role?

(1/2570 -2572 -2574)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A2

READ LIST, RECORD ALL THAT APPLY

2. Some companies/facilities work with an outside professional as part of the project design phase. Which individuals were responsible for recommending or specifying the exact type of high efficiency <MEAS1 > equipment to install through the <PROG > program?

(1/2576 -2577 -2578 -2579 -2580 -2581)

Someone within my firm	1
Design professional	2
Contractor	3
Manufacturer's representative	4
Utility account manager	5
Someone else	6
(Don't know)	7
(Refused)	8

A3

=> +1 if A2=1

3. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did this person have on your company's/facility's decision to install high efficiency equipment so that it would qualify for the program?

(1/2582)

-1- No influence at all	1	=> AP
-2-	2	=> AP
-3-	3	=> AP
-4-	4	
-5- A very strong influence	5	
Don't know	6	=> AP

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?
01=YES 02=NO/REFUSED 03=NO OUTSIDE ADVISOR INVOLVED 98=DK
ENTER HERE: @A4

NAME: @ANM3
TITLE: @ATT3
COMPANY: @ACP3
ADDRESS: @AADD3

PHONE NUMBER: @APH3

A4

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?

(1/2583)

Yes Record contact information)	01		
No, refused to give this information	02		=> AP
No, no outside advisor involved	03		=> AP
(Don't know)	98	X	=> AP

AP

P. Did your facility conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

(1/2825)

Yes	1	
No	2	=> AP2
(Not sure)	3	=> AP2

AP1

=> +1 if AP=2,3

P1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at your facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If <COMP > had not paid a portion of the cost, would your company/facility have paid about the entire amount to have a similar Technical Assessment Study done within one year of when the study took place?

(1/2826)

Yes	1
No	2
(Don't know)	3

AP2

DO NOT READ LIST. PLEASE CHOOSE ALL THAT APPLY.

P2. What factors motivated your firm/facility to install this <MEAS1 > equipment through the <PROG > program in 2004?

(1/2827 -2829 -2831 -2833 -2835 -2837 -2839 -2841 -2843)

(To reduce maintenance costs)	01	
(To reduce initial purchase costs)	02	
(The program incentive)	03	
(The technical assistance offered)	04	
(To reduce energy bills/save money)	05	
(To improve efficiency/save energy)	06	
(Took the advice of my installer/designer/contractor/utility rep)	07	
(Because of my past program participation)	08	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

AP3

P3. Did your firm/facility have specific plans set aside to install any of this equipment before you talked with anyone about the program?

(1/2845)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
(Don't know)	4	=> ATXT3
(Refused)	5	=> ATXT3

AP4

P4. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of equipment for the <MEAS1 > equipment in order to qualify for the <PROG > program?

(1/2846)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
Don't know	4	=> ATXT3
Refused	5	=> ATXT3

P4A. What changes were necessary? (Choose as many as apply)
(PROBE FOR TIMING, QUANTITY AND EFFICIENCY - SEE BELOW)

01 = Installation occurred SOONER than planned
02 = Installation occurred LATER than planned
03 = Installed MORE equipment than was planned
04 = Installed LESS equipment than was planned
05 = Equipment was MORE efficient than planned
06 = Equipment was LESS efficient than planned
00 = Other changes/comments (open text window)
98 = Don't know
99 = Refused

ENTER HERE:@AP4A

AP4A

P4A. What changes were necessary? (CUSTOM SCREEN)

(1/2847 -2849 -2851 -2853 -2855 -2857 -2859)

(Installation occurred SOONER than planned)	01	
(Installation occurred LATER than planned)	02	
(Installed MORE equipment than planned)	03	
(Installed LESS equipment than planned)	04	
(Equipment was MORE efficient than planned)	05	
(Equipment was LESS efficient than planned)	06	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

ATXT3

=> +1 if COST1==0

PRESS ENTER TWICE TO CONTINUE

According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. You may have also received some technical assistance from a <COMP > rep, engineer, or equipment vendor; if you did, the program also may have contributed toward the cost of a study.

(1/2861)

CONTINUE	1	D

AF1

F1. If <COMP > had not paid a portion of the equipment cost OR provided any technical assistance or education through the <PROG > program, would your company/facility have purchased any <MEAS1 > equipment within one year of when it was installed?

(1/2862)

Yes	1	
No	2	=> AF8
Don't know	3	=> AF8

AF2

F2. Without the program incentive, technical assistance, or education, would your company/facility have purchased the EXACT SAME QUANTITY of <MEAS1 > equipment within one year?

(1/2863)

Yes ..... 1 => AF3
No 2
Don't know 3

AF2A

ENTER PERCENTAGE 0-100%, 998=DK/REF

F2a. What percent of this <MEAS1 > equipment do you think your company/facility would have purchased on its own within one year? (PROBE: Would you have purchased about one- fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

(1/2864)

$E 0 100
(DK/REF) 998

AF3

ENTER PERCENTAGE 0-100%, 998=DK/REF

F3. You said your company/facility would have installed at least some <MEAS1 > equipment on its own if the program had not been available. What percent of this equipment would have been of the same efficiency or higher efficiency as what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

(1/2867)

$E 0 100
(DK/REF) 998

AF4

=> +1 if AF2=2,3 OR (AF3<100 OR AF3=998)

F4. Now I want to focus on what it would have cost your company/facility to install this equipment on its own without the program. Do you think your company/facility would have paid the additional cost that the utility paid on top of the amount you already paid, to install the same quantity and efficiency of <MEAS1 > equipment within one year?

(1/2870)

Yes ..... 1 => AF8
No 2
Don't know 3

AF5

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998)

SELECT ALL THAT APPLY

F5. How would you have adjusted your purchase to accommodate the fact that you wouldn't have paid all of the costs? Would you have purchased less equipment, lower efficiency equipment, or done something else?

(1/2871 -2873 -2875)

Purchased less equipment 01
Purchased lower efficiency of equipment 02
(Done something else, specify) ..... 00 O
(Don't know) ..... 98 X

AF6

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

ENTER PERCENTAGE 0-100%, 998=DK/REF

F6. What percent of the <MEAS1 > equipment do you think your company/facility 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?)

(1/2877)

$E 0 100
(Don't know/Refused) 998

AF7

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

F7. What percent of the <MEAS1 > equipment that your company/facility would have purchased on its own would have been of a lower efficiency than what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)

(1/2880)

$E 0 100
(Don't know/Refused) 998

AF8

=> +1 if	(AF1=1 AND AF4=2,3) AND (AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98)

F8. Was the information or advice you received from a contractor, design team, utility rep, or an engineer a crucial factor in your decision to install this high efficiency equipment through the program at the time you did?

(1/2883)

No information received 1
Yes 2
No 3
(Don't know) 4

COMF9

=> * if	IF((AF1=2,3 AND (AP4=3 OR AF8=2)),1,0)

computes for qf9

(1/2884)

get qf9 1
do not get qf9 0

CO2F9

=> * if	IF((AF2=1 AND (AF3<100 OR AF3=998) AND AF4=1),1,0)

(1/2885)

get qf9 1
do not get qf9 0

AF9

=> AF10 if	COMF9=0 AND CO2F9=0

PRESS 'ENTER' TO OPEN TEXT WINDOW

F9. I'd like to better understand your purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on your decision to install the energy efficient <MEAS1 > equipment at the time you did?

(1/2886 -2888 -2890)

Open text window ..... 00 DO
(Don't know) ..... 98 X
(Refused) ..... 99 X

AF10

F10. Did your company/facility participate in any of <COMP >'s energy efficiency programs before you installed energy efficient equipment in 2004?

(1/2892)

Yes 1
No ..... 2 => AS1
(Don't know) ..... 3 => AS1

ASK3

=> AS1 else => +1 if	CNT2=1 OR CNT3=1

(1/2893)

AF11

PRESS ENTER TWICE TO CONTINUE

F11. 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/facility. There are no right or wrong answers; we just want your honest opinion.

(1/2894)

CONTINUE ..... 1 D

AF11A

REPEAT IF NECESSARY

F11a. The energy savings performance of equipment installed through the <PROG > program in earlier years was a primary reason why we decided to install energy efficient <MEAS1 > through the program in 2004. Do you agree or disagree with this statement?

(1/2895)

Disagree 1
Agree 2
(Don't know) 3

AF11B

REPEAT IF NECESSARY

F11b. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > program, and what we learned by participating in the program we asked our contractor to look into energy efficient options for <MEAS1 > when developing project plans in 2004.

Do you agree or disagree with this statement?

(1/2896)

Disagree 1
Agree 2
(Don't know) 3

AF11C

REPEAT IF NECESSARY

F11c. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > Program and what we learned by participating in the program we took into account the cost-effectiveness of energy efficient <MEAS1 > equipment when evaluating different options in 2004. Do you agree or disagree with this statement?

(1/2897)

Disagree 1
Agree 2
(Don't know) 3

AS1

S1. Now I'd like you to think of the time since you participated in the <PROG > program in 2004. Has your company purchased and installed any <MEAS1 > equipment on its own for this or other facilities served by <COMP >?

(1/2898)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

AS1A

S1a. Was this equipment of THE SAME EFFICIENCY LEVEL OR A HIGHER LEVEL OF EFFICIENCY as the equipment you installed through the program?

(1/2899)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

S2. About how much energy efficient <MEAS1 > equipment did your company/facility purchase on its own since participating in this program in 2004?

(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 amount as you installed through the program, twice as much as what you installed through the program or some other amount?

@AS2
ENTER NUMBER, USE 998 FOR DON'T KNOW/REFUSED

AS2

SCREEN

(1/2900)

$E 0 100
(Don't know/Refused) 998

AS3A

S3a. Did a recommendation by the contractor or designer who you worked with under the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2903)

Yes 1
No 2
(Don't know) 3

AS3B

S3b. Did your experience with the energy efficient equipment installed through the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2904)

Yes 1
No 2
(Don't know) 3

AS3C

S3c. Did your participation in any past program offered by another company influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2905)

Yes 1
No 2
(Don't know) 3

AS4

S4. Why didn't you purchase this <MEAS1 > equipment through an <COMP > program?

(1/2906 -2908 -2910 -2912 -2914 -2916 -2918 -2920 -2922 -2924 -2926 -2928)

(Too much paperwork)	01	
(Cost savings not worth the effort of applying)	02	
(Takes too long for approval)	03	
(The equipment would not qualify)	04	
(Vendor does not participate in program)	05	
(Outside other company's service territory)	06	
(No time - needed equipment immediately)	07	
(Thought the program ended)	08	
(Didn't know the equipment qualified under another program)	09	
(Just didn't think of it)	10	
(Unable to get rebate--unsure why	11	
(Other - specify)	00	O
(Don't know)	13	

AS4A

=> +1 if AS4 NOT=04

S4a. Why wouldn't the equipment qualify?

(1/2930 -2932 -2934)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

SKIP1

=> QPS1 else => +1 if CNT2=0

SKIPS TO QPS1 IF NO SECOND MEASURE

(1/2936)

[REPEATS QUESTIONS BEGINNING FROM AR1 FOR SECOND MEASURE – IF NO OTHER MEASURES ASKS OPTIONAL GENERAL SATISFACTION QUESTIONS PS1 – PS4]

VTXT1

I'm with Opinion Dynamics, an independent research firm. We have been hired to talk with some of the design professionals and contractors who were involved with the <PROGRAM> in <YEAR>. I'm not selling anything; I'd just like to ask you about the types of equipment that have been recommended, sold, or installed by your firm through this program in <YEAR>.

I'd also like to assure you that your responses will be kept confidential by <COMP> and that this should take less than 15 minutes.

For the next set of questions, I'd like to review the equipment you recommended or specified through the <PROGRAM> for <COMP>.

VR1. Do you recall recommending or specifying <MEAS1> for <SNAME> at <ADD> through the <PROGRAM> in <YEAR>?

1 Yes => VA1
2 No
3 This equipment was never installed [IF CNT2=0 SKIP TO PS1, REPEAT FOR MEAS2]
-8 DON'T KNOW

VR1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your firm who would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

INT 22

I'm sorry, we cannot include you in our study. Thank you for your time!

Don't Know =>END

VA1. First I'd like to ask you about your decisions to recommend/specify <MEAS1> through the <PROGRAM>. Were you involved in the decision-making process at the design stage when the <MEAS1> equipment was specified and agreed upon for this facility?

1. Yes [SKIP TO VA2]
2. No
3. (Don't know)

1a. At what point in the process did you become involved?
(Open end)
(Don't know)
(Refused)

1b. What was your role?
(Open end)
(Don't know)
(Refused)

VA2. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of <MEAS1> so that it would qualify for the program? _____
(NOTE: IF Q3 < 4 AND NO OTHER MEASURE, SKIP TO NON-PARTICIPANT SPILLOVER; ELSE SKIP TO P1)

The next set of questions ask about what you think your company would have recommended or specified for <COMP> if the utility had not offered the <PROGRAM> in <YEAR>.

VAP. To your knowledge, did <SNAME> conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

Yes..... 1
No ..... 2 => VAP2
(Not sure) 3 => AP2

VAP1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at <SNAME>'s facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If the utility had not paid a portion of the cost, do you think <S_NAME> would have paid about the full amount to have a similar Technical Assessment Study done within one year of when the study took place?
1. Yes
2. No
3. Don't know

VAP2. As far as you know, did <S_NAME> have specific plans set aside to install any of this equipment before you talked with anyone about the program?
1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. (DK) [SKIP TO VATXT3]
5. (Refused) [SKIP TO VATXT3]

AP3. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of the <MEAS1> equipment in order to qualify for the <PROGRAM>?
1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. Don't know [SKIP TO VATXT3]
5. Refused [SKIP TO VATXT3]

AP3A. What changes were necessary?
(Installation occurred SOONER than planned)

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

VATXT3
According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. <S_NAME> may have also received some technical assistance from an <COMP> representative or a contribution toward the cost of a technical assessment study.

VF1 Would your company have recommended or specified any <MEAS1> to <S_NAME> within one year of when it was installed if they had not been able to receive this utility [contribution/incentive/rebate] or any technical assistance or education through the [program]?

1 Yes
2 No *(SKIP TO VF8)*
-8 DON'T KNOW *(SKIP TO VF8)*

VF2 Without the program [contribution/incentive/rebate], technical assistance or education, would your company have recommended or specified the exact same quantity of <MEAS1> for <S_NAME> within one year?

1 Yes *(SKIP TO VF3)*
2 No
-8 DON'T KNOW

VF2b What percent of this <MEAS1> do you think your company would have recommended/specified? (*PROBE:* Would you have recommended/specified about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

_____%
-8 DON'T KNOW

VF3 You said you would have recommended/specified at least some <MEAS1> for <S_NAME> if the program had not been available. What percent of this equipment that you would have recommended/specified would have been of the same efficiency or higher efficiency as what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

_____% *(IF RESPONSE NE 100% OR F2 NE 1 SKIP TO F10)*
-8 DON'T KNOW

(NOTE: IF VF1=1 AND VF2=1 AND VF3=100%, ASK VF4-VF7)

VF4 Now I want to focus on what it would have cost <S_NAME> to install this equipment on its own without the program. Do you think <S_NAME> would have paid the additional <COST1>, on top of the amount they already paid, to install the same quantity and efficiency of <MEAS1> within one year?

1 Yes *(SKIP TO VF8)*
2 No
-8 DON'T KNOW

VF5 How do you think <S_NAME> would have adjusted their purchase to accommodate the fact that they wouldn't have paid all of the costs? Would they have purchased less equipment, lower efficiency equipment, or done something else? *(INDICATE ALL THAT APPLY—ASK BOTH VF7 AND VF8 IF APPROPRIATE)*

1 Purchased less equipment *(ASK VF6)*
2 Purchased lower efficiency of equipment *(ASK VF7)*
3 Done something else *(SPECIFY AND SKIP TO VF10)*
8 Don't Know

VF6 What percent of the <MEAS1> do you think <S_NAME> would have purchased on its own at that same time? (*PROBE:* Would they have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what they installed through the program?)
_____% *(IF F5=2, SKIP TO VF7; ELSE SKIP TO VF10)*
-8 DON'T KNOW

VF7 What percent of the <MEAS1> that <S_NAME> would have purchased on its own would have been of a lower efficiency than what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)
_____% *(SKIP TO VF10)*
-8 DON'T KNOW *(SKIP TO VF10)*

(NOTE: ASK VF8 IF (VF1=2 OR VF1=-8) OR IF (VF1=1 AND VF2=1 AND VF3=100% AND VF4=1); ELSE SKIP TO VF10)

VF8 Was the technical assistance or advice you or another designer/vendor provided to <S_NAME> a crucial factor in their decision to install this high efficiency equipment through the program at the time they did?
0 NA, none received
1 Yes
2 No
-8 DON'T KNOW

(NOTE: ASK VF9 IF ((VF1=2 OR VF1=-8) AND (VP4=3 OR VF8=2)) OR IF ((VF1=1 AND VF2=1 AND VF3=100% AND VF4=1) AND (VP4=1 OR VP4=2 OR VF8=1)); ELSE SKIP TO VF10)

VF9 I'd like to better understand <S_NAME>'s purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on the installation of energy efficient <MEAS1>? *(RECORD VERBATIM THE CLARIFICATION—PROBE AS NEEDED TO UNDERSTAND REASON)*

VF10 On a scale of 1 to 5, with 1 being 'not at all important and 5 being 'very important', how important was your previous experience with a <COMP> program when making the decision to recommend or install <MEAS1>for this customer?

_____
-8 DON'T KNOW
-9 NA – No previous program experience

[ASK VNP1 FOR EVERY MEASURE GROUP IN PROGRAM BEFORE ASKING VNP2-VNP8.]

PS1. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your satisfaction with <COMP>'s <PROGRAM>.

1. Not at all satisfied [SKIP TO PS2B]
2. 2 [SKIP TO PS2B]
3. 3 [SKIP TO PS2B]
4. 4
5. Extremely satisfied
6. (DK) [SKIP TO PS2B]

GO TO PS2B if QPS1=1,2,3
PS2a. Why are you satisfied with the program?
Open text window
(Don't know)
(Refused)

GO TO PS3 if QPS1=4,5
PS2b. Why are you NOT satisfied with the program?
Open text window
(Don't know)
(Refused)

PS3. Do you have any other comments or suggestions for the program?
Open text window
(Don't know)
(Refused)

PS4. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your overall satisfaction with <COMP>.

1. Not at all satisfied
2. 2
3. 3
4. 4
5. Extremely satisfied
6. (DK)

END

That is all the questions I have for you. Thank you for your participation.

7.8 PARTICIPANT SATISFACTION

Respondents were asked to rate their satisfaction with the program and the company on a 5-point scale where 1 is *not at all satisfied* and 5 is *extremely satisfied*. These were supplemental questions not related to the calculation of free-ridership and spillover and in the interest of minimizing respondent fatigue, we only asked the supplemental questions once. As such if a respondent participated in multiple programs they were only asked the questions regarding one program. Respondents who were design or installation contractors for the customer were not asked these questions.

Table 7.4 Program Satisfaction
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
Custom Services (n=26)	100%
Energy Conscious Construction (n=6)	100%
Express Services (n=12)	75%
Municipal (n=6)	83%
RFP (n=1)	100%
Small Business Energy Advantage (n=34)	82%

Nearly 9 out of 10 (87%) customers (n=120) rated their overall satisfaction of WMECO a 4 or 5. Table 7.5 shows how respondents in each program rated their satisfaction of WMECO.

Table 7.5 Satisfaction with WMECO
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
Custom Services (n=32)	100%
Energy Conscious Construction (n=12)	92%
Express Services (n=15)	93%
Municipal (n=8)	63%
RFP (n=4)	100%
Small Business Energy Advantage (n=49)	78%

7.9 SURVEY DISPOSITION

The tables below present the final disposition of the survey used for the participant survey effort by program and measure group. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups. In practice, an attempted census of all participants was required to achieve the established survey quotas for most program measure groups.

The tables below present the survey disposition by quota group developed per the original sampling plan. Survey quota groups were developed for each program measure group combination. Per the sampling plan, the quota group for each program measure group combination represented either a census attempt of all participants or a stratified random sample of participants, depending on the number of participants. To meet the precision requirements, it was deemed most important to ask respondents about measures for which the sample plan called for a census attempt first. As such, for each program, customers that installed a measure for which the sample plan called for an attempted census were assigned to the quota group for that program measure group. Data for that customer regarding the installation of other measures within the program, and participation in other programs, were aggregated such that our interviewers could gather as much data as possible in a single interview with the customer. In the tables below, the "Surveyed Measures" row reflects the number of unique *measure groups* about which respondents could be surveyed based on program tracking data. As customers may have installed more than one type of measure through a given program, the number of "Surveyed Measures" for each program measure group combination does not equate to the number of unique decision makers associated with that program measure group, but the total number of measure groups associated with those decision-makers.

A description of the counts presented in other rows of the disposition tables are presented below:

- Measure not Installed: The number of respondents indicating in their response to survey question R3 that the measure in question was not installed.
- No Knowledgeable Respondent: The number of respondents indicating that they were not familiar with the equipment in question and could not provide an alternate knowledgeable contact person for that measure.
- Unresponsive: The number of potential respondents who did not refuse to participate but did not respond to voicemail requests to participate, were not available for scheduled interviews, repeatedly asked that we call back another time, or otherwise could not make time available to complete the survey during the study period.
- Completed Surveys: The number of completed surveys in the specified program measure group.

Table 7.6 Survey Disposition – Custom Services Program

Custom Services	Lighting	HVAC	Other	Process
Surveyed Measures	**19**	**6**	**8**	**20**
Not Called	0	0	0	0
No Working Number	0	1	1	1
Measure Not Installed	2	0	0	0
No Knowledgeable Respondent	7	2	1	0
Adjusted Sample	**10**	**3**	**6**	**19**
Refusal/Mid Terminate	1	0	2	2
Language Barrier	0	0	0	0
Unresponsive	1	0	0	4
Completed Surveys	**8**	**3**	**5**	**13**
Completed Surveys as a Percentage of Adjusted Sample	**80%**	**100%**	**83%**	**68%**

Table 7.7 Survey Disposition – Energy Conscious Construction Program

Energy Conscious Construction	Lighting	Motor	Refrigeration	HVAC
Surveyed Measures	**15**	**2**	**1**	**6**
Not Called	0	0	0	0
No Working Number	3	0	0	1
Measure Not Installed	1	0	0	1
No Knowledgeable Respondent	2	1	0	0
Adjusted Sample	**9**	**1**	**1**	**4**
Refusal/Mid Terminate	2	1	0	0
Language Barrier	0	0	0	0
Unresponsive	1	0	0	2
Completed Surveys	**6**	**0**	**1**	**2**
Completed Surveys as a Percentage of Adjusted Sample	**67%**	**0%**	**100%**	**50%**

Table 7.8 Survey Disposition – Express Services Program

Express Services	Lighting	Motor	HVAC
Surveyed Measures	**11**	**20**	**17**
Not Called	0	0	0
No Working Number	1	2	6
Measure Not Installed	0	1	1
No Knowledgeable Respondent	1	3	5
Adjusted Sample	**9**	**14**	**5**
Refusal/Mid Terminate	1	3	1
Language Barrier	0	0	0
Unresponsive	3	6	1
Completed Surveys	**5**	**5**	**3**
Completed Surveys as a Percentage of Adjusted Sample	**56%**	**36%**	**60%**

Table 7.9 Survey Disposition – Municipal Program

Municipal	Lighting	Other
Surveyed Measures	**17**	**4**
Not Called	0	0
No Working Number	0	0
Measure Not Installed	0	0
No Knowledgeable Respondent	3	1
Adjusted Sample	**14**	**3**
Refusal/Mid Terminate	1	0
Language Barrier	0	0
Unresponsive	10	0
Completed Surveys	**3**	**3**
Completed Surveys as a Percentage of Adjusted Sample	**21%**	**100%**

Table 7.10 Survey Disposition – RFP Program

RFP	Lighting	Other
Surveyed Measures	**6**	**1**
Not Called	0	0
No Working Number	1	0
Measure Not Installed	0	0
No Knowledgeable Respondent	1	0
Adjusted Sample	**4**	**1**
Refusal/Mid Terminate	0	0
Language Barrier	0	0
Unresponsive	1	0
Completed Surveys	**3**	**1**
Completed Surveys as a Percentage of Adjusted Sample	**75%**	**100%**

Table 7.11 Survey Disposition – Small Business Energy Advantage Program

Small Business Energy Advantage	Lighting	Refrigeration	HVAC
Surveyed Measures	**107**	**20**	**4**
Not Called	0	0	0
No Working Number	18	4	0
Measure Not Installed	0	1	0
No Knowledgeable Respondent	9	0	0
Adjusted Sample	**80**	**15**	**4**
Refusal/Mid Terminate	23	5	2
Language Barrier	4	1	1
Unresponsive	9	4	1
Completed Surveys	**44**	**5**	**0**
Completed Surveys as a Percentage of Adjusted Sample	**55%**	**33%**	**0%**

Table 7.12 Survey Disposition: NGRID Vendor Survey

	MA	NH	RI
Starting sample	**118**	**4**	**46**
Not called	0	0	0
No working number	13	3	4
Does not do work in state	1	0	1
Adjusted sample	**104**	**1**	**41**
Refusal	12	0	4
Language barrier	1	0	0
Unresponsive	64	0	29
Completed survey	**27**	**1**	**8**
Response Rate	**26%**	**100%**	**20%**

8. SUMMARY OF FINDINGS FOR CAPE LIGHT COMPACT

8.1 EXECUTIVE SUMMARY

Sections 8.1 through 8.6 of this chapter constitute the Executive Summary for this study and is consistent with the Executive Summaries provided by Massachusetts utilities for their 2004 Energy Efficiency Annual Report filing. In order to be consistent with the material provided for the filings, the wording in these sections has not been modified, except in the case of section and table numbering for consistency and to differentiate the tables across chapters.

This report summarizes the findings from the 2004 Commercial and Industrial Free-ridership and Spillover Study for each of Cape Light Compact's (CLC) commercial and industrial (C&I) programs. The purpose of this study was to assess program free-ridership, participant spillover and non-participant spillover for CLC's C&I Products and Services, C&I New Construction, Small C&I Retrofit, Government Products and Services, Government New Construction, Medium and Large C&I Retrofit, Medium and Large Government Retrofit, and Small Government Retrofit and the C&I programs of the other sponsors.

This joint sponsor study was conducted for six New England sponsors including CLC. Other sponsors include Unitil (Fitchburg Gas & Electric), National Grid, Western Massachusetts Electric Company (WMECo), Connecticut Light & Power (CL&P), and United Illuminating.

8.2 STUDY OBJECTIVES

The primary objective of the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study was to assist the sponsors in quantifying the net-to-gross energy and demand savings ratio of their commercial and industrial programs based upon surveys with 2004 program participants and their associated vendors and design professionals. Megdal & Associates along with Opinion Dynamics Corporation (ODC) was hired to adapt and utilize the *Standardized Methods for Free Ridership and Spillover Evaluation* (referred to as the Standardized Method) as developed by PA Consulting under contract to the Massachusetts energy efficiency program sponsors as finalized on June 16, 2003. This provided a common consistent method across Massachusetts for the estimation of a net-to-gross ratio based upon estimating the extent of:

- **Program free-ridership (FR)** - The percentage of program participants (proportion of expected savings) deemed to be free-rider where a free-rider refers to a customer who received an incentive through an energy efficiency program who would have installed the same or smaller quantity of the same high efficiency measure on their own within one year 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 equipment purchase decision.
- **Participant "like" spillover (PS)** - Refers to the situation where a customer installed equipment through the program in the past year and then installed additional equipment of the same type due to program influences.
- **Non-participant "like" spillover (NPS)** - Refers to energy efficient measures installed by program non-participants due to the program's influence.

8.3 STUDY METHDOLOGY FOR PROGRAM NET IMPACT RATIOS

The Standardized Method is based upon conducting telephone surveys with program participants to derive participant free-ridership and participant "like" spillover estimates. In cases where program participants indicate that a design professional or equipment vendor was the primary decision maker for the project, surveys are conducted with the design professional or equipment vendor to produce these estimates. To estimate non-participant "like" spillover attributable to 2004 program activities, the Standardized Method employs interviews with participating design professionals and equipment vendors. We conducted the participant and design professional surveys used to estimate free-ridership and spillover attributable to the sponsors' programs between May and August of 2005.

This study was designed to obtain estimates for these net impact elements at the program and measure group level based on the application of the Standardized Method. For CLC the programs examined in the study were the C&I Products and Services, C&I New Construction, Small C&I Retrofit, Government Products and Services, Government New Construction, Medium and Large C&I Retrofit, Medium and Large Government Retrofit, and Small Government Retrofit programs. The measure groups examined within these programs are listed in Table 8.1 below.

CLC provided the 2004 program databases containing all relevant program participation data for each application received for each program in 2004. These data were prepared for sample development by first aggregating applications by utility account number to determine the unique number of program participants (account numbers) for each program and measure group.[27]

For commercial and industrial customers there can be multiple account numbers at a single address or physical location. As CLC's tracking database associates program applications and installed measures to specific account numbers, there can be cases where a single contact person may be the decision-maker for measures associated with multiple account numbers. At the same time, there can be one decision-maker for multiple sites such as for chain stores, multi-site industrial firms, school districts, etc. The participant survey is conducted with the primary decision-maker responsible for selecting the equipment installed through the program. The survey is designed to ascertain how they made their decisions to install the high efficiency equipment and the effect of the program on those decisions. To ensure that we obtained all of the information regarding all measures installed through the programs from each decision-maker interviewed and that none were contacted for surveying more than once, we conducted additional database efforts. This work included additional programming and manual data processing where necessary to identify likely cases where a single contact person was the primary decision-maker for program participation and measures installed across multiple sites or account numbers.

Where available, we used the customer contact name from the application as the first and most definitive means to identify multi-site decision-makers. Within a program and measure

[27] Unique Participants as presented in Table 8.1 refers to the unique number of utility account numbers which could represent multiple applications for the same measure group in the same program.

group we grouped applications with the same or different account numbers and/or facility addresses having the same contact name. When administering the survey we asked participants to respond to questions regarding as many as three measures installed across all CLC programs for which they were the primary decision-maker. We never combined two sites that had different contact names, including cases where the participants were obviously part of a chain.

If there was no contact name in the database, then additional exams were made to identify potential multiple site decision-makers. The second exam was based on participant facility names that were identical across multiple locations or schools within a single town. The third was based upon facility addresses that were identical across multiple account numbers and those with different suite numbers but appeared to be managed by one of the suite firms.[28] The application of these grouping schemes to the program tracking data provided a list of unique program, measure group, and decision maker or physical location combinations for purposes of survey administration. This starting sample count is presented by program and measure group in Table 8.1 below.

The number of completed surveys presented in Table 8.1 represents the unique number of program, measure group, and decision maker or physical location combinations for which survey responses were gathered.[29] Note that one completed interview could account for more than one unique combination of program, measure group, and location.

Table 8.1 below presents the total number of unique participants, the starting sample, the number of completed surveys and associated kWh savings by CLC program and measure group.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover attributable to CLC's C&I programs in July and August of 2005. All sampled customers were mailed a letter on utility letterhead in advance of the telephone call. This letter explained the purpose of the call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Conducting surveys during the summer months, however, may have increased the difficulties in obtaining completed surveys. Prior studies based on the Standardized Method have had these surveys conducted in the spring; a much better time to obtain responses given potential vacation schedules and associated staffing issues. Fielding surveys in the spring also allows the interviews to occur somewhat closer to when the decision had been made. By fielding a

[28] In cases where applications were combined based on facility name or address we verified that the contact was the primary decision-maker for program participation and measures installed for each of the grouped applications.

[29] Note that the number and percentage of completed surveys does not equate to a survey response rate. Response rate is calculated as the number of completed surveys divided by the adjusted starting sample where the adjusted started sample is equal to the starting sample less any invalid sample points (no working number, language barrier, no installed measures, no valid decision maker available). A complete survey disposition report is provided in the appendices to the full report.

survey in the spring to gather information regarding program participation that occurred the prior calendar year implies that the equipment decisions were made between 4 and 16 months prior, depending on when participation occurred. Fielding the survey in mid-summer extended this period to between 8 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten.

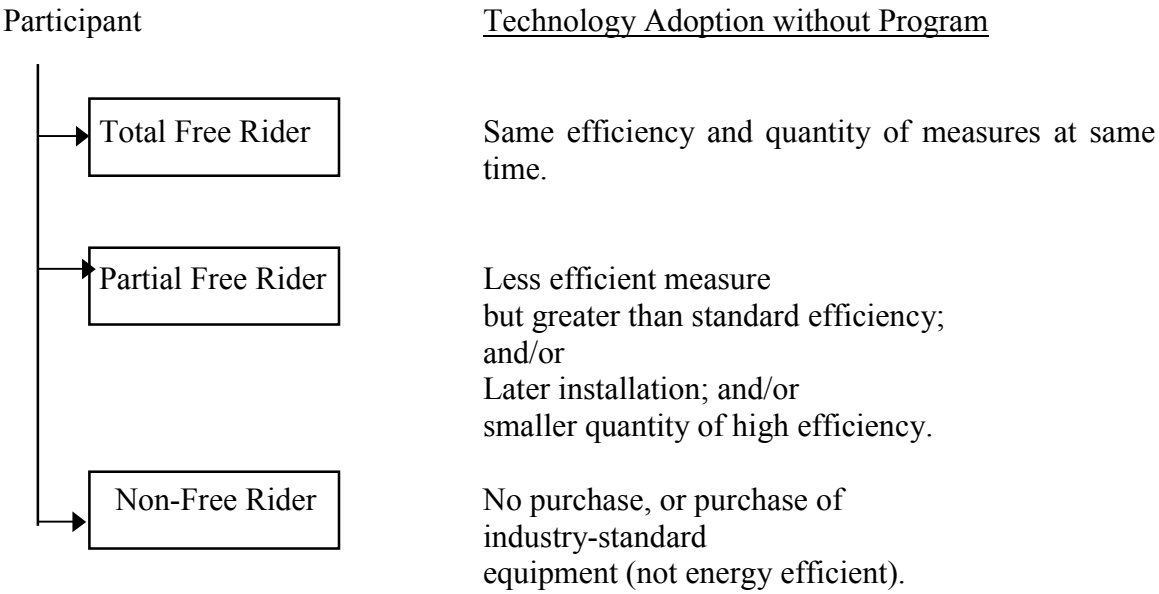
Table 8.1 CLC Unique Participants, Surveys Completed, Program and Sample kWh, and Sample Weights (where applicable)

Program	Measure Group	Strata/ Attempted Census	Unique Participants	Starting Sample	Total kWh	Completed Surveys	Surveyed kWh	% Surveyed	% kWh Surveyed
C&I Products and Services	Lighting	Attempted Census	0	0	0	0	0	NA	0.0%
	HVAC	Attempted Census	13	11	43,424	3	6,112	27.3%	14.1%
	Motor	Attempted Census	3	3	6,407	0	0	0.0%	0.0%
C&I New Construction	Lighting	Attempted Census	2	0	54,398	0	0	0.0%	0.0%
	VSD	Attempted Census	1	0	49,328	0	0	0.0%	0.0%
Small C&I Retrofit	Lighting	Attempted Census	121	89	2,395,495	56	1,873,706	62.9%	78.2%
	Custom/Tech	Attempted Census	1	0	80,719	0	0	0.0%	0.0%
	HVAC	Attempted Census	44	44	690,157	14	257,017	31.8%	37.2%
	VSD	Attempted Census	1	1	40,510	1	40,510	100.0%	100.0%
Government New Construction	Lighting	Attempted Census	3	2	49,295	0	0	0.0%	0.0%
Government Products and Services	HVAC	Attempted Census	2	0	4,311	0	0	0.0%	0.0%
	Motors	Attempted Census	6	2	14,163	1	602	50.0%	4.3%
Medium and Large C&I Retrofit	Lighting	Attempted Census	2	2	551,977	1	3,241	50.0%	0.6%
	Custom	Attempted Census	3	3	68,404	2	58,866	66.7%	86.1%
Medium and Large Government Retrofit	HVAC	Attempted Census	1	1	9,538	0	0	NA	NA
	Lighting	Attempted Census	2	1	584,060	0	0	NA	NA
	VSD	Attempted Census	2	1	9,538	1	9,538	100.0%	100.0%
Small Government Retrofit	HVAC	Attempted Census	5	5	15,878	0	0	0.0%	0.0%
	Lighting	Attempted Census	50	13	1,588,652	13	1,108,535	100.0%	69.8%

The sample plan specified stratified random sampling and a quota of 42 completed surveys for program measure groups with more than 50 participants and an attempted census for program measure groups with less than 50 participants. Based on this sample plan, only the Small C&I Retrofit Lighting program measure group required sampling with stratified random sampling. In practice, an attempted census of all participants was required to achieve the established survey quotas for this program measure group.

Free-ridership is the proportion of savings that would have occurred without the program's influences due to decision-makers that would have taken the same actions without the program. Free-ridership can range from 100% (Total Free-Rider) to 0% (Non-Free-Rider). The program could have some influence on the decision such as when the efficient equipment is purchased. This is one example of a partial free-rider. This continuum is shown in Figure 1.

Figure 1. Continuum of Free Riders



Free-ridership is estimated for each program and measure group based on the algorithms specified in the Standardized Method. The participant survey specified in the Standardized Method includes multiple questions to assess partial free-ridership and a number of questions designed as consistency checks.

Participant "like" spillover is estimated from responses to survey questions included in the participant survey that inquire about similar measures participants have installed without program assistance as a result of their experience with the program measures.

Per the Standardized Method, we weighted the free-ridership estimated for each individual decision-maker by the expected energy savings for that program measure group from that decision-maker to get the measure group free-ridership value. In this way, the free ridership

percentages can be directly applied to program savings to calculate the energy savings that would have occurred without the program intervention. We weighted participant spillover estimates in the same manner.

We calculated the net impact estimates from the participant surveys for each program measure group as one minus the program measure group's weighted free ridership rate and plus the program measure group's weighted participant spillover rate (1-FR+PS). Non-participant spillover (NPS) rate is added to this equation to get the program net impact for Large Commercial and Industrial program measures (1-FR+PS+NPS). As the components are already weighted by the respondents' expected savings, this rate can be applied to the expected program measure group savings from either the program database or from an impact evaluation study of actual savings to obtain net savings.

8.4 PARTICIPANT FREE-RIDERSHIP, SPILLOVER, AND NET IMPACT RATIOS

The free-ridership, participant like spillover percentages, and participant net impact factors by program measure group are presented in Table 8.2. The program level estimates are calculated as the sum of the measure group level estimates weighted (multiplied) by the proportion of the program savings represented by the measure group in the population. These program level estimates are also presented in Table 8.2.

Standard deviations for each program measure group and at the program level are provided for the participant net impact factors. There is no sampling error for those measures where an attempted census was conducted. Sampling relative precision and error bounds statistics are, therefore, not meaningful for populations where an attempted census was conducted. The standard deviation is provided just to allow readers to see the differences in the variation in responses across the programs and measure groups.

CLC is relatively small with many program measure group categories. This created very small populations for each of these survey categories. Given this, there are 10 program measure groups where no surveys were completed. We recommend using the program average for all measure groups with a "NA" in Table 8.2 since there were no survey completes. The two new construction programs had few participants and no surveys were completed with them. This really only allows the most similar program estimates to be used as a proxy for estimates for these programs.

Table 8.2 CLC Net-to-Gross Rates by Program and Measure Group

Program	Measure Group	Unique Participants	Completed Surveys*	Free-Ridership (%)	Participant Spillover (%)	Participant Net Impact Estimate (%)**	Standard Deviation
C&I Products and Services	Lighting	0	0	N/A	N/A	N/A	
	HVAC	13	3	22.38	0.00	77.62	22.1
	Motor	3	0	NA	N/A	N/A	
	Overall Program	**16**	**3**	**19.51**	**0.00**	**80.49**	**22.1**
C&I New Construction	Lighting	2	0	N/A	N/A	N/A	
	VSD	1	0	N/A	N/A	N/A	
	Overall Program	**3**	**0**	**N/A**	**N/A**	**N/A**	
Small C&I Retrofit	Lighting	121	56	5.87	3.46	97.59	27.1
	Custom/Tech	1	0	N/A	N/A	N/A	
	HVAC	44	14	8.05	0.43	92.38	21.3
	VSD	1	1	0.00	0.00	100.00	
	Overall Program	**122**	**59**	**6.12**	**2.68**	**96.56**	**25.7**
Government New Construction	Lighting	3	0	N/A	N/A	N/A	
	Overall Program	**3**	**0**	**N/A**	**N/A**	**N/A**	
Government Products and Services	HVAC	2	0	N/A	N/A	N/A	
	Motors	6	1	20.00	0.00	80.00	
	Overall Program	**7**	**1**	**4.67**	**0.00**	**95.33**	
Medium and Large C&I Retrofit	Lighting	2	1	0.00	0.00	100.00	
	Custom	3	2	0.00	0.00	100.00	0
	Overall Program	3	3	**0.00**	**0.00**	**100.00**	**0**
Medium and Large Government Retrofit	HVAC	1	0	N/A	N/A	N/A	
	Lighting	2	0	N/A	N/A	N/A	
	VSD	2	1	0.00	0.00	100.00	
	Overall Program	6	1	**0.00**	**0.00**	**100.00**	
Small Government Retrofit	HVAC	5	0	N/A	N/A	N/A	
	Lighting	50	13	7.65	0.00	92.35	18.7
	Overall Program	62	9	**7.57**	**0.00**	**92.43**	**18.7**

* Completed surveys indicate the number of unique Program/Measure/Contact or Measure location combinations about which survey responses were provided. Note that program databases were aggregated to the level of common facility address and/or contact person for purposes of survey administration. As such, one completed interview may provide survey responses for more than one Program/Measure/Contact or Measure location.

** Participant net impact estimates are calculated as 1-FR+PS.

8.5 STUDY METHDOLOGY FOR NON-PARTICIPANT LIKE SPILLOVER

The program can influence vendors and design professionals by teaching them about and giving them experience with high efficiency equipment. It is possible that due to the program vendors and design professionals may more often recommend and install high efficiency equipment to non-program customers. Non-participant "like" spillover rates adjust program savings to account for these circumstances. It is important to note that the Standardized Method is designed to measure only a portion of non-participant spillover. 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 non-participants to buy high efficiency products. This methodology is estimating non-participant like-measure spillover based on responses from design professionals and vendors participating in the programs during this particular year. It does not survey non-participating designers or vendors or non-participating customers.

We used the approach specified in the Standardized Method to estimate non-participant "like" spillover. The Standardized Method utilizes survey responses from the vendor survey to assign a measure-specific non-participant spillover percentage to design professionals or vendors that participated in a given energy efficiency program for that measure. The vendor survey includes questions designed to capture information on proportion of equipment sold and/or installed by vendors that would meet program requirements for high efficiency equipment, the proportion of this equipment sold outside of the program, and the level of influence of the program on these sales. We estimated energy savings associated with non-participant spillover measures for each vendor using the appropriate spillover percentage and the kWh savings attributable to that vendor for a specific measure based on data presented in the program tracking database. We then aggregated vendor specific non-participant spillover savings to the program and measure group level and extrapolated the savings to the program level. The non-participant like spillover percentage is calculated as non-participant spillover savings divided by expected program savings.

None of the Massachusetts sponsors had sufficient vendor data to conduct the non-participant like spillover interviews except for National Grid. Prior to surveying, it was decided by the study sponsors and evaluation team to rely upon results from the survey of National Grid vendors to represent the expected non-participant like spillover for all of the sponsors in Massachusetts.

8.6 NON-PARTICIPANT LIKE SPILLOVER FINDINGS

We completed interviews with a total of 36 vendors and design professionals, with one of these participating in two different program measures. Table 8.3 below presents the number of surveys completed by measure group. Column C shows the surveyed kWh included in the analysis. Column D presents the program expected savings for these measure groups for the surveyed vendors/design professionals in the program database. We used these expected savings to obtain vendor and measure-specific estimates of non-participant spillover for each

surveyed vendor. The sum of these estimates by measure group is shown in Table 8.3. The ratio of these two savings estimates provides the non-participant like spillover percentage.

The findings from the 2005 study provide a non-participant like spillover percentage of 159.8% (1.60). The prior study conducted in 2002 reported non-participant like spillover of 9.2% (0.092) for 2001 program data and 6.1% (0.061) for 2002 program data. Earlier studies had also found non-participant spillover in the range of that found in the 2002 study. Given this, we are not recommending that the findings from this study be used. We recommend instead that prior non-participant spillover estimates be used until one is estimated in a study that appears defensible or is thoroughly investigated and confirmed with other methodologies.

Table 8.3 National Grid 2004 Program Large Commercial and Industrial Non-Participant Like Spillover Results

A	B	C	D	E	F	G
Survey Categories	**Program kWh Savings[1]**	**Number of Firms Surveyed with kWh Savings/Number of Firms in Program with kWh Savings**	**Surveyed kWh Savings[2]**	**Surveyed Savings Coverage Rate (D/B)**	**Non-Participant Spillover from Surveyed Firms (kWh)[3]**	**Estimated Spillover Percent (F/D)**
Compressed Air	3,125,430	1/17	314,362	10.1%	314,362	100.0%
Custom	35,788,125	0/66	0	0.0%	0	0.0%
HVAC	7,146,372	23/113	250,070	3.5%	589,690	235.8%
Light	37,138,798	0/151	0	0.0%	0	0.0%
Motor	475,949	13/61	68,796	14.5%	108,053	157.1%
VSD	774,191	0/3	0	0.0%	0	0.0%
TOTAL	**84,448,865**	**36/373**	**633,228**	**0.7%**	**1,012,104**	**159.8%**

[1] The total program kWh represents the total savings for all measures for the Design 2000*plus* and Energy Initiative programs.

[2] The total surveyed kWh represents the total savings for all surveyed design professionals and surveyed vendors in the program tracking system database whose names suggested they were actual vendors, not participants.

[3] Net of "like" spillover for the customers associated with the surveyed design professionals/vendors, as identified from the participating customer survey.

8.7 REVISIONS TO THE SURVEY INSTRUMENT

Minor revisions were made to the original participant survey instrument included in Appendix A of the Standardized Method prior to fielding it with CLC customers. The specific revisions and justifications for those changes are presented below.

1. **Introduction (QI2) was abbreviated** – The introduction to the survey was revised slightly based on ODC's previous experience fielding this survey instrument. Each of the components of the original introduction is included in the revised survey (the sales concern, purpose of the survey, and timing) however we have abbreviated these components in an effort to maximize response rate. During training ODC interviewers are provided with the complete script included in the original survey to use as needed.

2. **Identification of decision maker (QR1-R3) was adjusted** – The standardized method was originally designed to ask respondents questions about as many as two measures installed through the same program. Because ODC will be asking respondents to respond to questions regarding a maximum of three measures installed through as many as three different CLC programs, we have revised the sequence of questions used to confirm that we are speaking to the appropriate decision maker for each measure. The original survey instrument is designed to identify the decision maker for each measure prior to completing the series of free-ridership and spillover questions for the first measure. Based on our experience fielding this survey instrument, and to accommodate situations where a participating facility may have installed multiple measures through different programs, we have revised the survey design to identify the decision maker for the first measure and complete all pertinent questions relevant to that measure prior to identifying the decision maker for the second and third measures. The survey instrument includes skip patterns designed to obtain contact information or responses to the series of free-ridership and spillover questions for each measure installed at each sampled facility.
3. **Technical Assessment questions revised (AP, AP1)** – We have modified the survey to account for the lack of information in program databases that identifies customers that conducted Technical Assessments (TA) or specifies TA incentive amounts. The revised survey instrument includes a question that asks respondents if they conducted a TA. Respondents answering "yes" are asked if they would have paid the full amount for the TA if the utility had not offered an incentive (assumed to be 50% of the total TA cost).
4. **Free ridership questions revised (ATXT3) –** We have modified the wording of free ridership questions to account for the fact that data regarding the total cost of the installed measures (Customer Cost + Utility Incentive) is not consistently available for all customers and all programs.
5. **Additional questions –** ODC has included a short series of general satisfaction questions (QPS1-PS4). These questions are optional and were included as an example of the supplemental questions included in the survey instruments approved by other sponsors.

The survey instrument fielded with CLC customers is presented below.

VARIABLE LIST

<CONTN> = Customer Contact Name
<COMP> = Sponsor
<PROGRAM> = Program Name
<YEAR> = Program Year
<SNAME> = Customer/Facility Name
<ADD> = Service address where equipment was installed
<MEAS1> = End-use Category (i.e. lighting)
<DESC1> = Detailed Measure Description
<COST1> = Incentive for Measure 1

START

IF NO NAME-ASK FOR EQUIPMENT INSTALLATION DECISION MAKER

Hello, my name is __, and I'm calling on behalf of <COMP >. May I speak with <CONTN >? Are you the person at your firm/facility who was most involved in making the decision to install equipment through the <PROG > program in 2004?

ALTERNATE PHONE: <PHONE2 >

(1/2326)

Yes	01	=> QI2
No	02	=> QI1A
(Don't know/Refused)	99	

INT18

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2328)

Would not disclose decision maker	18	D	=> END

I1a. Who at your company/facility did make the decision to install this equipment through the program?

TYPE '01' AND HIT ENTER TO TYPE IN CONTACT INFORMATION. 98= DON'T KNOW 99=REFUSED

ENTER HERE: @QI1A

NAME: @NM1

TITLE: @TT1

TELEPHONE NUMBER: @PH1

QI1A

CUSTOM SCREEN

(1/2330)

enter contact information	01
(Don't know)	98
(Refused)	99

INT19

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2442)

Not the decision maker	19	D	=> END

QI2

I2. Do you work directly for <SNAME > or are you a contractor who provides design and/or installation services for <SNAME >?

(1/2444)

Work directly for company/Employee	1	=> TXT1
Vendor/Contractor	2	=> VTXT1
(Don't know)	3	

INT20

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2445)

Don't know	20	D	=> END

I'm with Opinion Dynamics, an independent research firm. On behalf of <COMP>, we are following up with customers who participated in its <PROG > program to learn about their experiences. You or someone at your facility may have received a letter letting you know about this call. I'm not selling you anything, I'd just like to ask about the equipment you installed at <ADD >.
Your responses will be confidential, and this should take about 15 minutes.

@txt1
PRESS 'ENTER' TWICE TO CONTINUE

TXT1

PRESS ENTER TWICE TO CONTINUE
SCREEN

(1/2447)

CONTINUE..... 1 D

TXT2

PRESS ENTER TWICE TO CONTINUE
I'd like to review the equipment you installed through the <PROG > program.

(1/2448)

CONTINUE..... 1 D

AR1

R1. Do you recall installing <MEAS1 > equipment through the <PROG > program in 2004?

(1/2449)

Yes	1	=> A1
No	2	
(This equipment was never installed)	3	=> ASK4
(Don't know/Refused)	4	

R1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your facility that would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

ASK4

=> BR1 else => QPS1 if CNT2=1

skips those whose equipment was never installed for first measure to second measure, or to QPS1 if there isn't a second measure.

(1/2562)

A1

1. Were you involved in the decision-making process at the design stage when the <MEAS1 > equipment was specified and agreed upon for this facility?

(1/2563)

Yes	1	=> A2
No	2	
(Don't know)	3	

A1A

1a. At what point in the process did you become involved?

(1/2564 -2566 -2568)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A1B

1b. What was your role?

(1/2570 -2572 -2574)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A2

READ LIST, RECORD ALL THAT APPLY

2. Some companies/facilities work with an outside professional as part of the project design phase. Which individuals were responsible for recommending or specifying the exact type of high efficiency <MEAS1 > equipment to install through the <PROG > program?

(1/2576 -2577 -2578 -2579 -2580 -2581)

Someone within my firm	1
Design professional	2
Contractor	3
Manufacturer's representative	4
Energy Efficiency Service Provider account manager	5
Someone else	6
(Don't know)	7
(Refused)	8

A3

=> +1 if A2=1

3. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did this person have on your company's/facility's decision to install high efficiency equipment so that it would qualify for the program?

(1/2582)

-1- No influence at all	1	=> AP
-2-	2	=> AP
-3-	3	=> AP
-4-	4	
-5- A very strong influence	5	
Don't know	6	=> AP

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the Energy Efficiency Service Provider account manager. Could you give me the name and telephone number of this person?

01=YES 02=NO/REFUSED 03=NO OUTSIDE ADVISOR INVOLVED 98=DK

ENTER HERE: @A4

NAME: @ANM3
TITLE: @ATT3
COMPANY: @ACP3
ADDRESS: @AADD3

PHONE NUMBER: @APH3

A4

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the Energy Efficiency Service

Provider account manager. Could you give me the name and telephone number of this person?

(1/2583)

Yes Record contact information)	01		
No, refused to give this information	02		=> AP
No, no outside advisor involved	03		=> AP
(Don't know)	98	X	=> AP

AP

P. Did your facility conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

(1/2825)

Yes	1	
No	2	=> AP2
(Not sure)	3	=> AP2

AP1

=> +1 if AP=2,3

P1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at your facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If <COMP > had not paid a portion of the cost, would your company/facility have paid about the entire amount to have a similar Technical Assessment Study done within one year of when the study took place?

(1/2826)

Yes	1
No	2
(Don't know)	3

AP2

DO NOT READ LIST. PLEASE CHOOSE ALL THAT APPLY.

P2. What factors motivated your firm/facility to install this <MEAS1 > equipment through the <PROG > program in 2004?

(1/2827 -2829 -2831 -2833 -2835 -2837 -2839 -2841 -2843)

(To reduce maintenance costs)	01	
(To reduce initial purchase costs)	02	
(The program incentive)	03	
(The technical assistance offered)	04	
(To reduce energy bills/save money)	05	
(To improve efficiency/save energy)	06	
(Took the advice of my installer/designer/contractor/Energy Efficiency Service Provider rep)	07	
(Because of my past program participation)	08	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

AP3

P3. Did your firm/facility have specific plans set aside to install any of this equipment before you talked with anyone about the program?

(1/2845)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
(Don't know)	4	=> ATXT3
(Refused)	5	=> ATXT3

AP4

P4. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of equipment for the <MEAS1 > equipment in order to qualify for the <PROG > program?

(1/2846)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
Don't know	4	=> ATXT3
Refused	5	=> ATXT3

P4A. What changes were necessary? (Choose as many as apply)
(PROBE FOR TIMING, QUANTITY AND EFFICIENCY - SEE BELOW)

01 = Installation occurred SOONER than planned
02 = Installation occurred LATER than planned
03 = Installed MORE equipment than was planned
04 = Installed LESS equipment than was planned
05 = Equipment was MORE efficient than planned
06 = Equipment was LESS efficient than planned
00 = Other changes/comments (open text window)
98 = Don't know
99 = Refused

ENTER HERE:@AP4A

AP4A

P4A. What changes were necessary? (CUSTOM SCREEN)

(1/2847 -2849 -2851 -2853 -2855 -2857 -2859)

(Installation occurred SOONER than planned)	01	
(Installation occurred LATER than planned)	02	
(Installed MORE equipment than planned)	03	
(Installed LESS equipment than planned)	04	
(Equipment was MORE efficient than planned)	05	
(Equipment was LESS efficient than planned)	06	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

ATXT3

=> +1 if COST1==0

PRESS ENTER TWICE TO CONTINUE

According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. You may have also received some

technical assistance from a <COMP > rep, engineer, or equipment vendor; if you did, the program also may have contributed toward the cost of a study.

(1/2861)

CONTINUE..... 1 D

AF1

F1. If <COMP > had not paid a portion of the equipment cost OR provided any technical assistance or education through the <PROG > program, would your company/facility have purchased any <MEAS1 > equipment within one year of when it was installed?

(1/2862)

Yes..... 1
No..... 2 => AF8
Don't know..... 3 => AF8

AF2

F2. Without the program incentive, technical assistance, or education, would your company/facility have purchased the EXACT SAME QUANTITY of <MEAS1 > equipment within one year?

(1/2863)

Yes..... 1 => AF3
No..... 2
Don't know..... 3

AF2A

ENTER PERCENTAGE 0-100%, 998=DK/REF

F2a. What percent of this <MEAS1 > equipment do you think your company/facility would have purchased on its own within one year? (PROBE: Would you have purchased about one- fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

(1/2864)

$E 0 100
(DK/REF)..... 998

AF3

ENTER PERCENTAGE 0-100%, 998=DK/REF

F3. You said your company/facility would have installed at least some <MEAS1 > equipment on its own if the program had not been available. What percent of this equipment would have been of the same efficiency or higher efficiency as what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

(1/2867)

$E 0 100
(DK/REF)..... 998

AF4

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998)

F4. Now I want to focus on what it would have cost your company/facility to install this equipment on its own without the program. Do you think your company/facility would have paid the additional cost that the Energy Efficiency Service Provider paid on top of the amount you already paid, to install the same quantity and efficiency of <MEAS1 > equipment within one year?

(1/2870)

Yes ..... 1 => AF8
No 2
Don't know 3

AF5

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998)

SELECT ALL THAT APPLY

F5. How would you have adjusted your purchase to accommodate the fact that you wouldn't have paid all of the costs? Would you have purchased less equipment, lower efficiency equipment, or done something else?

(1/2871 -2873 -2875)

Purchased less equipment 01
Purchased lower efficiency of equipment 02
(Done something else, specify) ..... 00 O
(Don't know) ..... 98 X

AF6

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

ENTER PERCENTAGE 0-100%, 998=DK/REF

F6. What percent of the <MEAS1 > equipment do you think your company/facility 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?)

(1/2877)

$E 0 100
(Don't know/Refused) 998

AF7

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

F7. What percent of the <MEAS1 > equipment that your company/facility would have purchased on its own would have been of a lower efficiency than what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)

(1/2880)

$E 0 100
(Don't know/Refused) 998

AF8

=> +1 if	(AF1=1 AND AF4=2,3) AND (AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98)

F8. Was the information or advice you received from a contractor, design team, Energy Efficiency Service Provider rep, or an engineer a crucial factor in your decision to install this high efficiency equipment through the program at the time you did?

(1/2883)

No information received 1
Yes 2
No 3
(Don't know) 4

COMF9

=> * if	IF((AF1=2,3 AND (AP4=3 OR AF8=2)),1,0)

computes for qf9

(1/2884)

get qf9 1
do not get qf9 0

CO2F9

=> * if	IF((AF2=1 AND (AF3<100 OR AF3=998) AND AF4=1),1,0)

(1/2885)

get qf9 1
do not get qf9 0

AF9

=> AF10 if	COMF9=0 AND CO2F9=0

PRESS 'ENTER' TO OPEN TEXT WINDOW

F9. I'd like to better understand your purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on your decision to install the energy efficient <MEAS1 > equipment at the time you did?

(1/2886 -2888 -2890)

Open text window ..... 00 DO
(Don't know) ..... 98 X
(Refused) ..... 99 X

AF10

F10. Did your company/facility participate in any of <COMP >'s energy efficiency programs before you installed energy efficient equipment in 2004?

(1/2892)

Yes 1
No ..... 2 => AS1
(Don't know) ..... 3 => AS1

ASK3

=> AS1 else => +1 if	CNT2=1 OR CNT3=1

(1/2893)

AF11

PRESS ENTER TWICE TO CONTINUE

F11. 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/facility. There are no right or wrong answers; we just want your honest opinion.

(1/2894)

CONTINUE..... 1 D

AF11A

REPEAT IF NECESSARY

F11a. The energy savings performance of equipment installed through the <PROG > program in earlier years was a primary reason why we decided to install energy efficient <MEAS1 > through the program in 2004. Do you agree or disagree with this statement?

(1/2895)

Disagree..... 1
Agree 2
(Don't know)..... 3

AF11B

REPEAT IF NECESSARY

F11b. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > program, and what we learned by participating in the program we asked our contractor to look into energy efficient options for <MEAS1 > when developing project plans in 2004.

Do you agree or disagree with this statement?

(1/2896)

Disagree..... 1
Agree 2
(Don't know)..... 3

AF11C

REPEAT IF NECESSARY

F11c. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > Program and what we learned by participating in the program we took into account the cost-effectiveness of energy efficient <MEAS1 > equipment when evaluating different options in 2004. Do you agree or disagree with this statement?

(1/2897)

Disagree..... 1
Agree 2
(Don't know)..... 3

AS1

S1. Now I'd like you to think of the time since you participated in the <PROG > program in 2004. Has your company purchased and installed any <MEAS1 > equipment on its own for this or other facilities served by <COMP >?

(1/2898)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

AS1A

S1a. Was this equipment of THE SAME EFFICIENCY LEVEL OR A HIGHER LEVEL OF EFFICIENCY as the equipment you installed through the program?

(1/2899)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

S2. About how much energy efficient <MEAS1 > equipment did your company/facility purchase on its own since participating in this program in 2004?

(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 amount as you installed through the program, twice as much as what you installed through the program or some other amount?

@AS2
ENTER NUMBER, USE 998 FOR DON'T KNOW/REFUSED

AS2

SCREEN

(1/2900)

$E 0 100
(Don't know/Refused) 998

AS3A

S3a. Did a recommendation by the contractor or designer who you worked with under the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2903)

Yes 1
No 2
(Don't know) 3

AS3B

S3b. Did your experience with the energy efficient equipment installed through the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2904)

Yes 1
No 2
(Don't know) 3

AS3C

S3c. Did your participation in any past program offered by another company influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2905)

Yes 1
No 2
(Don't know) 3

AS4

S4. Why didn't you purchase this <MEAS1 > equipment through an <COMP > program?

(1/2906 -2908 -2910 -2912 -2914 -2916 -2918 -2920 -2922 -2924 -2926 -2928)

(Too much paperwork) 01
(Cost savings not worth the effort of applying) 02
(Takes too long for approval) 03
(The equipment would not qualify) 04
(Vendor does not participate in program) 05
(Outside other company's service territory) 06
(No time - needed equipment immediately) 07
(Thought the program ended) 08
(Didn't know the equipment qualified under another program) 09
(Just didn't think of it) 10
(Unable to get rebate--unsure why 11
(Other - specify) ..... 00 O
(Don't know) 13

AS4A

=> +1 if AS4 NOT=04

S4a. Why wouldn't the equipment qualify?

(1/2930 -2932 -2934)

Open text window ..... 00 DO
(Don't know) ..... 98 X
(Refused) ..... 99 X

SKIP1

=> QPS1 else => +1 if CNT2=0

SKIPS TO QPS1 IF NO SECOND MEASURE

(1/2936)

[REPEATS QUESTIONS BEGINNING FROM AR1 FOR SECOND MEASURE – IF NO OTHER MEASURES ASKS OPTIONAL GENERAL SATISFACTION QUESTIONS PS1 – PS4]

VTXT1

I'm with Opinion Dynamics, an independent research firm. We have been hired to talk with some of the design professionals and contractors who were involved with the <PROGRAM> in <YEAR>. I'm <u>not</u> selling anything; I'd just like to ask you about the types of equipment that have been recommended, sold, or installed by your firm through this program in <YEAR>.

I'd also like to assure you that your responses will be kept confidential by <COMP> and that this should take less than 15 minutes.

For the next set of questions, I'd like to review the equipment you recommended or specified through the <PROGRAM> for <COMP>.

VR1. Do you recall recommending or specifying <MEAS1> for <SNAME> at <ADD> through the <PROGRAM> in <YEAR>?

1	Yes	=> VA1
2	No	
3	This equipment was never installed	[IF CNT2=0 SKIP TO PS1, REPEAT FOR MEAS2]
-8	DON'T KNOW	

VR1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your firm who would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

INT 22

I'm sorry, we cannot include you in our study. Thank you for your time!

Don't Know =>END

VA1. First I'd like to ask you about your decisions to recommend/specify <MEAS1> through the <PROGRAM>. Were you involved in the decision-making process at the design stage when the <MEAS1> equipment was specified and agreed upon for this facility?

4. Yes [SKIP TO VA2]
5. No
6. (Don't know)

1a. At what point in the process did you become involved?
(Open end)
(Don't know)
(Refused)

1b. What was your role?
(Open end)
(Don't know)
(Refused)

VA2. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of <MEAS1> so that it would qualify for the program? _____
(NOTE: IF Q3 < 4 AND NO OTHER MEASURE, SKIP TO NON-PARTICIPANT SPILLOVER; ELSE SKIP TO P1)

The next set of questions ask about what you think your company would have recommended or specified for <COMP> if the Energy Efficiency Service Provider had not offered the <PROGRAM> in <YEAR>.

VAP. To your knowledge, did <SNAME> conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

Yes..... 1
No..... 2 => VAP2
(Not sure) 3 => AP2

VAP1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at <SNAME>'s facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If the Energy Efficiency Service Provider had not paid a portion of the cost, do you think <S_NAME> would have paid about the full amount to have a similar Technical Assessment Study done within one year of when the study took place?
4. Yes
5. No
6. Don't know

VAP2. As far as you know, did <S_NAME> have specific plans set aside to install any of this equipment before you talked with anyone about the program?
6. Yes
7. Yes, but don't remember specifics [SKIP TO VATXT3]
8. No [SKIP TO VATXT3]
9. (DK) [SKIP TO VATXT3]
10. (Refused) [SKIP TO VATXT3]

AP3. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of the <MEAS1> equipment in order to qualify for the <PROGRAM>?
6. Yes
7. Yes, but don't remember specifics [SKIP TO VATXT3]
8. No [SKIP TO VATXT3]
9. Don't know [SKIP TO VATXT3]
10. Refused [SKIP TO VATXT3]

AP3A. What changes were necessary?

9. (Installation occurred SOONER than planned)
10. (Installation occurred LATER than planned)
11. (Installed MORE equipment than planned)
12. (Installed LESS equipment than planned)
13. (Equipment was MORE efficient than planned)
14. (Equipment was LESS efficient than planned)
15. (Other - specify)
16. (Don't know)
17. (Refused)

VATXT3
According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. <S_NAME> may have also received some technical assistance from an <COMP> representative or a contribution toward the cost of a technical assessment study.

VF1 Would your company have recommended or specified any <MEAS1> to <S_NAME> within one year of when it was installed if they had not been able to receive this Energy Efficiency Service Provider [contribution/incentive/rebate] or any technical assistance or education through the [program]?

1 Yes
2 No *(SKIP TO VF8)*
-8 DON'T KNOW *(SKIP TO VF8)*

VF2 Without the program [contribution/incentive/rebate], technical assistance or education, would your company have recommended or specified the exact same quantity of <MEAS1> for <S_NAME> within one year?

1 Yes *(SKIP TO VF3)*
2 No
-8 DON'T KNOW

VF2b What percent of this <MEAS1> do you think your company would have recommended/specified? (*PROBE:* Would you have recommended/specified about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

_____%
-8 DON'T KNOW

VF3 You said you would have recommended/specified at least some <MEAS1> for <S_NAME> if the program had not been available. What percent of this equipment that you would have recommended/specified would have been of the same efficiency or higher efficiency as what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

_____% *(IF RESPONSE NE 100% OR F2 NE 1 SKIP TO F10)*
-8 DON'T KNOW

(NOTE: IF VF1=1 AND VF2=1 AND VF3=100%, ASK VF4-VF7)

VF4 Now I want to focus on what it would have cost <S_NAME> to install this equipment on its own without the program. Do you think <S_NAME> would have paid the additional <COST1>, on top of the amount they already paid, to install the same quantity and efficiency of <MEAS1> within one year?

1 Yes *(SKIP TO VF8)*
2 No
-8 DON'T KNOW

VF5 How do you think <S_NAME> would have adjusted their purchase to accommodate the fact that they wouldn't have paid all of the costs? Would they have purchased less equipment, lower efficiency equipment, or done something else? *(INDICATE ALL THAT APPLY—ASK <u>BOTH</u> VF7 AND VF8 IF APPROPRIATE)*

1 Purchased less equipment *(ASK VF6)*
2 Purchased lower efficiency of equipment *(ASK VF7)*
3 Done something else *(SPECIFY AND SKIP TO VF10)*
8 Don't Know

VF6 What percent of the <MEAS1> do you think <S_NAME> would have purchased on its own at that same time? (*PROBE:* Would they have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what they installed through the program?)
_____% *(IF F5=2, SKIP TO VF7; ELSE SKIP TO VF10)*
-8 DON'T KNOW

VF7 What percent of the <MEAS1> that <S_NAME> would have purchased on its own would have been of a lower efficiency than what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)
_____% *(SKIP TO VF10)*
-8 DON'T KNOW *(SKIP TO VF10)*

(NOTE: ASK VF8 IF (VF1=2 OR VF1=-8) OR IF (VF1=1 AND VF2=1 AND VF3=100% AND VF4=1); ELSE SKIP TO VF10)

VF8 Was the <u>technical assistance</u> or advice you or another designer/vendor provided to <S_NAME> a crucial factor in their decision to install this high efficiency equipment through the program at the time they did?
0 NA, none received
1 Yes
2 No
-8 DON'T KNOW

(NOTE: ASK VF9 IF ((VF1=2 OR VF1=-8) AND (VP4=3 OR VF8=2)) OR IF ((VF1=1 AND VF2=1 AND VF3=100% AND VF4=1) AND (VP4=1 OR VP4=2 OR VF8=1)); ELSE SKIP TO VF10)

VF9 I'd like to better understand <S_NAME>'s purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on the installation of energy efficient <MEAS1>? *(RECORD VERBATIM THE CLARIFICATION—PROBE AS NEEDED TO UNDERSTAND REASON)*

VF10 On a scale of 1 to 5, with 1 being 'not at all important and 5 being 'very important', how important was your previous experience with a <COMP> program when making the decision to recommend or install <MEAS1>for this customer?

_____
-8 DON'T KNOW
-9 NA – No previous program experience

[ASK VNP1 FOR EVERY MEASURE GROUP IN PROGRAM BEFORE ASKING VNP2-VNP8.]

PS1. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your satisfaction with <COMP>'s <PROGRAM>.

7. Not at all satisfied [SKIP TO PS2B]
8. 2 [SKIP TO PS2B]
9. 3 [SKIP TO PS2B]
10. 4
11. Extremely satisfied
12. (DK) [SKIP TO PS2B]

GO TO PS2B if QPS1=1,2,3
PS2a. Why are you satisfied with the program?
Open text window
(Don't know)
(Refused)

GO TO PS3 if QPS1=4,5
PS2b. Why are you NOT satisfied with the program?
Open text window
(Don't know)
(Refused)

PS3. Do you have any other comments or suggestions for the program?
Open text window
(Don't know)
(Refused)

PS4. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your overall satisfaction with <COMP>.

7. Not at all satisfied
8. 2
9. 3
10. 4
11. Extremely satisfied
12. (DK)

END

That is all the questions I have for you. Thank you for your participation.

8.8 PARTICIPANT SATISFACTION

Respondents were asked to rate their satisfaction with the program and the company on a 5-point scale where 1 is *not at all satisfied* and 5 is *extremely satisfied*. These were supplemental questions not related to the calculation of free-ridership and spillover and in the interest of minimizing respondent fatigue, we only asked the supplemental questions once. As such if a respondent participated in multiple programs they were only asked the questions regarding one program. Respondents who were design or installation contractors for the customer were not asked these questions.

Table 8.4 Program Satisfaction
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
C&I Products and Services Program (n=3)	33%
Government Products and Services (n=2)	100%
Medium and Large C&I Retrofit Program (n=5)	100%
Medium and Large Government Retrofit (n=1)	100%
Small C&I Retrofit (n=59)	88%
Small Government Retrofit (n=7)	100%

Almost all (96%) customers (n=100) rated their overall satisfaction of CLC a 4 or 5. Table 8.5 shows how respondents in each program rated their satisfaction of CLC.

Table 8.5 Satisfaction with CLC
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
C&I Products and Services Program (n=2)	100%
Government Products and Services (n=2)	100%
Medium and Large C&I Retrofit Program (n=5)	80%
Medium and Large Government Retrofit (n=2)	100%
Small C&I Retrofit (n=74)	96%
Small Government Retrofit (n=15)	100%

8.9 SURVEY DISPOSITION

The tables below present the final disposition of the survey used for the participant survey effort by program and measure group. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups. In practice, an attempted census of all participants was required to achieve the established survey quotas for most program measure groups.

The tables below present the survey disposition by quota group developed per the original sampling plan. Survey quota groups were developed for each program measure group combination. Per the sampling plan, the quota group for each program measure group combination represented either a census attempt of all participants or a stratified random sample of participants, depending on the number of participants. To meet the precision requirements, it was deemed most important to ask respondents about measures for which the sample plan called for a census attempt first. As such, for each program, customers that installed a measure for which the sample plan called for an attempted census were assigned to the quota group for that program measure group. Data for that customer regarding the installation of other measures within the program, and participation in other programs, were aggregated such that our interviewers could gather as much data as possible in a single interview with the customer. In the tables below, the "Surveyed Measures" row reflects the number of unique *measure groups* about which respondents could be surveyed based on program tracking data. As customers may have installed more than one type of measure through a given program, the number of "Surveyed Measures" for each program measure group combination does not equate to the number of unique decision makers associated with that program measure group, but the total number of measure groups associated with those decision-makers.

A description of the counts presented in other rows of the disposition tables are presented below:

- Measure not Installed: The number of respondents indicating in their response to survey question R3 that the measure in question was not installed.
- No Knowledgeable Respondent: The number of respondents indicating that they were not familiar with the equipment in question and could not provide an alternate knowledgeable contact person for that measure.
- Unresponsive: The number of potential respondents who did not refuse to participate but did not respond to voicemail requests to participate, were not available for scheduled interviews, repeatedly asked that we call back another time, or otherwise could not make time available to complete the survey during the study period.
- Completed Surveys: The number of completed surveys in the specified program measure group.

Table 8.6 Survey Disposition – Government Programs

Government Programs	New Construction	Products & Services	Small Gov't Retrofit	Small Gov't Retrofit	Med & Large Gov't Retrofit	Med & Large Gov't Retrofit	Med & Large Gov't Retrofit
End Use	**Lighting**	**Motors**	**Lighting**	**HVAC**	**Lighting**	**VSD**	**HVAC**
Surveyed Measures	**2**	**4**	**41**	**5**	**1**	**1**	**1**
Not Called	0	0	0	0	0	0	0
No Working Number	1	1	5	2	0	0	0
Measure Not Installed	0	1	0	1	0	0	0
No Knowledgeable Respondent	0	0	5	0	0	0	1
Adjusted Sample	**1**	**2**	**31**	**2**	**1**	**1**	**0**
Refusal/Mid Terminate	0	0	6	0	0	0	0
Language Barrier	0	0	0	0	0	0	0
Unresponsive	1	1	12	2	1	0	0
Completed Surveys	**0**	**1**	**13**	**0**	**0**	**1**	**0**
Completed Surveys as a Percentage of Adjusted Sample	**0%**	**50%**	**42%**	**0%**	**0%**	**100%**	**0%**

Table 8.7 Survey Disposition – C&I Programs

C&I Programs	Products & Services	Products & Services	Med & Large C&I Retrofit	Med & Large C&I Retrofit	Small C&I Retrofit	Small C&I Retrofit	Small C&I Retrofit
End Use	**Motors**	**HVAC**	**Lighting**	**Custom**	**Lighting**	**VSD**	**HVAC**
Surveyed Measures	**3**	**11**	**2**	**3**	**131**	**1**	**45**
Not Called	0	0	0	0	0	0	0
No Working Number	0	2	0	0	14	0	2
Measure Not Installed	0	0	0	0	1	0	0
No Knowledgeable Respondent	2	3	0	1	18	0	8
Adjusted Sample	**1**	**6**	**2**	**2**	**98**	**1**	**35**
Refusal/Mid Terminate	0	2	0	0	20	0	16
Language Barrier	0	0	0	0	4	0	0
Unresponsive	1	1	0	0	18	0	5
Completed Surveys	**0**	**3**	**1**	**2**	**56**	**1**	**14**
Completed Surveys as a Percentage of Adjusted Sample	**0%**	**50%**	**50%**	**100%**	**57%**	**100%**	**40%**

Table 8.8. Survey Disposition: NGRID Vendor Survey

	MA	NH	RI
Starting sample	**118**	**4**	**46**
Not called	0	0	0
No working number	13	3	4
Does not do work in state	1	0	1
Adjusted sample	**104**	**1**	**41**
Refusal	12	0	4
Language barrier	1	0	0
Unresponsive	64	0	29
Completed survey	**27**	**1**	**8**
Response Rate	**26%**	**100%**	**20%**

9. SUMMARY OF FINDINGS FOR CONNECTICUT LIGHT & POWER

9.1 EXECUTIVE SUMMARY

Sections 9.1 through 9.6 of this chapter constitute the Executive Summary for this study consistent with what other utilities in this study used in their 2004 Energy Efficiency Annual Report filing. In order to be consistent with the material provided for the filings, the wording in these sections has not been modified, except in the case of section and table numbering for consistency and to differentiate the tables across chapters.

This report summarizes the findings from the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study for each of Connecticut Light and Power Company's (CL&P) commercial and industrial (C&I) programs. The purpose of this study was to assess program free-ridership, participant spillover and non-participant spillover for CL&P's Custom Services, Express Energy, Municipal, New Construction, RFP, Operations & Maintenance (O&M), and Small Business Energy Advantage (SBEA) and the C&I programs of the other sponsors.

This joint sponsor study was conducted for six New England sponsors including CL&P. Other sponsors include Unitil (Fitchburg Gas & Electric), Cape Light Compact (CLC), Western Massachusetts Electric Company (WMECo), National Grid, and United Illuminating.

9.2 STUDY OBJECTIVES

The primary objective of the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study was to assist the sponsors in quantifying the net-to-gross energy and demand savings ratio of their commercial and industrial programs based upon surveys with 2004 program participants and their associated vendors and design professionals. Megdal & Associates along with Opinion Dynamics Corporation (ODC) was hired to adapt and utilize the *Standardized Methods for Free Ridership and Spillover Evaluation* (referred to as the Standardized Method) as developed by PA Consulting under contract to the Massachusetts energy efficiency program sponsors as finalized on June 16, 2003. This provided a common consistent method across Massachusetts for the estimation of a net-to-gross ratio based upon estimating the extent of:

- **Program free-ridership (FR)** - The percentage of program participants (proportion of expected savings) deemed to be free-rider where a free-rider refers to a customer who received an incentive through an energy efficiency program who would have installed the same or smaller quantity of the same high efficiency measure on their own within one year 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 equipment purchase decision.
- **Participant "like" spillover (PS)** - Refers to the situation where a customer installed equipment through the program in the past year and then installed additional equipment of the same type due to program influences but without program support (technical assistance or incentives).

- **Non-participant "like" spillover (NPS)** - Refers to energy efficient measures installed by program non-participants due to the program's influence.

9.3 STUDY METHDOLOGY FOR PROGRAM NET IMPACT RATIOS

The Standardized Method is based upon conducting telephone surveys with program participants to derive participant free-ridership and participant "like" spillover estimates. In cases where program participants indicate that a design professional or equipment vendor was the primary decision maker for the project, surveys are conducted with the design professional or equipment vendor to produce these estimates. To estimate non-participant "like" spillover attributable to 2004 program activities, the Standardized Method employs interviews with participating design professionals and equipment vendors. We conducted the participant and design professional surveys used to estimate free-ridership and spillover attributable to the sponsors' programs between May and August of 2005.

This study was designed to obtain estimates for these net impact elements at the program and measure group level based on the application of the Standardized Method. For CL&P the programs examined in the study were the Custom Services, Express Energy, Municipal, New Construction, RFP, Operations & Maintenance (O&M), and Small Business Energy Advantage (SBEA) programs. The measure groups examined within these programs are listed in Table 9.1 below.

CL&P provided the 2004 program databases containing all relevant program participation data for each application received for each program in 2004. Significant manual data on behalf of CL&P was required to gather the minimum level of data necessary to field the participant survey used for this study. These data were prepared for sample development by first aggregating applications by utility account number to determine the unique number of program participants (account numbers) for each program and measure group.[30]

For commercial and industrial customers there can be multiple account numbers at a single address or physical location. As CL&P's tracking database associates program applications and installed measures to specific account numbers, there can be cases where a single contact person may be the decision-maker for measures associated with multiple account numbers. At the same time, there can be one decision-maker for multiple sites such as for chain stores, multi-site industrial firms, school districts, etc. The participant survey is conducted with the primary decision-maker responsible for selecting the equipment installed through the program. The survey is designed to ascertain how they made their decisions to install the high efficiency equipment and the effect of the program on those decisions. To ensure that we obtained all of the information regarding all measures installed through the programs from each decision-maker interviewed and that none were contacted for surveying more than once, we conducted additional database efforts. This work included additional programming and manual data processing where necessary to identify likely cases where a single contact person was the primary decision-maker for program participation and measures installed across multiple sites or account numbers.

[30] Unique Participants as presented in Table 9.1 refers to the unique number of utility account numbers which could represent multiple applications for the same measure group in the same program.

Where available, we used the customer contact name from the application as the first and most definitive means to identify multi-site decision-makers. Within a program and measure group we grouped applications with the same or different account numbers and/or facility addresses having the same contact name. When administering the survey we asked participants to respond to questions regarding as many as three measures installed across all CL&P programs for which they were the primary decision-maker. We never combined two sites that had different contact names, including cases where the participants were obviously part of a chain.

If there was no contact name in the database, then additional exams were made to identify potential multiple site decision-makers. The second exam was based on participant facility names that were identical across multiple locations or schools within a single town. The third was based upon facility addresses that were identical across multiple account numbers and those with different suite numbers but appeared to be managed by one of the suite firms.[31] The application of these grouping schemes to the program tracking data provided a list of unique program, measure group, and decision maker or physical location combinations for purposes of survey administration. This starting sample count is presented by program and measure group in Table 9.1 below.

The number of completed surveys presented in Table 9.1 represents the unique number of program, measure group, and decision maker or physical location combinations for which survey responses were gathered.[32] Note that one completed interview could account for more than one unique combination of program, measure group, and location.

Table 9.1 below presents the total number of unique participants, the starting sample, the number of completed surveys and associated kWh savings by CL&P program and measure group.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover attributable to CL&P's C&I programs in July and August of 2005. All sampled customers were mailed a letter on utility letterhead in advance of the telephone call. This letter explained the purpose of the call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Conducting surveys during the summer months, however, may have increased the difficulties in obtaining completed surveys. Prior studies that based on the Standardized Method have

[31] In cases where applications were combined based on facility name or address we verified that the contact was the primary decision-maker for program participation and measures installed for each of the grouped applications.

[32] Note that the number and percentage of completed surveys does not equate to a survey response rate. Response rate is calculated as the number of completed surveys divided by the adjusted starting sample where the adjusted started sample is equal to the starting sample less any invalid sample points (no working number, language barrier, no installed measures, no valid decision maker available). A complete survey disposition report is provided in the appendices to the full report.

had these surveys conducted in the spring; a much better time to obtain responses given potential vacation schedules and associated staffing issues. Fielding surveys in the spring also allows the interviews to occur somewhat closer to when the decision had been made. By fielding a survey in the spring to gather information regarding program participation that occurred the prior calendar year implies that the equipment decisions were made between 4 and 16 months prior, depending on when participation occurred. Fielding the survey in mid-summer extended this period to between 8 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten.

Table 9.1 CL&P's Unique Participants, Surveys Completed, Program and Sample kWh, and Sample Weights (where applicable)

Program	Measure Group	Strata/ Attempted Census	Unique Participants	Starting Sample	Total kWh	Completed Surveys	Surveyed kWh	% Surveyed	% kWh Surveyed	Sample Weight
Custom Services	Light	Attempted Census	54	34	13,191,443	17	2,293,452	50.0%	17.4%	
	HVAC	Attempted Census	21	16	3,454,715	6	804,861	37.5%	23.3%	
	Other	Attempted Census	153	144	20,044,266	64	9,018,430	44.4%	45.0%	
Express Energy	Light	Attempted Census	131	130	5,891,655	50	3,291,379	38.5%	55.9%	
	HVAC	Attempted Census	103	105	895,396	24	123,325	22.9%	13.8%	
	Motors	Attempted Census	57	52	85,170	11	12,066	21.2%	14.2%	
SBEA	Light	Census	38	30	4,942,287	14	2,260,001	46.7%	45.7%	1.56
		Strata 2	121	99	6,491,483	24	1,535,676	24.2%	23.7%	0.809
		Strata 3	434	379	6,108,840	112	1,330,186	29.6%	21.8%	0.745
	HVAC	Attempted Census	1	0	889	0	0	NA	NA	
	Refrigerator	Attempted Census	91	87	1,691,138	8	135,767	9.2%	8.0%	
Municipal	Lighting	Attempted Census	164	83	5,786,875	2	33,656	2.4%	0.6%	
	Other	Attempted Census	0	0	0	0	0	NA	NA	

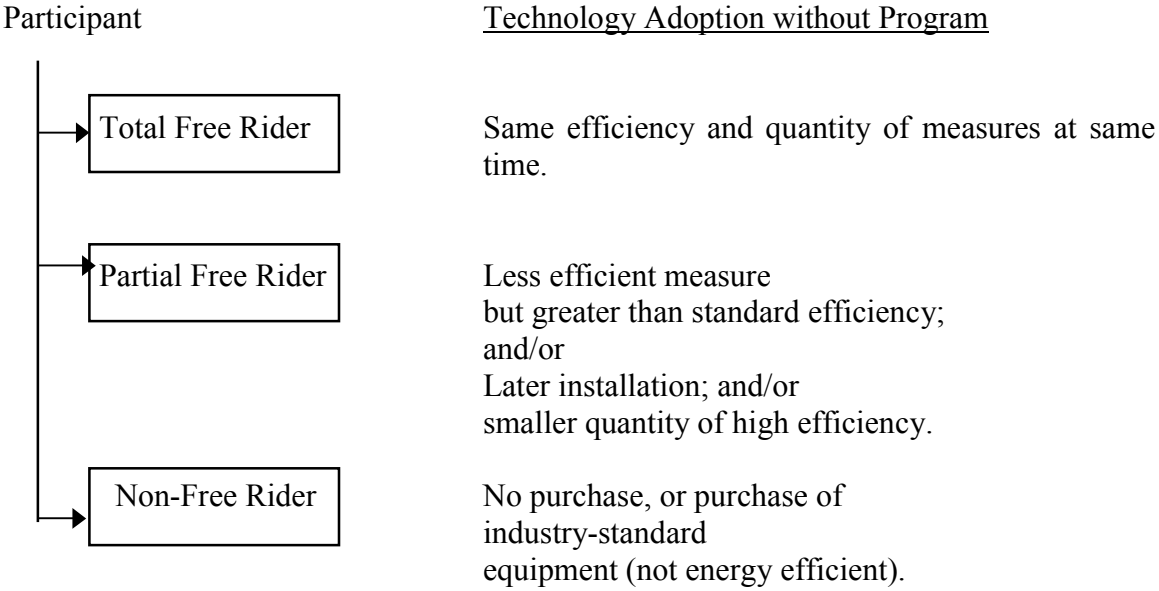
Program	Measure Group	Strata/ Attempted Census	Unique Participants	Starting Sample	Total kWh	Completed Surveys	Surveyed kWh	% Surveyed	% kWh Surveyed	Sample Weight
New Construction	Light	Attempted Census	107	81	19,560,667	18	3,381,567	22.2%	17.3%	
	HVAC	Attempted Census	82	55	8,776,920	8	773,755	14.5%	8.8%	
	Other	Attempted Census	49	42	4,206,840	10	1,587,143	23.8%	37.7%	
RFP	Light	Attempted Census	41	38	18,484,621	14	6,884,053	36.8%	37.2%	
	Other	Attempted Census	9	9	1,231,226	3	69,066	33.3%	5.6%	
O&M	Other	Attempted Census	13	11	2,560,698	5	748,160	45.5%	29.2%	
	HVAC	Attempted Census	4	2	757,581	0	0	0.0%	0.0%	

Sampling with stratified random sampling was planned for several program measure groups. In practice, an attempted census of all participants was required to achieve the established survey quotas for some program measure groups. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups. Larger sample sizes were sought for six of the largest program measure groups. The following program measures groups had sampling plans created for them with a goal of obtaining 66 completes: Express Lighting, SBEA Lighting, Custom—Other, Express HVAC, and New Construction Lighting. The New Construction HVAC sampling was designed with a goal of obtaining 62 completes.

Only the SBEA surveying employed the planned stratified random sampling methodology for the lighting measure group. Almost all commercial/industrial (C/I) programs are heterogeneous in their expected savings across participants. This means that the most efficient sampling design to achieve higher precision levels with lower sample sizes uses this fact to more heavily sample from the larger expected savers in the program database. We developed three sampling strata: a certainty strata (census attempt of the largest expected savers), strata 2, and strata 3. Table 9.1 above provides the number of unique participants, starting sample, completes, and the sampling weights for these strata based upon their completion statistics.

Free-ridership is the proportion of savings that would have occurred without the program's influences due to decision-makers that would have taken the same actions without the program. Free-ridership can range from 100% (Total Free-Rider) to 0% (Non-Free-Rider). The program could have some influence on the decision such as when the efficient equipment is purchased. This is one example of a partial free-rider. This continuum is shown in Figure 1.

Figure 1. Continuum of Free Riders



Free-ridership is estimated for each program and measure group based on the algorithms specified in the Standardized Method. The participant survey specified in the Standardized Method includes multiple questions to assess partial free-ridership and a number of questions designed as consistency checks.

Participant "like" spillover is estimated from responses to survey questions included in the participant survey that inquire about similar measures participants have installed without program assistance as a result of their experience with the program measures.

Per the Standardized Method, we weighted the free-ridership estimated for each individual decision-maker by the expected energy savings for that program measure group from that decision-maker to get the measure group free-ridership value.[33] In this way, the free ridership percentages can be directly applied to program savings to calculate the energy savings that would have occurred without the program intervention. We weighted participant spillover estimates in the same manner.

We calculated the net impact estimates from the participant surveys for each program measure group as one minus the program measure group's weighted free ridership rate and plus the program measure group's weighted participant spillover rate (1-FR+PS). Non-participant spillover (NPS) rate is added to this equation to get the program net impact for Large Commercial and Industrial program measures (1-FR+PS+NPS). As the components are already weighted by the respondents' expected savings, this rate can be applied to the expected program measure group savings from either the program database or from an impact evaluation study of actual savings to obtain net savings.

9.4 PARTICIPANT FREE-RIDERSHIP, SPILLOVER, AND NET IMPACT RATIOS

The free-ridership, participant like spillover percentages, and participant net impact factors by program measure group are presented in Table 9.2. The program level estimates are calculated as the sum of the measure group level estimates weighted (multiplied) by the proportion of the program savings represented by the measure group in the population. These program level estimates are also presented in Table 9.2.

[33] In the case of SBEA Lighting, the sampling strata weights as listed in Table 9.1 are also applied to ensure a proper representation for a program measure group estimate.

Table 9.2 Connecticut Light & Power Company's Net-to-Gross Rates by Program and Measure Group

Program	Measure Group	Unique Participants	Completed Surveys*	Free-Ridership (%)	Participant Spillover (%)	Participant Net Estimate (%)**	Standard Deviation@	Absolute Error Bound (+/- on Participant Net)#
Custom Services	Light	54	17	4.3	0.6	96.3	39.14	
	HVAC	21	6	7.1	1.6	94.5	45.61	
	Other	153	64	24.7	0.6	75.9	25.80	
	Overall Program	**205**	**87**	**15.7**	**0.7**	**85.0**	**29.90**	
Express Energy	Light	131	50	0.4	5.2	104.8	26.54	
	HVAC	103	24	5.0	0.0	95.0	31.59	
	Motors	57	11	5.0	4.5	99.5	33.49	
	Overall Program	**287**	**85**	**1.0**	**4.5**	**103.5**	**29.29**	
SBEA	Light	593	150	0.5	10.9	110.4	16.43	4.22
	HVAC	1	0	0.0	0.0	100.0	NA	
	Refrigerator	91	8	16.6	0.0	83.4	34.57	
	Overall Program	**602**	**158**	**1.9**	**10.0**	**108.0**	**18.07**	**1.79**
Municipal	Lighting	164	2	11.5	0.0	88.5	35.35	
	Other	0	0	0.0	0.0	100.0	NA	
	Overall Program	**164**	**2**	**11.5**	**0.0**	**88.5**	**35.35**	
New Construction	Light	107	18	5.4	1.0	95.6	39.06	
	HVAC	82	8	28.1	0.0	71.9	43.64	
	Other	49	10	24.5	1.3	76.9	52.89	
	Overall Program	**121**	**36**	**16.1**	**0.9**	**84.8**	**44.60**	

Program	Measure Group	Unique Participants	Completed Surveys*	Free-Ridership (%)	Participant Spillover (%)	Participant Net Estimate (%)**	Standard Deviation@	Absolute Error Bound (+/- on Participant Net)#
RFP	Light	41	14	0.5	17.5	117.1	26.71	
	Other	9	3	9.1	0.0	90.9	14.43	
	Overall Program	**43**	**17**	**1.0**	**16.4**	**115.4**	**25.37**	
O&M	Other	13	5	0.0	0.0	100.0	0.0	
	HVAC	4	0	0.0	0.0	100.0	NA	
	Overall Program	**17**	**5**	**0.0**	**0.0**	**100.0**	**0.0**	

* Completed surveys indicate the number of unique Program/Measure/Contact or Measure location combinations about which survey responses were provided. Note that program databases were aggregated to the level of common facility address and/or contact person for purposes of survey administration. As such, one completed interview may provide survey responses for more than one Program/Measure/Contact or Measure location.

** Participant net impact estimates are calculated as 1-FR+PS.

Standard deviations for each program measure group and at the program level are provided for the participant net impact factors. There is no sampling error for those measures where an attempted census was conducted. Sampling relative precision and error bounds statistics are, therefore, not meaningful for populations where an attempted census was conducted. Those measure groups where sampling was done contain a census attempt strata and stratified random samples. Given the presence of a census attempt strata, calculation of the error bound is based upon the chaining the effect on kWh and not through this standard deviation. The standard deviation is provided just to allow readers to see the differences in the variation in responses across the programs and measure groups.

Sampling statistics for precision, such as error bounds and relative precision are not meaningful for populations where an attempted census occurred. They have no sampling error. Therefore, error bounds are only presented for measures where sampling actually occurred. The error bound provides the range around the estimate for sampling precision that says we are 90% confidence that the estimate from the whole population (or repeated samples) would be within this range. The 90% error bound was calculated as: the sum of 1.645 * standard deviation (participant net impact % for each sample point in a sampling strata times their expected kWh)/ the sum of the (participant net impact % for each sample point in a sampling strata times their expected kWh) for all sample participants in the sample strata and census strata, recognizing there is no sampling error in the census strata. The error bounds are significantly reduced by the census attempt strata and census attempt measure groups. The error bound for the participant net impact percentage for the Small Business Energy Advantage (SBEA) Lighting measure group and SBEA program are presented in Table 9.2.

9.5 STUDY METHDOLOGY FOR NON-PARTICIPANT LIKE SPILLOVER

The program can influence vendors and design professionals by teaching them about and giving them experience with high efficiency equipment. It is possible that due to the program vendors and design professionals may more often recommend and install high efficiency equipment for customers who chose not to participate in the program. It is also possible that customers who have been influenced by the program in some way would ask the vendor to install high efficiency equipment but chose not to participate in the program. Non-participant "like" spillover rates adjust program savings to partially account for these circumstances. It is important to note that the Standardized Method is designed to measure only a portion of non-participant spillover. 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 non-participants to buy high efficiency products. This methodology is estimating non-participant like-measure spillover based on responses from design professionals and vendors participating in the programs during this particular year. It does not survey non-participating designers or vendors or non-participating customers.

We used the approach specified in the Standardized Method to estimate non-participant "like" spillover. The Standardized Method utilizes survey responses from the vendor survey

to assign a measure-specific non-participant spillover percentage to design professionals or vendors that participated in a given energy efficiency program for that measure. The vendor survey includes questions designed to capture information on proportion of equipment sold and/or installed by vendors that would meet program requirements for high efficiency equipment, the proportion of this equipment sold outside of the program, and the level of influence of the program on these sales. We estimated energy savings associated with non-participant spillover measures for each vendor using the appropriate spillover percentage and the kWh savings attributable to that vendor for a specific measure based on data presented in the program tracking database. We then aggregated vendor specific non-participant spillover savings to the program and measure group level and extrapolated the savings to the program level. The non-participant like spillover percentage is calculated as non-participant spillover savings divided by expected program savings.

CL&P had to do considerable data gathering from paper files in order to have sufficient vendor data to conduct the non-participant like spillover interviews. United Illuminating did not have sufficient vendor data to conduct the non-participant like spillover method according to the Standardized Method. Given this, the sponsors and evaluation team planned on using the results from the CL&P analysis for both Connecticut utilities.

9.6 NON-PARTICIPANT LIKE SPILLOVER FINDINGS

We completed interviews with a total of 14 vendors and design professionals. Table 9.3 below presents the number of surveys completed by measure group. Column D shows the surveyed kWh included in the analysis. Column F presents the program expected spillover savings for these measure groups for the surveyed vendors/design professionals in the program database. We used these expected savings to obtain vendor and measure-specific estimates of non-participant spillover for each surveyed vendor. The sum of these estimates by measure group is shown in Table 9.3. The ratio of these two savings estimates provides the non-participant like spillover percentage.

The findings from the 2005 study provide a non-participant like spillover percentage of 76.9% (0.77). National Grid (NGRID) (co-sponsor of this study) conducted a non-participant like spillover study in 2002 that obtained a rate of 9.2% (0.092) for 2001 program data and 6.1% (0.061) for 2002 program data. Earlier NGRID studies had also found non-participant spillover in the range of that found in the 2002 study. The very large differences in these estimates and the overwhelming impact using a non-participant spillover estimate of 77% would have on final savings estimates are such that doing so is not recommended without further study or other confirming research. Given this, we are not recommending that the findings from this study be used. We recommend instead that prior non-participant spillover estimates be used until one is estimated in a study that appears defensible or is thoroughly investigated and confirmed with other methodologies.

Table 9.3 CL&P 2004 Program Large Commercial and Industrial Non-Participant Like Spillover Results

A	B	C	D	E	F	G
Survey Categories	Program kWh Savings	Number of Firms Surveyed with kWh Savings/Number of Firms in Program with kWh Savings	Surveyed kWh Savings[1]	Surveyed Savings Coverage Rate (D/B)	Non-Participant Spillover from Surveyed Firms (kWh)[2]	Estimated Spillover Percent (F/D)
Light	62,915,261	3/92	1,463,430	2.3%	0	0.0%
HVAC	13,884,612	1/42	67,621	0.5%	67,621	100.0%
Motor	85,170	3/10	1,391,345	1633.6%	7,859	0.6%
Other	28,043,030	7/58	2,107,243	7.5%	3,790,470	179.9%
TOTAL	**104,928,073**	**14/181**	**5,029,639**	**4.8%**	**3,865,950**	**76.9%**

[1] The total surveyed kWh represents the total savings for all surveyed design professionals and surveyed vendors in the program tracking system database whose names suggested they were actual vendors, not participants.

[2] Net of "like" spillover for the customers associated with the surveyed design professionals/vendors, as identified from the participating customer survey.

9.7 REVISIONS TO THE SURVEY INSTRUMENT MEMO

This section presents the text of the memorandum outlining revisions made to the original participant survey instrument included in Appendix A of the Standardized Method prior to fielding it with CL&P customers. The memorandum presented below was developed and provided to CL&P for approval prior to commencing the participant survey effort.

This memorandum presents the proposed draft participant survey instrument to be fielded with CL&P customers for the purposes of calculating free-ridership and spillover rates based on the standardized method. The draft survey instrument is presented below. Minor revisions were made to the original survey instrument included in Appendix A of the Standardized Method. The specific revisions and justifications for those changes are presented below.

1. **Introduction (QI2) was abbreviated** – The introduction to the survey was revised slightly based on ODC's previous experience fielding this survey instrument. Each of the components of the original introduction is included in the revised survey (the sales concern, purpose of the survey, and timing) however we have abbreviated these components in an effort to maximize response rate. During training ODC interviewers are provided with the complete script included in the original survey to use as needed.
2. **Identification of decision maker (QR1-R3) was adjusted** – The standardized method was originally designed to ask respondents questions about as many as two measures installed through the same program. Because ODC will be asking respondents to respond to questions regarding a maximum of three measures installed through as many as three different CL&P programs, we have revised the sequence of questions used to confirm that we are speaking to the appropriate decision maker for each measure. The original

survey instrument is designed to identify the decision maker for each measure prior to completing the series of free-ridership and spillover questions for the first measure. Based on our experience fielding this survey instrument, and to accommodate situations where a participating facility may have installed multiple measures through different programs, we have revised the survey design to identify the decision maker for the first measure and complete all pertinent questions relevant to that measure prior to identifying the decision maker for the second and third measures. The survey instrument includes skip patterns designed to obtain contact information or responses to the series of free-ridership and spillover questions for each measure installed at each sampled facility.

3. **Technical Assessment questions revised (AP, AP1)** – We have modified the survey to account for the lack of information in program databases that identifies customers that conducted Technical Assessments (TA) or specifies TA incentive amounts. The revised survey instrument includes a question that asks respondents if they conducted a TA. Respondents answering "yes" are asked if they would have paid the full amount for the TA if the utility had not offered an incentive (assumed to be 50% of the total TA cost).
4. **Free ridership questions revised (ATXT3) –** We have modified the wording of free ridership questions to account for the fact that data regarding the total cost of the installed measures (Customer Cost + Utility Incentive) is not consistently available for all customers and all programs.
5. **Additional questions –** ODC has included a short series of general satisfaction questions (QPS1-PS4). These questions are optional and were included as an example of the supplemental questions included in the survey instruments approved by other sponsors.

VARIABLE LIST

<CONTN> = Customer Contact Name
<COMP> = Sponsor
<PROGRAM> = Program Name
<YEAR> = Program Year
<SNAME> = Customer/Facility Name
<ADD> = Service address where equipment was installed
<MEAS1> = End-use Category (i.e. lighting)
<DESC1> = Detailed Measure Description
<COST1> = Utility incentive for Measure 1

Draft Participant Survey Instrument

START

IF NO NAME-ASK FOR EQUIPMENT INSTALLATION DECISION MAKER

Hello, my name is __, and I'm calling on behalf of <COMP >. May I speak with <CONTN >? Are you the person at your firm/facility who was most involved in making the decision to install equipment through the <PROG > program in 2004?

ALTERNATE PHONE: <PHONE2 >

(1/2326)

Yes	01	=> QI2
No	02	=> QI1A
(Don't know/Refused)	99	

INT18

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2328)

Would not disclose decision maker ..... 18 D => END

I1a. Who at your company/facility did make the decision to install this equipment through the program?

TYPE '01' AND HIT ENTER TO TYPE IN CONTACT INFORMATION. 98= DON'T KNOW 99=REFUSED
ENTER HERE: @QI1A

NAME: @NM1

TITLE: @TT1

TELEPHONE NUMBER: @PH1

QI1A

CUSTOM SCREEN

(1/2330)

enter contact information 01
(Don't know) 98
(Refused) 99

INT19

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2442)

Not the decision maker ..... 19 D => END

QI2

I2. Do you work directly for <SNAME > or are you a contractor who provides design and/or installation services for <SNAME >?

(1/2444)

Work directly for company/Employee ..... 1 => TXT1
Vendor/Contractor ..... 2 => VTXT1
(Don't know) 3

INT20

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2445)

Don't know ..... 20 D => END

I'm with Opinion Dynamics, an independent research firm. On behalf of <COMP >, we are following up with customers who participated in its <PROG > program to learn about their experiences. You or someone at your facility may have received a letter letting you know about this call. I'm not selling you anything, I'd just like to ask about the equipment you installed at <ADD >.
Your responses will be confidential, and this should take about 15 minutes.

@txt1
PRESS 'ENTER' TWICE TO CONTINUE

TXT1

PRESS ENTER TWICE TO CONTINUE
SCREEN

(1/2447)

CONTINUE..... 1 D

TXT2

PRESS ENTER TWICE TO CONTINUE
I'd like to review the equipment you installed through the <PROG > program.

(1/2448)

CONTINUE..... 1 D

AR1

R1. Do you recall installing <MEAS1 > equipment through the <PROG > program in 2004?

(1/2449)

Yes	1	=> A1
No	2	
(This equipment was never installed)	3	=> ASK4
(Don't know/Refused)	4	

R1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your facility that would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

ASK4

=> BR1 else => QPS1 if CNT2=1

skips those whose equipment was never installed for first measure to second measure, or to QPS1 if there isn't a second measure.

(1/2562)

A1

1. Were you involved in the decision-making process at the design stage when the <MEAS1 > equipment was specified and agreed upon for this facility?

(1/2563)

Yes	1	=> A2
No	2	
(Don't know)	3	

A1A

1a. At what point in the process did you become involved?

(1/2564 -2566 -2568)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A1B

1b. What was your role?

(1/2570 -2572 -2574)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A2

READ LIST, RECORD ALL THAT APPLY

2. Some companies/facilities work with an outside professional as part of the project design phase. Which individuals were responsible for recommending or specifying the exact type of high efficiency <MEAS1 > equipment to install through the <PROG > program?

(1/2576 -2577 -2578 -2579 -2580 -2581)

Someone within my firm	1
Design professional	2
Contractor	3
Manufacturer's representative	4
Utility account manager	5
Someone else	6
(Don't know)	7
(Refused)	8

A3

=> +1 if A2=1

3. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did this person have on your company's/facility's decision to install high efficiency equipment so that it would qualify for the program?

(1/2582)

-1- No influence at all	1	=> AP
-2-	2	=> AP
-3-	3	=> AP
-4-	4	
-5- A very strong influence	5	
Don't know	6	=> AP

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?
01=YES 02=NO/REFUSED 03=NO OUTSIDE ADVISOR INVOLVED 98=DK
ENTER HERE: @A4

NAME: @ANM3
TITLE: @ATT3
COMPANY: @ACP3
ADDRESS: @AADD3

PHONE NUMBER: @APH3

A4

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?

(1/2583)

Yes Record contact information)	01		
No, refused to give this information	02		=> AP
No, no outside advisor involved	03		=> AP
(Don't know)	98	X	=> AP

AP

P. Did your facility conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

(1/2825)

Yes	1	
No	2	=> AP2
(Not sure)	3	=> AP2

AP1

=> +1 if AP=2,3

P1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at your facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If <COMP > had not paid a portion of the cost, would your company/facility have paid about the entire amount to have a similar Technical Assessment Study done within one year of when the study took place?

(1/2826)

Yes	1
No	2
(Don't know)	3

AP2

DO NOT READ LIST. PLEASE CHOOSE ALL THAT APPLY.

P2. What factors motivated your firm/facility to install this <MEAS1 > equipment through the <PROG > program in 2004?

(1/2827 -2829 -2831 -2833 -2835 -2837 -2839 -2841 -2843)

(To reduce maintenance costs)	01	
(To reduce initial purchase costs)	02	
(The program incentive)	03	
(The technical assistance offered)	04	
(To reduce energy bills/save money)	05	
(To improve efficiency/save energy)	06	
(Took the advice of my installer/designer/contractor/utility rep)	07	
(Because of my past program participation)	08	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

AP3

P3. Did your firm/facility have specific plans set aside to install any of this equipment before you talked with anyone about the program?

(1/2845)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
(Don't know)	4	=> ATXT3
(Refused)	5	=> ATXT3

AP4

P4. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of equipment for the <MEAS1 > equipment in order to qualify for the <PROG > program?

(1/2846)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
Don't know	4	=> ATXT3
Refused	5	=> ATXT3

P4A. What changes were necessary? (Choose as many as apply)
(PROBE FOR TIMING, QUANTITY AND EFFICIENCY - SEE BELOW)

01 = Installation occurred SOONER than planned
02 = Installation occurred LATER than planned
03 = Installed MORE equipment than was planned
04 = Installed LESS equipment than was planned
05 = Equipment was MORE efficient than planned
06 = Equipment was LESS efficient than planned
00 = Other changes/comments (open text window)
98 = Don't know
99 = Refused

ENTER HERE:@AP4A

AP4A

P4A. What changes were necessary? (CUSTOM SCREEN)

(1/2847 -2849 -2851 -2853 -2855 -2857 -2859)

(Installation occurred SOONER than planned)	01	
(Installation occurred LATER than planned)	02	
(Installed MORE equipment than planned)	03	
(Installed LESS equipment than planned)	04	
(Equipment was MORE efficient than planned)	05	
(Equipment was LESS efficient than planned)	06	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

ATXT3

=> +1 if COST1==0

PRESS ENTER TWICE TO CONTINUE

According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. You may have also received some technical assistance from a <COMP > rep, engineer, or equipment vendor; if you did, the program also may have contributed toward the cost of a study.

(1/2861)

CONTINUE	1	D

AF1

F1. If <COMP > had not paid a portion of the equipment cost OR provided any technical assistance or education through the <PROG > program, would your company/facility have purchased any <MEAS1 > equipment within one year of when it was installed?

(1/2862)

Yes	1	
No	2	=> AF8
Don't know	3	=> AF8

AF2

F2. Without the program incentive, technical assistance, or education, would your company/facility have purchased the EXACT SAME QUANTITY of <MEAS1 > equipment within one year?

(1/2863)

Yes ..... 1 => AF3
No 2
Don't know 3

AF2A

ENTER PERCENTAGE 0-100%, 998=DK/REF

F2a. What percent of this <MEAS1 > equipment do you think your company/facility would have purchased on its own within one year? (PROBE: Would you have purchased about one- fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

(1/2864)

$E 0 100
(DK/REF) 998

AF3

ENTER PERCENTAGE 0-100%, 998=DK/REF

F3. You said your company/facility would have installed at least some <MEAS1 > equipment on its own if the program had not been available. What percent of this equipment would have been of the same efficiency or higher efficiency as what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

(1/2867)

$E 0 100
(DK/REF) 998

AF4

=> +1 if AF2=2,3 OR (AF3<100 OR AF3=998)

F4. Now I want to focus on what it would have cost your company/facility to install this equipment on its own without the program. Do you think your company/facility would have paid the additional cost that the utility paid on top of the amount you already paid, to install the same quantity and efficiency of <MEAS1 > equipment within one year?

(1/2870)

Yes ..... 1 => AF8
No 2
Don't know 3

AF5

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998)

SELECT ALL THAT APPLY

F5. How would you have adjusted your purchase to accommodate the fact that you wouldn't have paid all of the costs? Would you have purchased less equipment, lower efficiency equipment, or done something else?

(1/2871 -2873 -2875)

Purchased less equipment	01	
Purchased lower efficiency of equipment	02	
(Done something else, specify)	00	O
(Don't know)	98	X

AF6

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

ENTER PERCENTAGE 0-100%, 998=DK/REF

F6. What percent of the <MEAS1 > equipment do you think your company/facility 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?)

(1/2877)

$E 0 100

(Don't know/Refused)	998

AF7

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

F7. What percent of the <MEAS1 > equipment that your company/facility would have purchased on its own would have been of a lower efficiency than what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)

(1/2880)

$E 0 100

(Don't know/Refused)	998

AF8

=> +1 if	(AF1=1 AND AF4=2,3) AND (AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98)

F8. Was the information or advice you received from a contractor, design team, utility rep, or an engineer a crucial factor in your decision to install this high efficiency equipment through the program at the time you did?

(1/2883)

No information received	1
Yes	2
No	3
(Don't know)	4

COMF9

=> * if	IF((AF1=2,3 AND (AP4=3 OR AF8=2)),1,0)

computes for qf9

(1/2884)

get qf9 1
do not get qf9 0

CO2F9

=> * if	IF((AF2=1 AND (AF3<100 OR AF3=998) AND AF4=1),1,0)

(1/2885)

get qf9 1
do not get qf9 0

AF9

=> AF10 if	COMF9=0 AND CO2F9=0

PRESS 'ENTER' TO OPEN TEXT WINDOW

F9. I'd like to better understand your purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on your decision to install the energy efficient <MEAS1 > equipment at the time you did?

(1/2886 -2888 -2890)

Open text window ..... 00 DO
(Don't know) ..... 98 X
(Refused) ..... 99 X

AF10

F10. Did your company/facility participate in any of <COMP >'s energy efficiency programs before you installed energy efficient equipment in 2004?

(1/2892)

Yes 1
No ..... 2 => AS1
(Don't know) ..... 3 => AS1

ASK3

=> AS1 else => +1 if	CNT2=1 OR CNT3=1

(1/2893)

AF11

PRESS ENTER TWICE TO CONTINUE

F11. 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/facility. There are no right or wrong answers; we just want your honest opinion.

(1/2894)

CONTINUE ..... 1 D

AF11A

REPEAT IF NECESSARY

F11a. The energy savings performance of equipment installed through the <PROG > program in earlier years was a primary reason why we decided to install energy efficient <MEAS1 > through the program in 2004. Do you agree or disagree with this statement?

(1/2895)

Disagree 1
Agree 2
(Don't know) 3

AF11B

REPEAT IF NECESSARY

F11b. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > program, and what we learned by participating in the program we asked our contractor to look into energy efficient options for <MEAS1 > when developing project plans in 2004.

Do you agree or disagree with this statement?

(1/2896)

Disagree 1
Agree 2
(Don't know) 3

AF11C

REPEAT IF NECESSARY

F11c. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > Program and what we learned by participating in the program we took into account the cost-effectiveness of energy efficient <MEAS1 > equipment when evaluating different options in 2004. Do you agree or disagree with this statement?

(1/2897)

Disagree 1
Agree 2
(Don't know) 3

AS1

S1. Now I'd like you to think of the time since you participated in the <PROG > program in 2004. Has your company purchased and installed any <MEAS1 > equipment on its own for this or other facilities served by <COMP >?

(1/2898)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

AS1A

S1a. Was this equipment of THE SAME EFFICIENCY LEVEL OR A HIGHER LEVEL OF EFFICIENCY as the equipment you installed through the program?

(1/2899)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

S2. About how much energy efficient <MEAS1 > equipment did your company/facility purchase on its own since participating in this program in 2004?

(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 amount as you installed through the program, twice as much as what you installed through the program or some other amount?

@AS2
ENTER NUMBER, USE 998 FOR DON'T KNOW/REFUSED

AS2

SCREEN

(1/2900)

$E 0 100
(Don't know/Refused) 998

AS3A

S3a. Did a recommendation by the contractor or designer who you worked with under the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2903)

Yes 1
No 2
(Don't know) 3

AS3B

S3b. Did your experience with the energy efficient equipment installed through the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2904)

Yes 1
No 2
(Don't know) 3

AS3C

S3c. Did your participation in any past program offered by another company influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2905)

Yes 1
No 2
(Don't know) 3

AS4

S4. Why didn't you purchase this <MEAS1 > equipment through an <COMP > program?

(1/2906 -2908 -2910 -2912 -2914 -2916 -2918 -2920 -2922 -2924 -2926 -2928)

(Too much paperwork)	01	
(Cost savings not worth the effort of applying)	02	
(Takes too long for approval)	03	
(The equipment would not qualify)	04	
(Vendor does not participate in program)	05	
(Outside other company's service territory)	06	
(No time - needed equipment immediately)	07	
(Thought the program ended)	08	
(Didn't know the equipment qualified under another program)	09	
(Just didn't think of it)	10	
(Unable to get rebate--unsure why	11	
(Other - specify)	00	O
(Don't know)	13	

AS4A

=> +1 if AS4 NOT=04

S4a. Why wouldn't the equipment qualify?

(1/2930 -2932 -2934)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

SKIP1

=> QPS1 else => +1 if CNT2=0

SKIPS TO QPS1 IF NO SECOND MEASURE

(1/2936)

[REPEATS QUESTIONS BEGINNING FROM AR1 FOR SECOND MEASURE – IF NO OTHER MEASURES ASKS OPTIONAL GENERAL SATISFACTION QUESTIONS PS1 – PS4]

VTXT1

I'm with Opinion Dynamics, an independent research firm. We have been hired to talk with some of the design professionals and contractors who were involved with the <PROGRAM> in <YEAR>. I'm not selling anything; I'd just like to ask you about the types of equipment that have been recommended, sold, or installed by your firm through this program in <YEAR>.

I'd also like to assure you that your responses will be kept confidential by <COMP> and that this should take less than 15 minutes.

For the next set of questions, I'd like to review the equipment you recommended or specified through the <PROGRAM> for <COMP>.

VR1. Do you recall recommending or specifying <MEAS1> for <SNAME> at <ADD> through the <PROGRAM> in <YEAR>?

1 Yes => VA1
2 No
3 This equipment was never installed [IF CNT2=0 SKIP TO PS1, REPEAT FOR MEAS2]
-8 DON'T KNOW

VR1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your firm who would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

INT 22

I'm sorry, we cannot include you in our study. Thank you for your time!

Don't Know =>END

VA1. First I'd like to ask you about your decisions to recommend/specify <MEAS1> through the <PROGRAM>. Were you involved in the decision-making process at the design stage when the <MEAS1> equipment was specified and agreed upon for this facility?

1. Yes [SKIP TO VA2]
2. No
3. (Don't know)

1a. At what point in the process did you become involved?
(Open end)
(Don't know)
(Refused)

1b. What was your role?
(Open end)
(Don't know)
(Refused)

VA2. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of <MEAS1> so that it would qualify for the program? _____
(NOTE: IF Q3 < 4 AND NO OTHER MEASURE, SKIP TO NON-PARTICIPANT SPILLOVER; ELSE SKIP TO P1)

The next set of questions ask about what you think your company would have recommended or specified for <COMP> if the utility had not offered the <PROGRAM> in <YEAR>.

VAP. To your knowledge, did <SNAME> conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

Yes..... 1
No..... 2 => VAP2
(Not sure) 3 => AP2

VAP1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at <SNAME>'s facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If the utility had not paid a portion of the cost, do you think <S_NAME> would have paid about the full amount to have a similar Technical Assessment Study done within one year of when the study took place?
1. Yes
2. No
3. Don't know

VAP2. As far as you know, did <S_NAME> have specific plans set aside to install any of this equipment before you talked with anyone about the program?
1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. (DK) [SKIP TO VATXT3]
5. (Refused) [SKIP TO VATXT3]

AP3. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of the <MEAS1> equipment in order to qualify for the <PROGRAM>?
1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. Don't know [SKIP TO VATXT3]
5. Refused [SKIP TO VATXT3]

AP3A. What changes were necessary?

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)
8. (Don't know)
9. (Refused)

VATXT3
According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. <S_NAME> may have also received some technical assistance from an <COMP> representative or a contribution toward the cost of a technical assessment study.

VF1 Would your company have recommended or specified any <MEAS1> to <S_NAME> within one year of when it was installed if they had not been able to receive this utility [contribution/incentive/rebate] or any technical assistance or education through the [program]?

1 Yes
2 No *(SKIP TO VF8)*
-8 DON'T KNOW *(SKIP TO VF8)*

VF2 Without the program [contribution/incentive/rebate], technical assistance or education, would your company have recommended or specified the exact same quantity of <MEAS1> for <S_NAME> within one year?

1 Yes *(SKIP TO VF3)*
2 No
-8 DON'T KNOW

VF2b What percent of this <MEAS1> do you think your company would have recommended/specified? (*PROBE:* Would you have recommended/specified about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

_____%
-8 DON'T KNOW

VF3 You said you would have recommended/specified at least some <MEAS1> for <S_NAME> if the program had not been available. What percent of this equipment that you would have recommended/specified would have been of the same efficiency or higher efficiency as what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

_____% *(IF RESPONSE NE 100% OR F2 NE 1 SKIP TO F10)*
-8 DON'T KNOW

(NOTE: IF VF1=1 AND VF2=1 AND VF3=100%, ASK VF4-VF7)

VF4 Now I want to focus on what it would have cost <S_NAME> to install this equipment on its own without the program. Do you think <S_NAME> would have paid the additional <COST1>, on top of the amount they already paid, to install the same quantity and efficiency of <MEAS1> within one year?

1 Yes *(SKIP TO VF8)*
2 No
-8 DON'T KNOW

VF5 How do you think <S_NAME> would have adjusted their purchase to accommodate the fact that they wouldn't have paid all of the costs? Would they have purchased less equipment, lower efficiency equipment, or done something else? *(INDICATE ALL THAT APPLY—ASK BOTH VF7 AND VF8 IF APPROPRIATE)*

1 Purchased less equipment *(ASK VF6)*
2 Purchased lower efficiency of equipment *(ASK VF7)*
3 Done something else *(SPECIFY AND SKIP TO VF10)*
8 Don't Know

VF6 What percent of the <MEAS1> do you think <S_NAME> would have purchased on its own at that same time? (*PROBE:* Would they have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what they installed through the program?)
_____% *(IF F5=2, SKIP TO VF7; ELSE SKIP TO VF10)*
-8 DON'T KNOW

VF7 What percent of the <MEAS1> that <S_NAME> would have purchased on its own would have been of a lower efficiency than what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)
_____% *(SKIP TO VF10)*
-8 DON'T KNOW *(SKIP TO VF10)*

(NOTE: ASK VF8 IF (VF1=2 OR VF1=-8) OR IF (VF1=1 AND VF2=1 AND VF3=100% AND VF4=1); ELSE SKIP TO VF10)

VF8 Was the technical assistance or advice you or another designer/vendor provided to <S_NAME> a crucial factor in their decision to install this high efficiency equipment through the program at the time they did?
0 NA, none received
1 Yes
2 No
-8 DON'T KNOW

(NOTE: ASK VF9 IF ((VF1=2 OR VF1=-8) AND (VP4=3 OR VF8=2)) OR IF ((VF1=1 AND VF2=1 AND VF3=100% AND VF4=1) AND (VP4=1 OR VP4=2 OR VF8=1)); ELSE SKIP TO VF10)

VF9 I'd like to better understand <S_NAME>'s purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on the installation of energy efficient <MEAS1>? *(RECORD VERBATIM THE CLARIFICATION—PROBE AS NEEDED TO UNDERSTAND REASON)*

VF10 On a scale of 1 to 5, with 1 being 'not at all important and 5 being 'very important', how important was your previous experience with a <COMP> program when making the decision to recommend or install <MEAS1>for this customer?

_____
-8 DON'T KNOW
-9 NA – No previous program experience

[ASK VNP1 FOR EVERY MEASURE GROUP IN PROGRAM BEFORE ASKING VNP2-VNP8.]

PS1. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your satisfaction with <COMP>'s <PROGRAM>.

1. Not at all satisfied [SKIP TO PS2B]
2. 2 [SKIP TO PS2B]
3. 3 [SKIP TO PS2B]
4. 4
5. Extremely satisfied
6. (DK) [SKIP TO PS2B]

GO TO PS2B if QPS1=1,2,3
PS2a. Why are you satisfied with the program?
Open text window
(Don't know)
(Refused)

GO TO PS3 if QPS1=4,5
PS2b. Why are you NOT satisfied with the program?
Open text window
(Don't know)
(Refused)

PS3. Do you have any other comments or suggestions for the program?
Open text window
(Don't know)
(Refused)

PS4. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your overall satisfaction with <COMP>.

1. Not at all satisfied
2. 2
3. 3
4. 4
5. Extremely satisfied
6. (DK)

END

That is all the questions I have for you. Thank you for your participation.

9.8 PARTICIPANT SATISFACTION

Respondents were asked to rate their satisfaction with the program and the company on a 5-point scale where 1 is *not at all satisfied* and 5 is *extremely satisfied*. These were supplemental questions not related to the calculation of free-ridership and spillover and in the interest of minimizing respondent fatigue, we only asked the supplemental questions once. As such if a respondent participated in multiple programs they were only asked the questions regarding one program. Respondents who were design or installation contractors for the customer were not asked these questions.

Table 9.4 Program Satisfaction
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
Small Business (n=63)	76%
Municipal (n=3)	100%
New Construction (n=13)	100%
Express Services (n=11)	100%
Custom Services (n=18)	100%
RFP (n=6)	100%
O&M (n=1)	100%

Nine out of ten (89%) customers (n=118) rated their overall satisfaction of CL&P a 4 or 5. Table 9.5 shows how respondents in each program rated their satisfaction of CL&P.

Table 9.5 Satisfaction with CL&P
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
Small Business (n=67)	85%
Municipal (n=3)	100%
New Construction (n=13)	92%
Express Services (n=11)	100%
Custom Services (n=18)	94%
RFP (n=5)	80%
O&M (n=1)	100%

9.9 SURVEY DISPOSITION

The tables below present the final disposition of the survey used for the participant survey effort by program and measure group. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups. In practice, an attempted census of all participants was required to achieve the established survey quotas for most program measure groups.

The tables below present the survey disposition by quota group developed per the original sampling plan. Survey quota groups were developed for each program measure group combination. Per the sampling plan, the quota group for each program measure group combination represented either a census attempt of all participants or a stratified random sample of participants, depending on the number of participants. To meet the precision requirements, it was deemed most important to ask respondents about measures for which the sample plan called for a census attempt first. As such, for each program, customers that installed a measure for which the sample plan called for an attempted census were assigned to the quota group for that program measure group. Data for that customer regarding the installation of other measures within the program, and participation in other programs, were aggregated such that our interviewers could gather as much data as possible in a single interview with the customer. In the tables below, the "Surveyed Measures" row reflects the number of unique *measure groups* about which respondents could be surveyed based on program tracking data. As customers may have installed more than one type of measure through a given program, the number of "Surveyed Measures" for each program measure group combination does not equate to the number of unique decision makers associated with that program measure group, but the total number of measure groups associated with those decision-makers.

A description of the counts presented in other rows of the disposition tables are presented below:

- Measure not Installed: The number of respondents indicating in their response to survey question R3 that the measure in question was not installed.
- No Knowledgeable Respondent: The number of respondents indicating that they were not familiar with the equipment in question and could not provide an alternate knowledgeable contact person for that measure.
- Unresponsive: The number of potential respondents who did not refuse to participate but did not respond to voicemail requests to participate, were not available for scheduled interviews, repeatedly asked that we call back another time, or otherwise could not make time available to complete the survey during the study period.
- Completed Surveys: The number of completed surveys in the specified program measure group.

Table 9.6 Survey Disposition – Custom Services Program

Custom Services	HVAC	Lighting	Other
Surveyed Measures	**13**	**34**	**140**
Not called	0	0	0
No working number	2	6	11
Measure Not installed	0	0	0
No knowledgeable respondent	2	3	7
Adjusted sample	**9**	**25**	**122**
Refusal	1	0	6
Language barrier	0	0	0
Unresponsive	2	8	52
Completed survey	**6**	**17**	**64**
Completed Surveys as a Percentage of Adjusted Sample	**67%**	**68%**	**52%**

Table 9.7 Survey Disposition – Express Energy Program

Express	HVAC	Lighting	Motors
Surveyed Measures	**108**	**123**	**46**
Not called	0	0	0
No working number	23	16	12
Measure Not installed	0	0	0
No knowledgeable respondent	25	12	6
Adjusted sample	**60**	**95**	**28**
Refusal	13	4	3
Language barrier	0	0	0
Unresponsive	23	41	14
Completed survey	**24**	**50**	**11**
Completed Surveys as a Percentage of Adjusted Sample	**40%**	**53%**	**39%**

Table 9.8 Survey Disposition – Municipal Program

MU	Lighting
Surveyed Measures	**79**
Not called	0
No working number	33
Measure Not installed	0
No knowledgeable respondent	14
Adjusted sample	**32**
Refusal	1
Language barrier	0
Unresponsive	29
Completed survey	**2**
Completed Surveys as a Percentage of Adjusted Sample	**6%**

Table 9.9 Survey Disposition – New Construction Program

New Construction	HVAC	Lighting	Other
Surveyed Measures	**50**	**80**	**41**
Not called	0	0	0
No working number	17	19	13
Measure Not installed	0	0	0
No knowledgeable respondent	5	14	4
Adjusted sample	**28**	**47**	**24**
Refusal	10	10	7
Language barrier	1	2	0
Unresponsive	9	17	7
Completed survey	**8**	**18**	**10**
Completed Surveys as a Percentage of Adjusted Sample	**29%**	**38%**	**42%**

Table 9.10 Survey Disposition – Operations and Maintenance Program

O&M	HVAC	Other	Process
Surveyed Measures	**3**	**1**	**9**
Not called	0	0	0
No working number	1	0	0
Measure Not installed	0	0	0
No knowledgeable respondent	0	0	1
Adjusted sample	**2**	**1**	**8**
Refusal	0	0	0
Language barrier	0	0	0
Unresponsive	2	1	3
Completed survey	**0**	**0**	**5**
Completed Surveys as a Percentage of Adjusted Sample	**0%**	**0%**	**63%**

Table 9.11 Survey Disposition – RFP Program

RFP	HVAC	Lighting	Other	Process
Surveyed Measures	**2**	**36**	**2**	**6**
Not called	0	0	0	0
No working number	1	6	0	1
Measure Not installed	0	0	0	0
No knowledgeable respondent	0	3	0	1
Adjusted sample	**1**	**27**	**2**	**4**
Refusal	0	2	0	0
Language barrier	0	0	0	0
Unresponsive	1	11	0	3
Completed survey	**0**	**14**	**2**	**1**
Completed Surveys as a Percentage of Adjusted Sample	**0%**	**52%**	**100%**	**25%**

Table 9.12 Survey Disposition – SBEA Program

SBEA	Lighting	HVAC	Ref
Surveyed Measures	**686**	**0**	**71**
Not called	279	0	0
No working number	66	0	17
Measure Not installed	0	0	0
No knowledgeable respondent	23	0	3
Adjusted sample	**318**	**0**	**51**
Refusal	29	0	4
Language barrier	5	0	3
Unresponsive	134	0	36
Completed survey	**150**	**0**	**8**
Completed Surveys as a Percentage of Adjusted Sample	**47%**	**0%**	**16%**

Table 9.13 Survey Disposition: CL&P Vendor Survey

	CT
Starting sample	**80**
Not called	0
No working number	19
Does not do work in state	0
Adjusted sample	**61**
Refusal	5
Language barrier	0
Unresponsive	42
Completed survey	**14**
Response Rate	**23%**

10. SUMMARY OF FINDINGS FOR UNITED ILLUMINATING

10.1 EXECUTIVE SUMMARY

Sections 10.1 through 10.6 of this chapter constitute the Executive Summary for this study consistent with what other utilities in this study used in their 2004 Energy Efficiency Annual Report filing. In order to be consistent with the material provided for the filings, the wording in these sections has not been modified, except in the case of section and table numbering for consistency and to differentiate the tables across chapters.

This report summarizes the findings from the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study for each of United Illuminating's (UI) commercial and industrial (C&I) programs. The purpose of this study was to assess program free-ridership, participant spillover and non-participant spillover for UI's Lost Opportunities, Retrofit, Small Business, and efforts with the Northeast Energy Efficiency Partnership (NEEP) and the C&I programs of the other sponsors.

This joint sponsor study was conducted for six New England sponsors including UI. Other sponsors include Unitil (Fitchburg Gas & Electric), Cape Light Compact (CLC), Western Massachusetts Electric Company (WMECo), Connecticut Light & Power (CL&P), and United Illuminating.

10.2 STUDY OBJECTIVES

The primary objective of the 2004 Commercial and Industrial Programs Free-ridership and Spillover Study was to assist the sponsors in quantifying the net-to-gross energy and demand savings ratio of their commercial and industrial programs based upon surveys with 2004 program participants and their associated vendors and design professionals. Megdal & Associates along with Opinion Dynamics Corporation (ODC) was hired to adapt and utilize the *Standardized Methods for Free Ridership and Spillover Evaluation* (referred to as the Standardized Method) as developed by PA Consulting under contract to the Massachusetts energy efficiency program sponsors as finalized on June 16, 2003. This provided a common consistent method across Massachusetts for the estimation of a net-to-gross ratio based upon estimating the extent of:

- **Program free-ridership (FR)** - The percentage of program participants (proportion of expected savings) deemed to be free-rider where a free-rider refers to a customer who received an incentive through an energy efficiency program who would have installed the same or smaller quantity of the same high efficiency measure on their own within one year 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 equipment purchase decision.
- **Participant "like" spillover (PS)** - Refers to the situation where a customer installed equipment through the program in the past year and then installed additional equipment of the same type due to program influences but without program support (technical assistance or incentives).
- **Non-participant "like" spillover (NPS)** - Refers to energy efficient measures installed by program non-participants due to the program's influence.

10.3 STUDY METHDOLOGY FOR PROGRAM NET IMPACT RATIOS

The Standardized Method is based upon conducting telephone surveys with program participants to derive participant free-ridership and participant "like" spillover estimates. In cases where program participants indicate that a design professional or equipment vendor was the primary decision maker for the project, surveys are conducted with the design professional or equipment vendor to produce these estimates. To estimate non-participant "like" spillover attributable to 2004 program activities, the Standardized Method employs interviews with participating design professionals and equipment vendors. We conducted the participant and design professional surveys used to estimate free-ridership and spillover attributable to the sponsors' programs between May and August of 2005.

This study was designed to obtain estimates for these net impact elements at the program and measure group level based on the application of the Standardized Method. For UI the programs examined in the study were the Lost Opportunities, Retrofit, Small Business, and NEEP programs. The measure groups examined within these programs are listed in Table 10.1 below.

UI provided the 2004 program databases containing all relevant program participation data for each application received for each program in 2004. These data were prepared for sample development by first aggregating applications by utility account number to determine the unique number of program participants (account numbers) for each program and measure group.[34]

For commercial and industrial customers there can be multiple account numbers at a single address or physical location. As UI's tracking database associates program applications and installed measures to specific account numbers, there can be cases where a single contact person may be the decision-maker for measures associated with multiple account numbers. At the same time, there can be one decision-maker for multiple sites such as for chain stores, multi-site industrial firms, school districts, etc. The participant survey is conducted with the primary decision-maker responsible for selecting the equipment installed through the program. The survey is designed to ascertain how they made their decisions to install the high efficiency equipment and the effect of the program on those decisions. To ensure that we obtained all of the information regarding all measures installed through the programs from each decision-maker interviewed and that none were contacted for surveying more than once, we conducted additional database efforts. This work included additional programming and manual data processing where necessary to identify likely cases where a single contact person was the primary decision-maker for program participation and measures installed across multiple sites or account numbers.

Where available, we used the customer contact name from the application as the first and most definitive means to identify multi-site decision-makers. Within a program and measure group we grouped applications with the same or different account numbers and/or facility

[34] Unique Participants as presented in Table 10.1 refers to the unique number of utility account numbers which could represent multiple applications for the same measure group in the same program.

addresses having the same contact name. When administering the survey we asked participants to respond to questions regarding as many as three measures installed across all UI programs for which they were the primary decision-maker. We never combined two sites that had different contact names, including cases where the participants were obviously part of a chain.

If there was no contact name in the database, then additional exams were made to identify potential multiple site decision-makers. The second exam was based on participant facility names that were identical across multiple locations or schools within a single town. The third was based upon facility addresses that were identical across multiple account numbers and those with different suite numbers but appeared to be managed by one of the suite firms.[35] The application of these grouping schemes to the program tracking data provided a list of unique program, measure group, and decision maker or physical location combinations for purposes of survey administration. This starting sample count is presented by program and measure group in Table 10.1 below.

The number of completed surveys presented in Table 10.1 represents the unique number of program, measure group, and decision maker or physical location combinations for which survey responses were gathered.[36] Note that one completed interview could account for more than one unique combination of program, measure group, and location.

Table 10.1 below presents the total number of unique participants, the starting sample, the number of completed surveys and associated kWh savings by UI program and measure group.

We conducted the participant and vendor surveys used to estimate free-ridership and spillover attributable to UI's C&I programs in July and August of 2005. All sampled customers were mailed a letter on utility letterhead in advance of the telephone call. This letter explained the purpose of the call, informed customers that someone would be calling them in the next couple of weeks to ask them some questions, and thanked them for their cooperation in advance. This methodology is recommended in the Standardized Method to help increase survey response rates.

Conducting surveys during the summer months, however, may have increased the difficulties in obtaining completed surveys. Prior studies that based on the Standardized Method have had these surveys conducted in the spring; a much better time to obtain responses given potential vacation schedules and associated staffing issues. Fielding surveys in the spring also allows the interviews to occur somewhat closer to when the decision had been made. By fielding a survey in the spring to gather information regarding program participation that occurred the prior calendar year implies that the equipment decisions were made between 4

[35] In cases where applications were combined based on facility name or address we verified that the contact was the primary decision-maker for program participation and measures installed for each of the grouped applications.

[36] Note that the number and percentage of completed surveys does not equate to a survey response rate. Response rate is calculated as the number of completed surveys divided by the adjusted starting sample where the adjusted started sample is equal to the starting sample less any invalid sample points (no working number, language barrier, no installed measures, no valid decision maker available). A complete survey disposition report is provided in the appendices to the full report.

and 16 months prior, depending on when participation occurred. Fielding the survey in mid-summer extended this period to between 8 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten.

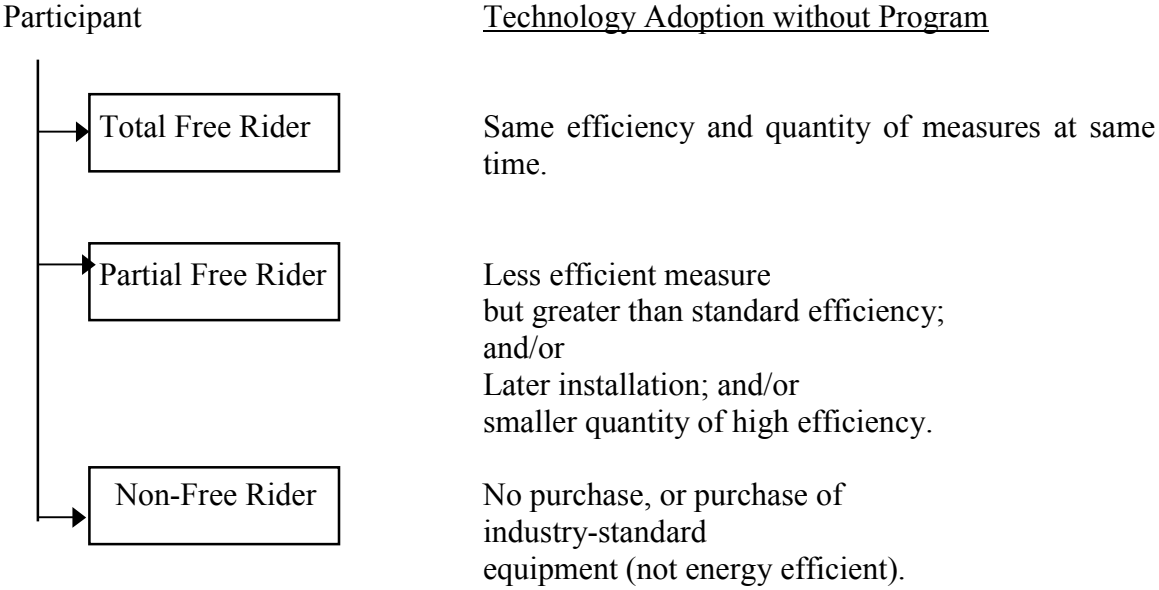
Table 10.1 UI's Unique Participants, Surveys Completed, Program and Sample kWh, and Sample Weights (where applicable)

	Measure Group	Strata/Attempted Census	Unique Participants	Starting Sample	Total kWh	Completed Surveys	Surveyed kWh	% Surveyed	% kWh Surveyed
Lost Opportunity	Light	Attempted Census	49	40	6,152,425	10	785,776	25.0%	12.8%
	Motor	Attempted Census	19	15	160,258	5	23,995	33.3%	15.0%
	Unitary	Attempted Census	16	11	462,852	3	50,285	27.3%	10.9%
	Water-GS HP	Attempted Census	1	0	28,763	0	0	0.0%	0.0%
	Air HP	Attempted Census	1	1	157,775	0	0	0.0%	0.0%
	Cool Other	Attempted Census	14	10	3,538,827	7	1,572,888	70.0%	44.4%
	VFD	Attempted Census	26	19	5,183,218	8	1,938,201	42.1%	37.4%
	Custom	Attempted Census	53	46	6,426,186	13	1,792,809	28.3%	27.9%
Retrofit	Light	Attempted Census	55	49	7,664,446	27	2,061,394	55.1%	26.9%
	Lighting Demand	Attempted Census	8	6	1,022,394	1	12,661	16.7%	1.2%
	AC Tune Up	Attempted Census	8	8	70,778	2	30,425	25.0%	43.0%
	Custom	Attempted Census	62	44	9,833,878	18	3,481,435	40.9%	35.4%
Small Business	Lighting	Attempted Census	200	163	3,760,062	57	1,248,510	35.0%	33.2%
	Non-Lighting	Attempted Census	66	54	639,061	16	177,073	29.6%	27.7%
NEEP	Motor	Attempted Census	20	20	60,904	12	17,583	60.0%	28.9%
	HVAC	Attempted Census	30	30	248,329	9	25,439	30.0%	10.2%

The sample plan specified stratified random sampling and a quota of 42 completed surveys for program measure groups with more than 50 participants and an attempted census for program measure groups with less than 50 participants. Based on this sample plan, the Lost Opportunity Lighting and Custom, Retrofit Lighting and Custom, and Small Business Lighting and Non-Lighting program measure groups required sampling with stratified random sampling. In practice, an attempted census of all participants was required to achieve the established survey quotas for these program measure groups. As such, sample weights were not required.

Free-ridership is the proportion of savings that would have occurred without the program's influences due to decision-makers that would have taken the same actions without the program. Free-ridership can range from 100% (Total Free-Rider) to 0% (Non-Free-Rider). The program could have some influence on the decision such as when the efficient equipment is purchased. This is one example of a partial free-rider. This continuum is shown in Figure 1.

Figure 1. Continuum of Free Riders



Free-ridership is estimated for each program and measure group based on the algorithms specified in the Standardized Method. The participant survey specified in the Standardized Method includes multiple questions to assess partial free-ridership and a number of questions designed as consistency checks.

Participant "like" spillover is estimated from responses to survey questions included in the participant survey that inquire about similar measures participants have installed without program assistance as a result of their experience with the program measures.

Per the Standardized Method, we weighted the free-ridership estimated for each individual decision-maker by the expected energy savings for that program measure group from that decision-maker to get the measure group free-ridership value. In this way, the free ridership percentages can be directly applied to program savings to calculate the energy savings that would have occurred without the program intervention. We weighted participant spillover estimates in the same manner.

We calculated the net impact estimates from the participant surveys for each program measure group as one minus the program measure group's weighted free ridership rate and plus the program measure group's weighted participant spillover rate (1-FR+PS). Non-participant spillover (NPS) rate is added to this equation to get the program net impact for Large Commercial and Industrial program measures (1-FR+PS+NPS). As the components are already weighted by the respondents' expected savings, this rate can be applied to the expected program measure group savings from either the program database or from an impact evaluation study of actual savings to obtain net savings.

10.4 PARTICIPANT FREE-RIDERSHIP, SPILLOVER, AND NET IMPACT RATIOS

The free-ridership, participant like spillover percentages, and participant net impact factors by program measure group are presented in Table 10.2. The program level estimates are calculated as the sum of the measure group level estimates weighted (multiplied) by the proportion of the program savings represented by the measure group in the population. These program level estimates are also presented in Table 10.2.

Standard deviations for each program measure group and at the program level are provided for the participant net impact factors. There is no sampling error for those measures where an attempted census was conducted. Sampling relative precision and error bounds statistics are, therefore, not meaningful for populations where an attempted census was conducted. The standard deviation is provided just to allow readers to see the differences in the variation in responses across the programs and measure groups.

The participant net rate for the Lost Opportunity Lighting program measure group is 17.4% for UI while rates for other UI programs range from 67% to 104%. The basic program design for UI's Lost Opportunity program is very similar to the CL&P New Construction program, which has a participant net rate of 95.6%. The dramatic differences in net rate for the Lighting measure group of the Lost Opportunity program is a function of the respondents on which this estimate is based. Ten (10) of the 40 participants in this program measure group responded to the participant survey and their responses were used to estimate free-ridership and spillover. Of these ten, two had a free-ridership rate of 100% based on the application of the Standardized Method and these two respondents had the largest expected savings, accounting for 82% of the surveyed kWh. As the free-ridership and spillover rates are weighted by expected savings, rates attributable to these two respondents play a large role in the program measure group estimate. In addition, there was also a third respondent with a free-ridership rate of 80%.

Table 10.2 United Illuminating's Net-to-Gross Rates by Program and Measure Group

Program	Measure Group	Unique Participants	Completed Surveys*	Free-Ridership (%)	Participant Spillover (%)	Participant Net Estimate (%)**	Standard Deviation
Lost Opportunity	Light	49	10	82.6%	0.0%	17.4%	46.0
	Motor	19	5	50.5%	17.1%	66.6%	82.6
	Unitary	16	3	0.0%	0.0%	100.0%	0
	Water-GS HP	1	0	NA	NA	NA	
	Air HP	1	0	NA	NA	NA	
	Cool Other	14	7	10.7%	0.0%	89.3%	41.1
	VFD	26	8	32.7%	5.4%	72.7%	38.7
	Custom	53	13	14.1%	2.3%	88.1%	25.6
	Overall Program	**116**	**33**	**36.8%**	**2.0%**	**65.2%**	**40.7**
Retrofit	Light	55	27	0.7%	0.0%	99.3%	2.4
	Lighting Demand	8	1	0.0%	0.0%	100.0%	
	AC Tune Up	8	2	0.0%	0.0%	100.0%	
	Custom	62	18	14.9%	18.9%	103.9%	27.8
	Overall Program	**121**	**42**	**8.2%**	**10.0%**	**101.8%**	**16.8**
Small Business	Lighting	200	57	0.5%	0.3%	99.7%	4.6
	Non-Lighting	66	16	0.0%	0.0%	100.0%	0
	Overall Program	**229**	**60**	**0.5%**	**0.2%**	**99.8%**	**4.1**
NEEP	Motor	20	12	12.6%	0.6%	88.0%	25.1
	HVAC	30	9	16.9%	0.0%	83.1%	43.7
	Overall Program	**49**	**21**	**16.1%**	**0.1%**	**84.0%**	**35.5**

* Completed surveys indicate the number of unique Program/Measure/Contact or Measure location combinations about which survey responses were provided. Note that program databases were aggregated to the level of common facility address and/or contact person for purposes of survey administration. As such, one completed interview may provide survey responses for more than one Program/Measure/Contact or Measure location.

** Participant net impact estimates are calculated as 1-FR+PS.

Small sample size and potentially non-response bias could be the reason for the different results. It is also possible that the same program design can obtain very different free ridership rates depending on how customer recruitment is conducted. A program can help lower its free ridership rate by aggressively marketing and selling itself to those customers that are more likely "fence sitters" or wouldn't take these actions without a real push and incentive. Marketing to green firms, easy sells, or not really selling and recruiting (just taking who comes in the door), alternatively, is likely to result in high free-ridership. A program can also purposefully avoid marketing to firms they know are already going to take these types of actions. This study did not include a non-response bias study design. Nor did it investigate the program marketing efforts. So we cannot ascertain if the much lower participant net impact rate for this one program measure group is an artifact of the sample or is an accurate representation of the net rates based upon the marketing efforts of the program.

Given this, we would recommend that this one lower program measure group rate not be used for program planning purposes. We think further investigation is warranted before one would take lighting measures out of the Lost Opportunity program given the good results seen at CL&P. However, this issue does warrant consideration at UI, where a process evaluation to specifically look at the marketing and recruiting effort of this program might prove helpful. Alternatively, another free-ridership study with those that didn't respond to this survey and/or the next year's participants might also be worthwhile.

10.5 STUDY METHDOLOGY FOR NON-PARTICIPANT LIKE SPILLOVER

The program can influence vendors and design professionals by teaching them about and giving them experience with high efficiency equipment. It is possible that due to the program vendors and design professionals may more often recommend and install high efficiency equipment for customers who chose not to participate in the program. It is also possible that customers who have been influenced by the program in some way would ask the vendor to install high efficiency equipment but chose not to participate in the program. Non-participant "like" spillover rates adjust program savings to partially account for these circumstances. It is important to note that the Standardized Method is designed to measure only a portion of non-participant spillover. 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 non-participants to buy high efficiency products. This methodology is estimating non-participant like-measure spillover based on responses from design professionals and vendors participating in the programs during this particular year. It does not survey non-participating designers or vendors or non-participating customers.

We used the approach specified in the Standardized Method to estimate non-participant "like" spillover. The Standardized Method utilizes survey responses from the vendor survey to assign a measure-specific non-participant spillover percentage to design professionals or vendors that participated in a given energy efficiency program for that measure. The vendor survey includes questions designed to capture information on proportion of equipment sold and/or installed by vendors that would meet program requirements for high efficiency

equipment, the proportion of this equipment sold outside of the program, and the level of influence of the program on these sales. We estimated energy savings associated with non-participant spillover measures for each vendor using the appropriate spillover percentage and the kWh savings attributable to that vendor for a specific measure based on data presented in the program tracking database. We then aggregated vendor specific non-participant spillover savings to the program and measure group level and extrapolated the savings to the program level. The non-participant like spillover percentage is calculated as non-participant spillover savings divided by expected program savings.

CL&P had to do considerable data gathering from paper files in order to have sufficient vendor data to conduct the non-participant like spillover interviews. United Illuminating did not have sufficient vendor data to conduct the non-participant like spillover method according to the Standardized Method. Given this, the sponsors and evaluation team planned on using the results from the CL&P analysis for both Connecticut utilities.

10.6 NON-PARTICIPANT LIKE SPILLOVER FINDINGS

We completed interviews with a total of 14 vendors and design professionals. Table 10.3 below presents the number of surveys completed by measure group. Column D shows the surveyed kWh included in the analysis. Column F presents the program expected spillover savings for these measure groups for the surveyed vendors/design professionals in the program database. We used these expected savings to obtain vendor and measure-specific estimates of non-participant spillover for each surveyed vendor. The sum of these estimates by measure group is shown in Table 10.3. The ratio of these two savings estimates provides the non-participant like spillover percentage.

The findings from the 2005 study provide a non-participant like spillover percentage of 76.9% (0.77). National Grid (NGRID) (another study sponsor) conducted a non-participant like spillover study in 2002 that obtained a rate of 9.2% (0.092) for 2001 program data and 6.1% (0.061) for 2002 program data. Earlier NGRID studies had also found non-participant spillover in the range of that found in the 2002 study. The very large differences in these estimates and the overwhelming impact using a non-participant spillover estimate of 77% would have on final savings estimates are such that doing so is not recommended without further study or other confirming research. Given this, we are not recommending that the findings from this study be used. We recommend instead that prior non-participant spillover estimates be used until one is estimated in a study that appears defensible or is thoroughly investigated and confirmed with other methodologies.

Table 10.3 CL&P 2004 Program Large Commercial and Industrial Non-Participant Like Spillover Results

A	B	C	D	E	F	G
Survey Categories	**Program kWh Savings**	**Number of Firms Surveyed with kWh Savings/Number of Firms in Program with kWh Savings**	**Surveyed kWh Savings[1]**	**Surveyed Savings Coverage Rate (D/B)**	**Non-Participant Spillover from Surveyed Firms (kWh)[2]**	**Estimated Spillover Percent (F/D)**
Light	62,915,261	3/92	1,463,430	2.3%	0	0.0%
HVAC	13,884,612	1/42	67,621	0.5%	67,621	100.0%
Motor	85,170	3/10	1,391,345	1633.6%	7,859	0.6%
Other	28,043,030	7/58	2,107,243	7.5%	3,790,470	179.9%
TOTAL	**104,928,073**	**14/181**	**5,029,639**	**4.8%**	**3,865,950**	**76.9%**

[1] The total surveyed kWh represents the total savings for all surveyed design professionals and surveyed vendors in the program tracking system database whose names suggested they were actual vendors, not participants.

[2] Net of "like" spillover for the customers associated with the surveyed design professionals/vendors, as identified from the participating customer survey.

10.7 REVISIONS TO THE SURVEY INSTRUMENT MEMO

This section presents the text of the memorandum outlining revisions made to the original participant survey instrument included in Appendix A of the Standardized Method prior to fielding it with UI customers. The memorandum presented below was developed and provided to UI for approval prior to commencing the participant survey effort.

This memorandum presents the proposed draft participant survey instrument to be fielded with United Illuminating customers for the purposes of calculating free-ridership and spillover rates based on the standardized method. The draft survey instrument is presented below. Minor revisions were made to the original survey instrument included in Appendix A of the Standardized Method. The specific revisions and justifications for those changes are presented below.

1. **Introduction (QI2) was abbreviated** – The introduction to the survey was revised slightly based on ODC's previous experience fielding this survey instrument. Each of the components of the original introduction is included in the revised survey (the sales concern, purpose of the survey, and timing) however we have abbreviated these components in an effort to maximize response rate. During training ODC interviewers are provided with the complete script included in the original survey to use as needed.
2. **Identification of decision maker (QR1-R3) was adjusted** – The standardized method was originally designed to ask respondents questions about as many as two measures installed through the same program. Because ODC will be asking respondents to respond to questions regarding a maximum of three measures installed through as many as three different UI programs, we have revised the sequence of questions used to confirm that we are speaking to the appropriate decision maker for each measure. The original survey

instrument is designed to identify the decision maker for each measure prior to completing the series of free-ridership and spillover questions for the first measure. Based on our experience fielding this survey instrument, and to accommodate situations where a participating facility may have installed multiple measures through different programs, we have revised the survey design to identify the decision maker for the first measure and complete all pertinent questions relevant to that measure prior to identifying the decision maker for the second and third measures. The survey instrument includes skip patterns designed to obtain contact information or responses to the series of free-ridership and spillover questions for each measure installed at each sampled facility.

3. **Detailed measure descriptions –** Per the syntax for the participant survey included in the Standardized Method, respondents are asked if they recall installing an energy efficient measure through the program where the measure description is simply the end-use category (lighting, air compressor, etc). If the respondent is uncertain or needs any further clarification, the survey programming skips to a text window that provides a detailed description of the measure installed. The survey calls for a detailed description of the measure only in cases where the respondent indicates that they do not recall installing the measure or do not know. Because the currently available UI program databases do not contain a detailed measure description, ODC will develop generic detailed descriptions for each measure or end-use category. For example, the lighting description may be: "Lighting equipment including fixtures and/or controls".
4. **Technical Assessment questions revised (AP, AP1)** – We have modified the survey to account for the lack of information in program databases that identifies customers that conducted Technical Assessments (TA) or specifies TA incentive amounts. The revised survey instrument includes a question that asks respondents if they conducted a TA. Respondents answering "yes" are asked if they would have paid the full amount for the TA if the utility had not offered an incentive (assumed to be 50% of the total TA cost).
5. **Free ridership questions revised (ATXT3) –** We have modified the wording of free ridership questions to account for a lack of data regarding the total cost of the installed measures (Customer Cost + Utility Incentive).
6. **Additional questions –** ODC has included a short series of general satisfaction questions (QPS1-PS4). These questions are optional and were included as an example of the supplemental questions included in the survey instruments approved by other sponsors.

VARIABLE LIST

<CONTN> = Customer Contact Name
<COMP> = Sponsor
<PROGRAM> = Program Name
<YEAR> = Program Year
<SNAME> = Customer/Facility Name
<ADD> = Service address where equipment was installed
<MEAS1> = End-use Category (i.e. lighting)
<DESC1> = Detailed Measure Description
<COST1> = Utility incentive for Measure 1

Draft Participant Survey Instrument

START

IF NO NAME-ASK FOR EQUIPMENT INSTALLATION DECISION MAKER

Hello, my name is __, and I'm calling on behalf of <COMP >. May I speak with <CONTN >? Are you the person at your firm/facility who was most involved in making the decision to install equipment through the <PROG > program in 2004?

ALTERNATE PHONE: <PHONE2 >

(1/2326)

Yes	01	=> QI2
No	02	=> QI1A
(Don't know/Refused)	99	

INT18

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2328)

Would not disclose decision maker	18	D	=> END

I1a. Who at your company/facility did make the decision to install this equipment through the program?

TYPE '01' AND HIT ENTER TO TYPE IN CONTACT INFORMATION. 98= DON'T KNOW 99=REFUSED

ENTER HERE: @QI1A

NAME: @NM1

TITLE: @TT1

TELEPHONE NUMBER: @PH1

QI1A

CUSTOM SCREEN

(1/2330)

enter contact information	01
(Don't know)	98
(Refused)	99

INT19

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2442)

Not the decision maker	19	D	=> END

QI2

I2. Do you work directly for <SNAME > or are you a contractor who provides design and/or installation services for <SNAME >?

(1/2444)

Work directly for company/Employee	1	=> TXT1
Vendor/Contractor	2	=> VTXT1
(Don't know)	3	

INT20

I'm sorry, we cannot include you in our study today. Thank you for your time!

(1/2445)

Don't know ..... 20 D => END

I'm with Opinion Dynamics, an independent research firm. On behalf of <COMP >, we are following up with customers who participated in its <PROG > program to learn about their experiences. You or someone at your facility may have received a letter letting you know about this call. I'm not selling you anything, I'd just like to ask about the equipment you installed at <ADD >.
Your responses will be confidential, and this should take about 15 minutes.

@txt1
PRESS 'ENTER' TWICE TO CONTINUE

TXT1

PRESS ENTER TWICE TO CONTINUE

SCREEN

(1/2447)

CONTINUE..... 1 D

TXT2

PRESS ENTER TWICE TO CONTINUE

I'd like to review the equipment you installed through the <PROG > program.

(1/2448)

CONTINUE..... 1 D

AR1

R1. Do you recall installing <MEAS1 > equipment through the <PROG > program in 2004?

(1/2449)

Yes..... 1 => A1
No 2
(This equipment was never installed) ..... 3 => ASK4
(Don't know/Refused)..... 4

R1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your facility that would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

ASK4

=> BR1 else => QPS1 if CNT2=1

skips those whose equipment was never installed for first measure to second measure, or to QPS1 if there isn't a second measure.

(1/2562)

A1

1. Were you involved in the decision-making process at the design stage when the <MEAS1 > equipment was specified and agreed upon for this facility?

(1/2563)

Yes	1	=> A2
No	2	
(Don't know)	3	

A1A

1a. At what point in the process did you become involved?

(1/2564 -2566 -2568)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A1B

1b. What was your role?

(1/2570 -2572 -2574)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

A2

READ LIST, RECORD ALL THAT APPLY

2. Some companies/facilities work with an outside professional as part of the project design phase. Which individuals were responsible for recommending or specifying the exact type of high efficiency <MEAS1 > equipment to install through the <PROG > program?

(1/2576 -2577 -2578 -2579 -2580 -2581)

Someone within my firm	1
Design professional	2
Contractor	3
Manufacturer's representative	4
Utility account manager	5
Someone else	6
(Don't know)	7
(Refused)	8

A3

=> +1 if A2=1

3. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did this person have on your company's/facility's decision to install high efficiency equipment so that it would qualify for the program?

(1/2582)

-1- No influence at all	1	=> AP
-2-	2	=> AP
-3-	3	=> AP
-4-	4	
-5- A very strong influence	5	
Don't know	6	=> AP

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?
01=YES 02=NO/REFUSED 03=NO OUTSIDE ADVISOR INVOLVED 98=DK
ENTER HERE: @A4

NAME: @ANM3
TITLE: @ATT3
COMPANY: @ACP3
ADDRESS: @AADD3

PHONE NUMBER: @APH3

A4

4. We would like to talk to the person who was most influential in recommending or specifying the efficient equipment to install through the program. This individual may be the project architect, engineer, equipment contractor, or the utility account manager. Could you give me the name and telephone number of this person?

(1/2583)

Yes Record contact information)	01		
No, refused to give this information	02		=> AP
No, no outside advisor involved	03		=> AP
(Don't know)	98	X	=> AP

AP

P. Did your facility conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

(1/2825)

Yes	1	
No	2	=> AP2
(Not sure)	3	=> AP2

AP1

=> +1 if AP=2,3

P1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at your facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If <COMP > had not paid a portion of the cost, would your company/facility have paid about the entire amount to have a similar Technical Assessment Study done within one year of when the study took place?

(1/2826)

Yes	1
No	2
(Don't know)	3

AP2

DO NOT READ LIST. PLEASE CHOOSE ALL THAT APPLY.

P2. What factors motivated your firm/facility to install this <MEAS1 > equipment through the <PROG > program in 2004?

(1/2827 -2829 -2831 -2833 -2835 -2837 -2839 -2841 -2843)

(To reduce maintenance costs)	01	
(To reduce initial purchase costs)	02	
(The program incentive)	03	
(The technical assistance offered)	04	
(To reduce energy bills/save money)	05	
(To improve efficiency/save energy)	06	
(Took the advice of my installer/designer/contractor/utility rep)	07	
(Because of my past program participation)	08	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

AP3

P3. Did your firm/facility have specific plans set aside to install any of this equipment before you talked with anyone about the program?

(1/2845)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
(Don't know)	4	=> ATXT3
(Refused)	5	=> ATXT3

AP4

P4. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of equipment for the <MEAS1 > equipment in order to qualify for the <PROG > program?

(1/2846)

Yes	1	
Yes, but don't remember specifics	2	=> ATXT3
No	3	=> ATXT3
Don't know	4	=> ATXT3
Refused	5	=> ATXT3

P4A. What changes were necessary? (Choose as many as apply)
(PROBE FOR TIMING, QUANTITY AND EFFICIENCY - SEE BELOW)

01 = Installation occurred SOONER than planned
02 = Installation occurred LATER than planned
03 = Installed MORE equipment than was planned
04 = Installed LESS equipment than was planned
05 = Equipment was MORE efficient than planned
06 = Equipment was LESS efficient than planned
00 = Other changes/comments (open text window)
98 = Don't know
99 = Refused

ENTER HERE:@AP4A

AP4A

P4A. What changes were necessary? (CUSTOM SCREEN)

(1/2847 -2849 -2851 -2853 -2855 -2857 -2859)

(Installation occurred SOONER than planned)	01	
(Installation occurred LATER than planned)	02	
(Installed MORE equipment than planned)	03	
(Installed LESS equipment than planned)	04	
(Equipment was MORE efficient than planned)	05	
(Equipment was LESS efficient than planned)	06	
(Other - specify)	00	O
(Don't know)	98	X
(Refused)	99	X

ATXT3

=> +1 if COST1==0

PRESS ENTER TWICE TO CONTINUE

According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. You may have also received some technical assistance from a <COMP > rep, engineer, or equipment vendor; if you did, the program also may have contributed toward the cost of a study.

(1/2861)

CONTINUE	1	D

AF1

F1. If <COMP > had not paid a portion of the equipment cost OR provided any technical assistance or education through the <PROG > program, would your company/facility have purchased any <MEAS1 > equipment within one year of when it was installed?

(1/2862)

Yes	1	
No	2	=> AF8
Don't know	3	=> AF8

AF2

F2. Without the program incentive, technical assistance, or education, would your company/facility have purchased the EXACT SAME QUANTITY of <MEAS1 > equipment within one year?

(1/2863)

Yes ..... 1 => AF3
No 2
Don't know 3

AF2A

ENTER PERCENTAGE 0-100%, 998=DK/REF

F2a. What percent of this <MEAS1 > equipment do you think your company/facility would have purchased on its own within one year? (PROBE: Would you have purchased about one- fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

(1/2864)

$E 0 100
(DK/REF) 998

AF3

ENTER PERCENTAGE 0-100%, 998=DK/REF

F3. You said your company/facility would have installed at least some <MEAS1 > equipment on its own if the program had not been available. What percent of this equipment would have been of the same efficiency or higher efficiency as what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

(1/2867)

$E 0 100
(DK/REF) 998

AF4

=> +1 if AF2=2,3 OR (AF3<100 OR AF3=998)

F4. Now I want to focus on what it would have cost your company/facility to install this equipment on its own without the program. Do you think your company/facility would have paid the additional cost that the utility paid on top of the amount you already paid, to install the same quantity and efficiency of <MEAS1 > equipment within one year?

(1/2870)

Yes ..... 1 => AF8
No 2
Don't know 3

AF5

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998)

SELECT ALL THAT APPLY

F5. How would you have adjusted your purchase to accommodate the fact that you wouldn't have paid all of the costs? Would you have purchased less equipment, lower efficiency equipment, or done something else?

(1/2871 -2873 -2875)

Purchased less equipment 01
Purchased lower efficiency of equipment 02
(Done something else, specify) ..... 00 O
(Don't know) ..... 98 X

AF6

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

ENTER PERCENTAGE 0-100%, 998=DK/REF

F6. What percent of the <MEAS1 > equipment do you think your company/facility 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?)

(1/2877)

$E 0 100
(Don't know/Refused) 998

AF7

=> +1 if	AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98

F7. What percent of the <MEAS1 > equipment that your company/facility would have purchased on its own would have been of a lower efficiency than what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)

(1/2880)

$E 0 100
(Don't know/Refused) 998

AF8

=> +1 if	(AF1=1 AND AF4=2,3) AND (AF2=2,3 OR (AF3<100 OR AF3=998) OR AF5=00,01,98)

F8. Was the information or advice you received from a contractor, design team, utility rep, or an engineer a crucial factor in your decision to install this high efficiency equipment through the program at the time you did?

(1/2883)

No information received 1
Yes 2
No 3
(Don't know) 4

COMF9

=> * if	IF((AF1=2,3 AND (AP4=3 OR AF8=2)),1,0)

computes for qf9

(1/2884)

get qf9 1
do not get qf9 0

CO2F9

=> * if	IF((AF2=1 AND (AF3<100 OR AF3=998) AND AF4=1),1,0)

(1/2885)

get qf9 1
do not get qf9 0

AF9

=> AF10 if	COMF9=0 AND CO2F9=0

PRESS 'ENTER' TO OPEN TEXT WINDOW

F9. I'd like to better understand your purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on your decision to install the energy efficient <MEAS1 > equipment at the time you did?

(1/2886 -2888 -2890)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

AF10

F10. Did your company/facility participate in any of <COMP >'s energy efficiency programs before you installed energy efficient equipment in 2004?

(1/2892)

Yes	1	
No	2	=> AS1
(Don't know)	3	=> AS1

ASK3

=> AS1 else => +1 if	CNT2=1 OR CNT3=1

(1/2893)

AF11

PRESS ENTER TWICE TO CONTINUE

F11. 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/facility. There are no right or wrong answers; we just want your honest opinion.

(1/2894)

CONTINUE	1	D

AF11A

REPEAT IF NECESSARY

F11a. The energy savings performance of equipment installed through the <PROG > program in earlier years was a primary reason why we decided to install energy efficient <MEAS1 > through the program in 2004. Do you agree or disagree with this statement?

(1/2895)

Disagree 1
Agree 2
(Don't know) 3

AF11B

REPEAT IF NECESSARY

F11b. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > program, and what we learned by participating in the program we asked our contractor to look into energy efficient options for <MEAS1 > when developing project plans in 2004.

Do you agree or disagree with this statement?

(1/2896)

Disagree 1
Agree 2
(Don't know) 3

AF11C

REPEAT IF NECESSARY

F11c. Because of our previous experience with the performance of energy efficient equipment installed through the <PROG > Program and what we learned by participating in the program we took into account the cost-effectiveness of energy efficient <MEAS1 > equipment when evaluating different options in 2004. Do you agree or disagree with this statement?

(1/2897)

Disagree 1
Agree 2
(Don't know) 3

AS1

S1. Now I'd like you to think of the time since you participated in the <PROG > program in 2004. Has your company purchased and installed any <MEAS1 > equipment on its own for this or other facilities served by <COMP >?

(1/2898)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

AS1A

S1a. Was this equipment of THE SAME EFFICIENCY LEVEL OR A HIGHER LEVEL OF EFFICIENCY as the equipment you installed through the program?

(1/2899)

Yes 1
No ..... 2 => SKIP1
(Don't know) ..... 3 => SKIP1

S2. About how much energy efficient <MEAS1 > equipment did your company/facility purchase on its own since participating in this program in 2004?

(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 amount as you installed through the program, twice as much as what you installed through the program or some other amount?

@AS2
ENTER NUMBER, USE 998 FOR DON'T KNOW/REFUSED

AS2

SCREEN

(1/2900)

$E 0 100
(Don't know/Refused) 998

AS3A

S3a. Did a recommendation by the contractor or designer who you worked with under the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2903)

Yes 1
No 2
(Don't know) 3

AS3B

S3b. Did your experience with the energy efficient equipment installed through the <PROG > program influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2904)

Yes 1
No 2
(Don't know) 3

AS3C

S3c. Did your participation in any past program offered by another company influence your decision to install some or all this efficient <MEAS1 > equipment on your own?

(1/2905)

Yes 1
No 2
(Don't know) 3

AS4

S4. Why didn't you purchase this <MEAS1 > equipment through an <COMP > program?

(1/2906 -2908 -2910 -2912 -2914 -2916 -2918 -2920 -2922 -2924 -2926 -2928)

(Too much paperwork)	01	
(Cost savings not worth the effort of applying)	02	
(Takes too long for approval)	03	
(The equipment would not qualify)	04	
(Vendor does not participate in program)	05	
(Outside other company's service territory)	06	
(No time - needed equipment immediately)	07	
(Thought the program ended)	08	
(Didn't know the equipment qualified under another program)	09	
(Just didn't think of it)	10	
(Unable to get rebate--unsure why	11	
(Other - specify)	00	O
(Don't know)	13	

AS4A

=> +1 if AS4 NOT=04

S4a. Why wouldn't the equipment qualify?

(1/2930 -2932 -2934)

Open text window	00	DO
(Don't know)	98	X
(Refused)	99	X

SKIP1

=> QPS1 else => +1 if CNT2=0

SKIPS TO QPS1 IF NO SECOND MEASURE

(1/2936)

[REPEATS QUESTIONS BEGINNING FROM AR1 FOR SECOND MEASURE – IF NO OTHER MEASURES ASKS OPTIONAL GENERAL SATISFACTION QUESTIONS PS1 – PS4]

VTXT1

I'm with Opinion Dynamics, an independent research firm. We have been hired to talk with some of the design professionals and contractors who were involved with the <PROGRAM> in <YEAR>. I'm not selling anything; I'd just like to ask you about the types of equipment that have been recommended, sold, or installed by your firm through this program in <YEAR>.

I'd also like to assure you that your responses will be kept confidential by <COMP> and that this should take less than 15 minutes.

For the next set of questions, I'd like to review the equipment you recommended or specified through the <PROGRAM> for <COMP>.

VR1. Do you recall recommending or specifying <MEAS1> for <SNAME> at <ADD> through the <PROGRAM> in <YEAR>?

1	Yes	=> VA1
2	No	
3	This equipment was never installed	[IF CNT2=0 SKIP TO PS1, REPEAT FOR MEAS2]
-8	DON'T KNOW	

VR1a. The <MEAS1 >
equipment included...
<DES11 >
<DES12 >
<DES13 >
<DES14 >
<DES15 >
<des16 >
<des17 >.
Is there someone else at your firm who would be more familiar with this equipment? 00=Respondent remembers-continue
01=YES (ENTER CONTACT INFO)
02=NO
98=DON'T KNOW ENTER HERE: @AR1a
99=REFUSED
(ENTER CONTACT INFORMATION)
NAME: @ANM2
TITLE: @ATT2
PHONE: @APH2

AR1A

SCREEN

(1/2450)

(Respondent remembers-continue)	00		=> A1
Yes, record contact information	01		
no	02		=> ASK4
(Don't know)	98	X	=> ASK4
(Refused)	99	X	=> ASK4

INT 22

I'm sorry, we cannot include you in our study. Thank you for your time!

Don't Know =>END

VA1. First I'd like to ask you about your decisions to recommend/specify <MEAS1> through the <PROGRAM>. Were you involved in the decision-making process at the design stage when the <MEAS1> equipment was specified and agreed upon for this facility?

1. Yes [SKIP TO VA2]
2. No
3. (Don't know)

1a. At what point in the process did you become involved?
(Open end)
(Don't know)
(Refused)

1b. What was your role?
(Open end)
(Don't know)
(Refused)

VA2. On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of <MEAS1> so that it would qualify for the program? _____
(NOTE: IF Q3 < 4 AND NO OTHER MEASURE, SKIP TO NON-PARTICIPANT SPILLOVER; ELSE SKIP TO P1)

The next set of questions ask about what you think your company would have recommended or specified for <COMP> if the utility had not offered the <PROGRAM> in <YEAR>.

VAP. To your knowledge, did <SNAME> conduct a Technical Assessment study to determine the cost-effectiveness of installing <MEAS1 > equipment? (NOTE: This is a significant study of specific measures, not a facility audit?)

Yes..... 1
No..... 2 => VAP2
(Not sure) 3 => AP2

VAP1. <COMP > paid about 50% of the total cost to conduct a Technical Assessment Study at <SNAME>'s facility to determine the cost-effectiveness of installing <MEAS1 > equipment. If the utility had not paid a portion of the cost, do you think <S_NAME> would have paid about the full amount to have a similar Technical Assessment Study done within one year of when the study took place?
1. Yes
2. No
3. Don't know

VAP2. As far as you know, did <S_NAME> have specific plans set aside to install any of this equipment before you talked with anyone about the program?
1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. (DK) [SKIP TO VATXT3]
5. (Refused) [SKIP TO VATXT3]

AP3. Was it necessary to change the timing of the installation, the quantity of equipment or the efficiency level of the <MEAS1> equipment in order to qualify for the <PROGRAM>?
1. Yes
2. Yes, but don't remember specifics [SKIP TO VATXT3]
3. No [SKIP TO VATXT3]
4. Don't know [SKIP TO VATXT3]
5. Refused [SKIP TO VATXT3]

AP3A. What changes were necessary?

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)
8. (Don't know)
9. (Refused)

VATXT3
According to our records, <COMP > paid about <COST1 > of the total cost for all <MEAS1 > equipment installed through the program. <S_NAME> may have also received some technical assistance from an <COMP> representative or a contribution toward the cost of a technical assessment study.

VF1 Would your company have recommended or specified any <MEAS1> to <S_NAME> within one year of when it was installed if they had not been able to receive this utility [contribution/incentive/rebate] or any technical assistance or education through the [program]?

1 Yes
2 No *(SKIP TO VF8)*
-8 DON'T KNOW *(SKIP TO VF8)*

VF2 Without the program [contribution/incentive/rebate], technical assistance or education, would your company have recommended or specified the exact same quantity of <MEAS1> for <S_NAME> within one year?

1 Yes *(SKIP TO VF3)*
2 No
-8 DON'T KNOW

VF2b What percent of this <MEAS1> do you think your company would have recommended/specified? (*PROBE:* Would you have recommended/specified about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

_____%
-8 DON'T KNOW

VF3 You said you would have recommended/specified at least some <MEAS1> for <S_NAME> if the program had not been available. What percent of this equipment that you would have recommended/specified would have been of the same efficiency or higher efficiency as what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

_____% *(IF RESPONSE NE 100% OR F2 NE 1 SKIP TO F10)*
-8 DON'T KNOW

(NOTE: IF VF1=1 AND VF2=1 AND VF3=100%, ASK VF4-VF7)

VF4 Now I want to focus on what it would have cost <S_NAME> to install this equipment on its own without the program. Do you think <S_NAME> would have paid the additional <COST1>, on top of the amount they already paid, to install the same quantity and efficiency of <MEAS1> within one year?

1 Yes *(SKIP TO VF8)*
2 No
-8 DON'T KNOW

VF5 How do you think <S_NAME> would have adjusted their purchase to accommodate the fact that they wouldn't have paid all of the costs? Would they have purchased less equipment, lower efficiency equipment, or done something else? *(INDICATE ALL THAT APPLY—ASK BOTH VF7 AND VF8 IF APPROPRIATE)*

1 Purchased less equipment *(ASK VF6)*
2 Purchased lower efficiency of equipment *(ASK VF7)*
3 Done something else *(SPECIFY AND SKIP TO VF10)*
8 Don't Know

VF6 What percent of the <MEAS1> do you think <S_NAME> would have purchased on its own at that same time? (*PROBE:* Would they have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what they installed through the program?)
_____% *(IF F5=2, SKIP TO VF7; ELSE SKIP TO VF10)*
-8 DON'T KNOW

VF7 What percent of the <MEAS1> that <S_NAME> would have purchased on its own would have been of a lower efficiency than what was installed through the program? (*PROBE:* Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)
_____% *(SKIP TO VF10)*
-8 DON'T KNOW *(SKIP TO VF10)*

(NOTE: ASK VF8 IF (VF1=2 OR VF1=-8) OR IF (VF1=1 AND VF2=1 AND VF3=100% AND VF4=1); ELSE SKIP TO VF10)

VF8 Was the technical assistance or advice you or another designer/vendor provided to <S_NAME> a crucial factor in their decision to install this high efficiency equipment through the program at the time they did?
0 NA, none received
1 Yes
2 No
-8 DON'T KNOW

(NOTE: ASK VF9 IF ((VF1=2 OR VF1=-8) AND (VP4=3 OR VF8=2)) OR IF ((VF1=1 AND VF2=1 AND VF3=100% AND VF4=1) AND (VP4=1 OR VP4=2 OR VF8=1)); ELSE SKIP TO VF10)

VF9 I'd like to better understand <S_NAME>'s purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on the installation of energy efficient <MEAS1>? *(RECORD VERBATIM THE CLARIFICATION—PROBE AS NEEDED TO UNDERSTAND REASON)*

VF10 On a scale of 1 to 5, with 1 being 'not at all important and 5 being 'very important', how important was your previous experience with a <COMP> program when making the decision to recommend or install <MEAS1>for this customer?

_____
-8 DON'T KNOW
-9 NA – No previous program experience

[ASK VNP1 FOR EVERY MEASURE GROUP IN PROGRAM BEFORE ASKING VNP2-VNP8.]

PS1. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your satisfaction with <COMP>'s <PROGRAM>.

1. Not at all satisfied [SKIP TO PS2B]
2. 2 [SKIP TO PS2B]
3. 3 [SKIP TO PS2B]
4. 4
5. Extremely satisfied
6. (DK) [SKIP TO PS2B]

GO TO PS2B if QPS1=1,2,3
PS2a. Why are you satisfied with the program?
Open text window
(Don't know)
(Refused)

GO TO PS3 if QPS1=4,5
PS2b. Why are you NOT satisfied with the program?
Open text window
(Don't know)
(Refused)

PS3. Do you have any other comments or suggestions for the program?
Open text window
(Don't know)
(Refused)

PS4. On a scale of 1 to 5, where 1 is not at all satisfied and 5 is extremely satisfied, please rate your overall satisfaction with <COMP>.

1. Not at all satisfied
2. 2
3. 3
4. 4
5. Extremely satisfied
6. (DK)

END

That is all the questions I have for you. Thank you for your participation.

10.8 PARTICIPANT SATISFACTION

Respondents were asked to rate their satisfaction with the program and the company on a 5-point scale where 1 is *not at all satisfied* and 5 is *extremely satisfied*. These were supplemental questions not related to the calculation of free-ridership and spillover and in the interest of minimizing respondent fatigue, we only asked the supplemental questions once. As such if a respondent participated in multiple programs they were only asked the questions regarding one program. Respondents who were design or installation contractors for the customer were not asked these questions.

Table 10.4 Program Satisfaction
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
C&I Retrofit (n=10)	90%
Lost Opportunity (n=21)	100%
Small Business (n=15)	87%
NEEP Cool Choice (n=1)	100%

Nine out of ten (91%) customers (n=46) rated their overall satisfaction of UI was a 4 or 5. Table 10.5 shows how respondents in each program rated their satisfaction of UI.

Table 10.5 Satisfaction with UI
(percentage rating a 4 or 5 on a 5-point satisfaction scale)

Program	% Satisfied
C&I Retrofit (n=10)	90%
Lost Opportunity (n=20)	95%
Small Business (n=15)	87%
NEEP Cool Choice (n=1)	100%

10.9 SURVEY DISPOSITION

The tables below present the final disposition of the survey used for the participant survey effort by program and measure group. The sample plan specified quotas of 42 completed surveys (or an attempted census for program measure groups with less than 50 participants) for most program measure groups. In practice, an attempted census of all participants was required to achieve the established survey quotas for most program measure groups.

The tables below present the survey disposition by quota group developed per the original sampling plan. Survey quota groups were developed for each program measure group combination. Per the sampling plan, the quota group for each program measure group combination represented either a census attempt of all participants or a stratified random sample of participants, depending on the number of participants. To meet the precision requirements, it was deemed most important to ask respondents about measures for which the sample plan called for a census attempt first. As such, for each program, customers that installed a measure for which the sample plan called for an attempted census were assigned to the quota group for that program measure group. Data for that customer regarding the installation of other measures within the program, and participation in other programs, were aggregated such that our interviewers could gather as much data as possible in a single interview with the customer. In the tables below, the "Surveyed Measures" row reflects the number of unique *measure groups* about which respondents could be surveyed based on program tracking data. As customers may have installed more than one type of measure through a given program, the number of "Surveyed Measures" for each program measure group combination does not equate to the number of unique decision makers associated with that program measure group, but the total number of measure groups associated with those decision-makers.

A description of the counts presented in other rows of the disposition tables are presented below:

- Measure not Installed: The number of respondents indicating in their response to survey question R3 that the measure in question was not installed.
- No Knowledgeable Respondent: The number of respondents indicating that they were not familiar with the equipment in question and could not provide an alternate knowledgeable contact person for that measure.
- Unresponsive: The number of potential respondents who did not refuse to participate but did not respond to voicemail requests to participate, were not available for scheduled interviews, repeatedly asked that we call back another time, or otherwise could not make time available to complete the survey during the study period.
- Completed Surveys: The number of completed surveys in the specified program measure group.

Table 10.6 Survey Disposition – Lost Opportunities Program

Lost Opportunities	Custom	Lighting	Motors	VSD	Unitary	Air HP	Cool Other
Surveyed Measures	**37**	**34**	**13**	**16**	**11**	**1**	**10**
Not Called	0	0	0	0	0	0	0
No Working Number	3	4	2	2	0	0	0
Measure Not Installed	1	0	0	0	0	0	0
No Knowledgeable Respondent	1	6	1	2	2	0	1
Adjusted Sample	**32**	**24**	**10**	**12**	**9**	**1**	**9**
Refusal/Mid Terminate	8	4	1	2	1	1	1
Language Barrier	1	0	0	0	0	0	0
Unresponsive	10	10	4	2	5	0	1
Completed Surveys	**13**	**10**	**5**	**8**	**3**	0	**7**
Completed Surveys as a Percentage of Adjusted Sample	**41%**	**42%**	**50%**	**67%**	**33%**	**0%**	**78%**

Table 10.7 Survey Disposition – Retrofit Program

Retrofit	Lighting	Lighting Demand	AC Tune Up	Custom
Surveyed Measures	**45**	**6**	**7**	**39**
Not Called	0	0	0	0
No Working Number	1	0	0	2
Measure Not Installed	0	0	0	0
No Knowledgeable Respondent	3	0	1	4
Adjusted Sample	**41**	**6**	**6**	**33**
Refusal/Mid Terminate	7	4	1	4
Language Barrier	0	0	0	0
Unresponsive	7	1	3	11
Completed Surveys	**27**	**1**	**2**	**18**
Completed Surveys as a Percentage of Adjusted Sample	**66%**	**17%**	**33%**	**55%**

Table 10.8 Survey Disposition – Small Business Services Program

Small Business Services	Lighting	Other
Surveyed Measures	**159**	**51**
Not Called	0	0
No Working Number	14	11
Measure Not Installed	1	1
No Knowledgeable Respondent	9	6
Adjusted Sample	**135**	**33**
Refusal/Mid Terminate	20	5
Language Barrier	2	2
Unresponsive	56	10
Completed Surveys	**57**	**16**
Completed Surveys as a Percentage of Adjusted Sample	**42%**	**48%**

Table 10.9 Survey Disposition – Retrofit Program

NEEP	Motors	HVAC
Surveyed Measures	**17**	**27**
Not Called	0	0
No Working Number	0	4
Measure Not Installed	0	1
No Knowledgeable Respondent	1	2
Adjusted Sample	**16**	**20**
Refusal/Mid Terminate	3	6
Language Barrier	0	0
Unresponsive	1	5
Completed Surveys	**12**	**9**
Completed Surveys as a Percentage of Adjusted Sample	**75%**	**45%**

Table 10.10 Survey Disposition: CL&P Vendor Survey

	CT
Starting sample	**80**
Not called	0
No working number	19
Does not do work in state	0
Adjusted sample	**61**
Refusal	5
Language barrier	0
Unresponsive	42
Completed survey	**14**
Response Rate	**23%**

11. RECOMMENDATIONS TO CONSIDER FOR FUTURE IMPROVEMENTS TO THE STANDARDIZED METHOD AND ITS IMPLEMENTATION

Conducting surveys during the summer months may have increased the difficulties in obtaining completed surveys. Prior studies for National Grid have had these surveys conducted in the spring; a much better time to obtain responses given potential vacation schedules and associated staffing issues. The spring surveys also allowed the interviews to occur somewhat closer to when the decision had been made. By fielding a survey in the spring to gather information regarding program participation that occurred the prior calendar year implies that the equipment decisions were made between 4 and 16 months prior, depending on when participation occurred. Fielding the survey in mid-summer extended this period to between 8 and 20 months prior. This increases the probability that the decision-maker may no longer work for the participating firm or that details regarding the decision to participate are forgotten.

We recommend that at a minimum the surveys be conducted to avoid the summer months (or winter holidays). If the surveys were to be a regular activity, consideration should be made of conducting half the sample in spring and half in fall so interviews occur within two to eight months after the decision instead of a year later.

While working with National Grid on comparing methodologies and results from prior work, we discovered that for prior studies, National Grid account representatives played a role in providing improved or additional customer contact information in cases where accurate contact information were not available, the customer contact identified in the program database was unresponsive, or alternate contacts were necessary. Account representatives did not provide such support for the current study. The program databases provided by the Sponsors varied in terms of the quality and completeness of contact information for program participants. In some cases, no or partially complete contact information was provided, in other cases a primary and secondary contact names and telephone numbers were provided. Our team took extraordinary efforts to achieve the highest possible response rate from the available program data, including attempting to contact both primary and secondary contacts where available, conducting telephone number look-ups for wrong numbers or customers with no contact information, probing respondents for alternate contacts, and making significantly more attempts to reach unresponsive contacts than was specified in our proposal.[37] To improve response rates we recommend that utility account representatives review program databases to ensure that all relevant contact information regarding each project is current and complete prior to sample development. Such an effort will likely reduce dramatically the number of unresponsive and incorrect customer contacts that may have resulted from our efforts to develop more complete contact information for program participants and the application aggregation scheme described above.

[37] Unresponsive contacts are defined as potential respondents who did not refuse to participate but either did not respond to voicemail requests to participate, were not available for scheduled interviews, repeatedly asked that we call back another time, or otherwise could not make time available to complete the survey during the study period.

Nevertheless, the sponsor programs should ensure that all participant applications clearly highlight that by participating and accepting incentive funds they agree to participate in evaluation efforts that may include one to two surveys and/or site visits a year. We recommend that the Sponsors use program implementers, program staff and account representatives to reinforce this message to customers throughout the program participation process and subsequent quality assurance contacts with customers. Such an approach makes customer responsibilities clear at the outset of program participation, helps encourage cooperation for evaluation efforts, ensures that evaluation notification letters are directed to appropriate contacts, and could be referred to in evaluation notification letters or survey introductions as need be.

The data requirements of the participant and vendor survey instruments specified in the Standardized Method requires that the sponsoring utilities mine program tracking databases in support of the survey effort. Due to limitations of program tracking databases a number of the sponsors had to conduct extensive database queries and manual record pulling in order to gather, compile and organize the data required in the Standardized Method. Despite these efforts several of the sponsors were lacking accurate contact information for customers and other key data elements required by the Standardized Method. As such, the participant and vendor survey instruments required adjustments and significant additional effort was required to identify appropriate survey respondents at participating customer organizations. If in the future the sponsors wish to make full use of the efficiencies afforded by the use of a standardized evaluation approach such as the Standardized Method, and to achieve response rates necessary to achieve the required levels of precision, it would prove useful for them to consider how they can better collect and maintain the required data through program implementation in electronic databases in a way that does not hamper program operation. We know that after the experience in working with this project several improvements for data provision in this area are already being contemplated by some of the sponsors.

We discovered that the Standardized Method does not provide any clear directions for the handling of "Don't Know" or "Don't Recall". These responses are normal occurrences for surveys, particular with C&I efforts. Forcing interviewers to enter other actual responses could introduce bias into the estimates. The best path is a well thought out assignment procedure for these responses for each free-ridership or spillover question asked. Developing such a procedure, assessing its potential to introduce bias, and testing how to make it most accurate is worth consideration when the Standardized Method is examined for improvements.

Another area of some concern in our application of the Standardized Method was with how the consistency check and adjustments are made. This has been one of the more difficult issues for this type of methodology in several jurisdictions. During the work conducted in this study, it appeared to us that the method currently used in the Standardized Method may be producing a downward bias in the estimates, given the use of the 0% free-ridership assumption. The extent of this can vary from year to year depending upon how open versus guided the "open-ended" responses are structured.

To address this potential downward bias, we tested using an assumption of 50%free-ridership. This assumption was found to upwardly bias the free-ridership estimates examined. A more thorough assessment and testing for development of a method to handle inconsistent responses in a way that minimizes potential bias or the loss of sample warrants further examination in any effort to make improvements to the Standardized Method.

This study made a large effort to ensure that decision-makers across projects, sites, and throughout an organization were identified. The database handling, collapsing, and modifications in survey wording to accommodate this within and across programs was extensive. Special efforts were also made to identify and conduct selected one-on-one interviews with key decision-makers that operated over many sites and across sponsors. This type of effort should be required for the Standardized Method whenever it is applicable. The Standardized Method should then be updated to describe in detail how this is to be accomplished and what is required. This will help provide more thorough guidance for quality work in this area and help serve to document the processes undertaken.

APPENDIX A. PARTICIPANT SURVEY INSTRUMENT

The participant survey instrument from the Standardized Method is presented below. The survey is provided such that questions that required some modification given a lack of project specific data or format of the information may be identified by means of comparison to the sponsor-specific surveys presented in the sponsor-specific sections of this report.

Copied from the July 2004 .pdf version of the Standardized Method.

National Grid, NSTAR Electric, Northeast Utilities, Unitil, Cape Light Compact 6/

APPENDIX F: PARTICIPANT FREE-RIDERSHIP AND "LIKE" SPILLOVER QUESTIONS AND NON-PARTICIPANT SPILLOVER QUESTIONS

(NOTE: ALL VARIABLES IN [BRACKETS] SHOULD BE AUTOMATICALLY FILLED IN BY THE CATI SYSTEM BASED ON INFORMATION FROM THE PROGRAM DATABASE AND/OR RESPONSES TO QUESTIONS.)

F.1 DETAILED FREE-RIDERSHIP AND "LIKE" SPILLOVER QUESTIONS – PROGRAM PARTICIPANTS

F.1.1 INTRODUCTION

I1 Hello, my name is _____, and I'm calling on behalf of [sponsor]. May I speak with [contact name]? Are you the person at your firm who was most involved in making the decision to install equipment through the [program] in [time period] at [address]? *(NOTE: IF R SAYS THEY WERE ONE OF SEVERAL PEOPLE, PROBE TO ENSURE THEY WERE A PRIMARY DECISION MAKER)*

1 Yes
2 No
-9 REFUSES *(PROBE IF NO OR REFUSES:* Who at your company did make the decision to install this equipment through the program?)
(IF UNABLE TO IDENTIFY DECISION-MAKER, THANK AND END INTERVIEW)

I2 Do you work directly for [company] or are you a contractor who provides design and/or installation services for [company]?

1 Employee *(CONTINUE WITH PARTICIPANT SURVEY)*
2 Vendor/Contractor *(SWITCH TO DESIGNER/VENDOR SURVEY)*

I'm with [data collection firm], an independent research firm. We have been hired to follow-up with customers who participated in this program to learn about their experiences. I'm not selling anything; I'd just like to ask you about the equipment you installed at [service address].
I'd also like to assure you that your responses will be kept confidential by [sponsor] and that this should take less than 15 minutes, depending on the amount of equipment installed through the program.
(WHY ARE YOU CONDUCTING THIS STUDY: Studies like this help [sponsor] adjust their programs to better meet customers' needs.*)*
(TIMING: This survey should take less than 10 to 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 [TOLL-FREE NUMBER].)*
(SALES CONCERN: You should have received a letter from [sponsor] explaining the purpose of this call. I want to assure you that I am not selling anything; I simply want to understand what factors were important to your company when deciding to purchase new equipment through this program. Your responses will be kept confidential by our firm and [sponsor]. If you would like to talk with someone from [sponsor], you can call [sponsor contact] at [phone number].*)*

F.1.2 IDENTIFICATION OF DECISION-MAKER

For the next set of questions, I'd like to review the equipment you installed through [program].

R1 Do you recall installing [measure 1 description] through the [program] in [time period]?
1 Yes
2 No
3 This equipment was never installed (DO NOT ASK FR/SO FOR THIS MEASURE)
-8 DON'T KNOW (PROBE IF NO OR DK: This [measure 1 description] included [fill with detailed description provided by Sponsor.] Is there someone else at your facility who would be more familiar with this equipment?)

R2 Do you recall installing [measure 2 description] through the [program] in [time period]?
1 Yes
2 No
3 This equipment was never installed (DO NOT ASK FR/SO FOR THIS MEASURE)
-8 DON'T KNOW (PROBE IF NO OR DK: This [measure 2 description] included [fill with detailed description provided by Sponsor.] Is there someone else at your facility who would be more familiar with this equipment?)

(Q1-S4 WILL BE ASKED OF EACH MEASURE GROUP RECALLED.)

Q2 (ONCE DECISION MAKER IS IDENTIFIED) Some companies work with a design professional, project architect, engineer, equipment contractor, or a utility account manager as part of the project design phase. Who do you feel was most responsible for recommending or specifying the exact type of high efficiency [measure # description] to install through the [program]. (PROBE: Was it someone within your firm; an outside Design Professional, contractor, or a manufacturer's representative; or a utility account manager with whom you worked?) (INDICATE ALL THAT APPLY)

1 Someone in my firm
2 Design Professional
3 Contractor
4 Manufacturer's Rep
5 Utility account manager

-8 DON'T KNOW
-9 REFUSES

Q3 (IF Q2 IS SOMEONE OTHER THAN A PERSON AT THE COMPANY) On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did this person have on your company's decision to install high efficiency equipment so that it would qualify for the program? _____

(NOTE: IF Q3 GE 4 ASK Q4; ELSE SKIP TO P1)

Q4 We would like to talk to the person who was most influential in recommending or specifying the energy efficient [measure # description] to install through the program. (PROBE: This individual may be the project architect, engineer, equipment contractor, or the utility account manager.)

Could you give me the name and telephone number of this person?[20]

1 Yes---------->Contact name: _____
Title: _____
Company name: _____
Address: _____
Phone number: ( )_____
2 No, refused to give this information
3 No, no outside advisor involved
-8 DON'T KNOW INFORMATION

(NOTE: THE INTERVIEW SHOULD BE CONTINUED WITH THE RESPONDENT, ALTHOUGH EVERY ATTEMPT SHOULD BE MADE TO REACH THIS OTHER PERSON TO VERIFY THAT THEY WERE THE DECISION-MAKER AND TO COMPLETE THE SURVEY WITH THEM. IF A COMPLETED SURVEY IS OBTAINED FROM THIS OTHER PERSON, THEIR RESPONSES WILL BE USED FOR THE FREE-RIDER ESTIMATES.)

(IF TWO MEASURES: CONTINUE TO PROJECT OVERVIEW, FR & SO BEFORE REPEATING Q1-Q4.)

[20] If the Project Closure questions are implemented, rather than asking this question, we would ask, "According to our records, the following firm(s) were involved with this project: [all design companies]. Which one of these firms had the most influence on your company's decision to install high efficiency equipment?"

PROJECT OVERVIEW
(P1-P4B WILL BE ASKED OF EACH MEASURE GROUP RECALLED.)

P1 (IF RECEIVED TA FOR MEASURE #) [Sponsor] paid [X%] of the [measure # technical assessment cost] that it cost to conduct a Technical Assessment Study at your facility to determine the cost-effectiveness of installing [measure # description]. If the utility had not paid a portion of the cost, would your company have paid about [measure # technical assessment cost] to have a similar Technical Assessment Study done within one year of when the study took place?[21]

1 Yes
2 No

-8 DON'T KNOW

P2 What factors motivated your firm to install this [measure # description] through the [program] in [time period]? (DO NOT READ; INDICATE ALL THAT APPLY)
1 To reduce maintenance costs
2 To reduce initial purchase costs 3 The program incentive 4 The technical assistance offered 5 To reduce energy bills/save money 6 To reduce efficiency/save energy 7 Took the advice of my installer/designer/contractor/utility rep 8 Needed to replace non-working equipment 9 Because of my past program participation 10 Other _____ -8 DON'T KNOW -9 REFUSES

P3 Did your firm have specific plans set aside to install any of this equipment before you talked with anyone about the program?[22]

1 Yes
2 Yes, but don't remember specifics (SKIP TO F1)
3 No (SKIP TO F1)
-8 DON'T KNOW (SKIP TO F1)
-9 REFUSES (SKIP TO F1)

P3b (IF YES) What plans existed? (Probe for timing, quantity and efficiency)
Timing:_____
Quantity:_____
Efficiency:_____
Other:_____

[21] This question is used later as part of the TA Impact to adjust free-ridership rates.

[22] Questions P3-P4b are used in the consistency analysis.

P4 (IF P3=YES) Was it necessary to change the type or efficiency level of equipment in your plans in order to qualify for the [program]?

1 Yes
2 Yes, but don't remember specifics (SKIP TO F1)
3 No (SKIP TO F1)
-8 DON'T KNOW (SKIP TO F1)
-9 REFUSES (SKIP TO F1)

P4b (IF YES) What changes were necessary? (PROBE FOR TIMING, QUANTITY AND EFFICIENCY)
Timing:_____
Quantity:_____
Efficiency:_____
Other:_____

(IF TWO MEASURES: CONTINUE TO FR & SO BEFORE REPEATING PROJECT OVERVIEW.)

F.1.3 FREE-RIDERSHIP QUESTIONS

(F1-F11c WILL BE ASKED OF EACH MEASURE GROUP RECALLED.)

According to our records, the total cost for all [measure # description] installed was about [measure # total project cost]. [Sponsor] paid about [measure # sponsor contribution] of the total cost of this equipment.

[NON-TECHNICAL ASSESSMENT: You might also have received some technical assistance from a utility rep, engineer, or equipment vendor.]

[TECHNICAL ASSESSMENT: The program also contributed toward the cost of a Technical Assessment Study.]

F1 If [sponsor] had not paid a portion of the equipment cost or provided any technical assistance or education through the [program], would your company have purchased any [measure # description] within one year of when it was installed?

1 Yes
2 No (SKIP TO F8)
-8 DON'T KNOW (SKIP TO F8)

F2 Without the program [contribution/incentive/rebate], technical assistance, or education, would your company have purchased the exact same quantity of [measure # description] within one year?
1 Yes (SKIP TO F3)
2 No
-8 DON'T KNOW

F2b What percent of this [measure # description] do you think your company would have purchased on its own within one year? (PROBE: Would you have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

_____% -8 DON'T KNOW

F3 You said your company would have installed at least some [measure # description] on its own if the program had not been available. What percent of this equipment would have been of the same efficiency or higher efficiency as what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

_____% (IF RESPONSE NE 100% OR F2 NE 1 SKIP TO F10)
-8 DON'T KNOW
(NOTE: IF F1=1 AND F2=1 AND F3=100%, ASK F4-F7)

F4 Now I want to focus on what it would have cost your company to install this equipment on its own without the program. Do you think your company would have paid the additional [measure # sponsor contribution], on top of the amount you already paid, to install the same quantity and efficiency of [measure # description] within one year?
1 Yes (SKIP TO F8)
2 No
-8 DON'T KNOW

F5 How would you have adjusted your purchase to accommodate the fact that you wouldn't have paid all of the costs? Would you have purchased less equipment, lower efficiency equipment, or done something else? (INDICATE ALL THAT APPLY—ASK BOTH F7 AND F8 IF APPROPRIATE)
1 Purchased less equipment (ASK F6)
2 Purchased lower efficiency of equipment (ASK F7)
3 Done something else (SPECIFY AND SKIP TO F10)
-8 DON'T KNOW (SKIP TO F10)

F6 What percent of the [measure # description] do you think your company 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?)

_____% (IF F5=2, SKIP TO F7; ELSE SKIP TO F10)
-8 DON'T KNOW

F7 What percent of the [measure # description] that your company would have purchased on its own would have been of a lower efficiency than what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)

_____% (SKIP TO F10)
-8 DON'T KNOW (SKIP TO F10)

F.1.4 CONSISTENCY QUESTIONS

(NOTE: ASK F8 IF (F1=2 OR F1=-8) OR IF (F1=1 AND F2=1 AND F3=100% AND F4=1); ELSE SKIP TO F10)

F8 Was the information or advice you received from a contractor, design team, utility rep, or an engineer a crucial factor in your decision to install this high efficiency equipment through the program at the time you did?

0 NA, none received
1 Yes
2 No
-8 DON'T KNOW

(NOTE: ASK F9 IF ((F1=2 OR F1=-8) AND ((P3=1 AND P4=3) OR F8=2)) OR IF ((F1=1 AND F2=1 AND F3=100% AND F4=1) AND (P3=3 OR (P3=1 AND P4=1) OR F8=1)); ELSE SKIP TO F10)

F9 I'd like to better understand your purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on your decision to install the energy efficient [measure # description] at the time you did? (RECORD VERBATIM THE CLARIFICATION—PROBE AS NEEDED TO UNDERSTAND REASON)

(NOTE: IF TWO MEASURES: ASK F10 ONLY AFTER FIRST MEASURE; ON SECOND MEASURE ASK F11a-F11c IF F10=1)

F10 Did your company participate in any of [sponsor's] energy efficiency programs before you installed energy efficient equipment around [date]?

1 Yes
2 No (SKIP TO NEXT SECTION)
-8 DON'T KNOW (SKIP TO NEXT SECTION)

F11a 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.

The energy savings performance of equipment installed through the [program] in earlier years was a primary reason why we decided to install energy efficient [measure # description] through the program in [year].

0 Disagree
1 Agree

Because of our previous experience with the performance of energy efficient equipment installed through the [program], and what we learned by participating in the program…

F11b… we asked our contractor to look into energy efficient options for [measure # description] when developing project plans in [year].

0 Disagree
1 Agree

F11c … we took into account the cost-effectiveness of energy efficient [measure # description] when evaluating different options in [year].

0 Disagree
1 Agree

(IF TWO MEASURES: CONTINUE TO SO BEFORE REPEATING FR.)

F.1.5 PARTICIPANT "LIKE" SPILLOVER

(S1-S4 WILL BE ASKED OF EACH MEASURE GROUP RECALLED.)

S1 Now I'd like you to think of the time since you participated in the [program] in [time period]. Has your company purchased and installed any [measure # description] on its own for this or other facilities served by [sponsor]?
1 Yes
2 No (SKIP TO END OF SECTION)
-8 DON'T KNOW (SKIP TO END OF SECTION)

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
2 No (SKIP TO END OF SECTION)
-8 DON'T KNOW (SKIP TO END OF SECTION)

S2 About how much energy efficient [measure # description] did your company purchase on its own since participating in this program in [time period]? (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 amount as you installed through the program, twice as much as what you installed through the program, or some other amount?)

_____%
-8 DON'T KNOW

S3 Did … influence your decision to install some or all this efficient [measure # description] on your own?

a. A recommendation by the contractor or designer who you worked with under the [program] 1 Yes 2 No
b. Your experience with the energy efficient equipment installed through the [program] 1 Yes 2 No
c. Your participation in any past program offered by [retail company] 1 Yes 2 No

S4 Why didn't you purchase this [equipment] through a [sponsor] program? (DO NOT READ; INDICATE 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_Why not?_____
5 Vendor does not participate in program
6 Outside [retail company] 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) -8 DON'T KNOW

(IF TWO MEASURES: RETURN TO Q1; ELSE CONTINUE TO NEXT SECTION.)

This concludes the FR & SO survey. If sponsor adds additional questions, such as program satisfaction or firmographics, they should be inserted here.

F.2 DETAILED FREE-RIDERSHIP AND NON-PARTICIPANT SPILLOVER QUESTIONS – PROGRAM DESIGNER/VENDORS

F.2.1 INTRODUCTION

I1 (IF CALLING A DESIGNER/VENDOR RECOMMENDED BY PROGRAM PARTICIPANT WHO SAID THE DESIGNER/VENDOR WAS MOST KNOWLEDGEABLE ABOUT THE DECISION) Hello, my name is _____, and I'm calling on behalf of [sponsor]. May I speak with [contact name]? Are you the person most familiar with the work your firm completed for [company] at [service address] as part of [sponsor's] [program] in [time period]? (NOTE: IF RESPONDENT SAYS THEY WERE ONE OF SEVERAL PEOPLE, PROBE TO ENSURE THEY WERE THE PRIMARY DECISION MAKER)

1 Yes
2 No---->(PROBE: Who at your company should I speak with about your work for [company]?)
3 NA, no work through program---->(THANK AND END INTERVIEW)

I2 (IF CALLING A DESIGNER/VENDOR SAMPLED ONLY FOR THE NONPARTICIPANT SPILLOVER) Hello, my name is _____, and I'm calling on behalf of [sponsor]. May I speak with [contact name]? Are you the person most familiar with the work your firm has completed as part of [sponsor's] [programs] in [time period]? (NOTE: IF RESPONDENT SAYS THEY WERE ONE OF SEVERAL PEOPLE, PROBE TO ENSURE THEY ARE THE MOST KNOWLEDGEABLE)

1 Yes
2 No---->(PROBE: Who at your company should I speak with about your work for [company]?)
3 NA, no work through program---->(THANK AND END INTERVIEW)

I'm with [data collection firm], an independent research firm. We have been hired to talk with some of the design professionals and contractors who were involved with the [program] in [time period]. I'm <u>not</u> selling anything; I'd just like to ask you about the types of equipment that have been recommended, sold, or installed by your firm through this program in [time period].

I'd also like to assure you that your responses will be kept confidential by [sponsor] and that this should take less than 15 minutes.

(WHY ARE YOU CONDUCTING THIS STUDY: Studies like this help [sponsor] adjust their programs to better meet customers' needs.)

(TIMING: This survey should take less than 10 to 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 [TOLL-FREE NUMBER].)

(SALES CONCERN: I want to assure you that I am not selling anything; I simply want to understand what factors are important to your company when recommending or specifying new equipment. Your responses will be kept confidential by our firm and [sponsor]. If you would like to talk with someone from [sponsor], you can call [sponsor contact] at [phone number].)

(IF CALLING A DESIGNER/VENDOR RECOMMENDED BY PROGRAM PARTICIPANT, CONTINUE WITH FREE-RIDERSHIP; ELSE SKIP TO NON-PARTICIPANT SPILLOVER.)

FREE-RIDERSHIP—DESIGNER/VENDOR QUESTIONS

(NOTE THAT THIS SECTION IS A PARALLEL VERSION OF THE PARTICIPANT FR SURVEY. THE PARALLEL QUESTIONS ARE NUMBERED THE SAME. QUESTIONS FROM THE PARTICIPANT FR SURVEY THAT ARE INAPPROPRIATE FOR DESIGNERS/VENDORS HAVE BEEN OMITTED.)

F.2.2 IDENTIFICATION OF DECISION-MAKER

For the next set of questions, I'd like to review the equipment you recommended or specified through [program] for [company].

R1 Do you recall recommending or specifying [measure 1 description] for [company] at [service address] through the [program] in [time period]?
1 Yes
2 No
3 This equipment was never installed (DO NOT ASK FR FOR THIS MEASURE)
-8 DON'T KNOW (PROBE IF NO OR DK: This [measure 1 description] included [fill with detailed description provided by Sponsor.] Is there someone else in your firm who would be more familiar with this project?)

R2 Do you recall recommending or specifying [measure 2 description] for [company] at [service address] through the [program] in [time period]?
1 Yes
2 No
3 This equipment was never installed (DO NOT ASK FR FOR THIS MEASURE)
-8 DON'T KNOW (PROBE IF NO OR DK: This [measure 2 description] included [fill with detailed description provided by Sponsor.] Is there someone else in your firm who would be more familiar with this project?)

(Q1-F10 WILL BE ASKED OF EACH MEASURE GROUP RECALLED.)

(IF TWO MEASURES: First, I'd like to ask you some questions about your decision to recommend/specify [measure 1 description]. Then, I'll repeat these questions for [measure 2 description].)

(IF TWO MEASURES, BEFORE SECOND ITERATION: Now, I'd like to ask you some questions about your decision to recommend/specify [measure 2 description].)

Q1 Were you involved at the design stage when the [measure # description] was specified and agreed upon for this facility?

1 Yes
2 No---------->(PROBE IF NO: At what point in the process did you become involved and what was your role?)

Timing:_____

Role:_____

(IF THIS PERSON IS CLEARLY NOT THE DECISION-MAKER, ASK FOR SOMEONE ELSE IN COMPANY; ELSE SKIP TO NON-PARTICIPANT SPILLOVER)

Q3 On a scale of 1 to 5, with 1 being no influence and 5 being a great deal of influence, how much influence did your firm have on specifying the efficiency levels or features of [measure # description] so that it would qualify for the program? _____

(NOTE: IF Q3 < 4 AND NO OTHER MEASURE, SKIP TO NON-PARTICIPANT SPILLOVER; ELSE SKIP TO P1)

(IF TWO MEASURES: CONTINUE TO PROJECT OVERVIEW & FR BEFORE REPEATING Q1-Q4.)

F.2.3 PROJECT OVERVIEW

(P1-P4B WILL BE ASKED OF EACH MEASURE GROUP RECALLED.)

The next set of questions ask about what you think your company would have recommended or specified for [company] if the utility had not offered the [program] in [time period].

P1 (IF RECEIVED TA FOR MEASURE #) [Sponsor] paid [X%] of the [measure # technical assessment cost] that it cost to conduct a Technical Assessment Study at [company] to determine the cost-effectiveness of installing [measure # description]. If the utility had not paid a portion of the cost, do you think [company] would have paid about [measure # technical assessment cost] to have a similar Technical Assessment Study done within one year of when the study took place?[23]

1 Yes
2 No
-8 DON'T KNOW

[23] This question is used later as part of the TA Impact to adjust free-ridership rates.

P3 As far as you know, did [company] have specific plans to install this [measure # description] before they learned about the program?[24]

1 Yes
2 Yes, but don't remember specifics (SKIP TO F1)
3 No (SKIP TO F1)
-8 DON'T KNOW (SKIP TO F1)
-9 REFUSES (SKIP TO F1)

P3b (IF YES) What plans existed? (Probe for timing, quantity and efficiency)
Timing:_____
Quantity:_____
Efficiency:_____
Other:_____

P4 (IF P3=YES) Was it necessary to change the type or efficiency level of equipment in order to qualify for the [program]?

1 Yes
2 Yes, but don't remember specifics (SKIP TO F1)
3 No (SKIP TO F1)
-8 DON'T KNOW (SKIP TO F1)
-9 REFUSES (SKIP TO F1)

P4b (IF YES) What changes were necessary? (PROBE FOR TIMING, QUANTITY AND EFFICIENCY)
Timing:_____
Quantity:_____
Efficiency:_____
Other:_____

(IF TWO MEASURES: CONTINUE TO FR BEFORE REPEATING PROJECT OVERVIEW.)

[24] Questions P3-P4b are used in the consistency analysis.

F.2.4 FREE-RIDERSHIP QUESTIONS

(F1-F10 WILL BE ASKED OF EACH MEASURE GROUP RECALLED.)

According to our records, the total project cost for all [measure # description] installed was about [measure # total project cost]. [Sponsor] paid about [measure # sponsor contribution] of the total cost of this equipment.

[TECHNICAL ASSESSMENT: The program also contributed toward the cost of a Technical Assessment Study.]

F1 Would your company have recommended or specified any [measure # description] to [company] within one year of when it was installed if they had not been able to receive this utility [contribution/incentive/rebate] or any technical assistance or education through the [program]?

1 Yes
2 No (SKIP TO F8)
-8 DON'T KNOW (SKIP TO F8)

F2 Without the program [contribution/incentive/rebate], technical assistance or education, would your company have recommended or specified the exact same quantity of [measure # description] for [company] within one year?
1 Yes (SKIP TO F3)
2 No
-8 DON'T KNOW

F2b What percent of this [measure # description] do you think your company would have recommended/specified? (PROBE: Would you have recommended/specified about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed through the program?)

_____% -8 DON'T KNOW

F3 You said you would have recommended/specified at least some [measure # description] for [company] if the program had not been available. What percent of this equipment that you would have recommended/specified would have been of the same efficiency or higher efficiency as what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of equal efficiency?)

_____% (IF RESPONSE NE 100% OR F2 NE 1 SKIP TO F10)
-8 DON'T KNOW

(NOTE: IF F1=1 AND F2=1 AND F3=100%, ASK F4-F7)

F4 Now I want to focus on what it would have cost [company] to install this equipment on its own without the program. Do you think [company] would have paid the additional [measure # sponsor contribution], on top of the amount they already paid, to install the same quantity and efficiency of [measure # description] within one year?
1 Yes (SKIP TO F8)
2 No
-8 DON'T KNOW

F5 How do you think [company] would have adjusted their purchase to accommodate the fact that they wouldn't have paid all of the costs? Would they have purchased less equipment, lower efficiency equipment, or done something else? (INDICATE ALL THAT APPLY—ASK BOTH F7 AND F8 IF APPROPRIATE)
1 Purchased less equipment (ASK F6)
2 Purchased lower efficiency of equipment (ASK F7)
3 Done something else (SPECIFY AND SKIP TO F10)
-8 DON'T KNOW (SKIP TO F10)

F6 What percent of the [measure # description] do you think [company] would have purchased on its own at that same time? (PROBE: Would they have purchased about one-fourth (25%), one-half (50%), three fourths (75%) of what they installed through the program?)

_____% (IF F5=2, SKIP TO F7; ELSE SKIP TO F10)
-8 DON'T KNOW

F7 What percent of the [measure # description] that [company] would have purchased on its own would have been of a lower efficiency than what was installed through the program? (PROBE: Would about one-fourth (25%), one-half (50%), three fourths (75%) been of lower efficiency?)

_____% (SKIP TO F10)
-8 DON'T KNOW (SKIP TO F10)

F.2.5 CONSISTENCY QUESTIONS

(NOTE: ASK F8 IF (F1=2 OR F1=-8) OR IF (F1=1 AND F2=1 AND F3=100% AND F4=1); ELSE SKIP TO F10)

F8 Was the technical assistance or advice you or another designer/vendor provided to [company] a crucial factor in their decision to install this high efficiency equipment through the program at the time they did?

0 NA, none received
1 Yes
2 No
-8 DON'T KNOW

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(NOTE: ASK F9 IF ((F1=2 OR F1=-8) AND ((P3=1 AND P4=3) OR F8=2)) OR IF ((F1=1 AND F2=1 AND F3=100% AND F4=1) AND (P3=3 OR (P3=1 AND P4=1) OR F8=1)); ELSE SKIP TO F10)

F9 I’d like to better understand [company’s] purchase decision. Maybe you could just describe in your own words what impact, if any, the program had on the installation of energy efficient [measure # description]? (RECORD VERBATIM THE CLARIFICATION—PROBE AS NEEDED TO UNDERSTAND REASON)

F10 On a scale of 1 to 5, with 1 being 'not at all important and 5 being 'very important’, how important was your previous experience with a [sponsor] program when making the decision to recommend or install [measure # description] for this customer?[25]

_____
-8 DON’T KNOW
-9 NA – No previous program experience

(IF TWO MEASURES: RETURN TO Q1; ELSE CONTINUE TO NON-PARTICIPANT SO.)

APPENDIX B. VENDOR SURVEY INSTRUMENT

The vendor survey instrument from the Standardized Method is presented below. The survey is provided such that questions that required some modification given a lack of project specific data or format of the information may be identified by means of comparison to the sponsor-specific surveys presented in the sponsor-specific sections of this report.

Copied from the July 2004 .pdf version of the Standardized Method.

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F.2.6 NON-PARTICIPANT SPILLOVER—DESIGNER/VENDOR QUESTIONS

(ASK NP1 FOR EVERY MEASURE GROUP IN PROGRAM BEFORE ASKING NP2-NP8.)

NP1 What types of equipment did your firm specify, sell, and/or install in Massachusetts to customers of [sponsor] in [time period]? Did you specify, sell, and/or install [ask of all measure categories in the program]?
1 Yes
2 No
-8 DON'T KNOW

(NP2-NP8 WILL BE ASKED FOR EACH MEASURE WHERE NP1=1)

NP2 What percent of all the [measure group] would have been eligible for the [program]? (*IF DK,* "What percent of the equipment your firm specified and/or installed in these types of projects would have been of the same level or a higher efficiency level as the equipment installed through these programs?"*)*
_____*%*

NP3 *(IF NP2 >0%)* What percent of the program-eligible [measure category] did not receive an incentive through the [program]?

25
This question was originally used to adjust the spillover rate, but as a result of the working group meeting will be used to adjust free-ridership as described in Section 5.4.

_____%

(ASK NP4-NP8 OF EACH MEASURE WHERE NP3 > 0%)

NP4 In [time period], you mentioned that about [___%] of the [measure category] you specified and/or installed would have been eligible for an incentive through the [program], but did not receive an incentive. What are the main reasons why your firm did not request a customer incentive from the utility for this energy saving equipment you specified/installed outside the program? (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?_____
6 vendor does not participate in program
7 outside [retail 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)
-8 DON'T KNOW

NP5 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 the program has convinced us that this equipment is cost effective or beneficial even without a program incentive.

0 Disagree
1 Agree

Because of our previous experience with the performance of energy efficient equipment installed through the [program], and what we learned through the program…

NP6 …we are better able to identify opportunities to improve the energy efficiency of [measure category].

0 Disagree
1 Agree

NP7 …we are more likely to discuss energy efficient options with all of our customers when developing project plans for [measure category].

0 Disagree

1 Agree

(IF ((NP5=0 AND NP6=0 AND NP7=0 AND NP4=5) OR (NP5=1 AND NP6=1 AND NP7=1 AND NP4 NE 5)) SKIP TO END; ELSE ASK NP8)

NP8 Maybe you could just describe in your own words what impact, if any, the [program] had on your decision to specify or install energy efficient [measure # description] outside of the program? (RECORD VERBATIM THE CLARIFICATION—PROBE IF DOESN'T MAKE SENSE; DO NOT CODE RESPONSES)

_____

(IF NP1=YES FOR OTHER MEASURES: RETURN TO NP2; ELSE CONTINUE TO NEXT SECTION)

This concludes the non-participant SO survey. If sponsor adds additional questions, such as program satisfaction or firmographics, they should be inserted here.