State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

Business Programs Impact Evaluation Report: Last Quarter of Calendar Year 2009 and First Two Quarters of Calendar Year 2010

January 27, 2011

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State of Wisconsin Public Service Commission of Wisconsin

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1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

This report presents the results of the impact evaluation of the statewide Focus on Energy (Focus) Business Programs of measures implemented from October 1, 2009, through June 30, 2010. This report covers one round of data collection.

The principal objective of the impact evaluation was to determine the energy and demand savings attributable to the program. The analysis calculates a set of adjustment factors that are used to determine evaluation verified gross and net energy savings for the statewide Focus Business Programs. Since the start of the program, the evaluation team has implemented thirteen rounds of data collection and documentation review to estimate the net energy savings for Business Programs.

1.2 METHODS

KEMA uses the statistical procedure of ratio estimation to develop estimates of evaluation verified gross and net impacts. There are two basic steps to the process:

- **Verify energy savings in a sample of participating customers.** KEMA estimated actual energy savings under current conditions for a sample of customers who installed energy efficient equipment or received energy efficiency services during calendar year 2010 (CY10).[1] KEMA conducted detailed engineering reviews to determine how tracking gross savings were calculated for the custom measures that accounted for a significant portion of total tracked savings. The engineering reviews included a review of program tracking data, a review of program documentation, and customer interviews by an energy engineer. A computer-aided telephone interview (CATI) was used to collect information on measure installation, gross savings calculation inputs, and program attribution for deemed measures. The gross savings calculation inputs collected during the CATI survey were used to verify the savings reported in the tracking database.
- **Expand sample results to the population of customers.** The sample results obtained in the first step were expanded to the population by calculating the ratios of verified-to-tracked (gross savings adjustment factor) and attributable-to-verified (attribution factor) for the sample. The results of the *Participant Spillover Savings Study*[2] were added to the ratios and they were then applied to the population. Finally, untracked attributable savings resulting from the impact evaluation of the

[1] Throughout this report, we refer to the current evaluation as the calendar year 2010 evaluation, or the CY10 evaluation for simplicity, even though the evaluation period covers the last quarter of calendar year 2009 (CY09) and the first two quarters of CY10.

[2] Miriam L. Goldberg, Christopher Dyson, and Valy T. Goepfrich, KEMA Inc. *Business Programs: Participant Spillover Savings Study*. December 22, 2005.

Education and Training Program and the CY09 supply side study were added to the population net savings.[3]

The adjustment factors estimated from the data collection and analysis include:

- **Gross savings adjustment factor.** This factor adjusts tracking gross savings for installation and changes based on the engineering review. Applying the gross savings adjustment factor to tracking gross savings produces the estimate of verified gross savings.
- **Attribution factor.** This factor adjusts verified gross savings for program attribution.
- **Realization rate.** This factor combines the gross savings adjustment factor and the attribution factor. It is the ratio of net savings to tracking gross savings.

1.2.1 Sampling

This year, KEMA will continue sampling data at the measure level as opposed to the customer level, a method that began in the CY09 evaluation. The change in sampling strategy allows for the estimation of net energy savings for selected measure types. Sampling at the measure level allows us to focus on measure groups with certain technology types, such as lighting, and estimate the adjustment factors for those specific measure groups.

The sampling method uses the Model Based Statistical Sampling (MBSS) tool, which maximizes precision based on the expected variance in the population to produce the optimally allocated sample. MBSS is a statistical approach to sampling pioneered by Roger Wright that leverages information known about the population to more efficiently design a sample. The tool is ideal for complex sample designs with large populations and multiple analysis variables.

Table 1-1 shows the final sample distribution by the measure groups used for sampling. We failed to meet our target number of completes in six of the groupings shown (process, CFL, agriculture, new construction, wastewater treatment, and motors and drives). In many cases, we far exceeded our target due to completing extra backup measures installed by participants who also completed a primary measure. For a detailed strata-by-strata look at the population, targets, and completed sample by strata, see Appendix G.

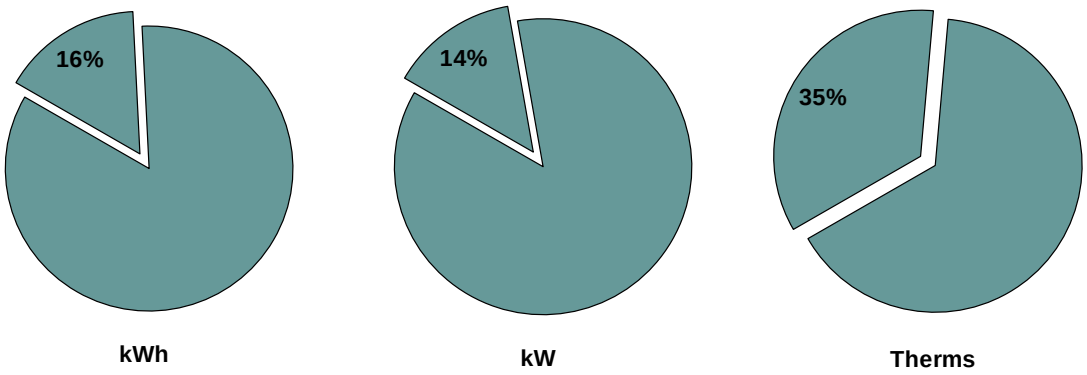
[3] Unlike the added spillover savings, the untracked attributable savings resulting from the impact evaluation of the Education and Training program and the recent supply-side study are not included in the adjustment factors.

Table 1-1. Population (Frame) and Final Sample by Sampling Measure Group

Sampling Measure Group	Frame	Target	Sample Completes	Fraction of Frame Total Reported Gross Savings					
				Frame			Sample		
				kWh	kW	Therms	kWh	kW	Therms
Lighting	8,617	182	364	40%	37%	0%	7%	7%	0%
HVAC	1,627	95	111	8%	18%	31%	1%	1%	8%
Process	80	20	18	6%	4%	22%	1%	0%	14%
Boilers & burners	1,633	142	229	0%	0%	32%	0%	0%	9%
CFL	11,401	25	21	7%	11%	0%	0%	0%	0%
Compressed air, vacuum pumps	372	15	15	9%	7%	0%	1%	0%	0%
Refrigeration	948	46	118	12%	10%	2%	5%	4%	2%
Agriculture	566	7	1	1%	1%	3%	0%	0%	1%
New construction	36	10	5	1%	2%	3%	0%	0%	1%
Industrial ovens and furnaces	8	3	3	0%	0%	1%	0%	0%	0%
Waste water treatment	15	4	3	2%	1%	0%	0%	0%	0%
Motors & drives	1,418	25	21	10%	7%	0%	0%	0%	0%
Other	1,163	30	41	5%	2%	6%	0%	0%	0%
Business Programs overall	**27,884**	**604**	**950**	**100%**	**100%**	**100%**	**16%**	**14%**	**35%**

During data collection, KEMA obtained 950 sample completes (measures) from the engineering and CATI samples. Figure 1-1 shows the percentage of population savings included in the sample. We completed surveys representing 16 percent of kWh savings, 14 percent of kW savings, and 35 percent of therm savings. In CY10, we surveyed a larger percentage of electric savings and a smaller percentage of therm savings compared to CY09 (12, 10, and 46 percent for kWh, kW, and therms, respectively, in CY09).

Figure 1-1. Percentage of CY10 Tracking Gross Savings Included in Sample



Each of the adjustment factors, as defined earlier, was calculated separately for each energy unit (kWh, kW, and therms) in combination with each sampling measure group, as well as for Business Programs overall. For some sampling measure groups, the precision achieved was insufficient to report as a stand-alone estimate in the body of the report. In general, measure groups with relative errors greater than 40 percent for their primary savings type were allocated into other measure groups. Some measure groups that did not meet this criterion were retained in CY10 to allow for cross-year comparisons and to maintain consistent reporting. The reporting measure groups include non-small CFL lighting,[4] HVAC, expanded process, boilers and burners, small CFLs, refrigeration, and other. The final sampling distribution by reporting measure group is in Table 1-2.

Table 1-2. Population (Frame) and Final Sample by Reporting Measure Group

Reporting Measure Group	Frame	Target	Sample Completes	Fraction of Frame Total Reported Gross Savings					
				Frame			Sample		
				kWh	kW	Therms	kWh	kW	Therms
Non-small CFL lighting	8,617	182	364	40%	37%	0%	7%	7%	0%
HVAC	1,627	95	111	8%	18%	31%	1%	1%	8%
Expanded process	475	42	39	16%	12%	23%	1%	1%	14%
Boilers & burners	1,633	142	229	0%	0%	32%	0%	0%	9%
Small CFLs	11,401	25	21	7%	11%	0%	0%	0%	0%
Refrigeration	948	46	118	12%	10%	2%	5%	4%	2%
Other	3,183	72	68	17%	12%	12%	0%	1%	2%
Business Programs overall	**27,884**	**604**	**950**	**100%**	**100%**	**100%**	**16%**	**14%**	**35%**

1.3 KEY FINDINGS

Overall, the Business Programs achieved kWh, kW, and therm realization rates of 59.3 percent, 56.9 percent, and 43.8 percent, respectively. The decrease between the CY10 therms realization rate and that of CY09 is statistically significant at the 95 percent confidence level, but the decrease in the kWh and kW realization rates are not statistically different. The realization rate is the ratio of achieved attributable savings to gross reported savings. As in previous years, the realization rates include the effects of the *Participant Spillover Savings Study*[5].

The following are key results from this study:

- CY10 net verified energy savings for the evaluation period amounted to 299,123,757 kWh/year, 52,973 kW, and 14,803,659 therms/year. This is the second evaluation period that has included the untracked attributable savings

[4] This measure group does not consist of large CFLs; rather, it is for all lighting that does not qualify as a small CFL.

[5] Miriam L. Goldberg, Christopher Dyson, and Valy T. Goepfrich, KEMA Inc. *Business Programs: Participant Spillover Savings Study*. December 22, 2005.

(UAS) resulting from the impact evaluation of the Education and Training program[6] in the net verified energy savings and the first to include UAS from the supply side study[7] completed in CY09. These are the energy savings that would not have occurred in the absence of the programs.[8]

- The CY10 attribution rates for kWh, kW, and therms are 59.8 percent, 58.8 percent, and 46.7 percent, respectively. The decrease in the CY10 therm attribution factor over CY09 is statistically different at the 95 percent confidence interval, but the decreases in the kWh and kW adjustment factors are not. Attribution is the fraction of verified gross that is attributable to the program; that is, the fraction of verified gross savings that would not have occurred without the program. It includes effects of program attributable energy efficiency measures implemented outside the program where these effects are well documented.
- The CY10 gross savings adjustment factors for kWh, kW, and therms are 99.1 percent, 96.8 percent, and 93.8 percent, respectively. The decrease in the CY10 therm gross savings adjustment factor over CY09 is statistically different at the 95 percent confidence interval, but the decreases in the kWh and kW gross savings adjustment factors are not. The gross savings adjustment factor adjusts gross reported savings for installation rates, tracking system data entry errors, and errors in gross savings calculations including corrections to input assumptions. These results indicate that the program is accurately and appropriately calculating and reporting gross energy savings in the WISeerts database.

1.3.1 Comparison across years

Figure 1-2 through Figure 1-4 show the gross savings, attribution, and realization rates over time. These charts incorporate 13 rounds of impact evaluation data collection (some fiscal years received multiple rounds of data collection) going back to the start of the program in April 2001. A crosshatched bar in the charts indicates that the increase or decrease of the adjustment factor, when compared to the previous fiscal year's result, is statistically significant at the 95 percent level of confidence.

The Business Programs have been continuously evolving since inception. Many of these changes have resulted in methodological changes over the years that may have affected the trends in adjustment factors and may not reflect improvements or declines in program effectiveness. Six such changes are highlighted below.

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[6] Shawn Bodmann, Christopher Dyson, Tammy Kuiken, Miriam Goldberg, KEMA Inc. *Business Programs: Education and Training Untracked Attributable Savings.* October 29, 2010.

[7] Christopher Dyson, Shawn Bodmann, Karen Rothkin, Maggie Pinckard, Erika Morgan, Ryan Barry, Miriam Goldberg, KEMA Inc. *Business Programs: Supply-side Evaluation.* April 22, 2010.

[8] Unlike the added spillover savings, the untracked attributable savings resulting from the impact evaluation of the Education and Training program and the recent supply-side study are not included in the adjustment factors.

- A revised survey instrument was developed based on an evaluation framework paper.[9] Changes to the instrument were made for both the 18-month contract period (18MCP) and the CY09 evaluations.
- Energy savings values for CFLs were deemed starting in fiscal year 2006 (FY06). The only potential adjustment for gross savings is based on the quantity of bulbs installed, not the wattages or operating hours of the bulbs.
- A number of other measures were deemed starting in fiscal year 2007 (FY07). The 18MCP was the first evaluation with a significant number of deemed measures implemented. As with the CFLs, deemed measures are only adjusted for the number of units installed or the algorithm inputs used to calculate the deemed savings. Deemed measures include a number of lighting measures, premium efficiency motors, furnaces, boilers, air conditioners, and others.
- The attribution estimation method for CFLs changed in FY06 from one based on self-reported program response to market-based methods. The most current attribution factors calculated by the evaluation team[10] were used for all low wattage (≤32 W) CFLs. These attribution rates were 84 percent for the Commercial sector and 85 percent for the Agricultural sector. This is the third evaluation that uses separate adjustment factors for the Commercial and Agriculture sectors.[11]
- The FY07 evaluation used an abbreviated approach. The approach combined a sample of the largest measures implemented in FY07 and the sample of all BUT the largest measures from the FY06 impact evaluation. This approach assumes that the net-to-gross components for all measures, except the largest, are essentially the same in FY06 and FY07. A detailed discussion of the abbreviated approach is provided in the memorandum that reports the FY07 results.[12] Because the FY07 adjustment factors include the effects of participants from both FY06 and FY07, we did not statistically compare the results of those two years. However, we did compare FY05 with FY06 and FY07[13] with the 18MCP.

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[9] Rick Winch and Tom Talerico, Glacier Consulting Group; Bobbi Tannenbaum, KEMA, Inc.; Pam Rathbun, PA Consulting Group; Ralph Prahl, Ralph Prahl & Associates. Wisconsin Public Service Commission, *Focus on Energy Evaluation: Framework for Self-Report Net-to-Gross (Attribution) Questions*. July 3, 2008.

[10] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. April 16, 2010.

[11] The Commercial value of 84 percent attribution was applied to CFLs in the CATI sample that fell under the Industrial or Schools & Government sectors.

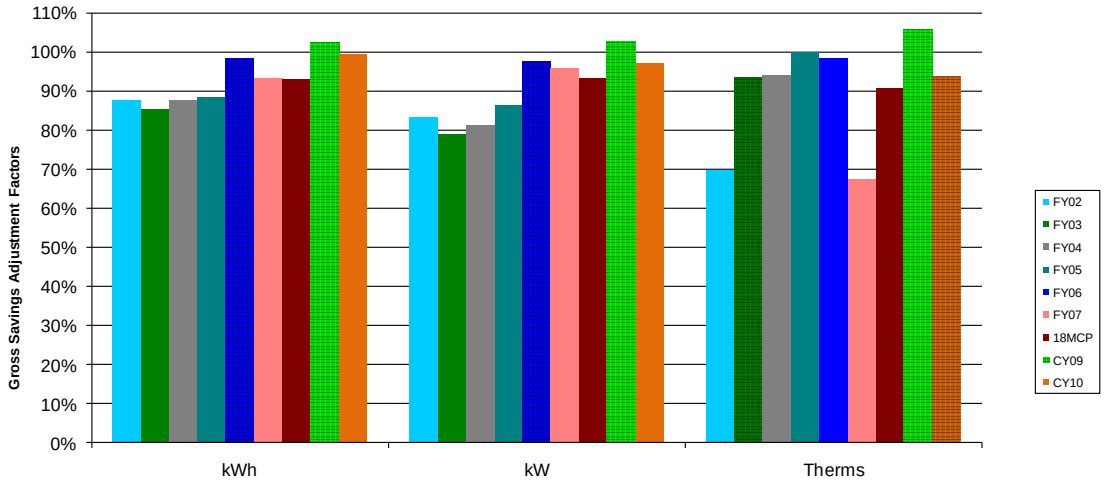
[12] Mimi Goldberg, Ryan Barry, Tammy Kuiken, Paula Ham-Su, and Ben Jones, KEMA, Inc. *Focus on Energy Evaluation Abbreviated FY07 Business Programs Impact Evaluation*. February 18, 2008.

[13] The statistical comparison to FY07 is not based solely on the FY07 data collected as part of the FY07 Abbreviated Impact Evaluation. It is based on a combination of FY06 and FY07 data. For more details on the abbreviated approach, see the *Focus on Energy Evaluation Abbreviated FY07 Business Programs Impact Evaluation* memo.

- Starting with the CY09 evaluation, data from the CATI survey is incorporated to help determine the engineering verification factor.

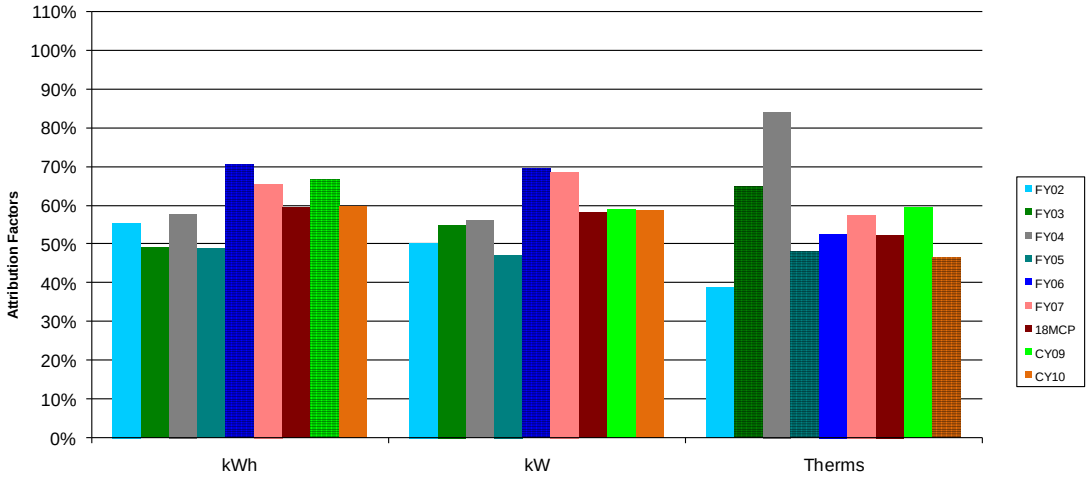
Cross-hatching in Figure 1-2 through Figure 1-4 indicates that the increase or decrease of the adjustment factor compared to the previous evaluation period's result is statistically significant at the 95 percent level of confidence.

Figure 1-2. Gross Savings Adjustment Factors by Energy Unit [a b]
Comparison across Fiscal Years



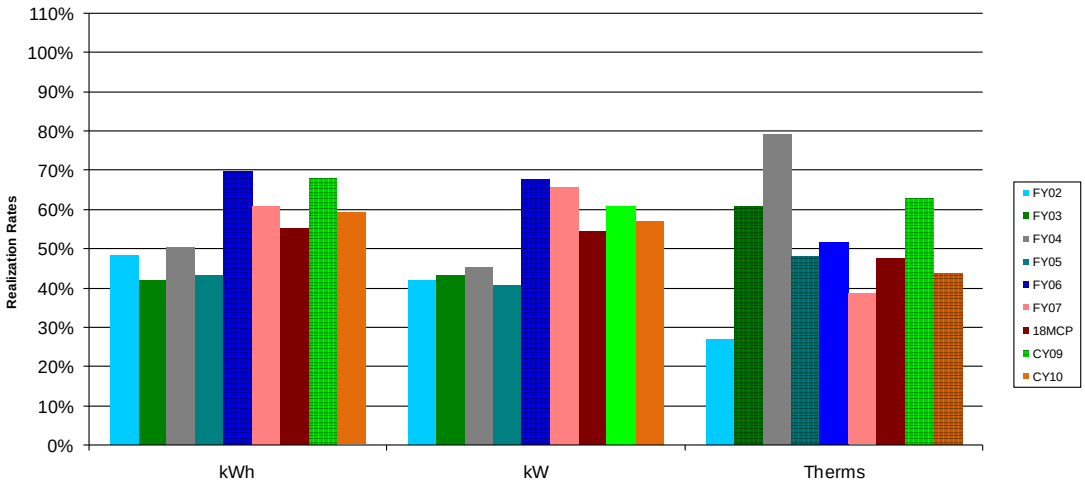
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure 1-3. Attribution Factors by Energy Unit [a b]
Comparison across Fiscal Years



[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure 1-4. Realization Rates by Energy Unit [a] [b]
Comparison across Fiscal Years



[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

1.3.2 Reasons for discrepancies between verified and tracked savings

Table 1-3 shows a summary of the relationship between verified and reported gross savings for the engineering sample for this evaluation and compares it to the last two evaluation periods.[14] In CY10, the percentage of adjusted measures is fairly consistent across energy units. Verified savings are equal to reported savings for 78 percent of kWh measures, 79 percent of kW measures, and 70 percent of therm measures with applicable savings for those energy units. These values are an improvement over the recent evaluations, meaning that a lesser percentage of measures were adjusted in this evaluation than in the recent past. This is the second evaluation period in a row where the percentage of projects that were not adjusted has increased.

[14] Table 1-3 reflects only adjustments for measures that were part of the engineering sample, not those for the CATI sample. This is necessary since adjustments to the CATI sample have not been handled consistently across the evaluations.

Table 1-3. Comparison to Previous Evaluations

Adjustments by Energy Unit		18MCP Rounds 1 & 2		CY09		CY10	
		#	%	#	%	#	%
kWh	Not installed	4	1%	1	0%	0	0%
	Verified equal reported	319	46%	213	68%	255	78%
	Verified not equal reported	368	53%	102	32%	72	22%
	Engineering sample	691		316		327	
kW	Not installed	3	0%	1	0%	0	0%
	Verified equal reported	325	51%	190	68%	228	79%
	Verified not equal reported	307	58%	91	32%	61	21%
	Engineering sample	635		282		289	
Therm	Not installed	1	1%	0	0%	0	0%
	Verified equal reported	74	47%	94	67%	89	70%
	Verified not equal reported	81	52%	47	33%	39	30%
	Engineering sample	156		141		128	
Total engineering sample		**801**		**410**		**412**	

There were three changes to the verified gross savings analysis for CY09 and CY10 that would affect the comparison to the 18MCP.

- Data have been collected from the CATI survey to inform the gross savings adjustment for measures other than CFLs. In CY09 and CY10, the CATI survey was restricted to deemed measures and questions were written to collect on the number of units installed or serviced and additional deemed savings multipliers, as necessary.
- In the 18MCP evaluation, discrepancies were not reported unless they were an adjustment of ten percent or more. In the past two evaluations, all discrepancies were reported, regardless of the degree of change from the tracking estimate.
- This is the third evaluation period that has a significant portion of savings that come from deemed measures. Though the 18MCP also had a significant number of deemed measures, the deeming process continues with each evaluation period and a greater number of measures were deemed in CY09 than in the 18MCP. The portion of deemed savings in the sample frame increased to 49 percent of the population kWh and kW savings in CY10, versus 32 percent and 31 percent, respectively, in CY09. The portion of therm deemed savings increased from 18 percent to 35 percent of the population.

The number of analysis changes between the 18MCP and the CY09 and CY10 evaluation periods limit the ability to compare gross savings adjustment results among the three years.

1.4 CONCLUSIONS AND RECOMMENDATIONS

This section of the report brings together the principal findings generated by the impact evaluation analysis with the goal of assessing trends and drawing conclusions. We have

also made some recommendations for program staff and Public Service Commission of Wisconsin (PSCW) consideration.

Several key observations emerge from the findings, as discussed below.

- Program realization rates for electric usage and demand have held steady from CY09. The CY10 kWh and kW realization rates are statistically consistent with the CY09 estimates. This is the fifth evaluation in a row that the program has achieved greater than a 50 percent realization rate for electric usage and demand.
- The program realization rate for natural gas has dropped from CY09. The therm realization rate decreased from 62.9 percent in CY09 to 43.8 percent in CY10. This change is statistically significant at the 95 percent confidence interval. Natural gas projects tend to be fewer in number and larger on average than electric projects, making the program therm results more susceptible to the variation in individual large projects.
- The program continues to do an effective job of estimating gross savings resulting from energy efficiency measures. Though all three gross savings adjustment factors are lower in CY10 than they were in CY09, only the change in the therm adjustment factor is statistically significant at the 95 percent confidence interval. The CY09 results were unusually high, with factors for all three energy units greater than 100 percent for the first time since the evaluation of the program began.
- The attribution factor estimates have either decreased or held steady from CY09. The therm attribution factor has decreased from 59.5 percent in CY09 to 46.7 percent in CY10. The kWh and kW attribution factors are statistically consistent with the CY09 results.
- Service buydown measures have a lower attribution than non-service buydown measures for all three energy units. The kWh attribution factor for service buydown measures is 35.6 percent and for non-service buydown measures is 65.3 percent. The kW attribution factor for service buydown measures is 26.0 percent and for non-service buydown measures, it is 67.5 percent. The therms attribution factor for service buydown measures is 34.2 percent and for non-service buydown measures, it is 53.2 percent. The differences for all three energy units are statistically significant at the 95 percent confidence interval.
- Early evidence shows positive potential for the retrocommissioning portion of the program. Retrocommissioning (RCx) is a time-intensive process that can require expert knowledge of building science and early evidence suggests it can result in high program attribution. Coupled with the large amount of gross savings generally estimated for this type of project, it appears that the RCx portion of Focus can make a strong contribution to the overall net savings.

  There have been some concerns about RCx projects that would be compounded if the program shifts to life cycle savings goals. Poor persistence may invalidate the benefit that RCx provides to the program. Further information should be available from upcoming studies.

The conclusions reached in this section offer guidance to program managers seeking to improve program performance. To that end, KEMA recommends the following actions:

- Continue to effectively estimate gross savings for the program, overall.
- Move to a standardized workbook format for summarizing all custom projects. Improvements in program documentation have made evaluating the gross savings easier. Two of the four sectors have transitioned to a standardized workbook format to summarize custom projects and the evaluation team has found the standardized approach easier to review. The documentation of program assumptions has also improved across all sectors in recent years.
- Review the results of upcoming RCx persistence studies. Based on those results, consider continuing to offer retrocommissioning projects to interested customers and consider expanding the program. Exclude companies that require retrocommissioning as part of their operations.
- Standardize savings calculations and/or methodologies for retrocommissioning projects. The evaluation team found wide variation in the methodology used to determine savings for retrocommissioning measures. Standardization would reduce program costs and allow for more effective evaluations.
- Add a more thorough review or reconciliation stage to the process. Estimating savings for retrocommissioning measures can be difficult because of the interactive effects of changes on the same end-use system. Pre-installation energy savings estimates can often be incorrect and the differences can be substantial. Adding a formal review to "true up" the savings estimates post-installation will make tracking estimates more accurate. In addition, we recommend developing a procedure in consultation with the evaluation team for correcting and updating savings estimates for projects that are expected to result in a stream of energy efficiency improvements identified by the program and trackable over an extended period.[15]

In addition to the above recommendations for program staff, KEMA recommends that the PSCW use the overall realization rate results reported in this study to determine net program impacts for the first six months of CY10 only. Given the major changes in the program between the first and second halves of CY10 (which are not reflected in this evaluation), KEMA recommends that the PSCW use the non-service buy-down realization rate for determining net impacts for the last six months of CY10. The non-service buy-down realization rates are 63.1 percent for kWh, 63.0 percent for kW, and 48.8 percent for therms. These values are all statistically different from the service buy-down realization rates at the 95 percent level of confidence.

[15] This recommendation applies specifically to retrocommissioning and might also apply in other situations where the program is tracking continuing improvements after an initial project. This situation does not apply to untracked savings that may or may not occur following Focus assistance. Untracked savings are accounted for in spillover estimates. Any procedure for tracking delayed savings must avoid double counting with initial tracked savings, adjustments already made by the evaluation verified gross savings adjustments, and/or spillover credit procedures.

2. INTRODUCTION

This report presents the results of the impact evaluation of the statewide Focus on Energy Business Programs of measures implemented from October 1, 2009, through June 30, 2010. Throughout the report, we refer to this evaluation as the calendar year 2010 (CY10) evaluation, though it covers one quarter of calendar year 2009 (CY09) and two quarters of CY10.

The principal objective of the impact evaluation was to determine the energy and demand savings attributable to the program. The analysis calculates a set of adjustment factors that are used to determine evaluation verified gross and net energy savings for the statewide Focus on Energy Business Program. Since the start of the program, the evaluation team has implemented thirteen rounds of data collection and documentation review to estimate the net energy savings for Business Programs.

In this section, we summarize the evaluation approach and describe the organization of the remainder of the report.

2.1 OVERVIEW OF APPROACH

KEMA uses the statistical procedure of ratio estimation to develop estimates of evaluation verified gross and net impacts. There are two basic steps to the process:

- **Verify energy savings in a sample of participating customers.** KEMA estimated actual energy savings under current conditions for a sample of customers who installed energy efficient equipment during CY10. KEMA conducted detailed engineering reviews to determine how tracking gross savings were calculated for the custom measures that accounted for a significant portion of total tracked savings. The engineering reviews included a review of program tracking data, a review of program documentation, and customer interviews by an energy engineer. In addition, a computer-aided telephone interview (CATI) was used to collect information on measure installation, gross savings calculation inputs, and program attribution for deemed measures. The gross savings calculation inputs collected during the CATI survey were used to verify the savings reported in the tracking database. Where a single customer contact represented both custom and deemed measures, an engineering review was given rather than a CATI survey for that customer.
- **Expand sample results to the population of customers.** The sample results obtained in the first step were expanded to the population by calculating the ratios of verified-to-tracked (gross savings adjustment factor) and attributable-to-verified (attribution factor) for the sample. The results of the *Participant Spillover Savings Study*[16] were added to the ratios and they were then applied to the population. Finally, untracked attributable savings (UAS) resulting from the impact evaluation

[16] Miriam L. Goldberg, Christopher Dyson, and Valy T. Goepfrich, KEMA Inc. *Business Programs: Participant Spillover Savings Study*. December 22, 2005.

of the Education and Training program and the CY09 supply-side study were then added to the population net savings.[17]

The adjustment factors estimated from the data collection and analysis include:

- **Gross savings adjustment factor.** This factor adjusts tracking gross savings for installation and changes based on the engineering review and CATI data collection. Applying the gross savings adjustment factor to tracking gross savings produces the estimate of verified gross savings.
- **Attribution factor.** This factor adjusts verified gross savings for program attribution.
- **Realization rate.** This factor combines the gross savings adjustment factor and the attribution factor. It is the ratio of net savings to tracking gross savings.

A number of changes made to the sampling method and report organization in CY09 are continued for this round of evaluation. KEMA moved from a customer-based sample design to a measure-based sample design. We use a Model Based Statistical Sampling (MBSS) tool to develop a design that produces the optimally allocated sample by maximizing precision based on the population and the expected variance in the population. Sampling measure groups were identified based on the percentage of program savings in each group and were consistent with the priorities communicated by the program and the PSCW in CY09. Once the data were collected and the results were calculated, KEMA defined reporting measure groups that aggregated some of the sample measure groups with related groups to yield broader but still meaningful categories with good precision. Further detail on the MBSS tool, the sampling measure groups, and the reporting format can be found in Section 3.

2.2 ORGANIZATION OF REPORT

Section 3 of the report presents a more detailed discussion of the impact evaluation approach. This section includes adjustment factor definitions, the sampling plan, and a brief description of major changes to the impact evaluation since CY09.

Section 4 of the report summarizes the adjustment factor results presented in this report, followed by the energy savings results. The CY10 results are provided for kWh, kW, and therms, both by reporting measure group and for the Business Program overall. Following the adjustment factor results is a table showing the application of the adjustment factors to the gross reported savings and a discussion of the discrepancies between gross reported and gross verified savings. The energy savings results table includes the effects of the impact evaluation of the Education and Training program and the supply-side study from CY09.

Section 5 of the report summarizes the major findings presented in Section 4. It also contains evaluation recommendations based on the findings of this study.

[17] Unlike the added spillover savings, the untracked attributable savings resulting from the impact evaluation of the Education and Training program and the recent supply-side study are not included in the adjustment factors.

Following Section 5 is a series of appendices containing:

- Appendix A: Series of tables and charts showing the five adjustment factors for CY10 at the reporting measure group level with additional statistical information not provided in the body of the report and all five adjustment factors for CY10 at the sampling measure group level.
- Appendix B: Additional detail from the engineering review reporting sector-level results.
- Appendix C: Sector-level results of the five adjustment factors and some sector-level sampling information.
- Appendix D: An overview of some of the survey responses received during data collection.
- Appendix E: A detailed explanation of the process used to determine attribution.
- Appendix F: An explanation of the process used to expand the sample results to the population.
- Appendix G: Detailed sample design tables showing various components of the sample design.
- Appendix H: Life cycle net savings (LCNS) analysis results.
- Appendix I: Discussion on the incorporation of non-CFL spillover into the existing attribution calculation and the addition of untracked attributable savings from the Education and Training impact evaluation and the supply-side study completed in CY09.
- Appendix J: A complete list of the deemed savings measures and their values for the period covered by this evaluation.
- Appendix K: Computer-Aided Telephone Interviewing (CATI) survey instrument.
- Appendix L: Engineering survey instrument.
- Appendix M: Supplier survey instrument.

3. GENERAL APPROACH

The broad approach of the impact evaluation fieldwork was similar to that used in the past and identical to the method used in CY09.[18] In the CY09 evaluation, KEMA began using a new sampling method and updated survey instruments. This section contains a general description of the adjustment factors used in this analysis, followed by a detailed discussion of the sample design and reporting format.

3.1 APPROACH AND DEFINITIONS

The evaluation team has implemented 13 rounds of data collection and document review to estimate net energy savings for Business Programs. Each evaluation has included a telephone survey of Focus Business Programs participants who installed measures in the appropriate period. Table 3-1 shows the fiscal or calendar year and the implementation period for measures included in each round. Some fiscal years have included multiple rounds of data collection. The most recent round included measures installed between October 1, 2009, and June 30, 2010, according to the Business Programs' tracking systems (WISeerts and Rebates databases).

Table 3-1. Thirteen Rounds of Impact Evaluation Data Collection

Impact Evaluation Round	Fiscal or Calendar Year of Implementation	Implementation Time Period [a]
1	F2001–2002	April 2001–December 2001
2	F2002	January 2002–March 2002
3	F2002	April 2002–June 2002
4	F2003	July 2002–December 2002
5	F2003	January 2003–June 2003
6	F2004	July 2003–December 2003
7	F2005	July 2004–December 2004
8	F2006	July 2005–June 2006
9	F2007	July 2006–June 2007
10	F2008[b]	July 2007–March 2008
11	C2008[c]	April 2008–September 2008
12	C2008 & C2009	Oct 2008–September 2009
13	C2009 & C2010	Oct 2009–June 2010

[a] Partners included in the sample frame for each round are those with implementation completed in the indicated time period

[b] Measures were implemented during the 2008 fiscal year but are part of the 18 Month Contract Period.

[c] Measures were implemented during the 2008 calendar year but are part of the 18 Month Contract Period.

[18] At the request of the PSCW, KEMA calculated adjustment factors using the Life Cycle Net Savings (LCNS) method in addition to the First Year Net Savings (Y1NS) method outlined in the body of this report. The LCNS method results can be seen in Appendix H.

The survey addresses measure installation and characteristics (e.g., quantities, equipment efficiencies, and operating hours), program attribution, and measure cost among other topics. Each evaluation has also included an engineering review of program documentation on how the tracking gross savings were calculated, where the tracking gross savings are the gross savings reported in the WISeerts and rebate databases. Finally, each evaluation has included on-site measurement at some participant sites to verify measure information and provide actual measured or metered data to support gross energy savings estimates.[19] The results of the survey, engineering review, and on-site data are combined to create several adjustment factors, as described below.

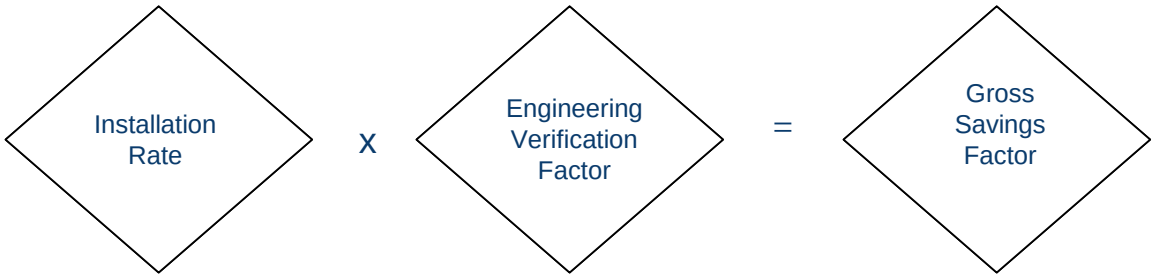
3.1.1 Adjustment factors defined

The adjustment factors estimated from the data collection and analysis are as follows:

- **Installation rate.** This factor corresponds to the fraction of measures that were installed. Each measure is assigned a binary factor that identifies whether it was installed or not installed. Adjustments to the number of units installed for a particular measure are included in the engineering verification factor, not in the installation rate.
- **Engineering verification factor.** This is the ratio of the verified gross savings to the tracking estimate of gross savings for installed measures. The engineering verification factor includes corrections to the numbers of units installed, changes in operating hours, changes in operating levels, etc. Starting with this round, the correction is determined both for measures in the engineering sample and measures in the CATI sample and is applied to measures that were installed by participants in both groups, custom and deemed. Measures in the CATI sample receive the deemed energy savings and adjustments based on the parameters used to calculate total measure savings, such as unit quantity or operating hours.
- **Gross savings adjustment factor.** This factor combines the installation rate and the engineering verification factor. It corresponds to the ratio of the verified gross savings to the tracking estimate of savings. Figure 3-1 shows how the installation rate and engineering verification factor are combined to produce the gross savings adjustment factor.

[19] We performed two site visits during the CY10 evaluation. We also utilized on-site data and reports provided by the Focus Measurement & Verification team.

Figure 3-1. Gross Savings Adjustment Factor Calculation



- **Attribution factor.** This factor adjusts verified gross savings for program attribution. It is the estimated proportion of verified gross savings attributable to the Focus Business Programs. It corresponds to the ratio of net savings to verified gross savings. Attribution factors used to estimate the net savings are calculated in one of two methods. The selection of market-based versus self-reported approaches is based on the white paper *Net-to-Gross Method Selection Framework for Evaluating Focus on Energy Program*[20] developed by the Focus evaluation team (March 2006). Based on the criteria laid out in the white paper it was determined that a market-based approach would be used only for small (≤ 32W) CFLs; all other technologies would continue to use self-reported approaches.
  - *Self-reported program response* methods determine attribution to the program on a measure-by-measure or an end use-by-end use basis using participant self-reported information about their plans and intentions. The calculation includes adjustments for the efficiency, quantity, and timing of measures that the participant may have installed in the absence of the program.
  - *Market sales-based* methods were added to the Business Programs impact evaluation for FY06. This method relies on aggregate sales data in total sales of a particular technology in Wisconsin. Sales volume data are compared with a baseline estimate of the volume that would have been sold in the absence of the program. Beginning with the FY06 impact evaluation, the attribution factor for CFLs has been determined using a market-based approach conducted jointly for the Business and Residential programs.[21] The attribution factor for this report is based on the results presented in the memorandum *2008 Sector-based CFL Net-to-Gross Analysis,* dated April 2010.[22] This is the most recent

[20] Miriam L. Goldberg, KEMA Inc, principle author, Oscar Bloch, Division of Energy, Wisconsin Department of Administration; Ralph Prahl, Prahl & Associates; David Sumi and Bryan Ward, PA Consulting Group; Rick Winch and Tom Talerico, Glacier Consulting Group; contributing authors. *Net-to-Gross Method Selection Framework for Evaluating Focus on Energy Programs.* March 16, 2006.

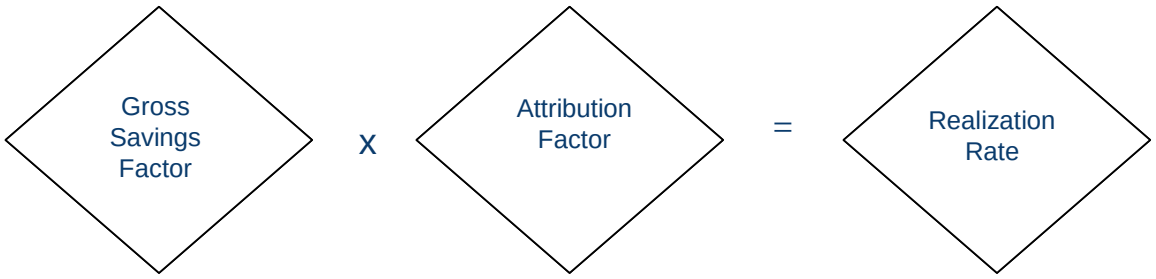
[21] Throughout this report, the term CFL is used to refer to CFLs less than or equal to 32 watts. CFLs larger than 32 watts are included in the non-small CFL lighting measure group and do not receive market based attribution.

[22] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. April 16, 2010.

study to produce attribution results for the Commercial and Agricultural sectors, separate from the Residential Programs. These attribution rates were 84 percent and 85 percent, respectively.[23] The Commercial value of 84 percent attribution was applied to CFLs that fell under the Industrial or Schools & Government sectors.

- **Realization rate.** This factor combines the gross savings adjustment factor and the attribution factor as shown in Figure 3-2. It corresponds to the ratio of the net savings to the tracking estimate of savings.

Figure 3-2. Realization Rate Calculation



3.2 SAMPLING

The CY10 adjustment factors are based on one round of data collection and documentation review, which covers energy efficiency measures implemented between October 1, 2009, and June 30, 2010. In this round, data were collected from and documentation was reviewed for a random sample of participants who installed measures during the last quarter of 2009 and the first two quarters of 2010. This determination is made based on the "WECCAuthorizedDt" variable entered in the WISeerts database.[24] If the variable value is on or between October 1, 2009, and June 30, 2010, then we consider the measure to have been installed during the evaluation period.

3.2.1 Sampling process

KEMA continued use of the sampling process created for the CY09 impact evaluation. Prior to CY09, we sampled the data at the customer level, which allowed us to collect data for a large number of measures and large fraction of avoided costs, while minimizing customer contacts. Sampling at the customer-level is a cost-effective method of collecting the data to achieve the desired level of precision at the portfolio level and by the sectors as

[23] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. April 16, 2010.

[24] This evaluation period includes the joint program implemented by Focus on Energy and Alliant Shared Savings. At the beginning of the sampling process, KEMA chose to evaluate all measures that received money from the Focus program as Focus measures and all measures that received money from the Shared Savings program as Shared Savings measures, regardless of which program identified the measure or worked with the customer. This assignment only affects how the projects were evaluated.

a secondary objective. However, it does not easily allow for prioritization of certain types of measures for estimation of net savings by measure types at acceptable levels of precision. Therefore, we employed a sampling process that selects units at the measure level, not the customer level. This allows for the estimation of net energy savings for selected measure types.

Sampling at the measure level requires more customer contacts to determine the impacts from the same number of sample measures. This raises the per-measure evaluation cost but also allows us to focus on measure groups with certain technology types, such as HVAC, and estimate the adjustment factors for those specific measure groups. For the same or similar evaluation budget, the measure level sampling will likely result in slightly lower precisions at the portfolio level when compared to customer level sampling.

The sampling method uses a KEMA tool to determine the sample design. The tool uses Model Based Statistical Sampling (MBSS) to develop a design that will produce the optimally allocated sample by maximizing precision based on the population and the expected variance in the population. The tool is a collection of modules that can help to choose appropriate sample sizes for data segments, develop efficiently stratified sample designs, draw samples, and validate sample data. MBSS is a statistical approach to sampling pioneered by Roger Wright, which leverages information known about the population to more efficiently design a sample. This tool has been used to design samples for many impact evaluations of energy efficiency programs across the country.

The tool is ideal for complex sample designs with large populations and multiple analysis variables. It allows KEMA to create code that can be used by a number of people and produce consistent results. The process is more efficient and less time consuming than the previous sampling method. The tool also produces anticipated precision estimates for each measure group in the population.

3.2.2 Sample design

As in previous years, KEMA designed the sample to achieve our primary objective of a relative precision of ± ten percent at the 90 percent confidence interval for the avoided cost of the overall program. Using the avoided cost of the measure allows us to combine electric consumption, demand, and natural gas savings into a single number that we then use to assign weight to the measure for sampling. Measures with greater avoided costs represent greater program savings.

The sample design looked at expected precisions from a number of different perspectives, including, but not limited to the following:

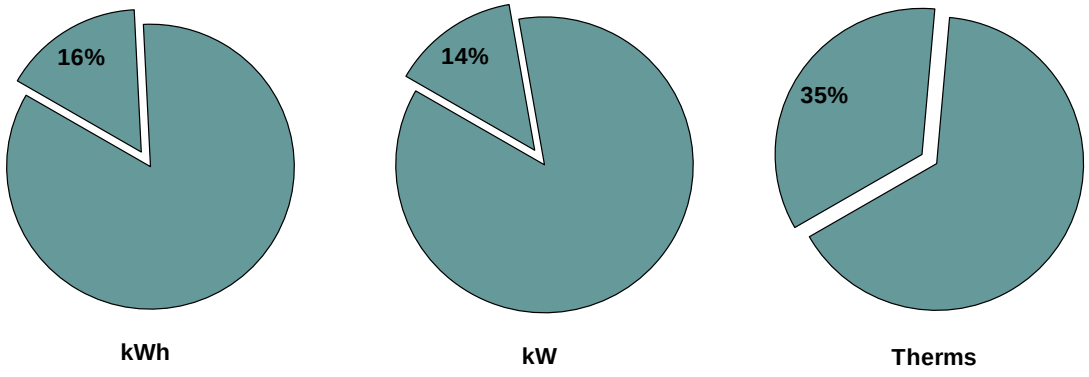
- Overall program
- Fuel savings type (i.e., natural gas or electricity)
- Measure group
- Sector
- Deemed/not deemed
- Service buydown or not.

Our goal was to identify measure categories that make up a large portion of program savings and attempt to sample them at a rate that would provide meaningful precision. At the same time, we sought to balance WECC and PSCW measure group priorities from CY09 with the primary objective of the study and the achievement of meaningful sector-level results in allocating sample targets among the different measure groups.

One limiting factor to the precision of estimates with finite populations is the inability of researchers to force respondents to participate in the research study. If program participants who installed large measures refuse or are unable to participate in the study, the precision of the estimates decreases because a large fraction of energy savings is not included in the sample.

The percentage of savings for which we completed surveys is shown in Figure 3-3. In CY10, we surveyed a larger percentage of electric savings and a smaller percentage of therm savings, compared to CY09 (12, 10, and 46 percent for kWh, kW, and therms, respectively, in CY09).

Figure 3-3. Percentage of Tracking Gross Savings Represented by Measures Included in the Sample



3.2.3 Computer-assisted telephone interview (CATI) versus engineering samples

The sample has two components: an engineering sample and CATI sample. Participants selected for the engineering sample receive an expert interview and their sampled measures undergo an engineering review. Participants selected for the CATI sample receive a telephone interview only. The CATI assignment is only for customers whose sample measures are all deemed measures.

A detailed description of the steps in the sample selection process is as follows:[25]

1. Each measure was assigned to a sampling stratum based on its sector, its measure group,[26] whether it was deemed or not, whether it had therm impacts or not, and the magnitude of its avoided costs.

[25] See Appendix G for detailed tables showing the distribution of the frame and sample by strata. These tables also show characteristics used to divide the frame into our sampling stratum.

2. The initial sample design was output by the MBSS system with an optimal sample design for precision at the overall program level.
3. The sample design was modified to improve precisions in groups of interest to WECC and the PSCW in CY09.
4. Measures were randomly assigned a call order. The call order was used to assign measures to the primary sample, backup sample, or non-sampled groups.
5. The primary sample included a number of measures equal to the target number of completed surveys in the strata.
6. The number of measures in the backup sample differed based on whether the stratum was deemed or not and whether the measure was a CFL or not, based on historic completion rates. The backup sample was determined as follows:

    a. For each non-deemed stratum, the backup sample included one-half the number of measures as the primary sample. All of these measures were included in the engineering survey.

    b. For non-CFL deemed strata, the backup sample included nine times the number of measures in the primary sample. Most of these measures were included in the CATI sample, but some were included in the engineering sample if they were installed by customers that also had a non-deemed measure selected. The CATI response rate is generally lower than that of the engineering survey, necessitating a much larger backup sample.

    c. For CFL strata, the backup sample included 19 times the number of measures in the primary sample. Many CFL records lack adequate contact data, so a very large group of backup measures is required.

7. All customers with measures in either the primary sample or measures in the non-deemed backup sample were contacted. If the participants had additional measures in the deemed backup sample, we surveyed them about the backup measures in the same call. This resulted in additional measures being completed in the deemed backup sample. We unit-weighted (i.e., gave them a sampling weight of one) these measures if they were completed prior to their randomly assigned call order. Unit weighting allows us to use the extra information collected, but force the results to represent only the specific measure completed (sampling weight of one) and not other measures in the same stratum. It allows us to use the extra information collected without biasing our sample.
8. CFL cases drawn for the CATI sample receive telephone interviews only for installation confirmation. Since FY06, a market-based method has been used to determine attribution for CFL-only participants.

Table 3-2 shows the final sample distribution by the measure groups used for sampling. We failed to meet our target number of completes in six of the groupings shown (process,

[26] Some measure groups with limited savings impacts in the frame were combined into another category for the purposes of sampling.

CFL, agriculture, new construction, waste water treatment, and motors and drives). In many cases, we far exceeded our target due to completing extra backup measures installed by participants who also completed a primary measure.

Table 3-3 shows the same information for deemed and not-deemed measures in the sample and population. The portion of the sample frame that includes deemed savings increased in CY10, from 32 percent for kWh and 31 percent for kW in CY09, to 49 percent for both in 2010. The portion of therm deemed savings increased from 18 percent in CY09 to 34 percent in CY10. For a detailed strata-by-strata look at the population, targets, and completed sample by strata, see Appendix G.

Table 3-2. Population (Frame) and Final Sample by Sampling Measure Group

Sampling Measure Group	Frame	Target	Sample Completes	Fraction of Frame Total Reported Gross Savings					
				Frame			Sample		
				kWh	kW	Therms	kWh	kW	Therms
Lighting	8,617	182	364	40%	37%	0%	7%	7%	0%
HVAC	1,627	95	111	8%	18%	31%	1%	1%	8%
Process	80	20	18	6%	4%	22%	1%	0%	14%
Boilers & burners	1,633	142	229	0%	0%	32%	0%	0%	9%
CFL	11,401	25	21	7%	11%	0%	0%	0%	0%
Compressed air, vacuum pumps	372	15	15	9%	7%	0%	1%	0%	0%
Refrigeration	948	46	118	12%	10%	2%	5%	4%	2%
Agriculture	566	7	1	1%	1%	3%	0%	0%	1%
New construction	36	10	5	1%	2%	3%	0%	0%	1%
Industrial ovens and furnaces	8	3	3	0%	0%	1%	0%	0%	0%
Waste Water treatment	15	4	3	2%	1%	0%	0%	0%	0%
Motors & drives	1,418	25	21	10%	7%	0%	0%	0%	0%
Other	1,163	30	41	5%	2%	6%	0%	0%	0%
Business Programs Overall	**27,884**	**604**	**950**	**100%**	**100%**	**100%**	**16%**	**14%**	**35%**

Table 3-3. Population (Frame) and Final Sample by Deemed/Not Deemed Categories

Deemed	Frame	Target	Sample Completes	Fraction of Frame Total Reported Gross Savings					
				Frame			Sample		
				kWh	kW	Therms	kWh	kW	Therms
Deemed	23,261	405	797	49%	49%	34%	11%	10%	10%
Not deemed	4,623	199	153	51%	51%	66%	5%	4%	25%
Business Programs overall	**27,884**	**604**	**950**	**100%**	**100%**	**100%**	**16%**	**14%**	**35%**

3.3 REPORTING FORMAT

Each adjustment factor (defined in Section 3.1.1) was calculated separately for each energy unit (kWh, kW, and therms) in combination with each sampling measure group, as well as for Business Programs overall. For some sampling measure groups, the precision achieved was insufficient to report as a stand-alone estimate in the body of the report. In general, measure groups with relative errors greater than 40 percent for their primary savings type were allocated into other measure groups as shown in Table 3-4. Those measure groups that did not meet this criterion were retained in CY10 to allow for cross-year comparisons to CY09 and to maintain consistent reporting. The reporting measure groups include non-small CFL lighting, HVAC, expanded process, boilers and burners, small CFLs, refrigeration, and other. The final sampling distribution by reporting measure group is in Table 3-5. Sector-level (Agriculture, Commercial, Industrial, and Schools and Government) and sampling measure group adjustment factor results were also calculated and are reported in Appendix C and Appendix A, respectively.

Table 3-4. Reporting Measure Groups

Reporting Measure Group	Sampling Measure Group
Non-small CFL lighting	Lighting
HVAC	HVAC
Small CFLs	CFL
Boilers & burners	Boilers & burners
Refrigeration	Refrigeration
Expanded process	Process
Expanded process	Compressed air, vacuum pumps
Expanded process	Industrial ovens and furnaces
Expanded process	Waste water treatment
Other	Agriculture
Other	Motors & drives
Other	New construction
Other	Other

Table 3-5. Population (Frame) and Final Sample by Reporting Measure Group

Reporting Measure Group	Frame	Target	Sample Completes	Fraction of Frame Total Reported Gross Savings					
				Frame			Sample		
				kWh	kW	Therms	kWh	kW	Therms
Non-small CFL lighting	8,617	182	364	40%	37%	0%	7%	7%	0%
HVAC	1,627	95	111	8%	18%	31%	1%	1%	8%
Expanded process	475	42	39	16%	12%	23%	1%	1%	14%
Boilers & burners	1,633	142	229	0%	0%	32%	0%	0%	9%
Small CFLs	11,401	25	21	7%	11%	0%	0%	0%	0%
Refrigeration	948	46	118	12%	10%	2%	5%	4%	2%
Other	3,183	72	68	17%	12%	12%	0%	1%	2%
Business Programs overall	**27,884**	**604**	**950**	**100%**	**100%**	**100%**	**16%**	**14%**	**35%**

The adjustment factors shown in the tables in the results section are based on data from CY10 data collection and documentation review. This covered measures implemented during the last quarter (October 1, 2009, through December 31, 2009) of 2009 and the first two quarters (January 1, 2010, through June 30, 2010) of 2010 for a total of three quarters evaluated. The reported adjustment factors are weighted according to the sampling rate within each stratum. The main objective in designing the sample drawn in the most recent round was to provide the best possible estimates for the Business Programs overall.

3.4 SUMMARY OF MAJOR CHANGES

Although the general impact evaluation approach was similar to that used in the past, changes in the program and evaluation environment have resulted in some modifications to the impact evaluation methodology and process.

It is important to appreciate these methodological changes, especially when interpreting the comparisons across years. Statistical tests consider the sample design but do not consider programmatic and methodological changes, such as the program's move to deemed savings or changes in the calculation of attribution factors.

Major changes affecting the impact evaluation methodology over the last few rounds are summarized below.

3.4.1 Change to sampling and reporting units

In CY09, KEMA changed from a customer-level sampling design to a measure-level sampling design. We also changed from reporting results at the sector-level to reporting them at the measure-group-level. Sector-level results are still available in Appendix C.

3.4.2 Updated survey instrument

KEMA made changes to both the engineering and CATI survey instruments for the CY09 evaluation. A number of questions were combined and some redundant questions were removed from the engineering survey. The CATI survey was changed to bring it in line with

the engineering survey and questions were added to allow the evaluation team to calculate verified gross savings for CATI measures.

3.4.3 Deemed measures

A number of measures used deemed savings or deemed algorithms to determine savings. Measures installed before January 1, 2010, were given deemed savings according to the list approved in November of 2008. Measures installed after January 1, 2010, were given deemed savings according to the list approved in December of 2009. Both lists are located in Appendix J.

The 18MCP evaluation was the first impact evaluation with a large fraction of deemed savings in the sample frame. Some of the deemed measures were included in the engineering sample, but the majority of the engineering sample was devoted to custom measures. Some small custom measures were included in the CATI sample, but the vast majority of the CATI non-CFL savings came from deemed measures. Since the makeup of the two samples (engineering and CATI) was different, a modification was made to the 18MCP calculation of the engineering verification factor. In that round, KEMA assumed that the verified gross savings for CATI non-CFL measures were equal to verified installed savings. That is, we did not apply the engineering verification factor (determined using the engineering sample) to CATI non-CFL measures and instead assumed the engineering factor to be 100 percent. We treated CFL measures in the same way as previous evaluations.

In CY09, the CATI sample was restricted to deemed measures, while the engineering sample again had a mix of deemed and custom measures. A new method was developed to determine the CY09 engineering verification factor. Questions were added to the CATI survey that allowed the evaluation team to verify the inputs into the deemed savings calculation and subsequently verify the tracking savings estimate for installed measures. Table 3-6 highlights the differences between the 18MCP and CY09 methods. The CY10 evaluation follows the CY09 process.

Table 3-6. Changes to Engineering Verification Factor Calculations from the 18MCP to CY09

Measure Type	18MCP	CY09
Engineering sample	Engineering factor based on engineering reviews	Same as the 18MCP
CATI sample: non-small CFL	Engineering factor assumed to be 100 percent.	Engineering factor based on verified deemed savings parameters collected in CATI survey
CATI sample: small CFL	Engineering factor based on verified # of units installed collected in CATI survey	Same as the 18MCP

3.4.4 Untracked attributable savings

Participant spillover effects for non-small CFLs were included in the attribution estimates based on the *Participant Spillover Savings Study*[27] (Appendix I) beginning in FY06. CFL participant spillover was included as part of the CFL market-based attribution approach beginning in FY06. Untracked attributable savings were included based on KEMA's *Impact Evaluation of the Education and Training Program*[28] (see Appendix I) beginning in the 18MCP. These values were updated in CY10, according to the study *Business Programs: Education and Training Untracked Attributable Savings.*[29] Untracked attributable savings (UAS) were included based on KEMA's *Supply-Side Study*[30] (see Appendix I) beginning in CY10. All four effects were included in this round of evaluation.

3.4.5 Databases

This impact evaluation encompasses two tracking databases. Most measures are tracked in a PSCW-maintained database (WISeerts) that contains the energy savings impacts for Focus Business Programs, starting in January 2008. CFL and other lighting rebate measures continue to be tracked in the EFI rebates database, which is maintained separately.

[27] Miriam L. Goldberg, Christopher Dyson, and Valy T. Goepfrich, KEMA Inc. *Business Programs: Participant Spillover Savings Study*. December 22, 2005.

[28] Christopher Dyson, Ken Agnew, Miriam Goldberg, Claire Palmgren, KEMA Inc. *Impact Evaluation of the Education and Training Program.* November 20, 2008.

[29] Shawn Bodmann, Christopher Dyson, Tammy Kuiken, Miriam Goldberg, KEMA Inc. *Business Programs: Education and Training Untracked Attributable Savings.* October 29, 2010.

[30] Christopher Dyson, Shawn Bodmann, Karen Rothkin, Maggie Pinckard, Erika Morgan, Ryan Barry, Miriam Goldberg, KEMA Inc. *Business Programs: Supply-side Evaluation.* April 22, 2010.

4. ENERGY SAVINGS RESULTS

The primary objective of this evaluation is to calculate energy and demand savings attributable to the program for CY10. This section of the report provides a brief description of the impact evaluation's key indices, the results of the CY10 adjustment factor analysis, a discussion of the discrepancies between gross verified and tracked energy savings, and the application of adjustment factors to gross reported savings. It also reports the key indices for service buydowns as an independent category.

4.1 DESCRIPTION OF KEY INDICES

The impact analysis determines the energy and demand savings attributable to the programs.

Direct impacts are the energy and demand savings of measures that have been implemented through the programs and are tracked by them.

Indirect impacts are energy and demand savings attributable to the programs, but not tracked by them. These impacts result from market effects attributable to the programs.

The program reports its estimate of the gross savings based on each tracked measure. The gross savings is the difference between customers' energy use with the tracked measure(s) installed and what usage would have been without the measure(s). The impact analysis for a measure, group of measures, sector, or program area determines two key adjustment factors to the program-reported gross savings:

- **The gross savings adjustment factor.** This is the ratio of gross savings as verified by the evaluation team to the program-reported savings.
- **The attribution factor.** This is the ratio of the total savings attributable to the program to the verified gross savings.

Both of these factors are determined at the sampling measure group and overall Business Programs levels.

The gross savings adjustment factor for each sampling measure group is determined by selecting a sample of completed measures from the group and conducting an engineering review of the program savings estimates for those measures. The sampling and review process was described in Section 3.

The attribution factor is determined by one of two methods:

- **Market sales-based method.** This relies on aggregate data on total sales of a particular technology in Wisconsin, and compares this sales volume with a baseline estimate of the volume that would have been sold in the absence of the program. The accuracy of this method depends on the completeness and accuracy of the sales data as well as the validity of the baseline estimate. In this evaluation, the market sales-based method is used for small (≤32W) CFLs only.
- **Self-reported program response method.** This relies on responses to survey questions asking end users and/or vendors what they would have done in the absence of the program. The accuracy of estimates based on self-reported data

depends on the ability (and likely inclination) of the respondent to give accurate answers, as well as on the validity of the statistical sampling and estimation process. In this evaluation, this method is used for all measures that are not small CFLs.

The impact analysis begins with the savings estimates tracked by the Business Programs. The analysis provides the following information:

- Savings estimates by reporting measure group, as reported in the program tracking systems (WISeerts and the Rebates database).
- Gross savings adjustment factors.
- Attribution adjustment factors.
- Verified gross savings developed by applying the gross adjustment factors to the savings estimates from the program tracking system.
- Verified net savings developed by applying the attribution adjustment factors to the verified gross savings.

The gross savings and attribution adjustment factors are based on one round of data collection that covers the last quarter of CY09 and the first two quarters of CY10. The adjustment factors presented in this report will be used to determine net program impacts through the end of CY10.

4.2 INTERPRETING THE RESULTS

The next few sections provide the results of the CY10 impact evaluation. The results are presented for the overall program and separately by reporting measure group for kWh, kW, and therms. The results are presented in the following order:

- **Gross savings adjustment factor.** This factor is the product of the installation rate and the engineering verification factor.
- **Attribution factor.** This factor adjusts verified gross savings for program attribution. It is determined from the self-reported survey responses for most measures.
- **Realization rate.** This factor combines the effect of all adjustment factors. It is the product of the gross savings adjustment factor and the attribution factor.

The installation rate and engineering verification factors, the components of the gross savings adjustment factor, are provided in Appendix A. The installation rate adjusts the gross savings for non-installation and the engineering verification factor adjusts gross savings for changes based on the engineering review and data collected in the CATI survey. Sector-level adjustment factors are reported in Appendix C.

4.2.1 CY10 results tables

The CY10 adjustment factors are provided in the tables below with indicators of statistical precision at the 90 percent confidence interval, sample sizes, and the percentage of program tracking savings represented by each measure group. The plus/minus (±) error (%) indicated at the 90 percent confidence interval is the absolute difference between the estimated percentage and the upper or lower confidence bound. For example, the HVAC kWh gross

savings adjustment estimate in Table 4-1 is 88.0 percent and the 90 percent confidence interval is ± 6.8 percentage points (i.e., 88.0 percent ± 6.8 percent).[31] The HVAC measure group accounted for 7.9 percent of the overall program tracking savings. The adjustment factors are calculated using a SAS® macro provided by SAS for ratio estimation by domains. Further statistical detail regarding the adjustment factors, including the relative error and the upper and lower bounds of the 90 percent confidence interval, can be found in Appendix A.

In this report, the sampling frame includes all measures installed within the analysis period (October 1, 2009–June 30, 2010) with energy impacts associated with the program tracking database.

4.2.2 Comparison across years

The next sections have figures that show the gross savings, attribution, and realization rates over time. These charts incorporate 13 rounds of impact evaluation data collection (some fiscal years received multiple rounds of data collection) going back to the start of the program in April 2001. A crosshatched bar in the charts indicates that the increase or decrease of the adjustment factor compared to the previous fiscal year's result is statistically significant at the 95 percent level of confidence.

KEMA has also added a comparison between CY09 and CY10 results at the reporting measure group level. The following sections each include three tables, which show a comparison between the adjustment factor data for CY09 and CY10. Asterisks (*) are used to indicate when the values for CY10 are statistically different from CY09 at the 95 percent level of confidence. Because sample sizes can be small or the variation among individual projects can be large within measure groups, changes that look large may not be statistically significant for a given measure group. The tables also show the proportion of program savings represented by each reporting measure group in CY09 and CY10. For example, the refrigeration measure group represented 5.5 percent of program kWh savings in CY09 and 11.7 percent in CY10.

The Business Programs have been continuously evolving since inception. Many of these changes have resulted in methodological changes over the years that may have affected the trends in adjustment factors and may not reflect improvements or declines in program effectiveness. Six such changes are highlighted below.

- A revised survey instrument was developed based on an evaluation framework paper.[32] Changes to the instrument were made for both the 18MCP and the CY09 evaluations.

[31] The critical value for calculating the confidence interval ± for each adjustment factor is determined using Student's t-distribution and n-1 for the degrees of freedom, where n is the sample size. The critical value for the Gross Savings Adjustment Factor and the Realization Rate is determined using the degrees of freedom based on the minimum sample size for the components of the adjustment factor. These two adjustment factors are products of other adjustment factors.

[32] Rick Winch and Tom Talerico, Glacier Consulting Group; Bobbi Tannenbaum, KEMA, Inc.; Pam Rathbun, PA Consulting Group; Ralph Prahl, Ralph Prahl & Associates. Wisconsin Public Service Commission, *Focus on Energy Evaluation: Framework for Self-Report Net-to-Gross (Attribution) Questions*. July 3, 2008.

- Energy savings values for CFLs were deemed starting in FY06. The only potential adjustment for gross savings is based on the quantity of bulbs installed, not the wattages or operating hours of the bulbs.
- A number of other measures were deemed starting in FY07. The 18MCP was the first evaluation with a significant number of deemed measures implemented. As with the CFLs, deemed measures are only adjusted for the number of units installed or the algorithm inputs used to calculate the deemed savings. Deemed measures include a number of lighting measures, premium efficiency motors, furnaces, boilers, air conditioners, and others.
- The attribution estimation method for CFLs changed in FY06 from one based on self-reported program response to market-based methods. The most current attribution factors calculated by the evaluation team[33] were used for all low wattage ($\leq$32 W) CFLs. These attribution rates were 84 percent for the Commercial sector and 85 percent for the Agricultural sector. This is the third evaluation that uses separate adjustment factors for Commercial and Agriculture.[34]
- The FY07 evaluation used an abbreviated approach. The approach combined a sample of the largest measures implemented in FY07 and the sample of all, but the largest measures from the FY06 impact evaluation. This approach assumes that the net-to-gross components for all measures except the largest are essentially the same in FY06 and FY07. A detailed discussion of the abbreviated approach is provided in the memorandum that reports the FY07 results.[35] Because the FY07 adjustment factors include the effects of participants from both FY06 and FY07, we did not statistically compare the results of those two years. However, we did compare FY05 with FY06 and FY07[36] with 18MCP.
- Starting with the CY09 evaluation, data from the CATI survey is incorporated to help determine the engineering verification factor.

4.3 GROSS SAVINGS ADJUSTMENT FACTORS

Table 4-1 shows the CY10 gross savings adjustment factors by reporting measure group. The gross savings adjustment factor combines the installation rate and the engineering verification factor to adjust the tracking estimate of gross savings.

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[33] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. April 16, 2010.

[34] The Commercial value of 84 percent attribution was applied to CFLs in the CATI sample that fell under the Industrial or Schools & Government sectors.

[35] Mimi Goldberg, Ryan Barry, Tammy Kuiken, Paula Ham-Su, and Ben Jones, KEMA, Inc. *Focus on Energy Evaluation Abbreviated FY07 Business Programs Impact Evaluation*. February 18, 2008.

[36] The statistical comparison to FY07 is not based solely on the FY07 data collected as part of the FY07 Abbreviated Impact Evaluation. It is based on a combination of FY06 and FY07 data. For more details on the abbreviated approach, see the *Focus on Energy Evaluation Abbreviated FY07 Business Programs Impact Evaluation* memo.

The gross savings adjustment factors are greater than 90 percent for all three energy units, indicating that the program is doing an effective job of estimating gross energy savings. Most of the measure-group-level gross savings adjustment factors are also above 90 percent.

The refrigeration measure group has the highest gross savings adjustment factor for kWh and kW, with factors of 116.5 percent and 121.6 percent. This is largely due to projects for which evaluation used the newly updated deemed savings to adjust estimates that were made using an older prescriptive calculation tool. Non-small CFL lighting has the highest proportion of electric savings in the population with 39.6 percent of kWh and 37.3 percent of kW and adjustment factors of 100.8 percent and 92.1 percent respectively. The non-small CFL lighting kW adjustment factor was impacted by several large projects which were adjusted significantly—one positively and several negatively. For therms, boilers and burners (the group representing the largest portion of therm savings) had the highest adjustment factor with 105.0 percent, which is primarily due to a single large project where savings were increased significantly.

The precisions of the kWh and kW estimates for the expanded process and other measure groups are poor relative to the rest of the groups. For expanded process, this is due to a wide variability in the gross savings adjustment for the individual measures, which saw very large positive and negative adjustments resulting from the engineering review. This is likely due to the large and complex custom projects that make up a significant portion of this group and often see significant variability. For the other measure group, the poor precision is related to a large number of completed projects in the sample frame, a relatively small sample size, and one project that was adjusted significantly.

Table 4-1. Gross Savings Adjustment Factors by Reporting Measure Group Based on Samples from Participants Who Installed a Measure during CY10

Measure Group	kWh				kW				Therms			
	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	3	96.7%	9.2%	0.5%	2	100.0%	<0.1%	0.2%	226	105.0%	10.4%	32.2%
Non-small CFL lighting	364	100.8%	1.2%	39.6%	329	92.1%	5.9%	37.3%	-	-	-	-
Refrigeration	116	116.5%	4.8%	11.7%	113	121.6%	8.3%	9.5%	3	103.1%	3.4%	2.2%
HVAC	73	88.0%	6.8%	7.9%	47	102.4%	3.1%	18.4%	79	91.4%	6.6%	31.1%
Expanded process	26	86.3%	19.6%	16.0%	25	78.1%	19.2%	11.6%	20	98.0%	4.6%	22.7%
Small CFLs	21	100.0%	<0.1%	7.3%	21	100.0%	<0.1%	10.6%	-	-	-	-
Other	50	98.6%	17.2%	17.1%	42	94.2%	27.3%	12.3%	27	62.7%	38.2%	11.9%
Business Programs overall	**653**	**99.1%**	**4.1%**	**100.0%**	**579**	**96.8%**	**4.3%**	**100.0%**	**355**	**93.8%**	**7.5%**	**100.0%**

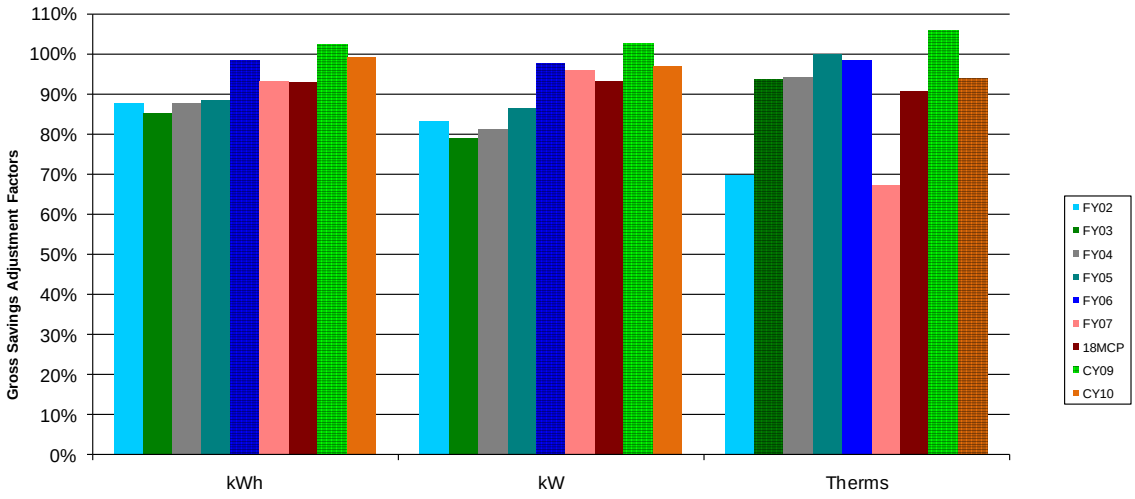
KEMA took a special look at the gross savings documentation for retrocommissioning projects, as this is the first program year with a relatively large number (10) of retrocommissioning projects completed since the program was piloted in 2007. Four of the

ten retrocommissioning projects were in the CY10 sample.[37] Retrocommissioning projects are included in the HVAC reporting measure group.

The gross savings documentation used by the program for the sampled projects was generally provided by the retrocommissioning vendor, either in a calculation tool or from a building simulation modeling program. Focus attempted to verify the vendor estimates using a number of "sanity" checks that varied in their complexity. In some cases, the inputs into the original vendor calculations were available and in other cases, they were not. The variability in the vendor-supplied calculation methods, availability of inputs, and thoroughness of the Focus sanity checks made evaluating the gross savings of these projects challenging. Because of this, retrocommissioning projects had very high gross savings adjustments in both positive and negative directions for all three energy units.

Figure 4-1 shows the overall program gross savings adjustment factors by energy unit for FY02 through CY10. The CY10 adjustment factors are greater than most previous program years for all the kWh and kW energy units and consistent with previous program years for therms. Though all three gross savings adjustment factors are lower in CY10 than they were in CY09, only the change in the therm adjustment factor is statistically significant at the 95 percent confidence interval. The CY09 results were unusually high with factors for all three energy units greater than 100 percent for the first time since the evaluation of the program began.

Figure 4-1. Overall Gross Savings Adjustment Factors by Energy Unit Comparison across Years



For this round of evaluation, KEMA has added a comparison analysis between the CY09 and CY10 results in an attempt to identify trends in the data. Table 4-2 shows the gross savings adjustment factors for kWh for CY09 and CY10 along with the percentage of savings represented by each measure group in that period and statistical precision at the 90 percent

[37] Given the small number of projects in the sample, the following summary should be taken as anecdotal and not necessarily representative of all retrocommissioning projects.

confidence interval. KEMA compared the CY10 results to the CY09 results and highlighted those that had statistically significant differences at the 95 percent confidence interval. Refrigeration was the only reporting measure group to have a statistically significant change in kWh gross savings adjustment factor from CY09 to CY10, increasing from 96.3 percent in CY09 to 116.5 percent in CY10. This is due to the calculation change from prescriptive to deemed savings as discussed above. HVAC and expanded process both saw a decrease in kWh gross savings adjustment in CY10, though the changes were not statistically significant. CY10 saw an increase in the percentage of total kWh savings represented by the refrigeration (5.5 percent in CY09 and 11.7 percent in CY10) and other (8.1 percent in CY09 and 17.1 percent in CY10) reporting measure groups and a decrease in percentage savings for the HVAC (14.5 percent in CY09 and 7.9 percent in CY10) and Small CFL (12.0 percent in CY09 and 7.3 percent in CY10) reporting measure groups.

Table 4-2. kWh Gross Savings Adjustment Factors, CY09 to CY10 Comparison

Reporting Measure Group	CY09			CY10		
	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	99.1%	2.3%	0.5%	96.7%	9.2%	0.5%
Non-small CFL lighting	101.0%	1.6%	42.5%	100.8%	1.2%	39.6%
Refrigeration	96.3%*	9.0%	5.5%	116.5%*	4.8%	11.7%
HVAC	101.8%	39.2%	14.5%	88.0%	6.8%	7.9%
Expanded process	109.9%	25.2%	17.0%	86.3%	19.6%	16.0%
Small CFLs	98.8%	1.5%	12.0%	100.0%	<0.1%	7.3%
Other	106.2%	15.4%	8.1%	98.6%	17.2%	17.1%
Business Programs overall	**102.3%**	**6.5%**	**100.0%**	**99.1%**	**4.1%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

Table 4-3 shows the gross savings adjustment factors for kW for CY09 and CY10 along with the percentage of savings represented by each measure group in that period and statistical precision at the 90 percent confidence interval. Again, KEMA compared the CY10 results to the CY09 results and highlighted those that were statistically significant differences at the 95 percent confidence interval. Three reporting measure groups had statistically significant changes. The non-small CFL lighting and expanded process groups both show decreases in kW gross savings adjustment factors with reductions of 9.4 percent and 67 percent respectively. The lighting decrease is due to large custom lighting projects where the program estimated that the maximum kW savings would occur during the peak period but the evaluation found that they would not. The expanded process decrease is a function of a very high gross savings adjustment factor in CY09 because of a single large project with a very conservative savings estimate entered in the tracking database. The refrigeration group shows a 26.4 percent increase in kW gross savings adjustment factor, due to the use of the new deemed savings to update the prescriptive savings tool used by Focus. As a percentage of program kW savings, the refrigeration group shows an increase (3.6 percent in CY09 and 9.5 percent in CY10), while the HVAC (30.0 percent in CY09 and 18.4 percent in CY10) and Small CFL (14.7 percent in CY09 and 10.6 percent in CY10) groups decreased.

Table 4-3. kW Gross Savings Adjustment Factors, CY09 to CY10 Comparison

Reporting Measure Group	CY09			CY10		
	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	100.0%	<0.1%	0.2%	100.0%	<0.1%	0.2%
Non-small CFL lighting	101.5%*	1.9%	36.5%	92.1%*	5.9%	37.3%
Refrigeration	95.2%*	9.6%	3.6%	121.6%*	8.3%	9.5%
HVAC	95.6%	9.9%	30.0%	102.4%	3.1%	18.4%
Expanded process	145.1%*	37.8%	9.4%	78.1%*	19.2%	11.6%
Small CFLs	98.9%	1.4%	14.7%	100.0%	<0.1%	10.6%
Other	112.5%	15.8%	5.7%	94.2%	27.3%	12.3%
Business Programs overall	**102.8%**	**4.2%**	**100.0%**	**96.8%**	**4.3%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

Table 4-4 shows the gross savings adjustment factors for therms for CY09 and CY10 along with the percentage of savings represented by each measure group in that period and statistical precision at the 90 percent confidence interval. Again, KEMA compared the CY10 results to the CY09 results and highlighted those that were statistically significant differences at the 95 percent confidence interval. The HVAC group was the only reporting measure group with a statistically significant change in therm gross savings adjustment factor, decreasing from 105.9 percent in CY09 to 91.4 percent in CY10. This is the result of several large non-service measures where the customer reported different parameters than what were assumed in the Focus calculations. As a percentage of program therm savings, the HVAC group shows an increase (19.1 percent in CY09 and 31.1 percent in CY10) and the expanded process group shows a decrease (35.7 percent in CY09 and 22.7 percent in CY10).

Table 4-4. Therms Gross Savings Adjustment Factors, CY09 to CY10 Comparison

Reporting Measure Group	CY09			CY10		
	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	99.1%	0.8%	38.1%	105.0%	10.4%	32.2%
Non-small CFL lighting	-	-	-	-	-	-
Refrigeration	94.1%	24.8%	0.3%	103.1%	3.4%	2.2%
HVAC	105.9%*	7.5%	19.1%	91.4%*	6.6%	31.1%
Expanded process	117.7%	16.5%	35.7%	98.0%	4.6%	22.7%
Small CFLs	-	-	-	-	-	-
Other	91.3%	8.7%	6.8%	62.7%	38.2%	11.9%
Business Programs overall	**105.8%***	**5.3%**	**100.0%**	**93.8%***	**7.5%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

4.4 ATTRIBUTION FACTORS

Table 4-5 shows the attribution adjustment factors by reporting measure group. For the kWh energy unit, the attribution adjustment factors at the reporting measure group level are above 50 percent for all but the HVAC measure group (7.9 percent of the overall tracking kWh savings). For the kW energy unit, the attribution adjustment factors are above 50 percent for all but the HVAC (18.4 percent of tracking kW) and refrigeration (9.5 percent of tracking kW) measure groups. For the therms energy unit, the attribution adjustment factors are above 50 percent for all but the boilers and burners measure group (32.2 percent of tracking therms). The low therms attribution for the boilers and burners measure group is primarily a function of boiler service buydowns, which make up a significant portion of the therm savings in this group and generally received poor attribution (18 percent on average).

Table 4-5. Attribution Factors by Reporting Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

	kWh				kW				Therms			
Measure Group	**n**	**Attribution Adjustment Factor**	**90% CI ±**	**% Pop Savings**	**n**	**Attribution Adjustment Factor**	**90% CI ±**	**% Pop Savings**	**n**	**Attribution Adjustment Factor**	**90% CI ±**	**% Pop Savings**
Boilers & burners	3	100.1%	<0.1%	0.5%	2	100.1%	<0.1%	0.2%	217	27.6%	9.6%	32.2%
Non-small CFL lighting	351	59.8%	5.9%	39.6%	318	61.3%	5.3%	37.3%	-	-	-	-
Refrigeration	115	50.8%	7.0%	11.7%	112	46.2%	7.1%	9.5%	3	95.1%	18.1%	2.2%
HVAC	72	40.0%	15.6%	7.9%	42	44.6%	22.9%	18.4%	74	52.1%	11.6%	31.1%
Expanded process	26	58.7%	12.0%	16.0%	25	53.7%	14.7%	11.6%	20	65.6%	9.3%	22.7%
Small CFLs	21	84.1%	0.1%	7.3%	21	84.2%	0.1%	10.6%	-	-	-	-
Other	48	66.9%	26.1%	17.1%	40	78.1%	11.1%	12.3%	28	51.9%	11.4%	11.9%
Business Programs overall	**636**	**59.8%**	**5.1%**	**100.0%**	**560**	**58.8%**	**6.3%**	**100.0%**	**342**	**46.7%**	**5.4%**	**100.0%**

As with the gross savings adjustment factor, KEMA took a special look at the attribution results of the four retrocommissioning projects sampled. Of these four projects, the attribution was 100 percent for three and zero percent for the fourth. The project with no attribution was mandated by an outside body and would have moved forward without program assistance. This early evidence suggests that retrocommissioning may be a source of high attribution for other projects as well.

Figure 4-2 shows the overall program attribution by energy unit for FY02 through CY10. The CY10 adjustment factor for kWh and kW are not statistically different from CY09. For therms, CY10 is less than CY09 at a statistically significant level, as indicated by the cross-hatching. The estimates for kWh and kW are higher than those for most other program years, though for therms, the estimate is lower than most other years.

Figure 4-2. Overall Attribution Factors by Energy Unit
Comparison across Years

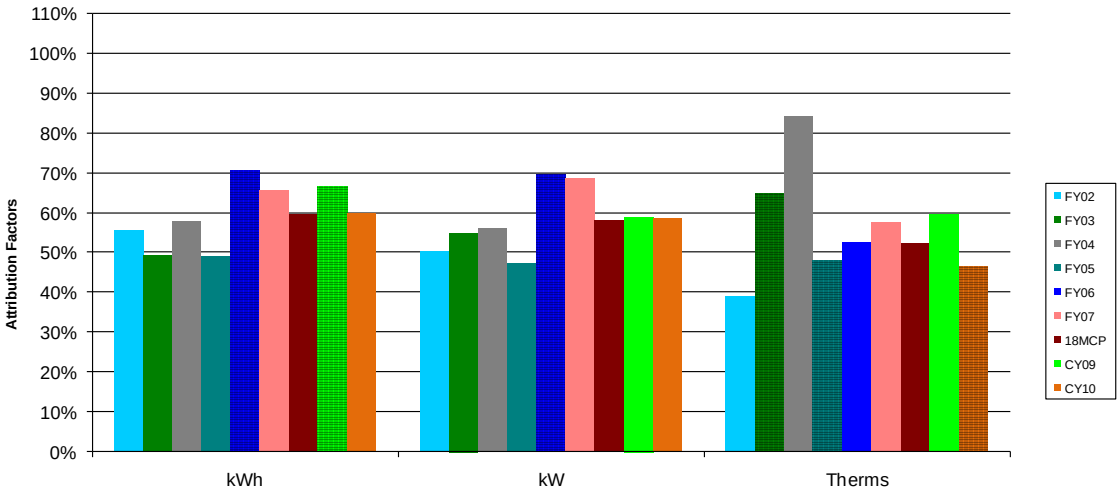


Table 4-6 shows the attribution adjustment factors for kWh for CY09 and CY10 along with the percentage of savings represented by each measure group in that period and statistical precision at the 90 percent confidence interval. As with the gross savings adjustment factor, KEMA compared the CY10 results to the CY09 results and highlighted those that had statistically significant differences at the 95 percent confidence interval. There was only one statistically significant change between the two years, with the attribution factor for the refrigeration group decreasing from 75.6 percent in CY09 to 50.8 percent in CY10. Several other noteworthy but not statistically significant changes occurred as well. The other reporting measure group shows a large increase (48.3 percent in CY09 to 66.9 percent in CY10). The building shell and food service measure groups (which are subsets of other) received particularly high attribution this year, resulting in an increase in the group overall. The HVAC group decreased from 77.1 percent in CY09 to 40 percent in CY10 because smaller, non-service measures received low attribution this year (large measures and service measures received similar attribution to last year). For the expanded process group, attribution for non-service measures increased (82 percent in CY10 from 63 percent in CY09), but service measures show a large decrease (35 percent in CY10 from 70 percent in CY09). Neither comparison is statistically significant at the 95 percent level of confidence.

Table 4-6. kWh Attribution Adjustment Factors, CY09 to CY10 Comparison

Reporting Measure Group	CY09			CY10		
	Attribution Adjustment Factor	90% CI ±	% Pop Savings	Attribution Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	89.3%	14.6%	0.5%	100.1%	<0.1%	0.5%
Non-small CFL lighting	59.6%	8.2%	42.5%	59.8%	5.9%	39.6%
Refrigeration	75.6%*	10.2%	5.5%	50.8%*	7.0%	11.7%
HVAC	77.1%	27.0%	14.5%	40.0%	15.6%	7.9%
Expanded process	66.2%	17.8%	17.0%	58.7%	12.0%	16.0%
Small CFLs	84.1%	<0.1%	12.0%	84.1%	0.1%	7.3%
Other	48.3%	16.3%	8.1%	66.9%	26.1%	17.1%
Business Programs overall	**65.7%**	**5.7%**	**100.0%**	**59.8%**	**5.1%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

Table 4-7 shows the attribution adjustment factors for kW for CY09 and CY10 along with the percentage of savings represented by each measure group in that period and statistical precision at the 90 percent confidence interval. Again, KEMA compared the CY10 results to the CY09 results and highlighted those that had statistically significant differences at the 95 percent confidence interval. The kW attribution adjustment factor for the refrigeration group decreased from 72.4 percent to 46.2 percent and the difference is statistically significant at the 95 percent level of confidence. Two other noteworthy but not statistically significant changes occurred as well. The other group increased from 53.9 percent to 78.1 percent due to several large motors projects, which received high attribution this year. In the expanded process group, attribution for non-service measures increased (78 percent in CY10 from 33 percent in CY09, not statistically significant) but the attribution for service measures decreased (35 percent in CY10 from 70 percent in CY09, statistically significant).

Table 4-7. kW Attribution Adjustment Factors, CY09 to CY10 Comparison[38]

Reporting Measure Group	CY09			CY10		
	Attribution Adjustment Factor	90% CI ±	% Pop Savings	Attribution Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	100.1%	<0.1%	0.2%	100.1%	<0.1%	0.2%
Non-small CFL lighting	60.8%	8.7%	36.5%	61.3%	5.3%	37.3%
Refrigeration	72.4%*	12.4%	3.6%	46.2%*	7.1%	9.5%
HVAC	37.9%	18.8%	30.0%	44.6%	22.9%	18.4%
Expanded process	58.3%	20.2%	9.4%	53.7%	14.7%	11.6%
Small CFLs	84.1%	<0.1%	14.7%	84.2%	0.1%	10.6%
Other	53.9%	20.4%	5.7%	78.1%	11.1%	12.3%
Business Programs overall	**58.1%**	**7.2%**	**100.0%**	**58.8%**	**6.3%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

Table 4-8 shows the attribution adjustment factors for therms for CY09 and CY10 along with the percentage of savings represented by each measure group in that period and statistical precision at the 90 percent confidence interval. Again, KEMA compared the CY10 results to the CY09 results and highlighted those that had statistically significant differences at the 95 percent confidence interval. The overall program therms attribution decreased at a statistically significant level. The decrease is primarily a result of decreased therms attribution in the expanded process and other measure groups, which both changed at a statistically significant level. While attribution for these groups is not particularly low in CY10, it was uncharacteristically high in CY09 and made the overall attribution high in that year. Large projects in this round of evaluation drove the therm savings for both of these groups. Therm attribution for boilers and burners service measures decreased somewhat this year compared to CY09 though the difference was not statistically significant.

[38] The CY09 attribution results for boilers and burners were repressed to protect customer confidentiality. There was only one observation in that group.

Table 4-8. Therms Attribution Adjustment Factors, CY09 to CY10 Comparison

Reporting Measure Group	CY09			CY10		
	Attribution Adjustment Factor	90% CI ±	% Pop Savings	Attribution Adjustment Factor	90% CI ±	% Pop Savings
Boilers & burners	33.3%	13.0%	38.1%	27.6%	9.6%	32.2%
Non-small CFL lighting	-	-	-	-	-	-
Refrigeration	77.4%	43.5%	0.3%	95.1%	18.1%	2.2%
HVAC	44.0%	19.5%	19.1%	52.1%	11.6%	31.1%
Expanded process	89.6%*	6.7%	35.7%	65.6%*	9.3%	22.7%
Small CFLs	-	-	-	-	-	-
Other	79.1%*	14.5%	6.8%	51.9%*	11.4%	11.9%
Business Programs overall	**59.5%***	**8.1%**	**100.0%**	**46.7%***	**5.4%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

4.5 REALIZATION RATES

Table 4-9 shows the CY10 realization rates by reporting measure group. The realization rates combine the effect of the gross savings adjustment factors and the attribution factors. Changes in those factors are reflected in the realization rate. See Sections 4.3 and 4.4 for more detail.

The kWh realization rate is greater than 50 percent for all measure groups except HVAC (35.2 percent realization rate, 7.9 percent of tracking savings). The realization rate for the non-small CFL lighting and refrigeration measure groups are near 60 percent, accounting for 51.3 percent of tracking kWh savings.

The kW realization rate is greater than 50 percent for all measure groups except HVAC (45.7 percent realization rate, 18.4 percent of tracking savings) and expanded process (42.0 percent realization rate, 11.6 percent of tracking savings).

The therms realization rate is less than 50 percent for most measure groups, particularly boilers and burners (29.0 percent realization rate, 32.2 percent of tracking savings). However, the expanded process group has a relatively high therms realization rate of 64.3 percent, representing 22.7 percent of tracking savings.

Table 4-9. Realization Rates by Reporting Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

Measure Group	kWh				kW				Therms			
	min n	Realization Rate	90% CI ±	% Pop Savings	min n	Realization Rate	90% CI ±	% Pop Savings	min n	Realization Rate	90% CI ±	% Pop Savings
Boilers & burners	3	96.8%	9.2%	0.5%	2	100.1%	<0.1%	0.2%	217	29.0%	10.5%	32.2%
Non-small CFL lighting	351	60.3%	6.0%	39.6%	318	56.5%	6.1%	37.3%	-	-	-	-
Refrigeration	115	59.2%	8.5%	11.7%	112	56.1%	9.5%	9.5%	3	98.1%	18.9%	2.2%
HVAC	72	35.2%	14.0%	7.9%	42	45.7%	23.5%	18.4%	74	47.7%	11.1%	31.1%
Expanded process	26	50.7%	15.5%	16.0%	25	42.0%	15.4%	11.6%	20	64.3%	9.6%	22.7%
Small CFLs	21	84.1%	0.1%	7.3%	21	84.2%	0.1%	10.6%	-	-	-	-
Other	48	65.9%	28.2%	17.1%	40	73.6%	23.8%	12.3%	27	32.5%	21.1%	11.9%
Business Programs overall	**636**	**59.3%**	**5.7%**	**100.0%**	**560**	**56.9%**	**6.6%**	**100.0%**	**342**	**43.8%**	**6.2%**	**100.0%**

Figure 4-3 shows the overall program realization rate by energy unit for FY02 through CY10. The CY10 adjustment factor is less than the CY09 factor and statistically significant, as indicated by the cross-hatching. The kWh and kW estimates are statistically consistent with CY09.

Figure 4-3. Overall Realization Rates by Energy Unit
Comparison across Years

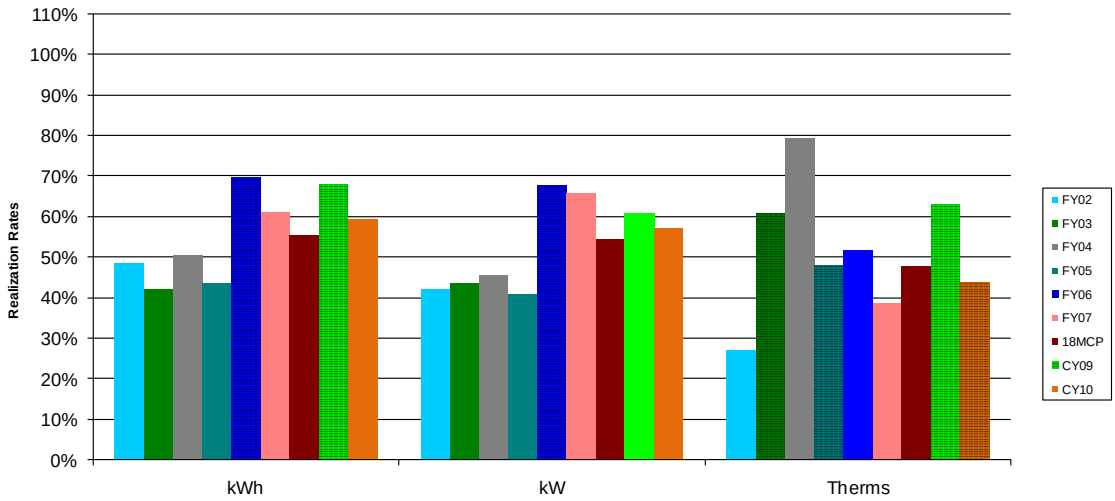


Table 4-10 shows the realization rates for kWh for CY09 and CY10, along with the percentage of savings represented by each measure group in that period and statistical

precision at the 90 percent confidence interval. As with the gross savings adjustment and attribution adjustment factors, KEMA compared the CY10 results to the CY09 results and highlighted those that had statistically significant differences at the 95 percent confidence interval. There were no statistically significant changes for this round.

Table 4-10. kWh Realization Rates, CY09 to CY10 Comparison

Reporting Measure Group	CY09			CY10		
	Realization Rate	90% CI ±	% Pop Savings	Realization Rate	90% CI ±	% Pop Savings
Boilers & burners	88.6%	14.6%	0.5%	96.8%	9.2%	0.5%
Non-small CFL lighting	60.2%	8.3%	42.5%	60.3%	6.0%	39.6%
Refrigeration	72.8%	12.0%	5.5%	59.2%	8.5%	11.7%
HVAC	78.5%	40.8%	14.5%	35.2%	14.0%	7.9%
Expanded process	72.8%	25.7%	17.0%	50.7%	15.5%	16.0%
Small CFLs	83.1%	1.3%	12.0%	84.1%	0.1%	7.3%
Other	51.3%	18.8%	8.1%	65.9%	28.2%	17.1%
Business Programs overall	**67.2%**	**7.2%**	**100.0%**	**59.3%**	**5.7%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

Table 4-11 shows the realization rates for kW for CY09 and CY10, along with the percentage of savings represented by each measure group in that period and statistical precision at the 90 percent confidence interval. Again, KEMA compared the CY10 results to the CY09 results and highlighted those that had statistically significant differences at the 95 percent confidence interval. Again, there are no statistically significant differences between the two years.

Table 4-11. kW Realization Rates, CY09 to CY10 Comparison

Reporting Measure Group	CY09			CY10		
	Realization Rate	90% CI ±	% Pop Savings	Realization Rate	90% CI ±	% Pop Savings
Boilers & burners	100.1%	<0.1%	0.2%	100.1%	<0.1%	0.2%
Non-small CFL lighting	61.7%	8.9%	36.5%	56.5%	6.1%	37.3%
Refrigeration	68.9%	13.7%	3.6%	56.1%	9.5%	9.5%
HVAC	36.3%	18.3%	30.0%	45.7%	23.5%	18.4%
Expanded process	84.6%	36.7%	9.4%	42.0%	15.4%	11.6%
Small CFLs	83.2%	1.1%	14.7%	84.2%	0.1%	10.6%
Other	60.6%	24.5%	5.7%	73.6%	23.8%	12.3%
Business Programs overall	**59.7%**	**7.8%**	**100.0%**	**56.9%**	**6.6%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

Table 4-12 shows the realization rates for therms for CY09 and CY10, along with the percentage of savings represented by each measure group in that period and statistical precision at the 90 percent confidence interval. Again, KEMA compared the CY10 results to

the CY09 results and highlighted those that had statistically significant differences at the 95 percent confidence interval. The overall realization rate for therms dropped from 62.9 percent in CY09 to 43.8 percent in CY10. This is a statistically significant drop at the 95 percent confidence level. The expanded process group decreased as well (105.5 percent in CY09 to 64.3 percent in CY10) although the group still has the highest attribution of any reporting measure group with a large portion of program savings (22.7 percent). The other group decreased as well (72.3 percent in CY09 to 32.5 percent in CY10). Both these changes are statistically significant at the 95 percent confidence interval. All other measure groups with more than five percent of program savings are within ten percent of their realization rate from CY09.

Table 4-12. Therms Realization Rates, CY09 to CY10 Comparison

Reporting Measure Group	CY09			CY10		
	Realization Rate	90% CI ±	% Pop Savings	Realization Rate	90% CI ±	% Pop Savings
Boilers & burners	33.0%	12.9%	38.1%	29.0%	10.5%	32.2%
Non-small CFL lighting	-	-	-	-	-	-
Refrigeration	72.8%	45.2%	0.3%	98.1%	18.9%	2.2%
HVAC	46.6%	20.9%	19.1%	47.7%	11.1%	31.1%
Expanded process	105.5%*	16.7%	35.7%	64.3%*	9.6%	22.7%
Small CFLs	-	-	-	-	-	-
Other	72.3%*	14.9%	6.8%	32.5%*	21.1%	11.9%
Business Programs overall	**62.9%***	**9.1%**	**100.0%**	**43.8%***	**6.2%**	**100.0%**

* Indicates a statistically significant difference at the 95 percent confidence interval.

4.6 SERVICE BUYDOWNS

In CY09, the PSCW requested that the evaluation team design our sample to include enough service buydown measures to allow us to analyze the adjustment factors specifically for this portion of the population. We repeated that process in CY10. Table 4-13 shows the gross savings adjustments for service buydown and non-service buydown measures.

The table shows that service buydowns make up a significant portion of program therm savings at 31.3 percent, which is similar to CY09 (31.7 percent). They make up a smaller portion of kWh and kW savings at 13.4 percent (12.8 percent in CY09) and 19.0 percent (18.0 percent in CY09), respectively. For the kWh and kW energy units, the service buydown gross savings adjustment factors are greater than the non-service buydown value. This is largely due to refrigeration projects for which evaluation used the newly updated deemed savings to adjust estimates that were made using an older prescriptive calculation tool. The differences between service and non-service are statistically significant for both kW and kWh at the 95 percent confidence interval.

Table 4-13. Gross Savings Adjustment Factors, Service Buydowns
Based on Samples from Participants Who Installed a Measure during CY10

Group	kWh				kW				Therms			
	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings	min n	Gross Savings Adjustment Factor	90% CI ±	% Pop Savings
Service	79	114.2%	9.6%	13.4%	78	114.5%	3.4%	19.0%	225	98.1%	1.5%	31.3%
Not service	574	96.5%	4.8%	86.6%	501	93.3%	5.0%	81.0%	130	91.8%	11.1%	68.7%
Business Programs overall	**653**	**99.1%**	**4.1%**	**100.0%**	**579**	**96.8%**	**4.3%**	**100.0%**	**355**	**93.8%**	**7.5%**	**100.0%**

Table 4-14 shows the attribution adjustments for service buydown and non-service buydown measures. For all three energy units, the service buydown adjustment factor is less than the non-service buydown value at a statistically significant level. Service measures that generally had lower than 50 percent attribution are boiler tune-ups, chillers tune-ups, HVAC steam trap service and repair, and refrigeration tune-ups.

Table 4-14. Attribution Adjustment Factors, Service Buydowns
Based on Samples from Participants Who Installed a Measure during CY10

Group	kWh				kW				Therms			
	n	Attribution Adjustment Factor	90% CI ±	% Pop Savings	n	Attribution Adjustment Factor	90% CI ±	% Pop Savings	n	Attribution Adjustment Factor	90% CI ±	% Pop Savings
Service	77	35.6%	7.6%	13.4%	76	26.0%	10.9%	19.0%	216	34.2%	7.8%	31.3%
Not service	559	65.3%	6.1%	86.6%	484	67.5%	5.6%	81.0%	126	53.2%	7.5%	68.7%
Business Programs overall	**636**	**60.2%**	**5.2%**	**100.0%**	**560**	**59.2%**	**6.4%**	**100.0%**	**342**	**46.7%**	**5.4%**	**100.0%**

Table 4-15 shows the realization rates for service buydown and non-service buydown measures. For all three energy units, the service buydown realization rate is less than the non-service buydown value at a statistically significant level.

Table 4-15. Realization Rate, Service Buydowns
Based on Samples from Participants Who Installed a Measure during the CY10

Group	kWh				kW				Therms			
	min n	Realization Rate	90% CI ±	% Pop Savings	min n	Realization Rate	90% CI ±	% Pop Savings	min n	Realization Rate	90% CI ±	% Pop Savings
Service	77	40.7%	9.4%	13.4%	76	29.7%	12.5%	19.0%	216	33.6%	7.6%	31.3%
Not service	559	63.1%	6.7%	86.6%	484	63.0%	6.2%	81.0%	126	48.8%	9.0%	68.7%
Business Programs overall	**636**	**59.7%**	**5.7%**	**100.0%**	**560**	**57.4%**	**6.7%**	**100.0%**	**342**	**43.8%**	**6.2%**	**100.0%**

4.7 ENGINEERING VERIFICATION FINDINGS

This section addresses gross savings adjustments based on engineering reviews (engineering sample) and information obtained through the CATI survey (CATI sample). Adjustments to each sample are discussed below.

4.7.1 Engineering savings adjustment

The engineering review determined the verified gross savings for each measure in the engineering sample. An evaluation engineer conducted a review of the energy savings estimates for each measure installed by customers in the sample and completed a telephone survey with the contact. The engineer used information from the telephone survey and the measure paperwork to determine whether the reported savings were reasonable.

The review had two main components:

- **Evaluation of the calculation parameters.** The engineer reviewed the parameters used in the energy savings equations to determine whether they were reasonable. When possible, parameters were verified through information gathered from the site contact over the telephone. Other parameters were verified using secondary sources.
- **Evaluation of the calculation method.** The engineer reviewed the method used to calculate the energy savings. Most energy savings estimates can be calculated in a variety of ways and still produce reasonable, though not equal, energy savings values. The engineer reviewed the method used for each measure to ensure that it followed the general conventions of energy savings calculations and could produce a reasonably accurate result.

For many measures, the calculation parameters were verified by the site contact or secondary source and the calculation method was verified as reasonable. In this case, the program savings estimate was taken as the verified gross savings. For other measures, one or more changes to the calculation parameters or method resulted in an adjustment to the program savings estimate. In this case, the evaluation savings estimate was reported as the verified gross savings. Prior to CY09, savings adjustments, for any reason, of less than ten percent were ignored and not reported and the program estimate was taken as VGI savings in these cases. This year, all adjustments are reported, no matter how small, and evaluation savings are taken as VGI when an adjustment is made.

Table 4-16, Table 4-17, and Table 4-18 show the adjustment counts and percentage savings for kWh, kW, and therms. In these tables and throughout this section, “V” refers to verified savings and “R” refers to reported (tracked) savings. So, “V>R” means that the verified savings were greater than reported, and “V<R” means that the verified savings were less than reported. The total adjustment count is the sum of the number of positive and negative adjustments. The values in the percentage total savings columns in these tables are not the amount adjusted; rather, they are the percentage of total reported savings in the engineering review represented by the measures that were adjusted. For example, a percentage total savings value of 20 percent does not mean that savings for measures in a particular category were adjusted by 20 percent. It means that the adjusted measures in that particular category represent measures that account for 20 percent of the total tracked savings.

Table 4-16 shows that, of the 412 measures in the engineering sample, 72 were adjusted for kWh, 255 were not adjusted and the remaining 85 measures did not have kWh savings. Of the 72 that were adjusted, 44 have verified savings greater than reported and 28 lesser than reported. These adjustments were made on measures that represent 32 percent of the kWh savings in the engineering sample. Adjustments of 41 to 50 percent were the greatest in number, with 29 adjustments representing eight percent of the total kWh savings. Note that

the five adjustments that were greater than 100 percent represent only one percent of total savings, indicating that the measures that were adjusted by more than 100 percent were small and do not represent a large portion of the total savings.

Table 4-16. kWh Adjustment Count and Percentage Savings, Engineering Sample

Percentage Change (%)	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	3	5	8	0%	5%	5%
11 to 20	4	7	11	3%	4%	7%
21 to 30	2	3	5	1%	1%	2%
31 to 40	4	3	7	0%	2%	3%
41 to 50	26	3	29	5%	3%	8%
51 to 100	0	6	6	0%	6%	6%
Greater than 100	5	0	5	1%	0%	1%
Non-zero verified with zero reported	0	1	1	0%	0%	0%
Adjusted	44	28	72	11%	21%	32%
Not adjusted			255			68%
Total			327			100%

Table 4-17 shows that, of the 412 measures in the engineering sample, 61 were adjusted for kW, 228 were not adjusted and the remaining 123 measures did not have kW savings. Of the 61 adjusted, 39 had verified savings greater than reported and 22 less than reported. The adjusted measures represent 34 percent of the total kW savings in the sample. As with the kWh adjustments, the greatest number of adjustments is for projects with 41–50 percent change in reported values, with 27 adjustments. Changes of 51 to 100 percent in reported value had the largest represented savings with 13 percent of total kW savings. Again, the measures that received adjustments of more than 100 percent of reported savings were those with low associated savings. The five adjustments greater than 100 percent represent only one percent of total kW savings.

Table 4-17. kW Adjustment Count and Percentage Savings, Engineering Sample

Percentage Change (%)	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	2	2	4	5%	0%	5%
11 to 20	3	2	5	8%	1%	8%
21 to 30	1	2	3	0%	1%	1%
31 to 40	0	3	3	0%	2%	2%
41 to 50	26	1	27	4%	0%	5%
51 to 100	1	11	12	0%	13%	13%
Greater than 100	5	0	5	1%	0%	1%
Non-zero verified with zero reported	1	1	2	0%	0%	0%
Adjusted	39	22	61	17%	17%	34%
Not adjusted			228			66%
Total			289			100%

Table 4-18 shows that, for therms, 39 measures were adjusted, 89 were not adjusted and 284 measures did not have therm savings. Of the 39 measures adjusted, 12 had verified savings greater than reported and 27 less than reported. The adjusted measures represent 41 percent of the tracked therm savings in the engineering sample. The greatest number of adjustments was made to projects that were changed between 51 to 100 percent with 11 projects adjusted. These adjustments represent 12 percent of total therm savings.

Table 4-18. Therm Adjustment Count and Percentage Savings, Engineering Sample

Percentage Change (%)	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	4	2	6	9%	1%	10%
11 to 20	2	4	6	1%	3%	4%
21 to 30	1	6	7	2%	7%	9%
31 to 40	1	2	3	1%	2%	3%
41 to 50	0	4	4	0%	4%	4%
51 to 100	3	8	11	1%	10%	12%
Greater than 100	1	0	1	0%	0%	0%
Non-zero verified with zero reported	0	1	1	0%	0%	0%
Adjusted	12	27	39	14%	27%	41%
Not adjusted			89			59%
Total			128			100%

KEMA categorized each adjustment according to its primary cause. The categories used and how they are populated are provided in Table 4-19. Note that there is some overlap in the categories, particularly regarding “customer provided different parameter(s).” “Site specific

rather than prescriptive" could be reported as a subset of this category since the information was obtained from the customer, but these are categorized separately for measures that used standard, prescriptive methods in the program estimate and for which site-specific parameters were obtained. Adjustments categorized as "different baseline or installation" also often included different parameters from the customer, but these were separately categorized to indicate a more fundamental or qualitative difference than those categorized as "customer provided different parameters."

Table 4-19. Primary Reasons for Adjustment

Primary Reason for Adjustment	Explanation of Population
Customer reported different parameter(s)	Inputs to calculation changed based on customer interview.
Different analysis or calculation method	Overall calculation method changed or parameters changed based on engineering analysis or research.
Different baseline or installation	Customer indicated a qualitatively different base case or installation, or evaluation uses market standard equipment as baseline where program used existing.
Deeming adjustment	Measures were misclassified within deemed measures or as not deemed.
Changes to assumptions	Changes were made to assumptions about parameter values but the analysis method was the same
Other savings in documentation	Reasonable savings exist in documentation, but other savings from documentation entered.
Used site-specific rather than prescriptive	More site-specific information gathered for those measures that use a standard prescriptive method and parameters.
Calculation method unclear	Could not determine program's calculation method.
Data entry error	Documentation provides a reasonable savings value, but an unrelated value entered in database.

Some measures received several adjustments and for these, a determination was made as to which adjustment was primary. For example, if a compressed air leak reduction measure used a slightly different engineering analysis and received a significant change to operating hours and flow rate of leaks that were repaired; this was classified as "customer reported different parameters" rather than "different analysis or calculation method." On the other hand, if the customer confirmed all parameters and the only change was the slight difference in engineering analysis, then it was classified as "different analysis or calculation method."

Table 4-20, Table 4-21, and Table 4-22 show the number of engineering sample measures for which KEMA adjusted the savings estimate for each energy unit, along with the percentage or tracking savings represented by the changed measures. For electric savings, the greatest number of adjustments was made due to "deeming adjustments," with 31 kWh and 30 kW measures having this as the main reason for adjustment. For therm savings, the greatest number of adjustments, 13, was categorized as "customer reported different parameter(s)." The greatest percentage of total reported savings adjustments for kWh and therms were categorized as "customer reported different parameter(s)," with eight percent of kWh savings and 24 percent of therm savings. KW savings had the greatest total reported savings adjustments in two categories, "different baseline or installation" and "used site-specific rather than prescriptive," with eight percent of reported savings being represented by each category.

Table 4-20. kWh Adjustment Counts and Percentage Savings by Reason, Engineering Sample

Primary Reason for Adjustment	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	7	9	16	2%	7%	8%
Different analysis or calculation method	4	5	9	3%	3%	6%
Different baseline or installation	3	3	6	0%	5%	5%
Deeming adjustment	28	3	31	4%	2%	5%
Changes to assumptions	0	2	2	0%	3%	3%
Other savings in documentation	1	1	2	2%	0%	2%
Used site-specific rather than prescriptive	0	3	3	0%	2%	2%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	1	2	3	0%	1%	1%
Adjusted	44	28	72	11%	21%	32%
Not adjusted			255			68%
Total			327			100%

Table 4-21. kW Adjustment Counts and Percentage Savings by Reason, Engineering Sample

Primary Reason for Adjustment	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	3	9	12	0%	6%	7%
Different analysis or calculation method	4	2	6	5%	1%	6%
Different baseline or installation	0	6	6	0%	8%	8%
Deeming adjustment	28	2	30	3%	1%	4%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	1	1	2	1%	0%	1%
Used site-specific rather than prescriptive	2	0	2	8%	0%	8%
Calculation method unclear	1	1	2	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	1	1	0%	1%	1%
Adjusted	39	22	61	17%	17%	34%
Not adjusted			228			66%
Total			289			100%

Table 4-22. Therm Adjustment Counts and Percentage Savings by Reason, Engineering Sample

Primary Reason for Adjustment	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	5	8	13	8%	16%	24%
Different analysis or calculation method	2	8	10	2%	1%	3%
Different baseline or installation	0	7	7	0%	7%	7%
Deeming adjustment	0	0	0	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	1	0	1	2%	0%	2%
Used site-specific rather than prescriptive	1	2	3	1%	1%	2%
Calculation method unclear	1	1	2	1%	0%	1%
Data entry error	2	0	2	0%	0%	0%
Other	0	1	1	0%	1%	1%
Adjusted	12	27	39	14%	27%	41%
Not adjusted			89			59%
Total			128			100%

Figure 4-4 and Figure 4-5 provide the information from the tables above in graphical form, such that adjustments can be compared across energy units. Figure 4-4 shows that there were a significant amount of adjustments for “deeming adjustment” for kWh and kW compared to all other categories. These deeming adjustments were mostly made to refrigeration projects, where prescriptive savings estimates were replaced with newly defined deemed savings values.

Figure 4-4. Number of Adjustments by Reason, Engineering Sample

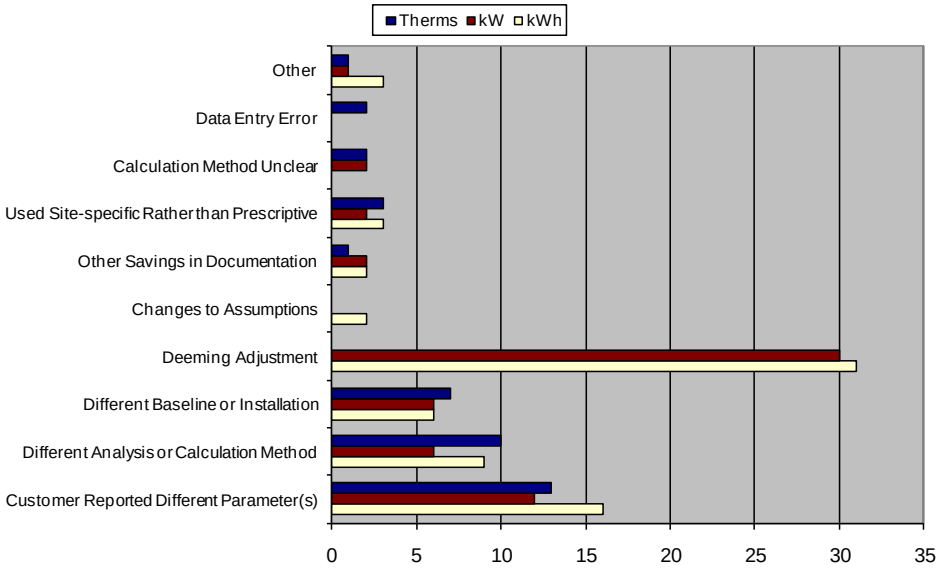
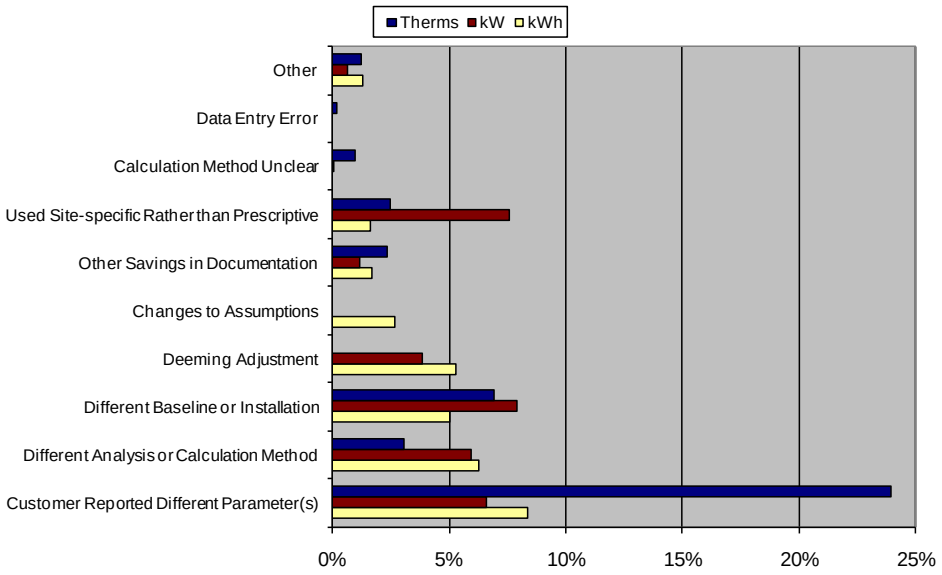


Figure 4-5 shows that a greater percentage of total therm savings received an adjustment due to the customer providing different parameters than did kW and kWh. It also shows that a

greater percentage of kW savings received an adjustment than did kWh due to using site-specific rather than prescriptive.

Comparing Figure 4-4 and Figure 4-5 also provides information about the relative savings of measures adjusted for particular reasons. For example, the number of measures adjusted because the customer provided different parameters is similar for therms and kW, but the percentage savings represented by those is much greater for therms than for kW. This means that the therm measures adjusted due to new information from the customer were a greater percentage of total savings than were kW measures adjusted for the same reason. Also, note that a greater number of kWh savings values compared to kW savings values were adjusted for using site-specific rather than prescriptive values, but that the percentage savings represented by the kW measures is considerably greater than that for kWh.

Figure 4-5. Percentage of Total Savings by Adjustment Reason, Engineering Sample



4.7.2 CATI savings adjustment

In previous evaluations, savings for the CATI sample were either not adjusted or were adjusted using data obtained from the engineering sample. In this evaluation, as with the previous evaluation, questions were added to the CATI survey to allow verified gross savings to be calculated from the data collected. Since all measures in the CATI survey are deemed, savings are based only on the number of units installed or serviced and, in some cases, an additional multiplier. The multiplier depends on the technology. For example, for lighting controls, the multiplier is “watts controlled” and for boiler service, the multiplier is “MBtu input” of the boiler. In addition, for high efficiency motor measures there is an additional multiplier, annual operating hours. The CATI survey included questions to verify these parameters.

Table 4-23, Table 4-24, and Table 4-25 show the count and percentage savings of the adjusted measures for the CATI sample for kWh, kW, and therms. As with the engineering sample, the percentage in the tables is not the amount adjusted, but is the percentage of tracking savings in the CATI sample represented by measures that were adjusted. The number of adjustments is fewer and the savings they represent are lower for the CATI sample than for the engineering sample. This is to be expected, since all measures in the CATI

sample are deemed. Most of the calculation parameters for deemed measures are determined during the deeming process so there are fewer possible adjustments.

Table 4-23 shows that for kWh in the CATI sample, 47 measures were adjusted representing 12 percent of total kWh savings in the sample. Of these adjustments, 36 were between 31 and 50 percent representing eight percent of tracked kWh savings. The majority of these adjustments were newly deemed lighting and refrigeration tune-up measures.

Table 4-23. kWh Adjustments and Percentage Savings, CATI Sample

Percentage Change (%)	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	4	1	5	3%	0%	4%
11 to 20	2	3	5	1%	0%	1%
21 to 30	1	0	1	0%	0%	0%
31 to 40	16	0	16	1%	0%	1%
41 to 50	20	0	20	7%	0%	7%
51 to 100	0	0	0	0%	0%	0%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	43	4	47	12%	1%	12%
Not adjusted			280			88%
Total			327			100%

Table 4-24 shows that for kW savings, 55 measures were adjusted and 237 were not, with adjustments representing ten percent of tracked kW savings in the sample. Of the 55 adjusted, 23 were adjusted between 41 and 50 percent from the reported savings. The majority of these adjustments were newly deemed lighting and refrigeration tune-up measures.

Table 4-24. kW Savings Adjustments and Percentage Savings, CATI Sample

Percentage Change (%)	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	7	7	14	1%	1%	2%
11 to 20	4	0	4	1%	0%	1%
21 to 30	8	0	8	1%	0%	1%
31 to 40	3	0	3	0%	0%	0%
41 to 50	23	0	23	6%	0%	6%
51 to 100	0	3	3	0%	0%	0%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	45	10	55	9%	1%	10%
Not adjusted			237			90%
Total			292			100%

Table 4-25 shows that only eight measures were adjusted for therms in the CATI sample, representing six percent of total reported therm savings. Three measures were adjusted less than ten percent, three were adjusted between 51 and 100 percent and two were adjusted by more than 100 percent.

Table 4-25. Therm Savings Adjustments and Percentage Savings, CATI Sample

Percentage Change (%)	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	0	3	3	0%	0%	0%
11 to 20	0	0	0	0%	0%	0%
21 to 30	0	0	0	0%	0%	0%
31 to 40	0	0	0	0%	0%	0%
41 to 50	0	0	0	0%	0%	0%
51 to 100	0	3	3	0%	1%	1%
Greater than 100	2	0	2	4%	0%	4%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	2	6	8	4%	2%	6%
Not adjusted			219			94%
Total			227			100%

As with the engineering sample, the CATI adjustments were categorized by the primary reason for the adjustment. Because the measures are deemed, there are fewer parameters in the calculations and fewer possible reasons for adjustment. Table 4-26, Table 4-27, and Table 4-28 show the primary reasons for adjustments to savings in the CATI sample for kWh, kW, and therms. For electric projects, the most common adjustment was “new deemed

measure" with 42 adjustments to kWh and 48 adjustments to kW. The number of adjustments is primarily because of two measures (refrigeration tune-ups and T8 bounty) that were prescriptive at the start of the evaluation period and became deemed. This change was made in the middle of the implementation period and projects implemented before deeming used the prescriptive value in the tracking database. When these projects were reviewed, the evaluation team applied the current, approved deemed savings as the verified savings. For measures with therm savings, the primary reason was that the customer provided a different quantity.

Table 4-26. kWh Adjustments and Percentage Savings by Reason, CATI Sample

Primary Reason for Adjustment	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
New deemed measure	38	4	42	10%	1%	11%
Customer provided different quantity	3	0	3	1%	0%	1%
Customer provided different size of equipment	2	0	2	1%	0%	1%
No savings of this type	0	0	0	0%	0%	0%
Adjusted	43	4	47	12%	1%	12%
Not adjusted			280			88%
Total			327			100%

Table 4-27. kW Adjustments and Percentage Savings by Reason, CATI Sample

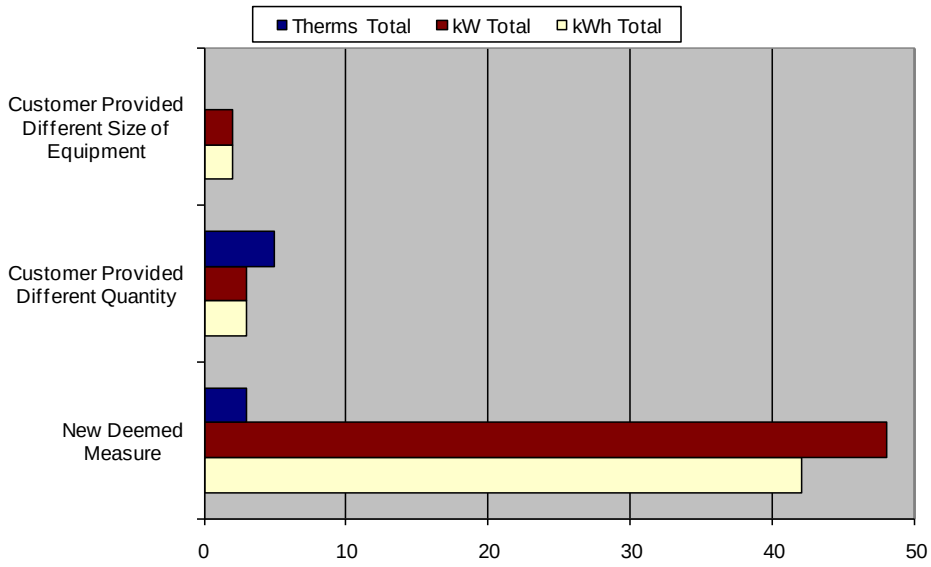
Primary Reason for Adjustment	Count			Percentage Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
New deemed measure	39	9	48	7%	1%	8%
Customer provided different quantity	3	0	3	1%	0%	1%
Customer provided different size of equipment	2	0	2	0%	0%	0%
Rounding error	1	1	2	0%	0%	0%
Adjusted	45	10	55	9%	1%	10%
Not adjusted			237			90%
Total			292			100%

Table 4-28. Therm Adjustments and Percentage Savings by Reason, CATI Sample

Primary Reason for Adjustment	Count			Percentage Total Savings[39]		
	V > R	V < R	Total	V > R	V < R	Total
New deemed measure	0	3	3	0%	0%	0%
Customer provided different quantity	2	3	5	5%	1%	5%
Customer provided different size of equipment	0	0	0	0%	0%	0%
No savings of this type	0	0	0	0%	0%	0%
Adjusted	2	6	8	5%	2%	6%
Not adjusted			219			94%
Total			227			100%

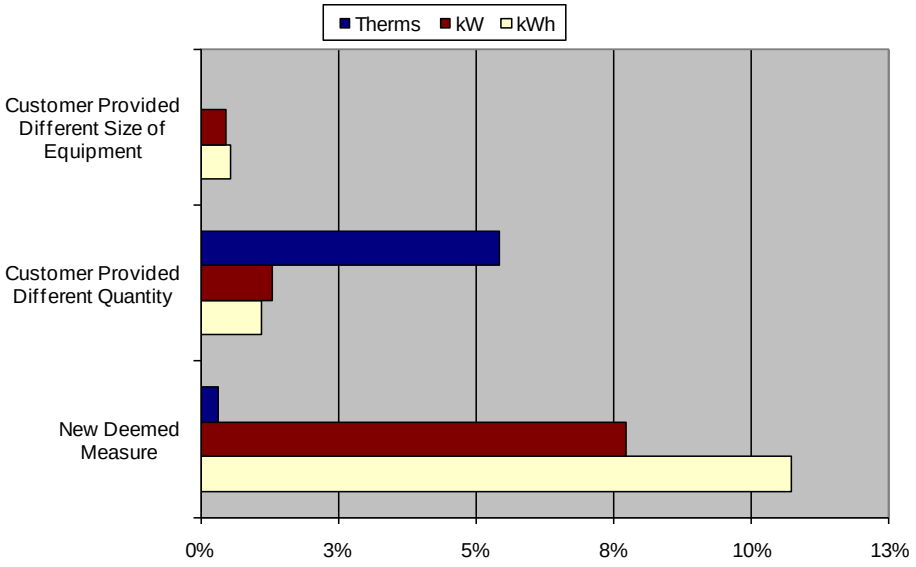
Figure 4-6 and Figure 4-7 present the above data in graphical form. Figure 4-6 makes more apparent the relative number of electric projects adjusted for new deemed measures, as compared to all other reasons for all energy units. Figure 4-7 looks similar to Figure 4-6, suggesting that the percentage overall savings of adjusted measures tracks closely with the number of measures adjusted. However, there are a greater quantity of new deemed measures resulting in changes to kW compared to kWh but the percentage of total savings is greater for kWh compared to kW. There is also a significantly greater percentage of therm savings for customers that provided a different quantity compared to electric savings despite similar quantities of changes between all three savings types.

Figure 4-6. Number of Adjustments by Reason, CATI Sample



[39] V>R + V<R percent total savings do not sum to total due to rounding at whole percentage points.

Figure 4-7. Percentage Total Savings by Reason, CATI Sample



4.7.3 Comparison with previous evaluations

Table 4-29 shows a summary of the relationship between verified and reported savings for the engineering sample for this evaluation and compares it to the last two evaluation periods.[40] In CY10, the percentage of adjusted measures is fairly consistent across energy units. Verified savings are equal to reported savings for 78 percent of kWh measures, 79 percent of kW measures, and 70 percent of therm measures with applicable savings for those energy units. These values are an improvement over the recent evaluations, meaning that a lesser percentage of measures were adjusted in this evaluation than in the recent past. This is the second evaluation period in a row where the percentage of projects that were not adjusted has increased.

[40] Discrepancies shown in Table 4-29 reflect only adjustments for measures that were part of the engineering sample, not those for the CATI sample. This is necessary since adjustments to the CATI sample have not been handled consistently across the evaluations.

Table 4-29. Comparison to Previous Evaluations

Adjustments by Energy Unit		18MCP Rounds 1 & 2		CY09		CY10	
		#	%	#	%	#	%
kWh	Not installed	4	1%	1	0%	0	0%
	Verified equal reported	319	46%	213	68%	255	78%
	Verified not equal reported	307	53%	102	32%	72	22%
	Engineering sample	691		316		327	
kW	Not installed	3	0%	1	0%	0	0%
	Verified equal reported	325	51%	190	68%	228	79%
	Verified not equal reported	368	58%	91	32%	61	21%
	Engineering sample	635		282		289	
Therm	Not installed	1	1%	0	0%	0	0%
	Verified equal reported	74	47%	94	67%	89	70%
	Verified not equal reported	81	52%	47	33%	39	30%
	Engineering sample	156		141		128	
Total engineering sample		**801**		**410**		**412**	

There were three changes to the verified gross savings analysis for CY09 and CY10 that would affect the comparison to the 18MCP.

- Data have been collected from the CATI survey to inform the gross savings adjustment for measures other than CFLs. In CY09 and CY10, the CATI survey was restricted to deemed measures and questions were written that allow data to be collected on the number of units installed or serviced and additional deemed savings multipliers as necessary.
- In the 18MCP evaluation, discrepancies were not reported unless they were an adjustment of ten percent or more. In the past two evaluations, all discrepancies were reported, regardless of the degree of change from the tracking estimate.
- This is the third evaluation period that has a significant portion of savings that come from deemed measures. Though the 18MCP also had a significant number of deemed measures, the deeming process continues with each evaluation period and a greater number of measures were deemed in CY09 than in the 18MCP. The portion of deemed savings in the sample frame increased to 49 percent of the population kWh and kW savings in CY10 versus 32 percent and 31 percent in CY09. The portion of therm deemed savings increased from 18 percent to 34 percent of the population.

The number of analysis changes between the 18MCP and the CY09 and CY10 evaluation periods limit the ability to compare gross savings adjustment results among the three years.

4.8 EVALUATED TRACKED ENERGY IMPACTS

The estimates of the adjustment factors by reporting measure group presented above are used to calculate verified gross savings and net savings for this period. Multiplying tracking gross savings by the gross savings adjustment factor, which is the product of the installation

rate and the engineering verification factor, yields verified gross savings. Multiplying verified gross savings, in turn, by the attribution factor yields net savings. Net savings may also be obtained by multiplying tracking gross savings by the realization rate.

The adjustment factors used to determine net savings include the effects of the *Participant Spillover Savings Study.*[41] The effects of the *Impact Evaluation of the Education and Training Program*[42] and the *Supply-side* Study[43] are represented below in the Untracked Attributable row of the following tables and are included in the total net savings for each energy unit.

For CY10 (October 1, 2009, through June 30, 2010), Table 4-30a gives tracking and verified gross savings and net savings by reporting measure group and for Business Programs overall for CY10.

[41] Miriam L. Goldberg, Christopher Dyson, and Valy T. Goepfrich, KEMA Inc. *Business Programs: Participant Spillover Savings Study*. December 22, 2005.

[42] Christopher Dyson, Ken Agnew, Miriam Goldberg, Claire Palmgren, KEMA Inc. *Impact Evaluation of the Education and Training Program,* Final Report. November 20, 2008.

[43] Christopher Dyson, Shawn Bodmann, Karen Rothkin, Maggie Pinckard, Erika Morgan, Ryan Barry, Miriam Goldberg, KEMA Inc. *Business Programs: Supply-side Evaluation.* April 22, 2010.

Table 4-30a. All Business Programs: Tracked Energy Impacts
CY10 (October 1, 2009–June 30, 2010)[a]

Reporting Measure Group	kWh			kW			Therms		
	Tracked Gross	Verified Gross	Net	Tracked Gross	Verified Gross	Net	Tracked Gross	Verified Gross	Net
Boilers & burners	1,974,481	1,909,205	1,910,733	166	166	166	5,928,089	6,221,662	1,719,273
Non-small CFL lighting	169,273,874	170,550,991	101,990,138	28,970	26,690	16,362	-	-	-
Refrigeration	50,158,587	58,438,437	29,700,653	7,414	9,014	4,160	396,919	409,358	389,381
HVAC	33,650,149	29,613,156	11,835,544	14,311	14,656	6,541	5,708,387	5,220,215	2,721,301
Expanded process	68,403,194	59,051,441	34,653,389	9,049	7,066	3,798	4,166,692	4,083,275	2,677,599
Small CFLs	31,013,587	31,013,587	26,096,648	8,261	8,261	6,953	-	-	-
Other	72,959,742	71,928,451	48,090,093	9,521	8,973	7,004	2,183,735	1,368,866	710,155
Untracked attributable			44,846,559			7,989			6,585,949
Business Programs Overall	**427,433,614**	**422,505,268**	**299,123,757**	**77,691**	**74,825**	**52,973**	**18,383,822**	**17,303,376**	**14,803,659**

[a] Tracking gross savings for measures installed during the last quarter of CY09 and the first two quarters of CY10 are based on one version of the WISeerts database and one version of the EFI Rebates database. The version of the WISeerts database used is WISeerts database as synchronized on July 17, 2010. The version of the EFI Rebates database used is EFI Rebates database as synchronized July 20, 2010.

Table 4-30b provides tracking and verified gross savings and net savings by reporting measure group and for Business Programs overall for CY09 (October 1, 2008, to September 30, 2009). Adjustment factors determined from the CY09 data collection and analysis are used to calculate verified gross savings and net savings for CY09.[44]

[44] *Business Programs Impact Evaluation Report: Last Quarter of the 18-month Contract Period and First Three Quarters of Calendar Year 2009.* March 2010.

Table 4-30b. All Business Programs: Tracked Energy Impacts
CY09 (October 1, 2008–September 30, 2009)[a]

Reporting Measure Group	kWh			kW			Therms		
	Tracked Gross	Verified Gross	Net	Tracked Gross	Verified Gross	Net	Tracked Gross	Verified Gross	Net
Boilers & burners	2,319,547	2,299,548	2,053,972	216	216	216	8,871,584	8,789,781	2,929,735
Non-small CFL lighting	208,913,925	210,942,005	125,775,520	40,429	41,044	24,954	-	-	-
Refrigeration	26,947,605	25,953,479	19,620,012	3,961	3,771	2,730	79,386	74,701	57,812
HVAC	71,417,706	72,667,867	56,028,600	33,238	31,791	12,051	4,443,840	4,705,996	2,068,847
Expanded process	83,531,456	91,793,675	60,796,681	10,407	15,102	8,806	8,312,670	9,787,150	8,766,862
Small CFLs	58,907,822	58,222,853	48,970,114	16,318	16,138	13,573	-	-	-
Other	39,795,588	42,269,871	20,399,429	6,263	7,047	3,795	1,580,608	1,443,345	1,142,134
Untracked attributable			12,442,016			3,630			5,036,638
Alliant shared savings	58,200,624	49,309,648	19,377,074	8,820	12,146	3,774	500,704	340,405	154,255
Business Programs overall	**550,034,272**	**553,458,944**	**365,463,418**	**119,653**	**127,254**	**73,528**	**23,788,792**	**25,141,378**	**20,156,282**

[a] Tracking gross savings for measures installed during the last quarter of the 18 MCP and the first three quarters of CY09 are based on one version of the WISeerts database and one version of the EFI Rebates database. The version of the WISeerts database used is WISeerts database as synchronized on October 19, 2009. The version of the EFI Rebates database used is EFI Rebates database as synchronized October 14, 2009.

Table 4-31 summarizes tracking and verified gross savings and net savings for Business Programs overall for the program through the second quarter of Calendar Year 2010 (program start through June 30, 2010.

Table 4-31. All Business Programs: Tracked Energy Impacts
Program to Date (Program start–June 30, 2010)

Evaluation Period	kWh			kW			Therms		
	Tracking Gross	Verified Gross	Net	Tracking Gross	Verified Gross	Net	Tracking Gross	Verified Gross	Net
2002 (Program start to June 30, 2002)	37,361,073	32,578,902	18,467,983	8,536	7,054	3,727	2,863,655	1,615,522	728,572
2003 (July 1, 2002 to June 30, 2003)	147,130,580	128,523,908	62,558,574	26,658	21,462	10,599	6,765,629	6,184,962	3,638,503
2004 (July 1, 2003 to June 30, 2004)	154,541,169	136,204,919	79,176,791	28,633	23,475	13,149	12,708,664	12,391,433	10,446,457
2005 (July 1, 2004 to June 30, 2005)	142,859,613	112,466,698	56,615,400	27,144	21,399	10,163	7,398,195	7,282,169	3,551,381
2006 (July 1, 2005 to June 30, 2006)	132,723,673	130,597,866	90,768,572	28,576	28,011	18,845	9,656,634	9,399,673	4,355,798
2007 (July 1, 2006 to June 30, 2007)	141,070,566	136,031,485	87,648,804	29,053	28,042	18,906	13,656,324	11,548,706	6,797,303
18MCP (July 1, 2007 to Sep. 30, 2008)	275,425,380	256,475,944	161,900,789	59,076	55,332	34,908	11,686,334	10,554,656	9,226,786
CY09 (Oct. 1, 2008 to Sep. 30, 2009)	550,034,272	553,458,944	365,463,418	119,653	127,254	73,528	23,788,792	25,141,378	20,156,282
CY10 (Oct. 1, 2009 to Jun. 30, 2010)	427,433,614	422,505,268	299,123,757	77,691	74,825	52,973	18,383,822	17,303,376	14,803,659
Total Focus on Energy (Program start to Jun. 30, 2010)	**2,008,579,940**	**1,908,843,935**	**1,221,724,087**	**405,020**	**386,854**	**236,797**	**106,908,050**	**101,421,876**	**73,704,740**

5. CONCLUSIONS AND RECOMMENDATIONS

This section of the report brings together the principal findings generated by the impact evaluation analysis with the goal of assessing trends and drawing conclusions. We have also made some recommendations for program staff and PSCW consideration.

Several key observations emerge from the findings, as discussed below.

- Program realization rates for electric usage and demand have held steady from CY09. The CY10 kWh and kW realization rates are statistically consistent with the CY09 estimates. This is the fifth evaluation in a row that the program has achieved greater than a 50 percent realization rate for electric usage and demand.
- The program realization rate for natural gas has dropped from CY09. The therm realization rate decreased from 62.9 percent in CY09 to 43.8 percent in CY10. This change is statistically significant at the 95 percent confidence interval. Natural gas projects tend to be fewer in number and larger on average than electric projects, making the program therm results more susceptible to the variation in individual large projects.
- The program continues to do an effective job of estimating gross savings resulting from energy efficiency measures. Though all three gross savings adjustment factors are lower in CY10 than they were in CY09, only the change in the therm adjustment factor is statistically significant at the 95 percent confidence interval. The CY09 results were unusually high, with factors for all three energy units greater than 100 percent for the first time since the evaluation of the program began.
- The attribution factor estimates have either decreased or held steady from CY09. The therm attribution factor has decreased from 59.5 percent in CY09 to 46.7 percent in CY10. The kWh and kW attribution factors are statistically consistent with the CY09 results.
- Service buydown measures have a lower attribution than non-service buydown measures for all three energy units. The kWh attribution factor for service buydown measures is 35.6 percent and for non-service buydown measures is 65.3 percent. The kW attribution factor for service buydown measures is 26.0 percent and, for non-service buydown measures, it is 67.5 percent. The therms attribution factor for service buydown measures is 34.2 percent and for non-service buydown measures, it is 53.2 percent. The differences for all three energy units are statistically significant at the 95 percent confidence interval.

  Early evidence shows positive potential for the retrocommissioning portion of the program. Retrocommissioning is a time-intensive process that can require expert knowledge of building science and early evidence suggests it can result in high program attribution. Coupled with the large amount of gross savings generally estimated for this type of project, it appears that the retrocommissioning portion of Focus on Energy can make a strong contribution to the overall net savings.

  There have been some concerns raised about the persistence of RCx projects that would be compounded if the program shifts to life cycle savings goals. Poor persistence may invalidate the benefit that RCx provides to the program. Further information should be available from upcoming studies.

The conclusions reached in this section offer guidance to program managers seeking to improve program performance. To that end, KEMA recommends the following actions:

- Continue to effectively estimate gross savings for the program overall.
- Move to a standardized workbook format for summarizing all custom projects. Improvements in program documentation have made evaluating the gross savings easier. Two of the four sectors have transitioned to a standardized workbook format to summarize custom projects and the evaluation team has found the standardized approach easier to review. The documentation of program assumptions has also improved across all sectors in recent years.
- Review the results of upcoming RCx persistence studies. Based on the results, consider continuing to offer retrocommissioning projects to interested customers and consider expanding the program. Exclude companies that require retrocommissioning as part of their operations.
- Standardize savings calculations and/or methodologies for retrocommissioning projects. The evaluation team found wide variation in the methodology used to determine savings for retrocommissioning measures. Standardization would reduce program costs and allow for more effective evaluations.
- Add a more thorough review or reconciliation stage to the process. Estimating savings for retrocommissioning measures can be difficult because of the interactive effects of changes on the same end-use system. Pre-installation energy savings estimates can often be incorrect and the differences can be substantial. Adding a formal review to "true up" the savings estimates post-installation will make tracking estimates more accurate. In addition, we recommend developing a procedure in consultation with the evaluation team for correcting and updating savings estimates for projects that are expected to result in a stream of energy efficiency improvements identified by the program and trackable over an extended period.[45]

In addition to the above recommendations for program staff, KEMA recommends that the PSCW use the overall realization rate results reported in this study to determine net program impacts for the first six months of CY10 only. Given the major changes in the program between the first and second halves of CY10 (which are not reflected in this evaluation), KEMA recommends that the PSCW use the non-service buy-down realization rate for determining net impacts for the last six months of CY10. The non-service buydown realization rates are 63.1 percent for kWh, 63.0 percent for kW, and 48.8 percent for therms. These values are all statistically different from the service buy-down realization rates at the 95 percent level of confidence.

[45] This recommendation applies specifically to retrocommissioning and might also apply in other situations where the program is tracking continuing improvements after an initial project. This situation does not apply to untracked savings that may or may not occur following Focus assistance. Untracked savings are accounted for in spillover estimates. Any procedure for tracking delayed savings must avoid double counting with initial tracked savings, adjustments already made by the evaluation verified gross savings adjustments, and/or spillover credit procedures.

APPENDIX A: OTHER ADJUSTMENT FACTORS

This appendix presents the CY10 statistical details of the adjustment factors at the reporting measure group level. It also has the adjustment factors and statistical details at the sampling measure group level.

A.1 STATISTICAL DETAILS, REPORTING MEASURE GROUPS

The tables in this section repeat the results shown in the main body of the report at the reporting measure group level, but contain greater statistical detail than that provided in the body. This section also includes tables that report the installation rate and the engineering verification factor. These are not shown separately in the main body because they are combined in the gross savings adjustment.

The CY10 adjustment factors are provided in the tables with indicators of statistical precision, the 90 percent confidence interval, and sample sizes. The relative error (%) indicated for each confidence interval is the relative difference between the estimated percentage and the upper or lower confidence bound, not the absolute difference. The ± amount indicated for each confidence interval is the absolute difference in the estimated percentage.[46] The adjustment factors are calculated using a SAS® macro provided by SAS for ratio estimation by domains. The procedure also returns the standard error of the estimate. The standard error is calculated using two methods.

The first method recognizes the sample as drawn from a finite population: the measures installed within the analysis period (October 1, 2009–June 30, 2010) with associated energy impacts in the program-tracking database. This calculation uses the Finite Population Correction (FPC) factor. This factor is a reduction to the calculated variance that accounts for the fact that a relatively large fraction of the population of interest has been observed directly and is not subject to uncertainty. It is appropriate to apply precision statistics, such as confidence intervals, based on the standard error calculated in this manner when quantifying the results of the program during the study period only.

The second method treats the population of interest as essentially infinite. Thus, the measures installed to date and the sample selected from them is regarded as random instances of a virtually infinite number of measures that could have been installed under the program. In this case, the FPC is not included. It is appropriate to apply standard errors calculated in this manner when applying the verification factors developed from this study to tracked savings from other years to estimate verified savings in those years.

In this report, the sampling frame includes all measures installed within the analysis period (October 1, 2009–June 30, 2010) with energy impacts associated with the program-tracking database. We use the FPC when applying the calculated adjustment factors to that period. We would not use the FPC when applying these adjustment factors to savings

[46] The critical value for calculating the confidence interval ± for each adjustment factor is determined using Student's t-distribution and n-1 for the degrees of freedom, where n is the sample size. The critical value for the Gross Savings Adjustment Factor and the Realization Rate is determined using the degrees of freedom based on the minimum sample size for the components of the adjustment factor. These two adjustment factors are products of other adjustment factors.

outside the analysis period; for example energy savings associated with measures installed in 2011.

Table A-1 through Table A-5 show the installation rate, engineering verification factor, gross savings adjustment factor, attribution adjustment factor, and realization rate by reporting measure group.

Table A-1. Installation Rates by Reporting Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Measure Group	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	100%	<0.1%	<0.1%	100.0%	100.0%	2	100%	<0.1%	<0.1%	100.0%	100.0%	226	100%	<0.1%	<0.1%	100.0%	100.0%
Non-small CFL lighting	364	100%	<0.1%	<0.1%	100.0%	100.0%	329	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Refrigeration	116	100%	<0.1%	<0.1%	100.0%	100.0%	113	100%	<0.1%	<0.1%	100.0%	100.0%	3	100%	<0.1%	<0.1%	100.0%	100.0%
HVAC	73	100%	<0.1%	<0.1%	100.0%	100.0%	47	100%	<0.1%	<0.1%	100.0%	100.0%	79	100%	<0.1%	<0.1%	100.0%	100.0%
Expanded process	26	100%	<0.1%	<0.1%	100.0%	100.0%	25	100%	<0.1%	<0.1%	100.0%	100.0%	20	100%	<0.1%	<0.1%	100.0%	100.0%
Small CFLs	21	100%	<0.1%	<0.1%	100.0%	100.0%	21	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Other	50	100%	<0.1%	<0.1%	100.0%	100.0%	42	100%	<0.1%	<0.1%	100.0%	100.0%	27	100%	<0.1%	<0.1%	100.0%	100.0%
Business Programs overall	**653**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**	**579**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**	**355**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**

Table A-2. Engineering Verification Factors by Reporting Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Measure Group	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	97%	9.5%	9.2%	87.5%	105.9%	2	100%	<0.1%	<0.1%	100.0%	100.0%	226	105%	9.9%	10.4%	94.6%	115.3%
Non-small CFL lighting	364	101%	1.2%	1.2%	99.6%	101.9%	330	92%	6.4%	5.9%	86.2%	98.1%	-	-	-	-	-	-
Refrigeration	117	117%	4.1%	4.8%	111.7%	121.3%	114	122%	6.8%	8.3%	113.3%	129.8%	3	103%	3.3%	3.4%	99.8%	106.5%
HVAC	73	88%	7.7%	6.8%	81.2%	94.8%	47	102%	3.0%	3.1%	99.3%	105.5%	79	91%	7.2%	6.6%	84.9%	98.0%
Expanded process	26	86%	22.7%	19.6%	66.7%	106.0%	25	78%	24.5%	19.2%	58.9%	97.3%	20	98%	4.7%	4.6%	93.4%	102.6%
Small CFLs	21	100%	<0.1%	<0.1 %	100.0%	100.0%	21	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Other	50	99%	17.4%	17.2%	81.4%	115.8%	42	94%	29.0%	27.3%	66.9%	121.5%	28	63%	60.9%	38.2%	24.5%	100.9%
Business Programs overall	**654**	**99%**	**4.2%**	**4.1%**	**95.0%**	**103.3%**	**581**	**97%**	**4.4%**	**4.3%**	**92.5%**	**101.1%**	**356**	**94%**	**8.0%**	**7.5%**	**86.3%**	**101.4%**

Table A-3. Gross Savings Adjustment Factors by Reporting Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Measure Group	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	97%	9.5%	9.2%	87.5%	105.9%	2	100%	<0.1%	<0.1%	100.0%	100.0%	226	105%	9.9%	10.4%	94.6%	115.3%
Non-small CFL lighting	364	101%	1.2%	1.2%	99.6%	101.9%	329	92%	6.4%	5.9%	86.2%	98.1%	-	-	-	-	-	-
Refrigeration	116	117%	4.1%	4.8%	111.7 %	121.3%	113	122%	6.8%	8.3%	113.3%	129.8%	3	103%	3.3%	3.4%	99.8%	106.5%
HVAC	73	88%	7.7%	6.8%	81.2%	94.8%	47	102%	3.0%	3.1%	99.3%	105.5%	79	91%	7.2%	6.6%	84.9%	98.0%
Expanded process	26	86%	22.7%	19.6%	66.7%	106.0%	25	78%	24.5%	19.2%	58.9%	97.3%	20	98%	4.7%	4.6%	93.4%	102.6%
Small CFLs	21	100%	<0.1%	<0.1 %	100.0 %	100.0%	21	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Other	50	99%	17.4%	17.2%	81.4%	115.8%	42	94%	29.0%	27.3%	66.9%	121.5%	27	63%	61.0%	38.2%	24.5%	100.9%
Business Programs overall	**653**	**99%**	**4.2%**	**4.1%**	**95.0%**	**103.3%**	**579**	**97%**	**4.4%**	**4.3%**	**92.5%**	**101.1%**	**355**	**94%**	**8.0%**	**7.5%**	**86.3%**	**101.4%**

Table A-4. Attribution Adjustment Factors by Reporting Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

Measure Group	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	100%	<0.1%	<0.1 %	100.1 %	100.1%	2	100%	<0.1%	<0.1 %	100.1 %	100.1 %	217	28%	34.9%	9.6%	18.0%	37.3%
Non-small CFL lighting	351	60%	9.8%	5.9%	53.9%	65.7%	318	61%	8.7%	5.3%	56.0%	66.6%	-	-	-	-	-	-
Refrigeration	115	51%	13.8%	7.0%	43.8%	57.8%	112	46%	15.4%	7.1%	39.0%	53.3%	3	95%	19.0%	18.1%	77.0%	113.2%
HVAC	72	40%	39.1%	15.6%	24.3%	55.6%	42	45%	51.3%	22.9%	21.7%	67.5%	74	52%	22.2%	11.6%	40.5%	63.7%
Expanded process	26	59%	20.4%	12.0%	46.7%	70.6%	25	54%	27.3%	14.7%	39.1%	68.4%	20	66%	14.1%	9.3%	56.3%	74.8%
Small CFLs	21	84%	0.1%	0.1%	84.0%	84.3%	21	84%	0.2%	0.1%	84.0%	84.3%	-	-	-	-	-	-
Other	48	67%	39.0%	26.1%	40.8%	93.0%	40	78%	14.2%	11.1%	66.9%	89.2%	28	52%	22.0%	11.4%	40.5%	63.3%
Business Programs overall	**636**	**60%**	**8.6%**	**5.1%**	**54.7%**	**65.0%**	**560**	**59%**	**10.8%**	**6.3%**	**52.4%**	**65.1%**	**342**	**47%**	**11.6%**	**5.4%**	**41.3%**	**52.1%**

Table A-5. Realization Rates by Reporting Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

Measure Group	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	min n	Realization Rate	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Realization Rate	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Realization Rate	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	97%	9.5%	9.2%	87.6%	106.0%	2	100%	<0.1%	<0.1 %	100.1 %	100.1%	217	29%	36.3%	10.5%	18.5%	39.5%
Non-small CFL lighting	351	60%	9.9%	6.0%	54.3%	66.2%	318	56%	10.8%	6.1%	50.4%	62.6%	-	-	-	-	-	-
Refrigeration	115	59%	14.4%	8.5%	50.7%	67.7%	112	56%	16.9%	9.5%	46.7%	65.6%	3	98%	19.3%	18.9%	79.2%	117.0%
HVAC	72	35%	39.9%	14.0%	21.1%	49.2%	42	46%	51.4%	23.5%	22.2%	69.2%	74	48%	23.4%	11.1%	36.5%	58.8%
Expanded process	26	51%	30.5%	15.5%	35.2%	66.1%	25	42%	36.7%	15.4%	26.6%	57.4%	20	64%	14.9%	9.6%	54.7%	73.8%
Small CFLs	21	84%	0.1%	0.1%	84.0%	84.3%	21	84%	0.2%	0.1%	84.0%	84.3%	-	-	-	-	-	-
Other	48	66%	42.8%	28.2%	37.7%	94.1%	40	74%	32.3%	23.8%	49.8%	97.3%	27	33%	64.8%	21.1%	11.4%	53.6%
Business Programs overall	**636**	**59%**	**9.6%**	**5.7%**	**53.6%**	**65.0%**	**560**	**57%**	**11.7%**	**6.6%**	**50.3%**	**63.5%**	**342**	**44%**	**14.1%**	**6.2%**	**37.7%**	**50.0%**

A.2 RESULTS BY SAMPLING MEASURE GROUPS

The tables in this section present the adjustment factors at the sampling measure group level.

Table A-6. Installation Rates by Sampling Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

Measure Group	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	100%	<0.1%	<0.1%	100.0%	100.0%	2	100%	<0.1%	<0.1%	100.0%	100.0%	226	100%	<0.1%	<0.1%	100.0%	100.0%
Lighting	364	100%	<0.1%	<0.1%	100.0%	100.0%	329	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Refrigeration	116	100%	<0.1%	<0.1%	100.0%	100.0%	113	100%	<0.1%	<0.1%	100.0%	100.0%	3	100%	<0.1%	<0.1%	100.0%	100.0%
HVAC	73	100%	<0.1%	<0.1%	100.0%	100.0%	47	100%	<0.1%	<0.1%	100.0%	100.0%	79	100%	<0.1%	<0.1%	100.0%	100.0%
Process	8	100%	<0.1%	<0.1%	100.0%	100.0%	7	100%	<0.1%	<0.1%	100.0%	100.0%	15	100%	<0.1%	<0.1%	100.0%	100.0%
Compressed air, vacuum pumps	14	100%	<0.1%	<0.1%	100.0%	100.0%	14	100%	<0.1%	<0.1%	100.0%	100.0%	1	100%	<0.1%	<0.1%	100.0%	100.0%
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	1	100%	<0.1%	<0.1%	100.0%	100.0%
Waste water treatment	3	100%	<0.1%	<0.1%	100.0%	100.0%	3	100%	<0.1%	<0.1%	100.0%	100.0%	1	100%	<0.1%	<0.1%	100.0%	100.0%
Industrial ovens and furnaces	1	100%	<0.1%	<0.1%	100.0%	100.0%	1	100%	<0.1%	<0.1%	100.0%	100.0%	3	100%	<0.1%	<0.1%	100.0%	100.0%
New construction	5	100%	<0.1%	<0.1%	100.0%	100.0%	5	100%	<0.1%	<0.1%	100.0%	100.0%	5	100%	<0.1%	<0.1%	100.0%	100.0%
Motors & drives	21	100%	<0.1%	<0.1%	100.0%	100.0%	18	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
CFL	21	100%	<0.1%	<0.1%	100.0%	100.0%	21	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Other	24	100%	<0.1%	<0.1%	100.0%	100.0%	19	100%	<0.1%	<0.1%	100.0%	100.0%	21	100%	<0.1%	<0.1%	100.0%	100.0%
Business Programs overall	**653**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**	**579**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**	**355**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**

Table A-7. Engineering Verification Factors by Sampling Measure Group
Based on Samples from Participants Who Installed a Measure during CY10

Measure Group	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	97%	9.5%	9.2%	87.5%	105.9%	2	100%	<0.1%	<0.1%	100.0%	100.0%	226	105%	9.9%	10.4%	94.6%	115.3%
Lighting	364	101%	1.2%	1.2%	99.6%	101.9%	330	92%	6.4%	5.9%	86.2%	98.1%	-	-	-	-	-	-
Refrigeration	117	117%	4.1%	4.8%	111.7%	121.3%	114	122%	6.8%	8.3%	113.3%	129.8%	3	103%	3.3%	3.4%	99.8%	106.5%
HVAC	73	88%	7.7%	6.8%	81.2%	94.8%	47	102%	3.0%	3.1%	99.3%	105.5%	79	91%	7.2%	6.6%	84.9%	98.0%
Process	8	102%	2.7%	2.7%	98.9%	104.3%	7	96%	16.2%	15.5%	80.3%	111.3%	15	98%	5.0%	4.9%	93.0%	102.8%
Compressed air, vacuum pumps	14	77%	37.8%	29.0%	47.8%	105.9%	14	74%	33.3%	24.7%	49.5%	98.9%	1	100%	<0.1%	<0.1%	100.0%	100.0%
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	1	100%	<0.1%	<0.1%	100.0%	100.0%
Waste water treatment	3	103%	13.0%	13.4%	89.6%	116.4%	3	75%	76.0%	57.2%	18.1%	132.5%	1	100%	<0.1%	<0.1%	100.0%	100.0%
Industrial ovens and furnaces	1	100%	<0.1%	<0.1%	100.0%	100.0%	1	61%	<0.1%	<0.1%	61.5%	61.5%	3	100%	<0.1%	<0.1%	100.0%	100.0%
New construction	5	79%	69.1%	54.4%	24.4%	133.2%	5	61%	110.2%	67.1%	-	128.0%	5	32%	192.4%	61.7%	-	93.8%
Motors & drives	21	99%	1.5%	1.5%	97.8%	100.7%	18	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
CFL	21	100%	<0.1%	<0.1%	100.0%	100.0%	21	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Other	24	101%	65.3%	65.7%	34.9%	166.2%	19	142%	166.5%	236.2 %	-	378.0%	22	69%	79.6%	54.8%	14.1%	123.8%
Business Programs overall	**654**	**99%**	**4.2%**	**4.1%**	**95.0%**	**103.3%**	**581**	**97%**	**4.4%**	**4.3%**	**92.5%**	**101.1%**	**356**	**94%**	**8.0%**	**7.5%**	**86.3%**	**101.4%**

Table A-8. Gross Savings Adjustment Factors by Sampling Measure Group Based on Samples from Participants Who Installed a Measure during CY10

Measure Group	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	97%	9.5%	9.2%	87.5%	105.9%	2	100%	<0.1%	<0.1%	100.0%	100.0%	226	105%	9.9%	10.4%	94.6%	115.3%
Lighting	364	101%	1.2%	1.2%	99.6%	101.9%	329	92%	6.4%	5.9%	86.2%	98.1%	-	-	-	-	-	-
Refrigeration	116	117%	4.1%	4.8%	111.7%	121.3%	113	122%	6.8%	8.3%	113.3%	129.8%	3	103%	3.3%	3.4%	99.8%	106.5%
HVAC	73	88%	7.7%	6.8%	81.2%	94.8%	47	102%	3.0%	3.1%	99.3%	105.5%	79	91%	7.2%	6.6%	84.9%	98.0%
Process	8	102%	2.7%	2.7%	98.9%	104.3%	7	96%	16.2%	15.5%	80.3%	111.3%	15	98%	5.0%	4.9%	93.0%	102.8%
Compressed air, vacuum pumps	14	77%	37.8%	29.0%	47.8%	105.9%	14	74%	33.3%	24.7%	49.5%	98.9%	1	100%	<0.1%	<0.1%	100.0%	100.0%
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	1	100%	<0.1%	<0.1%	100.0%	100.0%
Waste water treatment	3	103%	13.0%	13.4%	89.6%	116.4%	3	75%	76.0%	57.2%	18.1%	132.5%	1	100%	<0.1%	<0.1%	100.0%	100.0%
Industrial ovens and furnaces	1	100%	<0.1%	<0.1%	100.0%	100.0%	1	61%	<0.1%	<0.1%	61.5%	61.5%	3	100%	<0.1%	<0.1%	100.0%	100.0%
New construction	5	79%	69.1%	54.4%	24.4%	133.2%	5	61%	110.2%	67.1%	-	128.0%	5	32%	192.4%	61.7%	-	93.8%
Motors & drives	21	99%	1.5%	1.5%	97.8%	100.7%	18	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
CFL	21	100%	<0.1%	<0.1%	100.0%	100.0%	21	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Other	24	101%	65.3%	65.7%	34.9%	166.2%	19	142%	166.5%	236.2 %	-	378.0%	21	69%	79.8%	55.0%	14.0%	123.9%
Business Programs overall	**653**	**99%**	**4.2%**	**4.1%**	**95.0%**	**103.3%**	**579**	**97%**	**4.4%**	**4.3%**	**92.5%**	**101.1%**	**355**	**94%**	**8.0%**	**7.5%**	**86.3%**	**101.4%**

Table A-9. Attribution Adjustment Factors by Sampling Measure Group Based on Samples from Participants Who Installed a Measure during CY10[47]

Measure Group	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	100%	<0.1%	<0.1 %	100.1 %	100.1%	2	100%	<0.1%	<0.1 %	100.1 %	100.1%	217	28%	34.9%	9.6%	18.0%	37.3%
Lighting	351	60%	9.8%	5.9%	53.9%	65.7%	318	61%	8.7%	5.3%	56.0%	66.6%	-	-	-	-	-	-
Refrigeration	115	51%	13.8%	7.0%	43.8%	57.8%	112	46%	15.4%	7.1%	39.0%	53.3%	3	95%	19.0%	18.1%	77.0%	113.2%
HVAC	72	40%	39.1%	15.6%	24.3%	55.6%	42	45%	51.3%	22.9%	21.7%	67.5%	74	52%	22.2%	11.6%	40.5%	63.7%
Process	8	97%	3.5%	3.5%	93.9%	100.8%	7	95%	8.9%	8.5%	86.9%	103.8%	15	63%	15.5%	9.8%	53.5%	73.1%
Compressed air, vacuum pumps	14	39%	37.4%	14.5%	24.2%	53.2%	14	39%	34.9%	13.6%	25.4%	52.6%	1	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Waste water treatment	3	61%	67.5%	40.9%	19.7%	101.5%	3	73%	80.0%	58.1%	14.6%	130.7%	1	-	-	-	-	-
Industrial ovens and furnaces	1	-	-	-	-	-	1	-	-	-	-	-	3	120%	58.3%	69.7%	49.8%	189.3%
New construction	5	50%	48.7%	24.4%	25.7%	74.4%	5	40%	58.8%	23.6%	16.5%	63.6%	5	47%	50.4%	23.6%	23.2%	70.3%
Motors & drives	19	73%	53.3%	38.7%	33.9%	111.3%	16	98%	2.8%	2.7%	95.1%	100.6%	-	-	-	-	-	-
CFL	21	84%	0.1%	0.1%	84.0%	84.3%	21	84%	0.2%	0.1%	84.0%	84.3%	-	-	-	-	-	-
Other	24	55%	31.0%	17.0%	37.8%	71.9%	19	37%	31.4%	11.6%	25.3%	48.5%	22	53%	57.7%	30.4%	22.3%	83.0%
Business Programs overall	**636**	**60%**	**8.6%**	**5.1%**	**54.7%**	**65.0%**	**560**	**59%**	**10.8%**	**6.3%**	**52.4%**	**65.1%**	**342**	**47%**	**11.6%**	**5.4%**	**41.3%**	**52.1%**

[47] Attribution data for measure groups where only one customer was sampled is suppressed to protect customer privacy.

Table A-10. Realization Rates by Sampling Measure Group Based on Samples from Participants Who Installed a Measure during CY10[48]

Measure Group	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	min n	Realization Rate	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Realiz-ation Rate	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Realization Rate	Relative Error (%)	±	Lower Bound	Upper Bound
Boilers & burners	3	97%	9.5%	9.2%	87.6%	106.0%	2	100%	<0.1%	<0.1%	100.1%	100.1%	217	29%	36.3%	10.5%	18.5%	39.5%
Lighting	351	60%	9.9%	6.0%	54.3%	66.2%	318	56%	10.8%	6.1%	50.4%	62.6%	-	-	-	-	-	-
Refrigeration	115	59%	14.4%	8.5%	50.7%	67.7%	112	56%	16.9%	9.5%	46.7%	65.6%	3	98%	19.3%	18.9%	79.2%	117.0%
HVAC	72	35%	39.9%	14.0%	21.1%	49.2%	42	46%	51.4%	23.5%	22.2%	69.2%	74	48%	23.4%	11.1%	36.5%	58.8%
Process	8	99%	4.4%	4.4%	94.5%	103.3%	7	91%	18.4%	16.8%	74.5%	108.2%	15	62%	16.3%	10.1%	51.8%	72.0%
Compressed air, vacuum pumps	14	30%	53.2%	15.8%	13.9%	45.6%	14	29%	48.3%	14.0%	15.0%	42.9%	1	-	-	-	-	-
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Waste water treatment	3	62%	68.8%	42.9%	19.5%	105.4%	3	55%	110.3%	60.3%	-	115.0%	1	-	-	-	-	-
Industrial ovens and furnaces	1	-	-	-	-	-	1	-	-	-	-	-	3	120%	58.3%	69.7%	49.8%	189.3%
New construction	5	39%	84.5%	33.3%	6.1%	72.7%	5	24%	124.9%	30.5%	-	54.9%	5	15%	198.9%	29.8%	-	44.8%
Motors & drives	19	72%	53.3%	38.4%	33.6%	110.5%	16	98%	2.8%	2.7%	95.1%	100.6%	-	-	-	-	-	-
CFL	21	84%	0.1%	0.1%	84.0%	84.3%	21	84%	0.2%	0.1%	84.0%	84.3%	-	-	-	-	-	-
Other	24	55%	72.3%	39.9%	15.3%	95.0%	19	52%	169.5%	88.8%	-	141.1%	21	36%	98.5%	35.8%	0.5%	72.1%
Business Programs overall	**636**	**59%**	**9.6%**	**5.7%**	**53.6%**	**65.0%**	**560**	**57%**	**11.7%**	**6.6%**	**50.3%**	**63.5%**	**342**	**44%**	**14.1%**	**6.2%**	**37.7%**	**50.0%**

[48] Realization rate data for measure groups where only one customer was sampled is suppressed to protect customer privacy.

APPENDIX B: ADDITIONAL ENGINEERING REVIEW DATA

This appendix provides additional data from the engineering review with breakouts by sector. Given the program delivery method, the evaluation team felt that reporting this data by sector was more valuable than reporting by measure group.

The overall population addressed in this section is the engineering sample. This section does not include any adjustments resulting from the CATI sample. Data are provided for the number of adjustments, the percentage savings represented by those adjustments, and the reasons for the adjustments.

Table B-1. shows the number of measures, percentage of measures, and the percentage of total savings for each energy unit by sector. For example, in the engineering review there were 204 commercial measures, accounting for 50 percent of the total measures reviewed. The commercial measures accounted for 38 percent of the reported kWh savings, 40 percent of the reported kW savings, and 22 percent of the reported therm savings in the engineering sample.

Table B-1. Number of Measures and Percentage Reported Savings by Sector

	Measures		Percentage of Reported Savings		
Sector	**Number**	**Percentage**	**kWh**	**kW**	**therm**
Agriculture	6	1%	2%	3%	0%
Commercial	204	50%	38%	40%	22%
Industrial	98	24%	40%	37%	58%
S & G	104	25%	20%	20%	21%
Total	**412**	**100%**	**100%**	**100%**	**100%**

In the tables in this appendix, as in the body of the report, “V” refers to verified savings and “R” refers to reported savings. Thus “V>R” refers to an increase in verified savings over reported savings, and “V<R” refers to a decrease.

B.1.1 Degree of difference

Table B-2, Table B-3, and Table B-4 show the number of adjusted measures in the engineering sample for kWh, kW, and therms, by sector. The percentages at the bottom of the tables are the percentage of total adjusted measures represented by each category.

Table B-2. Number of Measures with Adjustments by Sector, kWh

Percentage Change (%)	kWh Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
0 to 10	0	0	0	2	2	4	1	2	3	0	1	1	**3**	**5**	**8**
11 to 20	1	0	1	0	6	6	2	1	3	1	0	1	**4**	**7**	**11**
21 to 30	0	1	1	0	1	1	2	0	2	0	1	1	**2**	**3**	**5**
31 to 40	0	0	0	2	0	2	1	2	3	1	1	2	**4**	**3**	**7**
41 to 50	0	0	0	24	1	25	2	1	3	0	1	1	**26**	**3**	**29**
51 to 100	0	1	1	0	3	3	0	2	2	0	0	0	**0**	**6**	**6**
Greater than 100	0	0	0	3	0	3	2	0	2	0	0	0	**5**	**0**	**5**
Non-zero verified with zero reported	0	0	0	0	0	0	0	1	1	0	0	0	**0**	**1**	**1**
Total adjusted	**1**	**2**	**3**	**31**	**13**	**44**	**10**	**9**	**19**	**2**	**4**	**6**	**44**	**28**	**72**
Percentage of adjusted measures	**1%**	**3%**	**4%**	**43%**	**18%**	**61%**	**14%**	**13%**	**26%**	**3%**	**6%**	**8%**	**61%**	**39%**	**100%**

Table B-3. Number of Measures with Adjustments by Sector, kW

Percentage Change (%)	kW Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
0 to 10	0	0	0	0	0	0	1	2	3	1	0	1	**2**	**2**	**4**
11 to 20	0	0	0	2	2	4	0	0	0	1	0	1	**3**	**2**	**5**
21 to 30	0	0	0	0	1	1	0	1	1	1	0	1	**1**	**2**	**3**
31 to 40	0	1	1	0	0	0	0	1	1	0	1	1	**0**	**3**	**3**
41 to 50	0	0	0	24	0	24	2	1	3	0	0	0	**26**	**1**	**27**
51 to 100	0	1	1	0	3	3	1	3	4	0	4	4	**1**	**11**	**12**
Greater than 100	0	0	0	3	0	3	2	0	2	0	0	0	**5**	**0**	**5**
Non-zero verified with zero reported	0	0	0	1	0	1	0	1	1	0	0	0	**1**	**1**	**2**
Total adjusted	**0**	**2**	**2**	**30**	**6**	**36**	**6**	**9**	**15**	**3**	**5**	**8**	**39**	**22**	**61**
Percentage of adjusted measures	**0%**	**3%**	**3%**	**49%**	**10%**	**59%**	**10%**	**15%**	**25%**	**5%**	**8%**	**13%**	**64%**	**36%**	**100%**

Table B-4. Number of Measures with Adjustments by Sector, Therm

Percentage Change (%)	Therm Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**
0 to 10	0	0	0	1	1	2	3	1	4	0	0	0	**4**	**2**	**6**
11 to 20	0	0	0	2	2	4	0	2	2	0	0	0	**2**	**4**	**6**
21 to 30	0	0	0	0	3	3	1	2	3	0	1	1	**1**	**6**	**7**
31 to 40	0	0	0	0	0	0	1	2	3	0	0	0	**1**	**2**	**3**
41 to 50	0	0	0	0	3	3	0	0	0	0	1	1	**0**	**4**	**4**
51 to 100	0	0	0	1	4	5	2	2	4	0	2	2	**3**	**8**	**11**
Greater than 100	0	0	0	1	0	1	0	0	0	0	0	0	**1**	**0**	**1**
Non-zero verified with zero reported	0	0	0	0	1	1	0	0	0	0	0	0	**0**	**1**	**1**
Total adjusted	**0**	**0**	**0**	**5**	**14**	**19**	**7**	**9**	**16**	**0**	**4**	**4**	**12**	**27**	**39**
Percentage of adjusted measures	**0%**	**0%**	**0%**	**13%**	**36%**	**49%**	**18%**	**23%**	**41%**	**0%**	**10%**	**10%**	**31%**	**69%**	**100%**

Table B-5, Table B-6, and Table B-7 show the percentage of reported engineering sample energy savings represented by the measures adjusted in the engineering review, by sector. For example, adjusted commercial measures represent 27 percent of reported commercial sector kWh savings in the commercial engineering sample and 11 percent of total reported kWh savings in the overall engineering sample.

Table B-5. Percentage of Sample Savings with Adjustments, kWh

Percentage Change (%)	kWh: Percentage Reported Savings Represented by Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total
Not installed	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**0%**	**0%**	**0%**
1 to 10	0%	0%	0%	0%	1%	1%	0%	6%	6%	0%	12%	12%	**0%**	**5%**	**5%**
11 to 20	80%	0%	80%	0%	8%	8%	4%	1%	5%	2%	0%	2%	**3%**	**4%**	**7%**
21 to 30	0%	18%	18%	0%	1%	1%	2%	0%	2%	0%	2%	2%	**1%**	**1%**	**2%**
31 to 40	0%	0%	0%	1%	0%	1%	0%	1%	1%	0%	10%	10%	**0%**	**2%**	**3%**
41 to 50	0%	0%	0%	9%	1%	10%	4%	3%	8%	0%	4%	4%	**5%**	**3%**	**8%**
51 to 100	0%	1%	1%	0%	4%	4%	0%	11%	11%	0%	0%	0%	**0%**	**6%**	**6%**
Greater than 100	0%	0%	0%	2%	0%	2%	2%	0%	2%	0%	0%	0%	**1%**	**0%**	**1%**
Non-zero verified with zero reported	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**0%**	**0%**	**0%**
Percentage of sector savings	**80%**	**19%**	**100%**	**11%**	**16%**	**27%**	**12%**	**22%**	**35%**	**2%**	**28%**	**30%**	**11%**	**21%**	**32%**
Percentage of total savings	**1%**	**0%**	**2%**	**4%**	**6%**	**11%**	**5%**	**9%**	**14%**	**0%**	**6%**	**6%**	**11%**	**21%**	**32%**

Table B-6. Percentage of Sample Savings with Adjustments, kW

Percentage Change (%)	kW: Percentage Reported Savings Represented by Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total
Not installed	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**0%**	**0%**	**0%**
1 to 10	0%	0%	0%	0%	0%	0%	0%	1%	2%	24%	0%	24%	**5%**	**0%**	**5%**
11 to 20	0%	0%	0%	10%	2%	12%	0%	0%	0%	17%	0%	17%	**8%**	**1%**	**8%**
21 to 30	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	**0%**	**1%**	**1%**
31 to 40	0%	19%	19%	0%	0%	0%	0%	1%	1%	0%	3%	3%	**0%**	**2%**	**2%**
41 to 50	0%	0%	0%	7%	0%	7%	3%	1%	5%	0%	0%	0%	**4%**	**0%**	**5%**
51 to 100	0%	80%	80%	0%	6%	6%	-1%	13%	12%	0%	17%	17%	**0%**	**13%**	**13%**
Greater than 100	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	**1%**	**0%**	**1%**
Non-zero verified with zero reported	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**0%**	**0%**	**0%**
Percentage of sector savings	**0%**	**100%**	**100%**	**18%**	**9%**	**27%**	**4%**	**16%**	**20%**	**41%**	**20%**	**61%**	**17%**	**17%**	**34%**
Percentage of total savings	**0%**	**3%**	**3%**	**7%**	**4%**	**11%**	**1%**	**6%**	**7%**	**9%**	**4%**	**13%**	**18%**	**17%**	**34%**

Table B-7. Percentage of Sample Savings with Adjustments, Therm

Percentage Change (%)	Therm Percentage Reported Savings Represented by Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total	V > R	V < R	Total
Not installed	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**0%**	**0%**	**0%**
1 to 10	0%	0%	0%	2%	0%	2%	15%	1%	16%	0%	0%	0%	**9%**	**1%**	**10%**
11 to 20	0%	0%	0%	5%	11%	16%	0%	1%	1%	0%	0%	0%	**1%**	**3%**	**4%**
21 to 30	0%	0%	0%	0%	2%	2%	3%	10%	13%	0%	3%	3%	**2%**	**7%**	**9%**
31 to 40	0%	0%	0%	0%	0%	0%	2%	3%	5%	0%	0%	0%	**1%**	**2%**	**3%**
41 to 50	0%	0%	0%	0%	5%	5%	0%	0%	0%	0%	14%	14%	**0%**	**4%**	**4%**
51 to 100	0%	0%	0%	0%	27%	27%	2%	5%	7%	0%	7%	7%	**1%**	**10%**	**12%**
Greater than 100	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**0%**	**0%**	**0%**
Non-zero verified with zero reported	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	**0%**	**0%**	**0%**
Percentage of sector savings	**0%**	**0%**	**0%**	**8%**	**45%**	**53%**	**22%**	**21%**	**43%**	**0%**	**24%**	**24%**	**14%**	**27%**	**41%**
Percentage of total savings	**0%**	**0%**	**0%**	**2%**	**10%**	**11%**	**13%**	**12%**	**25%**	**0%**	**5%**	**5%**	**14%**	**27%**	**41%**

Table B-8, Table B-9, and Table B-10 show the number of adjustments and percentage of sector savings represented by those adjustments for the Agriculture sector.

Table B-8. Agriculture Sector Adjustment Count and Percentage Savings, kWh

	Agriculture kWh					
	Count			Percentage Sector Savings		
Percentage change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	0	0	0	0%	0%	0%
11 to 20	1	0	1	80%	0%	80%
21 to 30	0	1	1	0%	18%	18%
31 to 40	0	0	0	0%	0%	0%
41 to 50	0	0	0	0%	0%	0%
51 to 100	0	1	1	0%	1%	1%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	1	2	3	80%	19%	100%
Not adjusted			2			0%
Total			5			100%

Table B-9. Agriculture Sector Adjustment Count and Percentage Savings, kW

	Agriculture kW					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	0	0	0	0%	0%	0%
11 to 20	0	0	0	0%	0%	0%
21 to 30	0	0	0	0%	0%	0%
31 to 40	0	1	1	0%	19%	19%
41 to 50	0	0	0	0%	0%	0%
51 to 100	0	1	1	0%	80%	80%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	0	2	2	0%	100%	100%
Not adjusted			1			0%
Total			3			100%

Table B-10. Agriculture Sector Adjustment Count and Percentage Savings, Therms

	Agriculture Therm					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	0	0	0	0%	0%	0%
11 to 20	0	0	0	0%	0%	0%
21 to 30	0	0	0	0%	0%	0%
31 to 40	0	0	0	0%	0%	0%
41 to 50	0	0	0	0%	0%	0%
51 to 100	0	0	0	0%	0%	0%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	0	0	0	0%	0%	0%
Not adjusted			2			100%
Total			2			100%

Table B-11, Table B-12, and Table B-13 show the number of adjustments and percentage of sector savings represented by those adjustments for the Commercial sector.

Table B-11. Commercial Sector Adjustment Count and Percentage Savings, kWh

	Commercial kWh					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	2	2	4	0%	1%	1%
11 to 20	0	6	6	0%	8%	8%
21 to 30	0	1	1	0%	1%	1%
31 to 40	2	0	2	1%	0%	1%
41 to 50	24	1	25	9%	1%	10%
51 to 100	0	3	3	0%	4%	4%
Greater than 100	3	0	3	2%	0%	2%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	31	13	44	11%	16%	27%
Not adjusted			135			73%
Total			179			100%

Table B-12. Commercial Sector Adjustment Count and Percentage Savings, kW

	Commercial kW					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	0	0	0	0%	0%	0%
11 to 20	2	2	4	10%	2%	12%
21 to 30	0	1	1	0%	2%	2%
31 to 40	0	0	0	0%	0%	0%
41 to 50	24	0	24	7%	0%	7%
51 to 100	0	3	3	0%	6%	6%
Greater than 100	3	0	3	1%	0%	1%
Non-zero verified with zero reported	1	0	1	0%	0%	0%
Adjusted	30	6	36	18%	9%	27%
Not adjusted			128			73%
Total			164			100%

Table B-13. Commercial Sector Adjustment Count and Percentage Savings, Therms

	Commercial Therm					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	1	1	2	2%	0%	2%
11 to 20	2	2	4	5%	11%	16%
21 to 30	0	3	3	0%	2%	2%
31 to 40	0	0	0	0%	0%	0%
41 to 50	0	3	3	0%	5%	5%
51 to 100	1	4	5	0%	27%	27%
Greater than 100	1	0	1	0%	0%	0%
Non-zero verified with zero reported	0	1	1	0%	0%	0%
Adjusted	5	14	19	8%	45%	53%
Not adjusted			27			47%
Total			46			100%

Table B-14, Table B-15, and Table B-16 show the number of adjustments and the percentage of sector savings the adjustments represent for the Industrial sector.

Table B-14. Industrial Sector Adjustment Count and Percentage Savings, kWh

	Industrial kWh					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	1	2	3	0%	6%	6%
11 to 20	2	1	3	4%	1%	5%
21 to 30	2	0	2	2%	0%	2%
31 to 40	1	2	3	0%	1%	1%
41 to 50	2	1	3	4%	3%	8%
51 to 100	0	2	2	0%	11%	11%
Greater than 100	2	0	2	2%	0%	2%
Non-zero verified with zero reported	0	1	1	0%	0%	0%
Adjusted	10	9	19	12%	22%	35%
Not adjusted			46			65%
Total			65			100%

Table B-15. Industrial Sector Adjustment Count and Percentage Savings, kW

	Industrial kW					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	1	2	3	0%	1%	2%
11 to 20	0	0	0	0%	0%	0%
21 to 30	0	1	1	0%	0%	0%
31 to 40	0	1	1	0%	1%	1%
41 to 50	2	1	3	3%	1%	5%
51 to 100	1	3	4	-1%	13%	12%
Greater than 100	2	0	2	0%	0%	0%
Non-zero verified with zero reported	0	1	1	0%	0%	0%
Adjusted	6	9	15	4%	16%	20%
Not adjusted			43			80%
Total			58			100%

Table B-16. Industrial Sector Adjustment Count and Percentage Savings, Therms

	Industrial Therm					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	3	1	4	15%	1%	16%
11 to 20	0	2	2	0%	1%	1%
21 to 30	1	2	3	3%	10%	13%
31 to 40	1	2	3	2%	3%	5%
41 to 50	0	0	0	0%	0%	0%
51 to 100	2	2	4	2%	5%	7%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	7	9	16	22%	21%	43%
Not adjusted			27			57%
Total			43			100%

Table B-17, Table B-18, and Table B-19 show the number of adjustments and the percentage of sector savings the adjustments represent for the Schools and Government sector.

Table B-17. Schools and Government Sector Adjustment Count and Percentage Savings, kWh

	Schools and Government kWh					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	0	1	1	0%	12%	12%
11 to 20	1	0	1	2%	0%	2%
21 to 30	0	1	1	0%	2%	2%
31 to 40	1	1	2	0%	10%	10%
41 to 50	0	1	1	0%	4%	4%
51 to 100	0	0	0	0%	0%	0%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	2	4	6	2%	28%	30%
Not adjusted			72			70%
Total			78			100%

Table B-18. Schools and Government Sector Adjustment Count and Percentage Savings, kW

	Schools and Government kW					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	1	0	1	24%	0%	24%
11 to 20	1	0	1	17%	0%	17%
21 to 30	1	0	1	0%	0%	0%
31 to 40	0	1	1	0%	3%	3%
41 to 50	0	0	0	0%	0%	0%
51 to 100	0	4	4	0%	17%	17%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	3	5	8	41%	20%	61%
Not adjusted			56			39%
Total			64			100%

Table B-19. Schools and Government Sector Adjustment Count and Percentage Savings, Therms

	Schools and Government Therm					
	Count			Percentage Sector Savings		
Percentage Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
0 to 10	0	0	0	0%	0%	0%
11 to 20	0	0	0	0%	0%	0%
21 to 30	0	1	1	0%	3%	3%
31 to 40	0	0	0	0%	0%	0%
41 to 50	0	1	1	0%	14%	14%
51 to 100	0	2	2	0%	7%	7%
Greater than 100	0	0	0	0%	0%	0%
Non-zero verified with zero reported	0	0	0	0%	0%	0%
Adjusted	0	4	4	0%	24%	24%
Not adjusted			33			76%
Total			37			100%

Figure B-1, Figure B-2, and Figure B-3 show the relative counts of adjusted measures by sector and for the engineering sample overall. The top set of bars in each graph represents data for the overall engineering sample while the remainder breaks out the data by sector. The top bar in each set represents the total adjusted measures and is the sum of the two adjustment categories below it.

Figure B-1. Count of Measures with Adjustments, kWh

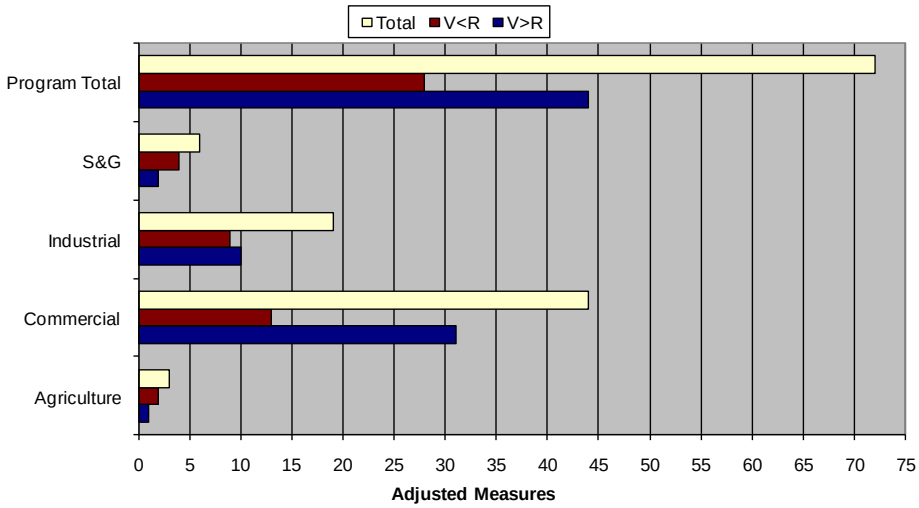


Figure B-2. Count of Measures with Adjustments, kW

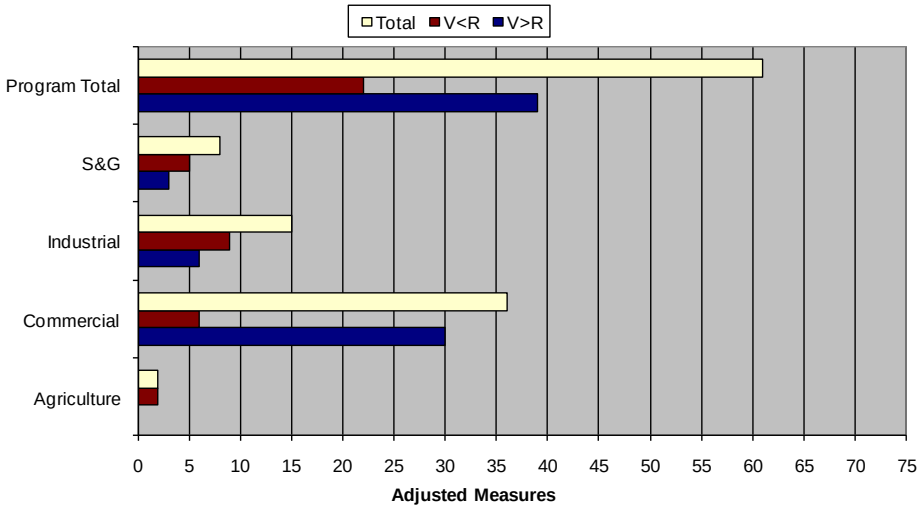


Figure B-3. Count of Measures with Adjustments, Therms

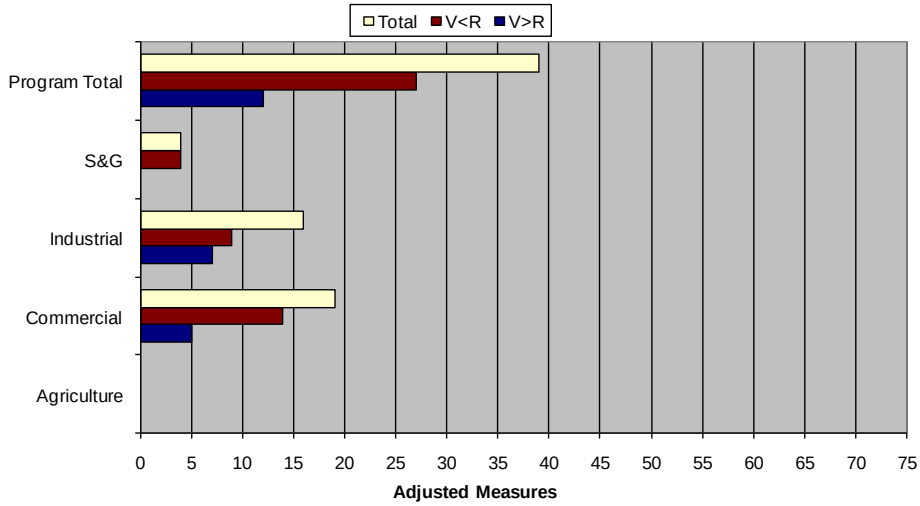


Figure B-4, Figure B-5, and Figure B-6 show the percentage of total engineering sample savings represented by adjustments for each sector and for the engineering sample overall.

Figure B-4. Percentage Savings with Adjustments, kWh

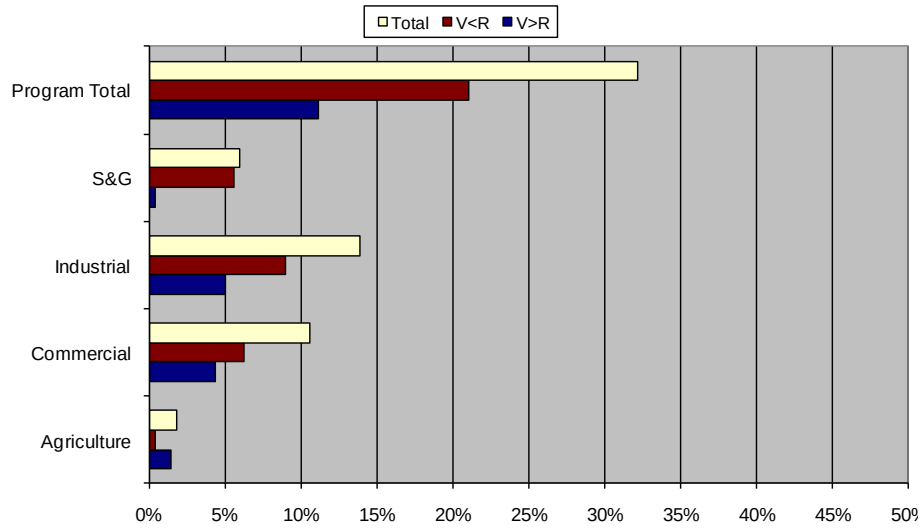


Figure B-5. Percentage Savings with Adjustments, kW

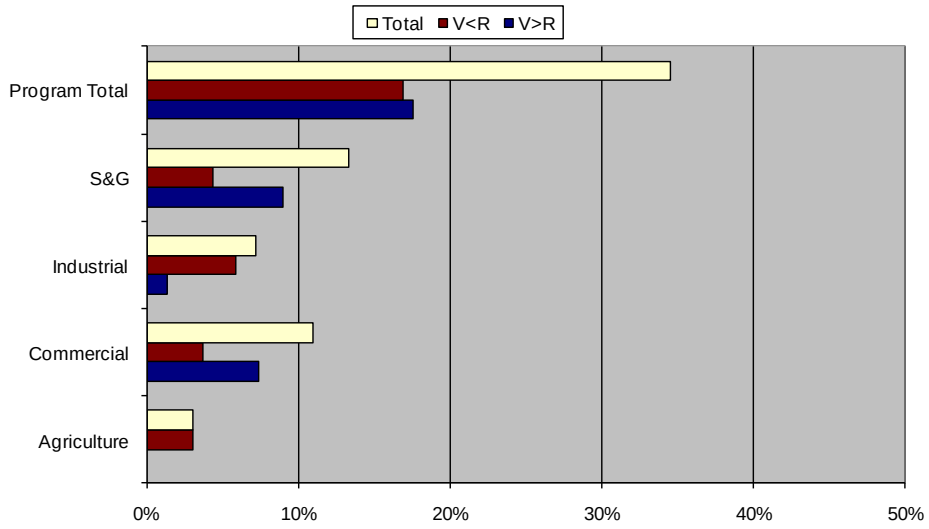
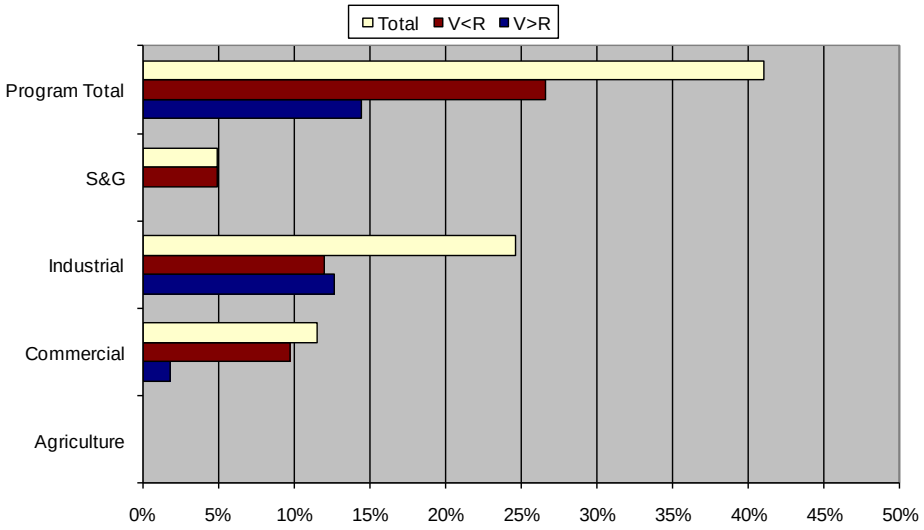


Figure B-6. Percentage Savings with Adjustments, Therms



B.1.2 Reasons for adjustment

As discussed in the body of the report, each adjusted measure was categorized by the primary reason for the adjustment.

Table B-20, Table B-21, and Table B-22 show the number of adjustments and the percentage of sector savings those adjustments represent for the Agriculture sector, by primary reason for adjustment.

Table B-20. Agriculture Sector Adjustments and Percentage Savings by Reason, kWh

Primary Reason for Adjustment	Agriculture kWh					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	0	0	0%	0%	0%
Different analysis or calculation method	1	2	3	80%	19%	100%
Different baseline or installation	0	0	0	0%	0%	0%
Deeming adjustment	0	0	0	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	0	0	0%	0%	0%
Adjusted	1	2	3	80%	19%	100%
Not adjusted			2			0%
Total			5			100%

Table B-21. Agriculture Sector Adjustments and Percentage Savings by Reason, kW

Primary Reason for Adjustment	Agriculture kW					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	0	0	0%	0%	0%
Different analysis or calculation method	0	1	1	0%	19%	19%
Different baseline or installation	0	1	1	0%	80%	80%
Deeming adjustment	0	0	0	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	0	0	0%	0%	0%
Adjusted	0	2	2	0%	100%	100%
Not adjusted			1			0%
Total			3			100%

Table B-22. Agriculture Sector Adjustments and Percentage Savings by Reason, Therms

Primary Reason for Adjustment	Agriculture Therm					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	0	0	0%	0%	0%
Different analysis or calculation method	0	0	0	0%	0%	0%
Different baseline or installation	0	0	0	0%	0%	0%
Deeming adjustment	0	0	0	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	0	0	0%	0%	0%
Adjusted	0	0	0	0%	0%	0%
Not adjusted			2			100%
Total			2			100%

Table B-23, Table B-24, and Table B-25 show the number of adjustments and the percentage of sector savings those adjustments represent for the Commercial sector, by primary reason for adjustment.

Table B-23. Commercial Sector Adjustments and Percentage Savings by Reason, kWh

Primary Reason for Adjustment	Commercial kWh					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	1	4	5	0%	6%	6%
Different analysis or calculation method	1	1	2	1%	1%	3%
Different baseline or installation	2	1	3	0%	0%	0%
Deeming adjustment	26	3	29	9%	4%	14%
Changes to assumptions	0	1	1	0%	1%	1%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	0	2	2	0%	2%	2%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	1	1	2	1%	1%	2%
Adjusted	31	13	44	11%	16%	27%
Not adjusted			135			73%
Total			179			100%

Table B-24. Commercial Sector Adjustments and Percentage Savings by Reason, kW

Primary Reason for Adjustment	Commercial kW					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	2	2	0%	6%	6%
Different analysis or calculation method	1	0	1	0%	0%	0%
Different baseline or installation	0	2	2	0%	2%	2%
Deeming adjustment	27	2	29	8%	2%	10%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	1	0	1	10%	0%	10%
Calculation method unclear	1	0	1	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	0	0	0%	0%	0%
Adjusted	30	6	36	18%	9%	27%
Not adjusted			128			73%
Total			164			100%

Table B-25. Commercial Sector Adjustments and Percentage Savings by Reason, Therms

Primary Reason for Adjustment	Commercial Therm					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	2	4	6	2%	33%	36%
Different analysis or calculation method	1	5	6	0%	0%	1%
Different baseline or installation	0	3	3	0%	5%	5%
Deeming adjustment	0	0	0	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	1	0	1	5%	0%	5%
Calculation method unclear	0	1	1	0%	0%	0%
Data entry error	1	0	1	0%	0%	0%
Other	0	1	1	0%	6%	6%
Adjusted	5	14	19	8%	45%	53%
Not adjusted			27			47%
Total			46			100%

Table B-26, Table B-27, and Table B-28 show the number of adjustments and the percentage of sector savings those adjustments represent for the Industrial sector, by primary reason for adjustment.

Table B-26. Industrial Sector Adjustments and Percentage Savings by Reason, kWh

Primary Reason for Adjustment	Industrial kWh					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	6	4	10	4%	5%	10%
Different analysis or calculation method	1	1	2	3%	0%	3%
Different baseline or installation	1	2	3	1%	11%	12%
Deeming adjustment	1	0	1	0%	0%	0%
Changes to assumptions	0	1	1	0%	5%	5%
Other savings in documentation	1	1	2	4%	0%	4%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	0	0	0%	0%	0%
Adjusted	10	9	19	12%	22%	35%
Not adjusted			46			65%
Total			65			100%

Table B-27. Industrial Sector Adjustments and Percentage Savings by Reason, kW

Primary Reason for Adjustment	Industrial kW					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	3	3	6	0%	2%	3%
Different analysis or calculation method	2	1	3	0%	1%	1%
Different baseline or installation	0	3	3	0%	13%	13%
Deeming adjustment	0	0	0	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	1	1	2	3%	0%	3%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Calculation method unclear	0	1	1	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	0	0	0%	0%	0%
Adjusted	6	9	15	4%	16%	20%
Not adjusted			43			80%
Total			58			100%

Table B-28. Industrial Sector Adjustments and Percentage Savings by Reason, Therms

Primary Reason for Adjustment	Industrial Therm					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	3	4	7	13%	15%	28%
Different analysis or calculation method	1	2	3	3%	1%	4%
Different baseline or installation	0	1	1	0%	3%	3%
Deeming adjustment	0	0	0	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	1	0	1	4%	0%	4%
Used site-specific rather than prescriptive	0	2	2	0%	2%	2%
Calculation method unclear	1	0	1	2%	0%	2%
Data entry error	1	0	1	0%	0%	0%
Other	0	0	0	0%	0%	0%
Adjusted	7	9	16	22%	21%	43%
Not adjusted			27			57%
Total			43			100%

Table B-29, Table B-30, and Table B-31 show the number of adjustments and the percentage of sector savings those adjustments represent for the Schools and Government sector, by primary reason for adjustment.

Table B-29. Schools and Government Sector Adjustments and Percentage Savings by Reason, kWh

Primary Reason for Adjustment	Schools and Government kWh					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	1	1	0%	12%	12%
Different analysis or calculation method	1	1	2	2%	10%	12%
Different baseline or installation	0	0	0	0%	0%	0%
Deeming adjustment	1	0	1	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	0	1	1	0%	4%	4%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	1	1	0%	2%	2%
Adjusted	2	4	6	2%	28%	30%
Not adjusted			72			70%
Total			78			100%

Table B-30. Schools and Government Sector Adjustments and Percentage Savings by Reason, kW

Primary Reason for Adjustment	Schools and Government kW					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	4	4	0%	17%	17%
Different analysis or calculation method	1	0	1	24%	0%	24%
Different baseline or installation	0	0	0	0%	0%	0%
Deeming adjustment	1	0	1	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	1	0	1	17%	0%	17%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	1	1	0%	3%	3%
Adjusted	3	5	8	41%	20%	61%
Not adjusted			56			39%
Total			64			100%

Table B-31. Schools and Government Sector Adjustments and Percentage Savings by Reason, Therms

Primary Reason for Adjustment	Schools and Government Therm					
	Count			Percentage Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	0	0	0%	0%	0%
Different analysis or calculation method	0	1	1	0%	3%	3%
Different baseline or installation	0	3	3	0%	21%	21%
Deeming adjustment	0	0	0	0%	0%	0%
Changes to assumptions	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Other	0	0	0	0%	0%	0%
Adjusted	0	4	4	0%	24%	24%
Not adjusted			33			76%
Total			37			100%

APPENDIX C: SECTOR LEVEL RESULTS

This appendix presents the adjustment factors at the sector level.[49] Evaluation results were traditionally reported at this level in the past. However, starting last round (CY09) the evaluation team moved to a measure group level of analysis with endorsement from the PSCW. Though the measure group is the primary level of analysis, the PSCW requested that sector-level results continue to be calculated and reported.

This appendix provides sector-level sample design information and all five adjustment factors at the sector level. It also contains charts that compare the CY10 adjustment factors to those calculated in previous evaluations.

C.1 SECTOR-LEVEL SAMPLE DESIGN

Though the sample was designed at the measure group level, KEMA did some sample design analysis at the sector level to ensure that sector-level results could still be determined as requested by the PSCW. The table below shows the sample design and disposition by sector and deemed/not deemed measure types.

Table C-1. Population (Frame) and Final Sample by Sector and Deemed Categories

Sector	Deemed	Frame	Target	Sample Completes	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
Agriculture	Deemed	4,570	25	18	3%	3%	0%	0%	0%	0%
Agriculture	Not deemed	1,072	18	6	3%	4%	1%	0%	0%	0%
Commercial	Deemed	13,521	165	386	25%	27%	11%	7%	6%	3%
Commercial	Not deemed	1,566	61	53	15%	17%	16%	2%	2%	2%
Industrial	Deemed	2,379	108	166	16%	14%	7%	4%	3%	2%
Industrial	Not deemed	970	82	61	27%	22%	37%	2%	1%	21%
Schools and Government	Deemed	2,791	107	227	5%	5%	16%	1%	1%	5%
Schools and Government	Not deemed	1,015	38	33	6%	8%	12%	0%	1%	1%
	Deemed	**23,261**	**405**	**797**	**49%**	**49%**	**34%**	**11%**	**10%**	**10%**
	Not deemed	**4,623**	**199**	**153**	**51%**	**51%**	**66%**	**5%**	**4%**	**25%**
Business Programs overall		**27,884**	**604**	**950**	**100%**	**100%**	**100%**	**16%**	**14%**	**35%**

C.2 SECTOR-LEVEL ADJUSTMENT FACTORS

Table C-2 through Table C-6 show the installation rate, engineering verification factor, gross savings adjustment factor, attribution adjustment factor, and realization rate by sector.

[49] The results are based on both the CATI and engineering samples, unlike the previous appendix.

Table C-2. Installation Rates by Sector
Based on Samples from Participants Who Installed a Measure during CY10

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Segment	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound	n	Installation Rate	Relative Error (%)	±	Lower Bound	Upper Bound
Agriculture	20	100%	<0.1%	<0.1%	100.0%	100.0%	18	100%	<0.1%	<0.1%	100.0%	100.0%	5	100%	<0.1%	<0.1%	100.0%	100.0%
Commercial	331	100%	<0.1%	<0.1%	100.0%	100.0%	304	100%	<0.1%	<0.1%	100.0%	100.0%	134	100%	<0.1%	<0.1%	100.0%	100.0%
Industrial	158	100%	<0.1%	<0.1%	100.0%	100.0%	141	100%	<0.1%	<0.1%	100.0%	100.0%	80	100%	<0.1%	<0.1%	100.0%	100.0%
S&G	144	100%	<0.1%	<0.1%	100.0%	100.0%	116	100%	<0.1%	<0.1%	100.0%	100.0%	136	100%	<0.1%	<0.1%	100.0%	100.0%
Business Programs Overall	**653**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**	**579**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**	**355**	**100%**	**<0.1%**	**<0.1%**	**100.0%**	**100.0%**

Table C-3. Engineering Verification Factor by Sector
Based on Samples from Participants Who Installed a Measure during CY10

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Segment	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Engineering Verification Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Agriculture	20	103%	6.9%	7.1%	95.9%	110.1%	18	76%	37.9%	28.7%	47.0%	104.3%	5	100%	<0.1%	<0.1%	100.0%	100.0%
Commercial	331	103%	6.2%	6.4%	96.4%	109.1%	305	103%	6.0%	6.2%	96.4%	108.7%	135	90%	32.4%	29.2%	60.9%	119.2%
Industrial	159	96%	8.3%	8.1%	88.4%	104.5%	142	96%	7.7%	7.4%	88.6%	103.4%	80	96%	4.1%	4.0%	92.1%	100.0%
S&G	144	95%	4.1%	3.9%	91.4%	99.2%	116	90%	8.3%	7.5%	82.9%	97.9%	136	93%	6.5%	6.1%	87.2%	99.4%
Business Programs Overall	**654**	**99%**	**4.2%**	**4.1%**	**95.0%**	**103.3%**	**581**	**97%**	**4.4%**	**4.3%**	**92.5%**	**101.1%**	**356**	**94%**	**8.0%**	**7.5%**	**86.3%**	**101.4%**

Table C-4. Gross Savings Adjustment Factor by Sector
Based on Samples from Participants Who Installed a Measure during the CY10

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Segment	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Gross Savings Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Agriculture	20	103%	6.9%	7.1%	95.9%	110.1%	18	76%	37.9%	28.7%	47.0%	104.3%	5	100%	<0.1%	<0.1%	100.0%	100.0%
Commercial	331	103%	6.2%	6.4%	96.4%	109.1%	305	103%	6.0%	6.2%	96.4%	108.7%	135	90%	32.4%	29.2%	60.9%	119.2%
Industrial	159	96%	8.3%	8.1%	88.4%	104.5%	142	96%	7.7%	7.4%	88.6%	103.4%	80	96%	4.1%	4.0%	92.1%	100.0%
S&G	144	95%	4.1%	3.9%	91.4%	99.2%	116	90%	8.3%	7.5%	82.9%	97.9%	136	93%	6.5%	6.1%	87.2%	99.4%
Business Programs Overall	**654**	**99%**	**4.2%**	**4.1%**	**95.0%**	**103.3%**	**581**	**97%**	**4.4%**	**4.3%**	**92.5%**	**101.1%**	**356**	**94%**	**8.0%**	**7.5%**	**86.3%**	**101.4%**

Table C-5. Attribution Adjustment Factor by Sector
Based on Samples from Participants Who Installed a Measure during CY10

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Segment	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound	n	Attribution Adjustment Factor	Relative Error (%)	±	Lower Bound	Upper Bound
Agriculture	20	33%	70.6%	23.1%	9.6%	55.8%	18	41%	63.0%	25.8%	15.1%	66.8%	4	20%	133.7 %	26.6%	- 6.7%	46.4%
Commercial	322	65%	8.2%	5.3%	59.3%	69.9%	297	66%	16.6%	11.0%	55.1%	77.1%	129	33%	31.1%	10.3%	22.8%	43.4%
Industrial	155	59%	11.2%	6.6%	52.4%	65.6%	137	56%	11.0%	6.1%	49.8%	62.0%	77	56%	12.3%	6.8%	48.8%	62.5%
S&G	139	56%	41.6%	23.3%	32.7%	79.4%	108	48%	34.7%	16.5%	31.1%	64.1%	132	42%	27.4%	11.6%	30.7%	54.0%
Business Programs Overall	**636**	**60%**	**8.6%**	**5.1%**	**54.7%**	**65.0%**	**560**	**59%**	**10.8%**	**6.3%**	**52.4%**	**65.1%**	**342**	**47%**	**11.6%**	**5.4%**	**41.3%**	**52.1%**

Table C-6. Realization Rate by Sector
Based on Samples from Participants Who Installed a Measure during the CY10

Segment	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
	min n	Realization Rate	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Realization Rate	Relative Error (%)	±	Lower Bound	Upper Bound	min n	Realization Rate	Relative Error (%)	±	Lower Bound	Upper Bound
Agriculture	20	34%	70.9%	23.9%	9.8%	57.6%	18	31%	73.5%	22.8%	8.2%	53.8%	4	20%	133.7%	26.6%	-6.7%	46.4%
Commercial	322	66%	10.3%	6.8%	59.5%	73.2%	297	68%	17.7%	12.0%	55.8%	79.8%	129	30%	44.9%	13.4%	16.4%	43.2%
Industrial	155	57%	14.0%	8.0%	49.0%	64.9%	137	54%	13.4%	7.2%	46.5%	60.9%	77	53%	13.0%	6.9%	46.6%	60.4%
S&G	139	53%	41.8%	22.3%	31.1%	75.7%	108	43%	35.7%	15.4%	27.7%	58.4%	132	40%	28.2%	11.1%	28.4%	50.7%
Business Programs Overall	**636**	**59%**	**9.6%**	**5.7%**	**53.6%**	**65.0%**	**560**	**57%**	**11.7%**	**6.6%**	**50.3%**	**63.5%**	**342**	**44%**	**14.1%**	**6.2%**	**37.7%**	**50.0%**

C.3 COMPARISONS ACROSS YEARS

This section shows the five sector-level adjustment factors from CY10 compared to the same factors from previous evaluations. A separate chart is provided for kWh, kW, and therms for each adjustment factor. These charts incorporate thirteen rounds of impact evaluation data collection (earlier fiscal years received multiple rounds of data collection) going back to the start of the program in April 2001. A crosshatched bar in the charts indicates that the increase or decrease of the adjustment factor compared to the previous evaluation period's result is statistically significant at the 95 percent level of confidence.

The Business Programs have been continuously evolving since inception. Much of this evolution has resulted in methodological changes over the years that may have affected the trends in adjustment factors and may not reflect improvements or declines in program effectiveness. Several such changes are highlighted below.

- A revised survey instrument was developed based on the recent evaluation framework paper.[50]
- Energy savings values for CFLs were deemed starting in FY06. The only potential adjustment for gross savings is based on the quantity of bulbs installed, not the wattages or operating hours of the bulbs.
- A number of other measures were deemed starting in FY07. The 18MCP was the first evaluation with a significant number of deemed measures implemented. As with the CFLs, deemed measures are only adjusted for the number of units installed or the algorithm inputs used to calculate the deemed savings. Deemed measures include a number of lighting measures, premium efficiency motors, furnaces, boilers, air conditioners, and others.
- In FY06, all CFL savings tracked in the Rebates database were being credited to the Channel Lighting sector and were not part of the Agriculture or Commercial sectors. However, for the purposes of this report the FY06 Channel savings were rolled up into the four sectors to allow apples-to-apples comparisons across program years.

[50] Rick Winch and Tom Talerico, Glacier Consulting Group; Bobbi Tannenbaum, KEMA Inc.; Pam Rathbun, PA Consulting Group; Ralph Prahl, Prahl & Associates. *Focus on Energy Evaluation Framework for Self-Report Net-To-Gross (Attribution) Questions*. July 2, 2008.

- The attribution estimation method for CFLs changed in FY06 from one based on self-reported program response to market-based methods. The most current attribution factors calculated by the evaluation team[51] were used for all low wattage (≤32 W) CFLs. These attribution rates were 84 percent for the Commercial sector and 85 percent for the Agricultural sector. This is the third evaluation that uses separate adjustment factors for Commercial and Agriculture.[52]
- In FY06, the program implemented the Channel Initiatives and allocated energy savings from these measures to the Channels. The FY06 impact evaluation was designed and reported separately by sector and channel. In FY07, the program reverted back to allocating all energy savings to the four primary sectors. Beginning with the FY07 evaluation, the results of the impact evaluations are presented separately for each of the four primary sectors: Agricultural, Commercial, Industrial, and Schools & Government. For the purposes of this report the FY06 Channel savings were rolled up into the four sectors to allow apples-to-apples comparisons across program years.
- The FY07 evaluation used an abbreviated approach. The approach combined a sample of the largest measures implemented in FY07 and the sample of all BUT the largest measures from the FY06 impact evaluation. This approach assumes that the net-to-gross components for all measures except the largest are essentially the same in FY06 and FY07. A detailed discussion of the abbreviated approach is provided in the memorandum that reports the FY07 results.[53] Because the FY07 adjustment factors include the effects of participants from both FY06 and FY07, we did not statistically compare the results of those two years. However we did compare FY05 with FY06 and FY07[54] with the 18MCP.
- Starting with the CY09 evaluation, data from the CATI survey is incorporated to help determine the engineering verification factor.

[51] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. April 16, 2010.

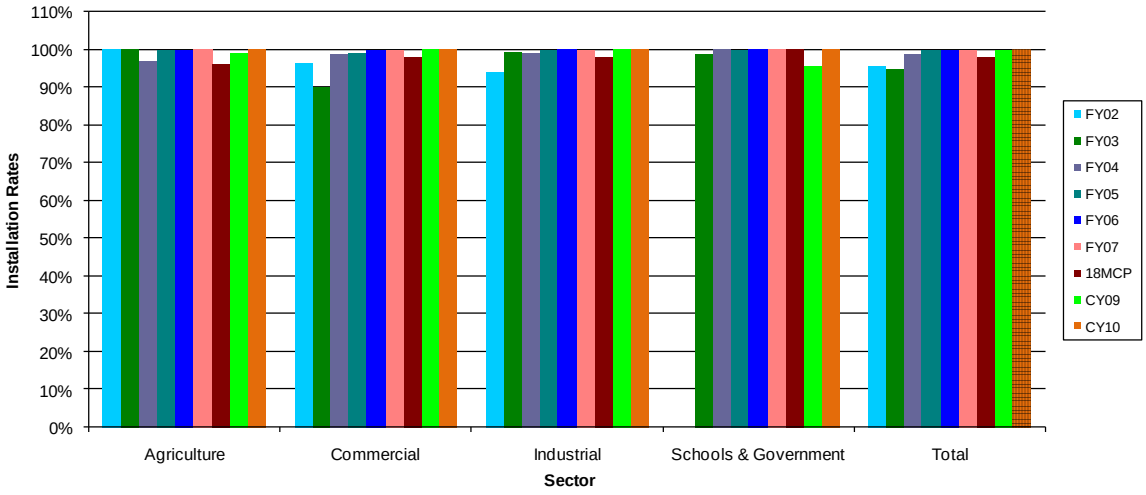
[52] The Commercial value of 84 percent attribution was applied to CFLs in the CATI sample that fell under the Industrial or Schools & Government sectors.

[53] Mimi Goldberg, Ryan Barry, Tammy Kuiken, Paula Ham-Su, and Ben Jones, KEMA, Inc. *Focus on Energy Evaluation Abbreviated FY07 Business Programs Impact Evaluation*. February 18, 2008.

[54] The statistical comparison to FY07 is not based solely on the FY07 data collected as part of the FY07 Abbreviated Impact Evaluation. It is based on a combination of FY06 and FY07 data. For more details on the abbreviated approach, see the *Focus on Energy Evaluation Abbreviated FY07 Business Programs Impact Evaluation* memo.

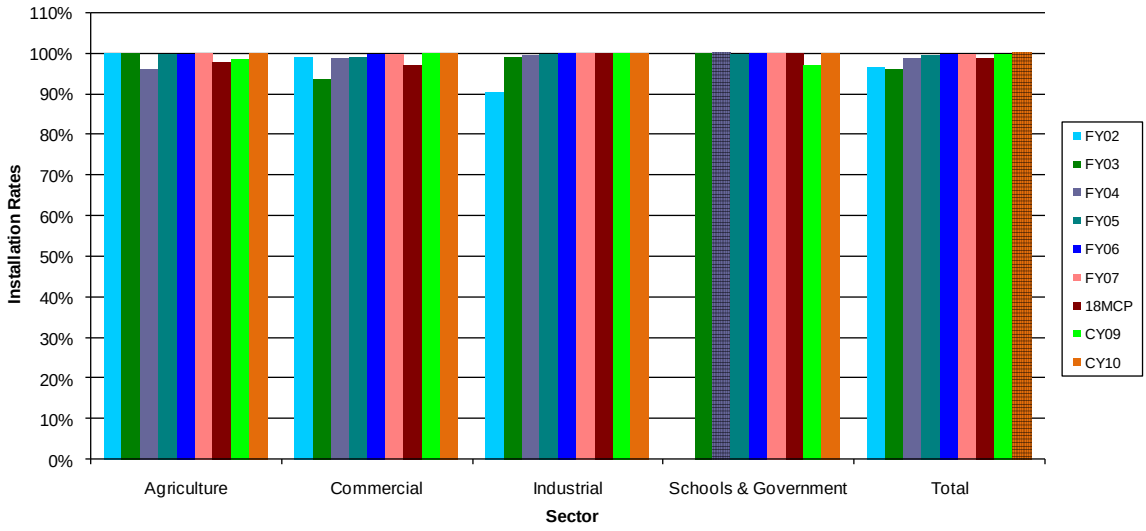
Figure C-1 through Figure C-3 compare the CY10 installation rate to previous years.

Figure C-1. kWh Installation Rate by Sector [a] [b]
Comparison across Years



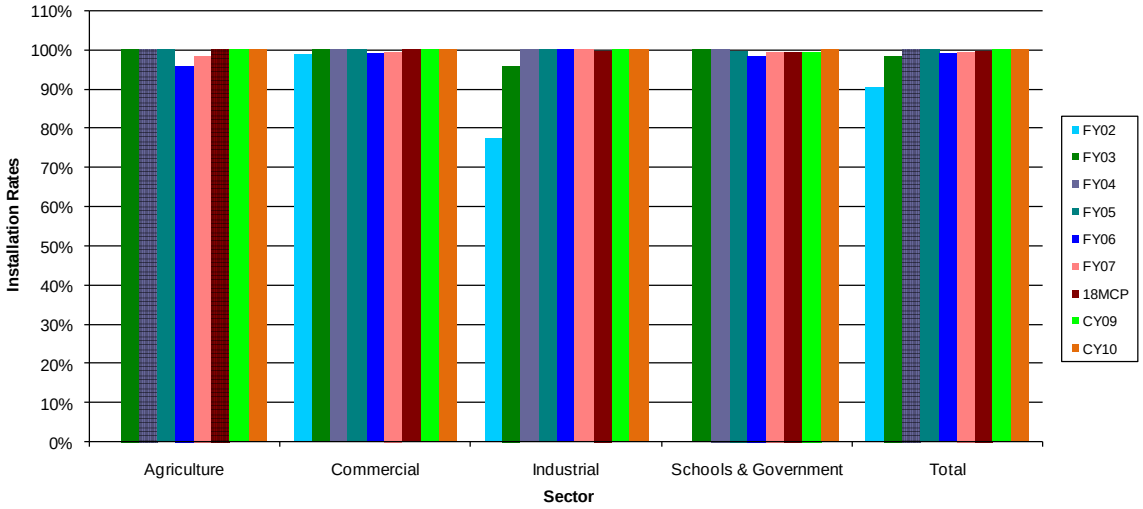
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-2. kW Installation Rate by Sector [a] [b]
Comparison across Years



[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-3. Therms Installation Rate by Sector [a b c]
Comparison across Years [a]



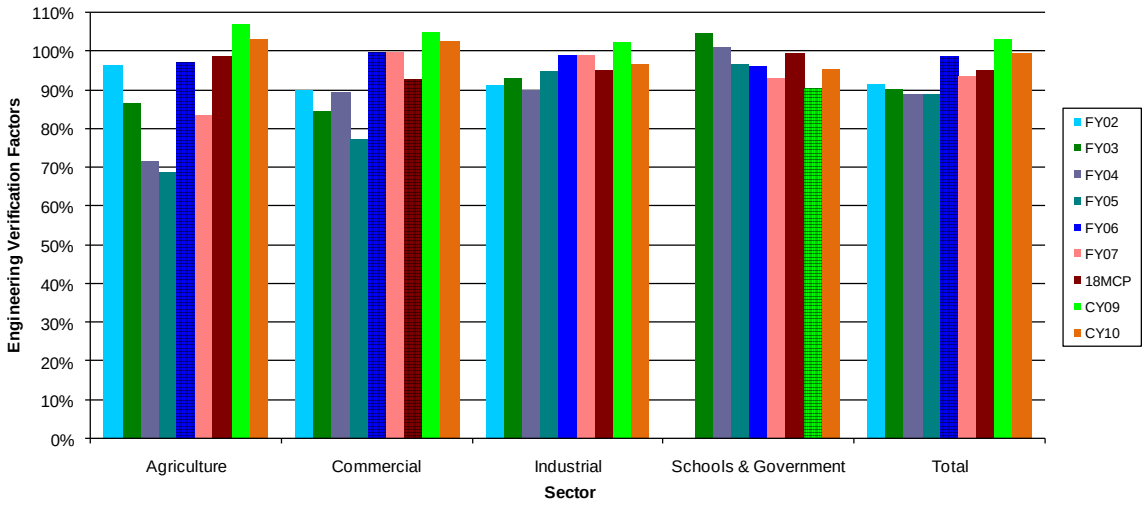
[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy because many of the agriculture segment therms savings (both tracking and verified) were negative due to fuel switching (from electricity to gas).

[b] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.

[c] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

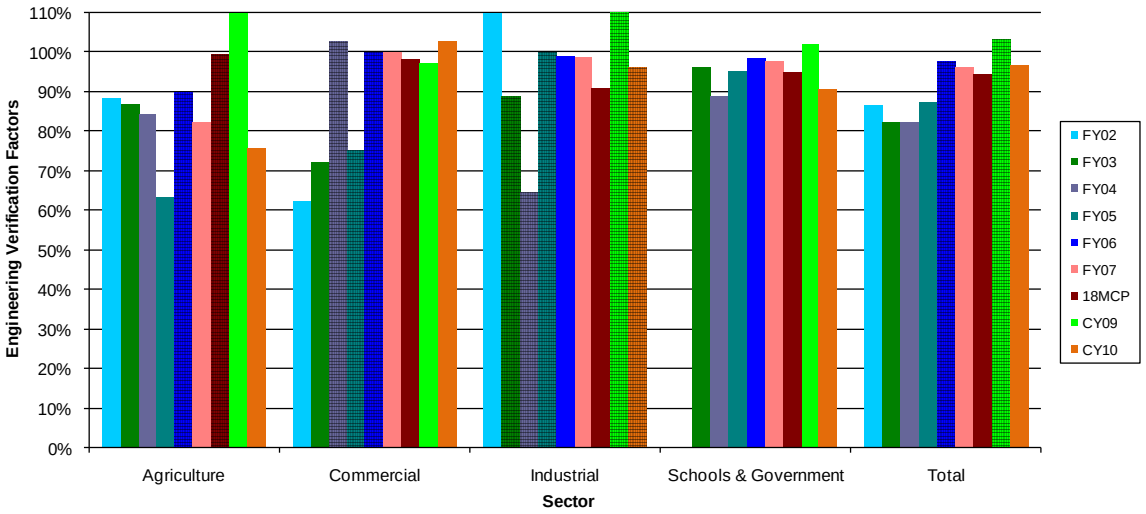
Figure C-4 through Figure C-6 compare the CY10 engineering verification factor to previous years.

Figure C-4. kWh Engineering Verification Factor by Sector [a b]
Comparison across Years



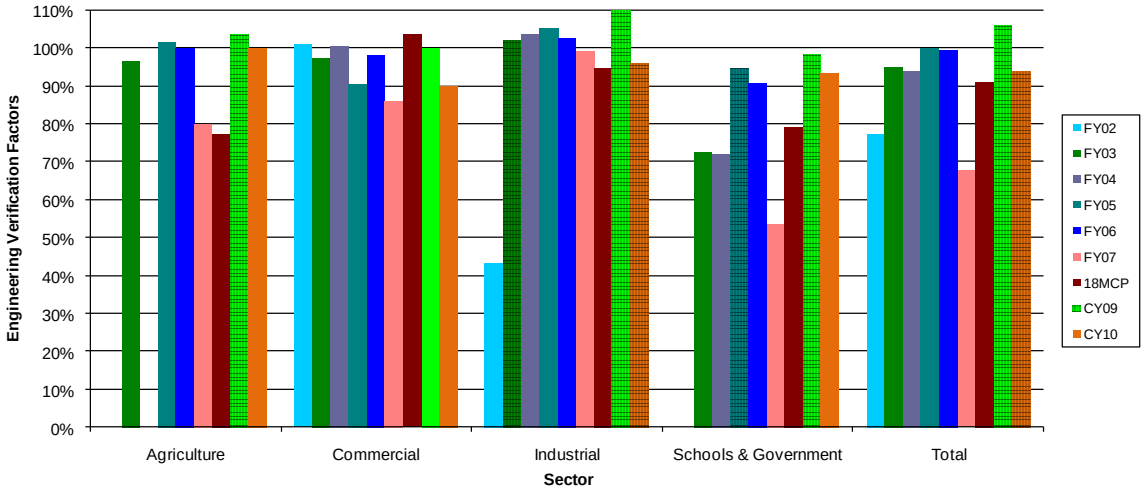
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-5. kW Engineering Verification Factor by Sector [a b]
Comparison across Years



[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-6. Therms Engineering Verification Factor by Sector [a b c]
Comparison across Years [a]



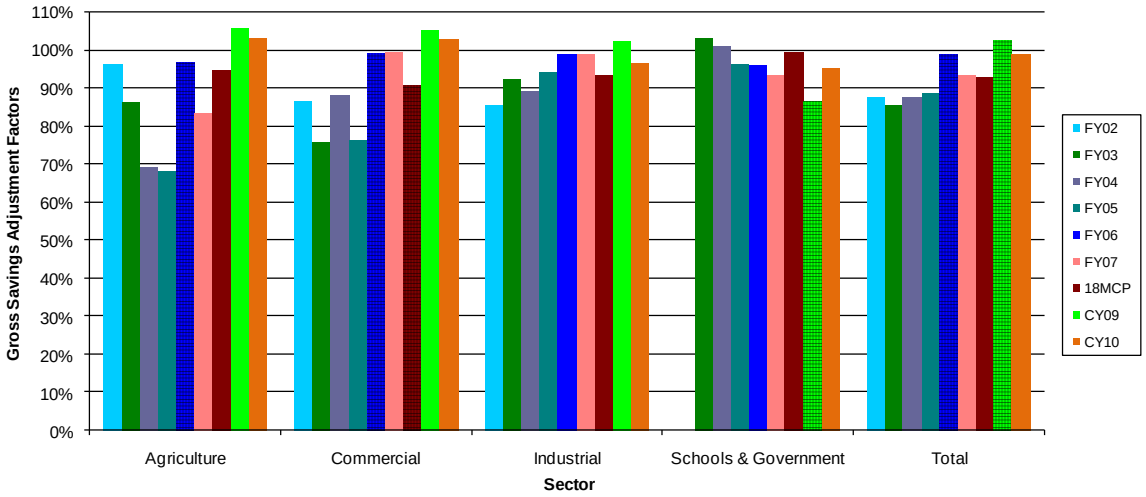
[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy because many of the agriculture segment therms savings (both tracking and verified) were negative due to fuel switching (from electricity to gas).

[b] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.

[c] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

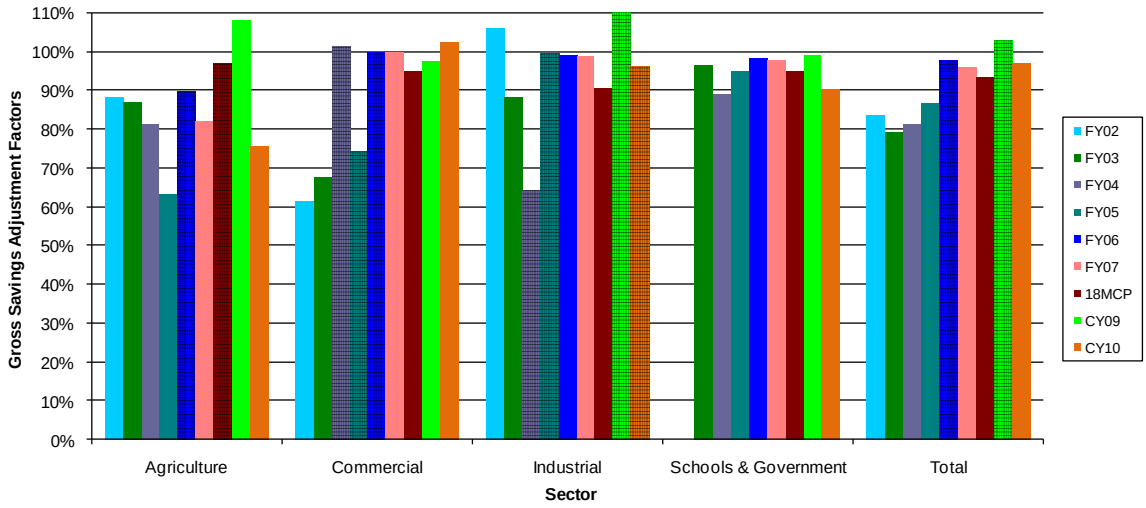
Figure C-7 through Figure C-9 compare the CY10 gross savings adjustment factor to previous years.

Figure C-7. kWh Gross Savings Adjustment Factor by Sector [a b]
Comparison across Years



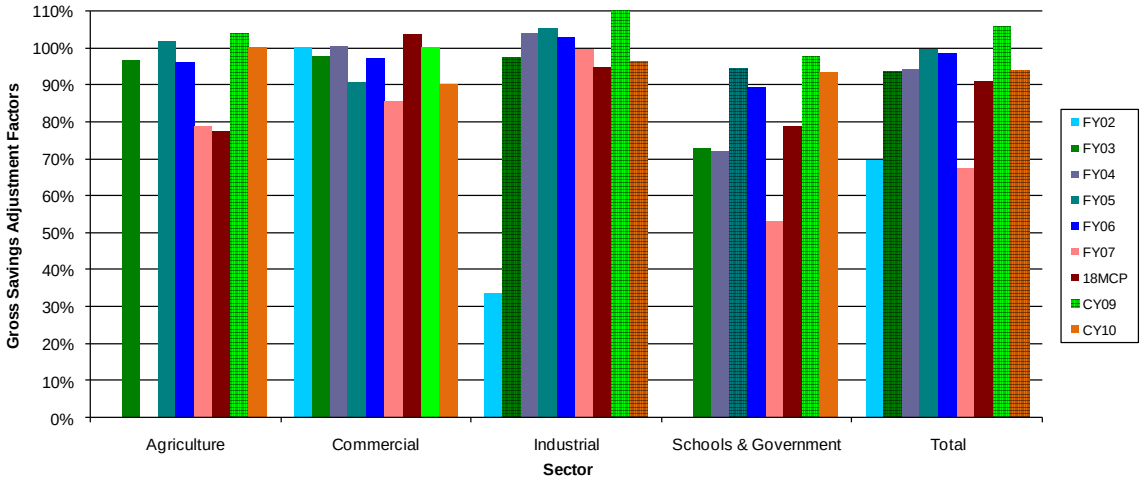
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-8. kW Gross Savings Adjustment Factor by Sector [a b]
Comparison across Years



[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-9. Therms Gross Savings Adjustment Factor by Sector [a b c]
Comparison across Years [a]



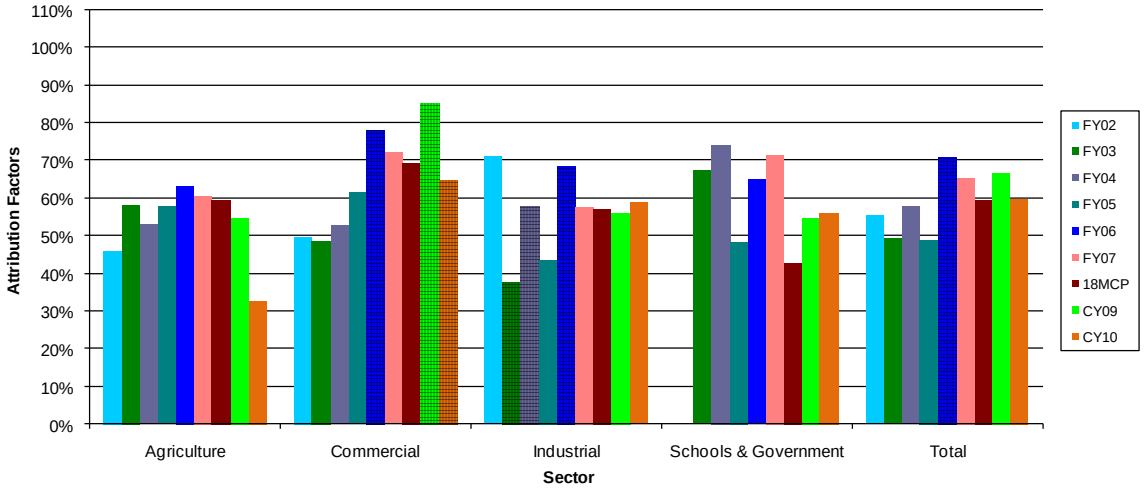
[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy because many of the agriculture segment therms savings (both tracking and verified) were negative due to fuel switching (from electricity to gas).

[b] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.

[c] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

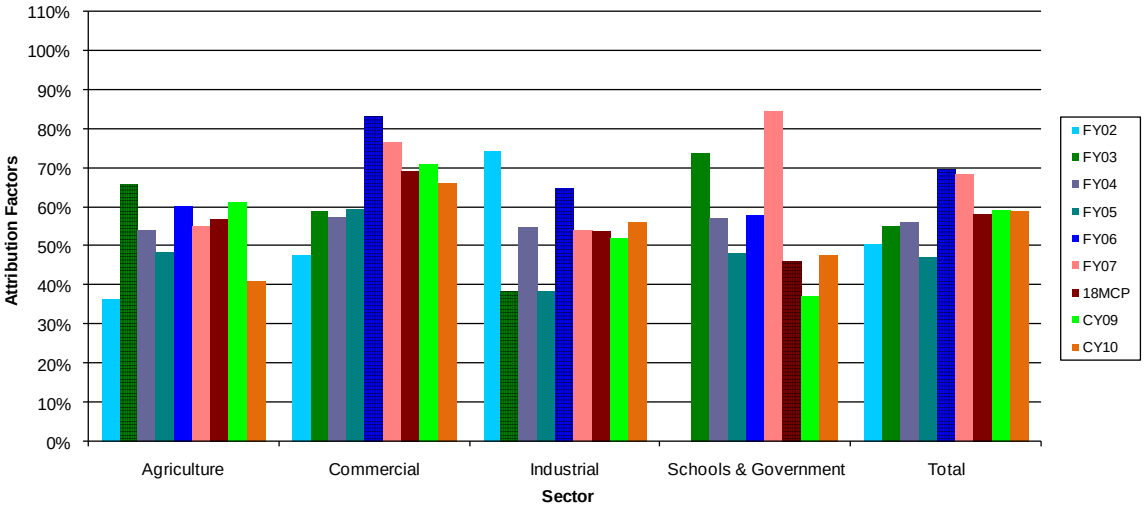
Figure C-10 through Figure C-12 compare the CY10 attribution adjustment factor to previous years.

Figure C-10. kWh Attribution Adjustment Factor by Sector [a b]
Comparison across Years



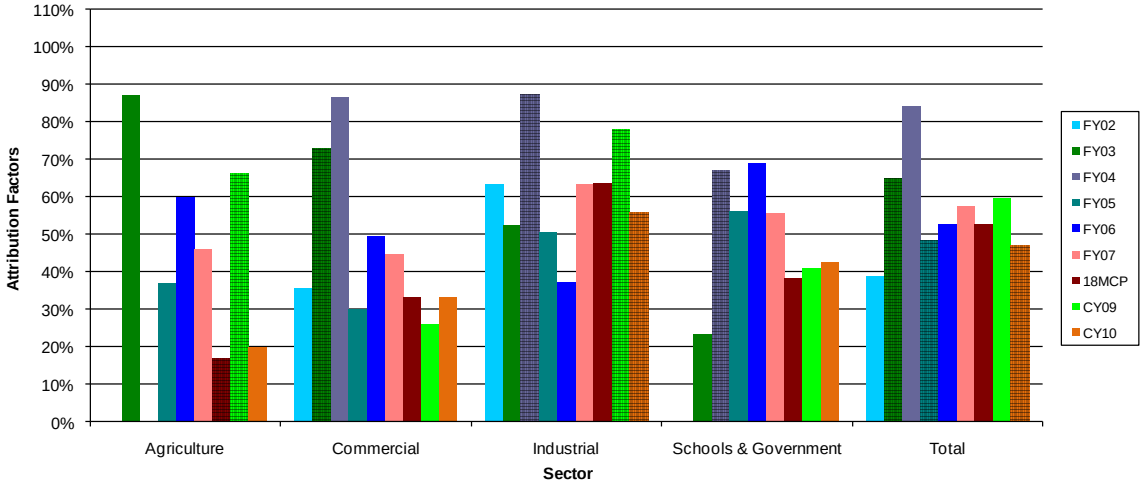
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-11. kW Attribution Adjustment Factor by Sector [a b]
Comparison across Years



[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-12. Therms Attribution Adjustment Factor by Sector [a b c]
Comparison across Years [a]



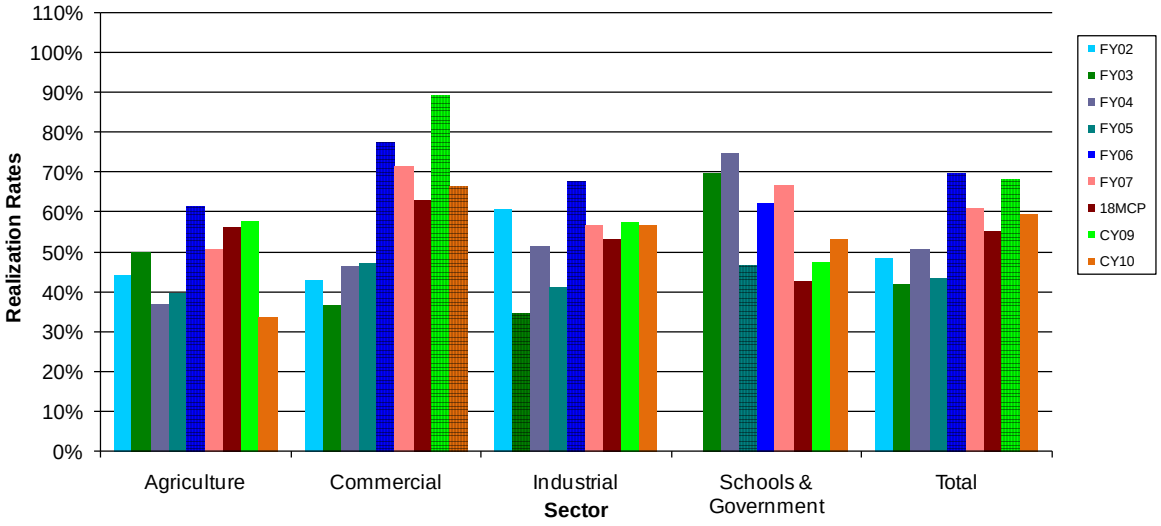
[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy because many of the agriculture segment therms savings (both tracking and verified) were negative due to fuel switching (from electricity to gas).

[b] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.

[c] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

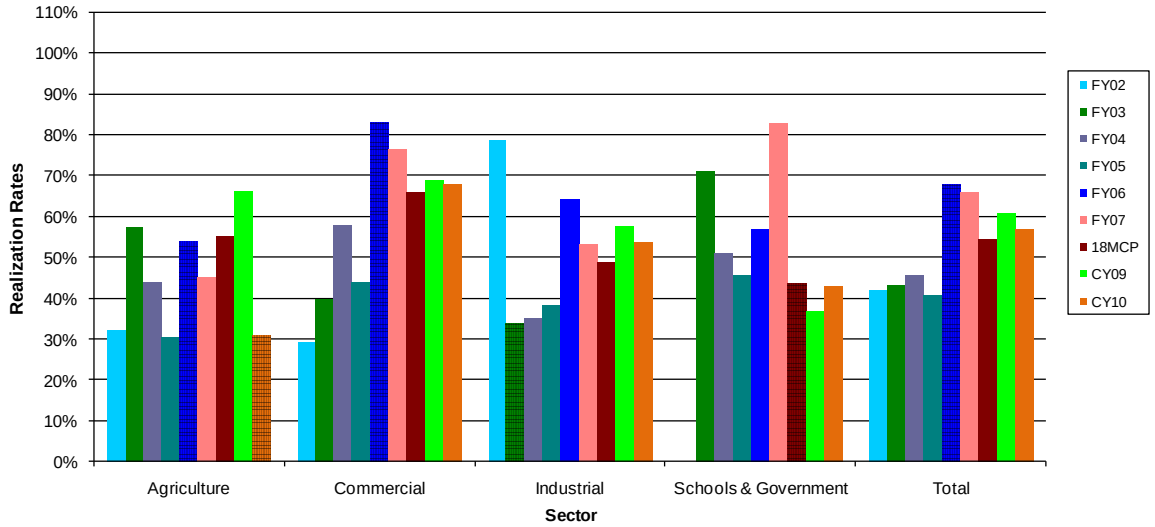
Figure C-13 through Figure C-15 compare the CY10 realization rate to previous years.

Figure C-13. kWh Realization Rate by Sector [a] [b]
Comparison across Years



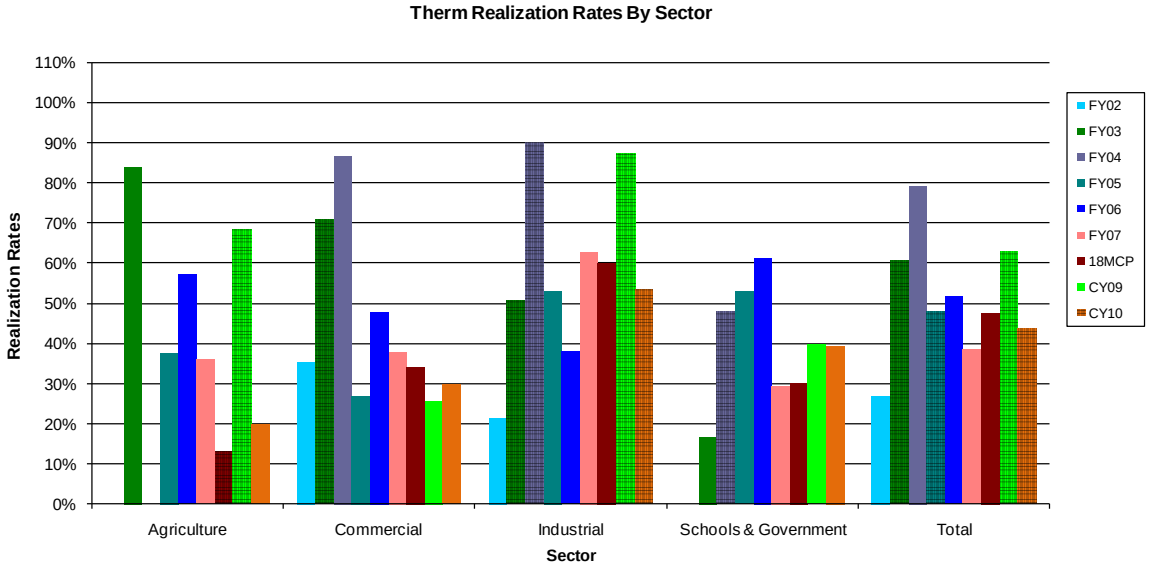
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-14. kW Realization Rate by Sector [a] [b]
Comparison across Years



[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

Figure C-15. Therms Realization Rate by Sector [a b c]
Comparison across Years [a]



[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy because many of the agriculture segment therms savings (both tracking and verified) were negative due to fuel switching (from electricity to gas).

[b] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.

[c] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more detail

C.4 HISTORICAL EVALUATED TRACKED ENERGY IMPACTS

Table C-7 through Table C-13 give historical tracking and verified gross savings and net savings by reporting measure group and for Focus Business Programs overall. Estimating adjustment factors at the reporting measure group level does not allow the evaluation team to continue to produce precise sector-level energy impacts. The body of the report shows the energy impacts for CY10 at the reporting measure group level and the historical sector-level results are included below.

Table C-7 through Table C-13 provide tracking and verified gross savings and net savings by program and for Business Programs overall for the 18MCP (July 1, 2007, through September 30, 2008), FY07 (July 1, 2006, through June 30, 2007), FY06 (July 1, 2005, through June 30, 2006), FY05 (July 1, 2004, through June 30, 2005), FY04 (July 1, 2003, through June 30, 2004), FY03 (July 1, 2002, through June 30, 2003), and FY02 (program start through June 30, 2002), respectively. Adjustment factors determined from earlier rounds of similar data collection and analysis are used to calculate verified gross savings and net savings for FY02 through the 18MCP.[55]

[55] 18MCP: *Business Programs Impact Evaluation Report: First Five Quarters of the 18-month Contract Period, April 2, 2009*
FY07: *Abbreviated FY07 Business Programs Impact Evaluation memo, February 18, 2008.*
FY06: *Business Programs Impact Evaluation Report–Fiscal Year 2006, March 2, 2007.*
FY05: *Business Programs Impact Evaluation Report–Year 4, Round 1, June 1, 2005.*
FY04: *Business Programs Impact Evaluation Report–Year 3, Round 1, June 17, 2004.*
FY03: *Business Programs Impact Evaluation Report–Contract Year 2 Complete, January 14, 2004*.
FY02: *Volume III, Impact Evaluation of the Business Programs Comprehensive Report, December 23, 2002.*

Table C-7. All Business Programs: Tracked Energy Impacts
18MCP (July 1, 2007–September 30, 2008)

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net
Agriculture	Agriculture	27,056,057	25,573,120	15,226,090	6,944	6,730	3,819	690,018	533,841	88,941
Commercial	Commercial	90,241,320	81,776,073	56,837,224	21,950	20,862	14,443	1,324,547	1,370,874	454,252
Industrial	Industrial	127,183,265	118,421,382	67,701,464	20,704	18,755	10,077	6,555,228	6,198,998	3,928,889
Schools & Government	Schools & Government	30,944,737	30,705,369	13,187,665	9,477	8,985	4,123	3,116,541	2,450,943	936,432
Untracked Attributable Savings				8,948,346			2,447			3,818,271
Total 18MCP Rounds 1&2, WPS (July 1, 2007, to Sep. 30, 2008)		**275,425,380**	**256,475,944**	**161,900,789**	**59,076**	**55,332**	**34,908**	**11,686,334**	**10,554,656**	**9,226,786**

[a] Tracking gross savings for measures installed during the 18MCP are from two versions of the WATTS database and three versions of the WISeerts database. The two versions of the WATTS database used are: (1) WATTS database as synchronized on May 12, 2008: measures installed in the first nine months of the 18MCP included in the sampling frame; and (2) WATTS database as synchronized on November 17, 2008: a small number of WPS measures installed in the second six months of the 18MCP included in the sampling frame and measures installed in the 18MCP not included in the sampling frame. The three versions of the WISeerts database used are: (1) WISeerts database as synchronized on April 29, 2008: measures installed in the 18MCP included in the sampling frame; and (2) WISeerts database as synchronized on November 7, 2008: measures installed in the second six months of the 18MCP included in the sampling frame; (3) WISeerts database as synchronized on February 27, 2009: measures installed in the 18MCP not included in the sampling frame.

Table C-8. All Business Programs: Tracked Energy Impacts
FY07 (July 1, 2006–June 30, 2007)

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net
Agriculture	Agriculture	14,201,305	11,830,921	7,179,717	3,899	3,197	1,761	757,220	595,356	271,983
Commercial	Commercial	41,193,748	40,849,432	29,496,805	8,764	8,740	6,693	1,480,056	1,264,036	561,175
Industrial	Industrial	62,455,412	61,733,041	35,497,637	10,526	10,372	5,605	7,828,288	7,784,241	4,907,494
Schools & Government	Schools & Government	23,220,101	21,618,090	15,474,645	5,864	5,734	4,846	3,590,759	1,905,073	1,056,650
Total FY07, Focus (July 1, 2006, to June 30, 2007)		**141,070,566**	**136,031,485**	**87,648,804**	**29,053**	**28,042**	**18,906**	**13,656,324**	**11,548,706**	**6,797,303**

[a] Tracking gross savings for measures installed during FY07 are from two versions of the WATTS database. The two versions of the WATTS database used are: (1) WATTS database as synchronized on August 7, 2007: measures installed in FY07 included in the sampling frame; and (2) WATTS database as synchronized on October 1, 2008 measures installed in FY07 not included in the sampling frame.

Table C-9. All Business Programs: Tracked Energy Impacts
FY06 (July 1, 2005–June 30, 2006)

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net
Agriculture	Agriculture	10,380,773	10,844,886	5,506,946	2,569	2,379	1,060	169,600	162,261	97,784
Commercial	Commercial	25,128,760	24,477,896	14,697,541	3,489	3,436	1,988	1,395,712	1,349,793	685,019
Industrial	Industrial	40,327,629	39,913,615	31,819,533	6,966	6,898	5,279	5,135,468	5,261,531	1,951,784
Schools & Government	Schools & Government	15,119,767	14,513,009	9,413,490	4,444	4,373	2,528	2,586,683	2,287,500	1,334,962
Channel EHCI	Channel EHCI-Agriculture	3,206	3,089	1,144	2	2	1	2,482	2,275	1,927
Channel EHCI	Channel EHCI-Commercial	710,322	684,315	253,511	664	658	285	287,520	263,569	223,256
Channel EHCI	Channel EHCI-Industrial	14,316	13,792	5,109	1	1	1	16,674	15,285	12,947
Channel EHCI	Channel EHCI-Schools & Government	11,629	11,203	4,150	4	4	2	59,924	54,932	46,530
Channel Lighting	Channel Lighting-Agriculture	5,834,805	5,708,084	4,135,403	1,487	1,462	1,098	1,594	1,566	984
Channel Lighting	Channel Lighting-Commercial	21,919,547	21,443,494	15,535,423	5,957	5,857	4,397	978	961	604
Channel Lighting	Channel Lighting-Industrial	12,647,805	12,373,117	8,964,099	2,877	2,829	2,123	0	0	0
Channel Lighting	Channel Lighting-Schools & Government	501,190	490,305	355,217	111	109	82	0	0	0
Channel Motors	Channel Motors & VSDs-Agriculture [b]	412	430	218	0	0	0	0	0	0
Channel Motors	Channel Motors & VSDs-Commercial [b]	99,835	97,249	58,392	2	2	1	0	0	0
Channel Motors	Channel Motors & VSDs-Industrial [b]	21,941	21,716	17,312	2	2	1	0	0	0
Channel Motors	Channel Motors & VSDs-Schools & Government [b]	1,737	1,668	1,082	0	0	0	0	0	0
	CTT	0	0	0	0	0	0	0	0	0
Total FY06, Focus (July 1, 2005, to June 30, 2006)		**132,723,673**	**130,597,866**	**90,768,572**	**28,576**	**28,011**	**18,845**	**9,656,634**	**9,399,673**	**4,355,798**

[a] Tracking gross savings for measures installed during FY06 are from two versions of the WATTS database. The two versions of the WATTS database used are: (1) WATTS database as synchronized on July 25, 2006: measures installed in FY06 included in the sampling frame; and (2) WATTS database as synchronized on October 1, 2008: measures installed in FY06 not included in the sampling frame.

[b] The sector-level adjustment factors were applied to the measures in Channel Motors.

Table C-10. All Business Programs: Tracked Energy Impacts
FY05 (July 1, 2004–June 30, 2005)

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net
Agriculture	Agriculture	14,290,200	9,761,272	5,664,060	3,544	2,235	1,078	266,533	271,115	99,916
Commercial	Commercial	39,991,452	30,585,968	18,851,973	8,779	6,501	3,854	1,016,078	919,691	274,946
Industrial	Industrial	59,293,344	55,881,423	24,270,711	8,752	8,708	3,329	4,193,799	4,406,258	2,230,603
Schools & Government	Schools & Government	16,877,246	16,238,035	7,828,656	4,167	3,955	1,901	1,786,812	1,685,105	945,915
	Channel Lighting-Agriculture [b]	312,579	0	0	79	0	0	225	0	0
	Channel Lighting-Commercial [b]	2,390,318	0	0	683	0	0	66	0	0
	EE Products	0	0	0	0	0	0	0	0	0
	Existing Buildings	0	0	0	0	0	0	0	0	0
	General Industrial [c]	9,704,474	0	0	1,140	0	0	134,682	0	0
	Industry of the Future	0	0	0	0	0	0	0	0	0
	New Buildings [d]	0	0	0	0	0	0	0	0	0
	Small Retail & Services	0	0	0	0	0	0	0	0	0
	Water - Waste Water	0	0	0	0	0	0	0	0	0
Total FY05 (July 1, 2004, to June 30, 2005)		**142,859,613**	**112,466,698**	**56,615,400**	**27,144**	**21,399**	**10,163**	**7,398,195**	**7,282,169**	**3,551,381**

[a] Tracking gross savings for measures installed during FY05 are from two separate extracts from the Focus tracking system. The two versions of the Focus tracking database used are: (1) STAR database as synchronized on January 17, 2005: measures installed during the first half of FY05 and included in the FY05 sampling frame; and (2) WATTS database as synchronized on October 1, 2008: measures installed in FY05 not included in the sampling frame.

[b] The WATTS database includes measures in the lighting channel for FY05, however, the program confirmed that savings for channels did not start until October 2005.

[c] The tracking gross savings associated with "General Industrial" were also associated with "Industrial." Therefore, these savings were evaluated as part of the industrial segment and the "General Industrial" verified gross (and net) savings are set to zero.

[d] Adjustment factors were generated only for programs/sectors that were known to exist.

Table C-11. All Business Programs: Tracked Energy Impacts
FY04 (July 1, 2003–June 30, 2004)

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net
Agriculture/Business Programs Overall [b]	Production Agriculture	8,355,974	5,796,265	3,073,926	1,815	1,473	794	62,016	58,394	49,142
Agriculture	Agriculture	7,654,233	5,309,491	2,815,775	1,728	1,403	756	5,333	5,022	4,226
Commercial	Commercial	42,898,833	37,837,194	19,906,541	9,503	9,629	5,514	584,477	585,706	506,642
Industrial	Industrial	77,624,175	69,095,159	39,903,009	11,651	7,472	4,085	9,678,274	10,032,355	8,745,272
Schools & Government	Schools & Government	18,007,954	18,166,810	13,477,540	3,935	3,498	1,999	2,378,564	1,709,958	1,141,175
	EE Products	0	0	0	0	0	0	0	0	0
	Existing Buildings	0	0	0	0	0	0	0	0	0
	Industry of the Future	0	0	0	0	0	0	0	0	0
	MM Renewables	0	0	0	0	0	0	0	0	0
	New Buildings	0	0	0	0	0	0	0	0	0
	Pilot - General Industrial	0	0	0	0	0	0	0	0	0
	Small Retail & Services	0	0	0	0	0	0	0	0	0
	Water - Waste Water	0	0	0	0	0	0	0	0	0
Total FY04 (July 1, 2003, to June 30, 2004)		**154,541,169**	**136,204,919**	**79,176,791**	**28,633**	**23,475**	**13,149**	**12,708,664**	**12,391,433**	**10,446,457**

[a] Tracking gross savings for measures installed during FY04 are from two separate extracts from the Focus tracking system. The two versions of the Focus tracking database used are: (1) STAR database as synchronized on January 20, 2004: measures installed during the first half of FY04 and included in the FY04 sampling frame; and (2) WATTS database as synchronized on October 1, 2008: measures installed in FY04 not included in the sampling frame.

[b] The Business Programs overall adjustment factors for therms were used because the agriculture segment adjustment factors (with the exception of the installation rate) for therms were estimated with inadequate accuracy.

Table C-12. All Business Programs: Tracked Energy Impacts
FY03 (July 1, 2002–June 30, 2003)

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net
Agriculture	Agriculture	7,785,645	6,716,282	3,905,035	1,980	1,722	1,134	60,906	58,897	51,166
Commercial	Commercial	0	0	0	0	0	0	938	914	666
Commercial	Existing Buildings	16,332,823	12,357,439	5,995,214	3,033	2,048	1,206	726,169	707,218	515,452
Commercial	New Buildings	500,166	378,426	183,594	197	133	78	222,294	216,493	157,790
Commercial	Pilot - Commercial	278,178	210,470	102,110	37	25	15	10,666	10,388	7,571
Commercial	Small Retail & Services	30,974,155	23,435,093	11,369,540	8,385	5,660	3,334	266,418	259,465	189,110
Industrial	General Industrial	49,974,712	46,053,342	17,363,524	7,026	6,190	2,378	1,490,593	1,451,245	755,266
Industrial	Industrial	2,202,094	2,029,302	765,109	441	389	149	94,049	91,566	47,654
Industrial	Pilot - General Industrial	3,058,760	2,818,748	1,062,755	448	395	152	219,482	213,688	111,209
Industrial	Water - Waste Water	6,455,315	5,948,785	2,242,875	851	750	288	3,100	3,018	1,571
Institutional	Government	6,177,040	6,371,227	4,303,723	1,365	1,313	971	91,275	66,240	15,287
Institutional	Schools	6,906,206	7,123,316	4,811,754	983	945	699	1,612,075	1,169,921	270,002
Institutional	Schools & Government	794,300	819,270	553,412	274	263	195	29,840	21,656	4,998
EE Products	EE Products	0			0			0		
Industries of the Future	Industry of the Future	15,691,186	14,262,206	9,899,931	1,638	1,628	1,182b	1,235,975	1,235,975	833,046
Renewables	MM Renewables	0			0			701,849	678,278	677,718
Total FY03 (July 1, 2002, to June 30, 2003)		**147,130,580**	**128,523,908**	**62,558,574**	**26,658**	**21,462**	**10,599**	**6,765,629**	**6,184,962**	**3,638,503**

[a] Tracking gross savings for measures installed during FY03 are from three separate extracts from the Focus tracking system. The three versions of the Focus tracking database used are: (1) STAR database as synchronized on January 7, 2003: measures installed during the first half of FY03 and included in the sampling frame for the first half of FY03; (2) STAR database as synchronized on July 10, 2003: measures installed during the second half of FY03 and included in the sampling frame for the second half of FY03, and (3) WATTS database as synchronized on October 1, 2008: measures installed in FY03 not included in either FY03 sampling frames.

[b] The Industries of the Future segment attribution adjustment factor for kWh was used to calculate net kW because the attribution adjustment factor kW was suppressed to preserve confidentiality.

Table C-13. All Business Programs: Tracked Energy Impacts
FY02 (Program start–June 30, 2002)

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net	Tracking Gross [a]	Verified Gross	Net
Agriculture / Commerical [b]	Agriculture	993,447	957,662	438,982	282	249	91	1,319	1,316	466
Commercial	Existing Buildings	5,544,182	4,799,946	2,390,906	922	567	270	120,903	120,627	42,676
Commercial	Government	461,295	399,372	198,932	55	34	16	3,997	3,988	1,411
Commercial	Pilot - Commercial	1,647,891	1,426,683	710,646	405	249	118	74,069	73,900	26,145
Commercial	Schools	4,099,112	3,548,858	1,767,726	1,787	1,098	523	418,326	417,372	147,661
Commercial	Schools & Government	1,077,050	932,470	464,473	280	172	82	46,791	46,684	16,516
Commercial	Small Retail & Services	1,967,208	1,703,135	848,351	768	472	225	267,178	266,568	94,308
Industrial	General Industrial	13,083,660	11,179,260	7,937,940	2,099	2,223	1,648	727,413	244,577	154,766
Industrial	Industrial	939,330	802,605	569,897	159	168	125	74,304	24,983	15,809
Industrial	Industry of the Future	528,654	451,705	320,738	65	68	51	0	0	0
Industrial	MM Renewables	0	0	0	0	0	0	984,201	330,916	209,401
Industrial	Pilot - General Industrial	3,246,314	2,773,795	1,969,559	336	356	264	91,080	30,624	19,378
Industrial	Water - Waste Water	1,163,789	994,393	706,078	344	364	270	160	54	34
New Buildings	New Buildings	2,608,160	2,608,160	143,279	1,034	1,034	46	53,914	53,914	0
Programs overall	Unknown	981	858	476	.	.	.	.	.	.
Total FY02 (Program Start to June 30, 2002)		**37,361,073**	**32,578,902**	**18,467,983**	**8,536**	**7,054**	**3,727**	**2,863,655**	**1,615,522**	**728,572**

[a] Tracking gross savings for measures installed during FY02 prior to January 1, 2002, and included in the FY02, round 1, frame were provided by the program. The remaining tracking gross savings for measures installed during FY02 are from three separate extracts from the Focus tracking system: (1) STAR database as synchronized on April 13, 2002: measures installed between January 1, 2002, and March 31, 2002, and included in the FY02, round 2, sampling frame; (2) STAR database as synchronized on July 11, 2002: measures installed between April 1, 2002, and June 30, 2002, and included in the FY02, round 3, sampling frame; and (3) WATTS database as synchronized on October 1, 2008: measures installed during FY02 not included in any of the three FY02 sampling frames.

[b] The commercial segment adjustment factors for therms were used because agriculture segment adjustment factors for therms were not available.

C.5 DETAILED SAMPLING TABLES BY SECTOR

The two terms which are used in the “status” columns are defined as follows:

- **Exhausted:** All of the sample available in that strata was used. We either completed a survey with the customer or "killed" the data point for all measures in the sample. Data points are killed if the customer refuses to complete the survey, terminates the survey before the attribution questions are answered, or is called six times on different days and at different times of the day without being reached.

- **Available:** We reached the target amount without using all of the sample points in the strata.

Table C-14. Agriculture Sample Disposition by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
1	Boilers & burners	Deemed	Has therms	1,023	3	1	2	Exhausted
2	Boilers & burners	Deemed	Has therms	24,040	1	1	0	Exhausted
3	Boilers & burners	Not deemed	Has therms	1,059	1	1	0	Exhausted
4	Boilers & burners	Not deemed	No therms	644	2	1	1	Exhausted
5	Lighting	Deemed	No therms	393	271	3	3	Available
6	Lighting	Deemed	No therms	2,547	59	3	3	Available
7	Lighting	Not deemed	No therms	529	181	2	1	Exhausted
8	Refrigeration	Deemed	No therms	3,153	5	1	1	Available
9	HVAC	Deemed	Has therms	9,145	1	1	1	Exhausted
10	HVAC	Deemed	No therms	1,980	77	5	5	Available
11	HVAC	Not deemed	Has therms	1,587	4	1	2	Exhausted
12	HVAC	Not deemed	No therms	3,266	43	2	1	Exhausted
13	Compressed air, vacuum pumps	Not deemed	No therms	707	5	1	1	Exhausted
14	Agriculture	Not deemed	Has therms	6,325	44	2	0	Exhausted
15	Agriculture	Not deemed	No therms	694	518	3	0	Exhausted
16	Motors & drives	Deemed	No therms	67	5	1	1	Exhausted
17	Motors & drives	Not deemed	No therms	1,531	157	2	0	Exhausted
18	CFL	Deemed	No therms	43	3,459	4	1	Exhausted
19	CFL	Deemed	No therms	327	687	3	1	Exhausted
20	Other	Deemed	Has therms	430	1	1	0	Exhausted
21	Other	Deemed	No therms	421	1	1	0	Exhausted
22	Other	Not deemed	Has therms	2,069	14	1	0	Exhausted
23	Other	Not deemed	No therms	1,230	103	2	0	Exhausted
	All	**All**	**All**		**5,642**	**43**	**24**	

Table C-15. Commercial Sample Disposition by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
24	Boilers & burners	Deemed	Has therms	360	504	9	13	Available
25	Boilers & burners	Deemed	Has therms	1,240	183	9	13	Available
26	Boilers & burners	Deemed	Has therms	2,472	105	9	25	Available
27	Boilers & burners	Deemed	Has therms	5,502	56	9	29	Exhausted
28	Boilers & burners	Deemed	Has therms	20,374	20	8	8	Exhausted
29	Boilers & burners	Deemed	Has therms	86,798	1	1	0	Exhausted
30	Boilers & burners	Not deemed	Has therms	4,201	16	1	2	Exhausted
31	Lighting	Deemed	No therms	157	2,853	13	27	Available
32	Lighting	Deemed	No therms	884	674	12	26	Available
33	Lighting	Deemed	No therms	2,203	323	12	30	Available
34	Lighting	Deemed	No therms	5,297	160	12	44	Available
35	Lighting	Deemed	No therms	14,846	72	12	30	Exhausted
36	Lighting	Not deemed	No therms	1,187	323	5	4	Exhausted
37	Lighting	Not deemed	No therms	31,178	22	5	6	Exhausted
38	Refrigeration	Deemed	No therms	392	533	5	7	Available
39	Refrigeration	Deemed	No therms	2,879	101	5	22	Exhausted
40	Refrigeration	Deemed	No therms	7,689	46	4	32	Exhausted
41	Refrigeration	Deemed	No therms	14,879	27	4	23	Exhausted
42	Refrigeration	Deemed	No therms	37,297	13	4	10	Exhausted
43	Refrigeration	Not deemed	Has therms	3,205	21	1	1	Exhausted
44	Refrigeration	Not deemed	No therms	2,874	92	4	3	Exhausted
45	Refrigeration	Not deemed	No therms	38,980	10	4	4	Exhausted
46	HVAC	Deemed	Has therms	395	116	4	5	Available
47	HVAC	Deemed	Has therms	4,102	18	3	6	Available
48	HVAC	Deemed	Has therms	22,130	5	3	3	Exhausted
49	HVAC	Deemed	Has therms	203,010	1	1	0	Exhausted
50	HVAC	Deemed	No therms	726	172	5	9	Available
51	HVAC	Not deemed	Has therms	3,254	111	5	7	Exhausted
52	HVAC	Not deemed	Has therms	23,296	22	5	6	Exhausted
53	HVAC	Not deemed	Has therms	76,191	9	4	5	Exhausted
54	HVAC	Not deemed	Has therms	903,640	1	1	0	Exhausted
55	HVAC	Not deemed	No therms	1,255	468	5	4	Exhausted
56	HVAC	Not deemed	No therms	15,964	61	4	2	Exhausted
57	Process	Not deemed	Has therms	1,112	2	1	1	Exhausted
58	Process	Not deemed	No therms	4,051	6	1	0	Exhausted
59	Compressed air, vacuum pumps	Not deemed	No therms	2,664	15	1	2	Exhausted
60	New construction	Not deemed	Has therms	26,614	22	5	2	Exhausted
61	Motors & drives	Deemed	No therms	150	51	1	3	Exhausted
62	Motors & drives	Not deemed	No therms	3,019	129	4	1	Exhausted
63	CFL	Deemed	No therms	109	6,589	5	4	Exhausted
64	CFL	Deemed	No therms	1,574	552	5	3	Available
65	CFL	Deemed	No therms	17,608	26	5	3	Exhausted
66	Other	Deemed	Has therms	1,005	83	3	7	Available
67	Other	Deemed	No therms	263	237	2	4	Available
68	Other	Not deemed	Has therms	1,913	131	2	1	Exhausted
69	Other	Not deemed	No therms	4,201	105	3	2	Exhausted

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
	All	All	All		15,087	226	439	

Table C-16. Industrial Sample Disposition by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
70	Boilers & burners	Deemed	Has therms	935	124	6	11	Available
71	Boilers & burners	Deemed	Has therms	3,978	38	6	12	Exhausted
72	Boilers & burners	Deemed	Has therms	9,273	18	6	8	Exhausted
73	Boilers & burners	Deemed	Has therms	16,374	12	5	6	Exhausted
74	Boilers & burners	Deemed	Has therms	29,923	8	5	2	Exhausted
75	Boilers & burners	Deemed	Has therms	61,110	2	2	1	Exhausted
76	Boilers & burners	Not deemed	Has therms	30,378	14	4	4	Exhausted
77	Boilers & burners	Not deemed	No therms	45,536	2	1	2	Exhausted
78	Lighting	Deemed	No Therms	457	1,084	13	30	Available
79	Lighting	Deemed	No Therms	2,724	239	13	20	Available
80	Lighting	Deemed	No Therms	5,819	131	13	24	Available
81	Lighting	Deemed	No Therms	11,930	73	13	19	Available
82	Lighting	Deemed	No Therms	35,011	32	13	7	Exhausted
83	Lighting	Deemed	No Therms	113,875	1	1	1	Exhausted
84	Lighting	Not Deemed	No Therms	1,422	65	4	1	Exhausted
85	Lighting	Not Deemed	No Therms	14,197	10	3	0	Exhausted
86	Lighting	Not Deemed	No Therms	148,641	1	1	0	Exhausted
87	Refrigeration	Deemed	No Therms	12,175	27	4	9	Exhausted
88	Refrigeration	Not Deemed	Has Therms	15,993	1	1	1	Exhausted
89	Refrigeration	Not Deemed	Has Therms	260,710	1	1	1	Exhausted
90	Refrigeration	Not Deemed	No Therms	18,589	8	3	2	Exhausted
91	Refrigeration	Not Deemed	No Therms	157,557	2	2	0	Exhausted
92	HVAC	Deemed	Has therms	1,940	12	1	6	Available
93	HVAC	Deemed	Has therms	44,401	1	1	0	Exhausted
94	HVAC	Deemed	No therms	831	15	2	3	Available
95	HVAC	Not deemed	Has therms	9,483	40	3	2	Exhausted
96	HVAC	Not deemed	Has therms	90,919	7	3	4	Exhausted
97	HVAC	Not deemed	No therms	7,134	70	3	1	Exhausted
98	Process	Not Deemed	Has Therms	20,269	22	3	4	Exhausted
99	Process	Not Deemed	Has Therms	76,486	7	2	3	Exhausted
100	Process	Not Deemed	Has Therms	184,091	4	2	3	Exhausted
101	Process	Not Deemed	Has Therms	424,042	5	5	4	Exhausted
102	Process	Not Deemed	No Therms	31,077	33	5	3	Exhausted
103	Compressed air, vacuum pumps	Not deemed	Has therms	7,376	6	1	1	Exhausted
104	Compressed air, vacuum pumps	Not deemed	No therms	2,352	237	4	5	Exhausted
105	Compressed air, vacuum pumps	Not deemed	No therms	10,129	72	4	2	Exhausted
106	Compressed air, vacuum pumps	Not deemed	No therms	28,810	32	3	4	Exhausted
107	Agriculture	Not Deemed	Has Therms	74,740	4	2	1	Exhausted

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
108	Waste water treatment	Not deemed	Has therms	25,249	1	1	1	Exhausted
109	Waste water treatment	Not deemed	No therms	29,681	13	2	2	Exhausted
110	Industrial Ovens and Furnaces	Not Deemed	Has Therms	22,471	6	2	3	Exhausted
111	Industrial Ovens and Furnaces	Not Deemed	No Therms	23,482	2	1	0	Exhausted
112	New construction	Not deemed	Has therms	9,167	3	1	0	Exhausted
113	Motors & drives	Deemed	No therms	79	543	2	3	Available
114	Motors & drives	Not deemed	No therms	2,289	175	4	2	Exhausted
115	Motors & drives	Not deemed	No therms	12,686	41	4	1	Exhausted
116	Motors & drives	Not deemed	No therms	45,486	16	4	1	Exhausted
117	CFL	Deemed	No therms	234	11	1	3	Exhausted
118	Other	Deemed	No Therms	155	8	1	1	Available
119	Other	Not Deemed	Has Therms	3,261	66	2	2	Exhausted
120	Other	Not Deemed	No Therms	4,646	4	1	1	Exhausted
	All	**All**	**All**		**3,349**	**190**	**227**	

Table C-17. Schools and Government Sample Disposition by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
121	Boilers & burners	Deemed	Has therms	1,045	229	10	28	Available
122	Boilers & burners	Deemed	Has therms	3,501	83	10	16	Available
123	Boilers & burners	Deemed	Has therms	6,693	50	10	22	Exhausted
124	Boilers & burners	Deemed	Has therms	11,474	32	10	10	Exhausted
125	Boilers & burners	Deemed	Has therms	20,817	21	10	9	Exhausted
126	Boilers & burners	Not deemed	Has therms	4,304	79	3	2	Exhausted
127	Boilers & burners	Not deemed	Has therms	25,882	18	3	3	Exhausted
128	Boilers & burners	Not deemed	No therms	2,331	11	1	0	Exhausted
129	Lighting	Deemed	No therms	153	1,200	5	14	Available
130	Lighting	Deemed	No therms	762	311	5	15	Available
131	Lighting	Deemed	No therms	1,485	183	5	18	Available
132	Lighting	Deemed	No therms	2,751	111	4	14	Available
133	Lighting	Deemed	No therms	6,705	56	4	20	Available
134	Lighting	Not deemed	No therms	1,489	162	3	4	Exhausted
135	Lighting	Not deemed	No therms	19,716	20	3	3	Exhausted
136	Refrigeration	Deemed	No therms	431	58	1	2	Exhausted
137	Refrigeration	Not deemed	Has therms	3,441	1	1	0	Exhausted
138	Refrigeration	Not deemed	No therms	1,700	2	1	0	Exhausted
139	HVAC	Deemed	Has therms	2,142	40	4	18	Exhausted
140	HVAC	Deemed	Has therms	11,361	11	4	3	Exhausted
141	HVAC	Deemed	Has therms	22,931	5	3	1	Exhausted
142	HVAC	Deemed	Has therms	35,643	4	3	2	Exhausted
143	HVAC	Deemed	Has therms	45,639	4	3	0	Exhausted
144	HVAC	Deemed	Has therms	57,302	6	6	2	Exhausted

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
145	HVAC	Deemed	No therms	477	37	2	4	Exhausted
146	HVAC	Not deemed	Has therms	7,304	120	5	6	Exhausted
147	HVAC	Not deemed	No therms	3,409	146	3	3	Exhausted
148	Process	Not deemed	No therms	415	1	1	0	Exhausted
149	Compressed air, vacuum pumps	Not deemed	No therms	1,987	5	1	0	Exhausted
150	Waste water treatment	Not deemed	No therms	713	1	1	0	Exhausted
151	New construction	Not deemed	Has therms	30,166	10	3	3	Exhausted
152	New construction	Not deemed	No therms	11,842	1	1	0	Exhausted
153	Motors & drives	Deemed	No therms	63	86	1	6	Exhausted
154	Motors & drives	Not deemed	No therms	1,413	215	2	3	Exhausted
155	CFL	Deemed	No therms	584	77	2	6	Available
156	Other	Deemed	Has therms	902	44	2	6	Available
157	Other	Deemed	No therms	464	143	3	11	Exhausted
158	Other	Not deemed	Has therms	2,855	160	4	5	Exhausted
159	Other	Not deemed	No therms	3,302	63	2	1	Exhausted
	All	**All**	**All**		**3,806**	**145**	**260**	

Table C-18. Agriculture Fraction of Frame Savings in Sample by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
1	Boilers & burners	Deemed	Has therms	1,023	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2	Boilers & burners	Deemed	Has therms	24,040	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
3	Boilers & burners	Not deemed	Has therms	1,059	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	Boilers & burners	Not deemed	No therms	644	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5	Lighting	Deemed	No therms	393	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
6	Lighting	Deemed	No therms	2,547	0.6%	0.5%	0.0%	0.0%	0.0%	0.0%
7	Lighting	Not deemed	No therms	529	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
8	Refrigeration	Deemed	No therms	3,153	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
9	HVAC	Deemed	Has therms	9,145	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	HVAC	Deemed	No therms	1,980	0.4%	0.7%	0.0%	0.0%	0.1%	0.0%
11	HVAC	Not deemed	Has therms	1,587	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
12	HVAC	Not deemed	No therms	3,266	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%
13	Compressed air, vacuum pumps	Not deemed	No therms	707	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
14	Agriculture	Not deemed	Has therms	6,325	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%
15	Agriculture	Not deemed	No therms	694	1.2%	1.4%	0.0%	0.0%	0.0%	0.0%
16	Motors & drives	Deemed	No therms	67	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
17	Motors & drives	Not deemed	No therms	1,531	0.8%	0.9%	0.0%	0.0%	0.0%	0.0%
18	CFL	Deemed	No therms	43	0.5%	0.7%	0.0%	0.0%	0.0%	0.0%
19	CFL	Deemed	No therms	327	0.7%	1.0%	0.0%	0.0%	0.0%	0.0%
20	Other	Deemed	Has therms	430	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
21	Other	Deemed	No therms	421	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
22	Other	Not deemed	Has therms	2,069	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
23	Other	Not deemed	No therms	1,230	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%
	All	**All**	**All**		**6.0%**	**7.0%**	**1.7%**	**0.1%**	**0.1%**	**0.1%**

Table C-19. Commercial Fraction of Frame Savings in Sample by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
24	Boilers & burners	Deemed	Has therms	360	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%
25	Boilers & burners	Deemed	Has therms	1,240	0.0%	0.0%	1.2%	0.0%	0.0%	0.1%
26	Boilers & burners	Deemed	Has therms	2,472	0.0%	0.0%	1.4%	0.0%	0.0%	0.3%
27	Boilers & burners	Deemed	Has therms	5,502	0.0%	0.0%	1.7%	0.0%	0.0%	0.9%
28	Boilers & burners	Deemed	Has therms	20,374	0.0%	0.0%	2.2%	0.0%	0.0%	1.0%
29	Boilers & burners	Deemed	Has therms	86,798	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%
30	Boilers & burners	Not deemed	Has therms	4,201	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
31	Lighting	Deemed	No therms	157	1.5%	1.5%	0.0%	0.0%	0.0%	0.0%
32	Lighting	Deemed	No therms	884	2.0%	2.1%	0.0%	0.1%	0.1%	0.0%
33	Lighting	Deemed	No therms	2,203	2.4%	2.5%	0.0%	0.2%	0.2%	0.0%
34	Lighting	Deemed	No therms	5,297	2.8%	2.9%	0.0%	0.8%	0.8%	0.0%
35	Lighting	Deemed	No therms	14,846	3.5%	3.8%	0.0%	1.5%	1.5%	0.0%
36	Lighting	Not deemed	No therms	1,187	1.3%	1.2%	0.0%	0.0%	0.0%	0.0%
37	Lighting	Not deemed	No therms	31,178	2.3%	2.3%	0.0%	0.9%	0.8%	0.0%
38	Refrigeration	Deemed	No therms	392	0.8%	0.5%	0.0%	0.0%	0.0%	0.0%
39	Refrigeration	Deemed	No therms	2,879	1.1%	0.8%	0.0%	0.2%	0.2%	0.0%
40	Refrigeration	Deemed	No therms	7,689	1.3%	0.8%	0.0%	0.9%	0.6%	0.0%
41	Refrigeration	Deemed	No therms	14,879	1.5%	1.1%	0.0%	1.3%	1.0%	0.0%
42	Refrigeration	Deemed	No therms	37,297	1.8%	1.5%	0.0%	1.4%	1.2%	0.0%
43	Refrigeration	Not deemed	Has therms	3,205	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
44	Refrigeration	Not deemed	No therms	2,874	1.1%	0.6%	0.0%	0.1%	0.0%	0.0%
45	Refrigeration	Not deemed	No therms	38,980	1.4%	1.3%	0.0%	0.5%	0.4%	0.0%
46	HVAC	Deemed	Has therms	395	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
47	HVAC	Deemed	Has therms	4,102	0.0%	0.0%	0.4%	0.0%	0.0%	0.1%
48	HVAC	Deemed	Has therms	22,130	0.0%	0.0%	0.6%	0.0%	0.0%	0.4%
49	HVAC	Deemed	Has therms	203,010	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%
50	HVAC	Deemed	No therms	726	0.3%	0.7%	0.0%	0.0%	0.0%	0.0%
51	HVAC	Not deemed	Has therms	3,254	0.2%	0.6%	1.4%	0.0%	0.0%	0.1%
52	HVAC	Not deemed	Has therms	23,296	0.6%	0.4%	1.9%	0.2%	0.2%	0.4%
53	HVAC	Not deemed	Has therms	76,191	0.6%	0.4%	2.8%	0.5%	0.2%	1.5%
54	HVAC	Not deemed	Has therms	903,640	-0.9%	-0.2%	6.0%	0.0%	0.0%	0.0%
55	HVAC	Not deemed	No therms	1,255	1.4%	2.9%	0.0%	0.0%	0.0%	0.0%
56	HVAC	Not deemed	No therms	15,964	2.1%	5.3%	0.0%	0.0%	0.2%	0.0%
57	Process	Not deemed	Has therms	1,112	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
58	Process	Not deemed	No therms	4,051	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
59	Compressed air, vacuum pumps	Not deemed	No therms	2,664	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
60	New construction	Not deemed	Has therms	26,614	0.5%	1.4%	1.9%	0.0%	0.2%	0.4%
61	Motors & drives	Deemed	No therms	150	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
62	Motors & drives	Not deemed	No therms	3,019	1.6%	0.5%	0.0%	0.0%	0.0%	0.0%
63	CFL	Deemed	No therms	109	2.0%	3.2%	0.0%	0.0%	0.0%	0.0%
64	CFL	Deemed	No therms	1,574	2.5%	3.8%	0.0%	0.0%	0.0%	0.0%
65	CFL	Deemed	No therms	17,608	1.4%	1.8%	0.0%	0.1%	0.2%	0.0%
66	Other	Deemed	Has therms	1,005	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
67	Other	Deemed	No therms	263	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
68	Other	Not deemed	Has therms	1,913	0.2%	0.3%	1.0%	0.0%	0.0%	0.0%
69	Other	Not deemed	No therms	4,201	2.2%	0.2%	0.0%	0.0%	0.0%	0.0%
	All	**All**	**All**		**40.1%**	**44.4%**	**26.4%**	**8.9%**	**7.9%**	**5.2%**

Table C-20. Industrial Fraction of Frame Savings in Sample by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
70	Boilers & burners	Deemed	Has therms	935	0.0%	0.0%	0.7%	0.0%	0.0%	0.1%
71	Boilers & burners	Deemed	Has therms	3,978	0.0%	0.0%	0.9%	0.0%	0.0%	0.3%
72	Boilers & burners	Deemed	Has therms	9,273	0.0%	0.0%	1.0%	0.0%	0.0%	0.5%
73	Boilers & burners	Deemed	Has therms	16,374	0.0%	0.0%	1.2%	0.0%	0.0%	0.6%
74	Boilers & burners	Deemed	Has therms	29,923	0.0%	0.0%	1.5%	0.0%	0.0%	0.4%
75	Boilers & burners	Deemed	Has therms	61,110	0.0%	0.0%	0.8%	0.0%	0.0%	0.4%
76	Boilers & burners	Not deemed	Has therms	30,378	0.0%	0.0%	2.7%	0.0%	0.0%	0.9%
77	Boilers & burners	Not deemed	No therms	45,536	0.3%	0.2%	0.0%	0.3%	0.2%	0.0%
78	Lighting	Deemed	No therms	457	1.8%	1.4%	0.0%	0.0%	0.0%	0.0%
79	Lighting	Deemed	No therms	2,724	2.3%	2.1%	0.0%	0.2%	0.2%	0.0%
80	Lighting	Deemed	No therms	5,819	2.7%	2.3%	0.0%	0.5%	0.4%	0.0%
81	Lighting	Deemed	No therms	11,930	3.0%	2.8%	0.0%	0.8%	0.7%	0.0%
82	Lighting	Deemed	No therms	35,011	4.0%	3.4%	0.0%	0.9%	0.7%	0.0%
83	Lighting	Deemed	No therms	113,875	0.4%	0.4%	0.0%	0.4%	0.4%	0.0%
84	Lighting	Not deemed	No therms	1,422	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%
85	Lighting	Not deemed	No therms	14,197	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%
86	Lighting	Not deemed	No therms	148,641	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%
87	Refrigeration	Deemed	No therms	12,175	1.2%	1.1%	0.0%	0.7%	0.6%	0.0%
88	Refrigeration	Not deemed	Has therms	15,993	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
89	Refrigeration	Not deemed	Has therms	260,710	0.0%	0.0%	1.6%	0.0%	0.0%	1.6%
90	Refrigeration	Not deemed	No therms	18,589	0.5%	0.5%	0.0%	0.2%	0.0%	0.0%
91	Refrigeration	Not deemed	No therms	157,557	1.0%	1.4%	0.0%	0.0%	0.0%	0.0%
92	HVAC	Deemed	Has therms	1,940	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
93	HVAC	Deemed	Has therms	44,401	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
94	HVAC	Deemed	No therms	831	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
95	HVAC	Not deemed	Has therms	9,483	0.2%	0.2%	2.0%	0.0%	0.0%	0.1%
96	HVAC	Not deemed	Has therms	90,919	-0.1%	-0.2%	4.2%	-0.1%	-0.1%	3.3%
97	HVAC	Not deemed	No therms	7,134	1.1%	2.8%	0.0%	0.0%	0.1%	0.0%
98	Process	Not deemed	Has therms	20,269	0.1%	0.2%	2.5%	0.0%	0.0%	0.5%
99	Process	Not deemed	Has therms	76,486	1.1%	0.6%	1.7%	0.1%	0.0%	0.9%
100	Process	Not deemed	Has therms	184,091	0.0%	0.0%	4.6%	0.0%	0.0%	2.7%
101	Process	Not deemed	Has therms	424,042	0.2%	0.2%	12.9%	0.2%	0.2%	9.6%
102	Process	Not deemed	No therms	31,077	4.0%	2.7%	0.0%	0.2%	0.1%	0.0%
103	Compressed air, vacuum pumps	Not deemed	Has therms	7,376	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
104	Compressed air, vacuum pumps	Not deemed	No therms	2,352	1.9%	2.0%	0.0%	0.0%	0.1%	0.0%
105	Compressed air, vacuum pumps	Not deemed	No therms	10,129	2.8%	2.1%	0.0%	0.1%	0.1%	0.0%
106	Compressed air, vacuum pumps	Not deemed	No therms	28,810	3.6%	2.4%	0.0%	0.4%	0.3%	0.0%
107	Agriculture	Not deemed	Has therms	74,740	0.0%	0.0%	1.9%	0.0%	0.0%	1.0%
108	Waste water treatment	Not deemed	Has therms	25,249	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
109	Waste water treatment	Not deemed	No therms	29,681	1.6%	0.9%	0.0%	0.2%	0.1%	0.0%
110	Industrial ovens and furnaces	Not deemed	Has therms	22,471	0.2%	0.1%	0.6%	0.1%	0.1%	0.4%
111	Industrial ovens and furnaces	Not deemed	No therms	23,482	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
112	New construction	Not deemed	Has therms	9,167	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
113	Motors & drives	Deemed	No therms	79	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
114	Motors & drives	Not deemed	No therms	2,289	1.5%	1.2%	0.0%	0.0%	0.0%	0.0%
115	Motors & drives	Not deemed	No therms	12,686	2.0%	1.6%	0.0%	0.1%	0.0%	0.0%
116	Motors & drives	Not deemed	No therms	45,486	2.8%	2.0%	0.0%	0.1%	0.1%	0.0%
117	CFL	Deemed	No therms	234	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
118	Other	Deemed	No therms	155	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
119	Other	Not deemed	Has therms	3,261	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%
120	Other	Not deemed	No therms	4,646	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
	All	**All**	**All**		**42.2%**	**35.9%**	**43.1%**	**5.7%**	**4.4%**	**23.7%**

Table C-21. Schools and Government Fraction of Frame Savings in Sample by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
121	Boilers & burners	Deemed	Has therms	1,045	0.0%	0.0%	1.4%	0.0%	0.0%	0.2%
122	Boilers & burners	Deemed	Has therms	3,501	0.0%	0.0%	1.8%	0.0%	0.0%	0.3%
123	Boilers & burners	Deemed	Has therms	6,693	0.0%	0.0%	2.0%	0.0%	0.0%	0.9%
124	Boilers & burners	Deemed	Has therms	11,474	0.0%	0.0%	2.2%	0.0%	0.0%	0.7%
125	Boilers & burners	Deemed	Has therms	20,817	0.0%	0.0%	2.6%	0.0%	0.0%	1.0%
126	Boilers & burners	Not deemed	Has therms	4,304	0.0%	0.0%	2.0%	0.0%	0.0%	0.1%
127	Boilers & burners	Not deemed	Has therms	25,882	0.0%	0.0%	2.8%	0.0%	0.0%	0.6%
128	Boilers & burners	Not deemed	No therms	2,331	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
129	Lighting	Deemed	No therms	153	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%
130	Lighting	Deemed	No therms	762	0.8%	0.7%	0.0%	0.0%	0.0%	0.0%
131	Lighting	Deemed	No therms	1,485	0.9%	0.9%	0.0%	0.1%	0.1%	0.0%
132	Lighting	Deemed	No therms	2,751	1.0%	1.1%	0.0%	0.1%	0.1%	0.0%
133	Lighting	Deemed	No therms	6,705	1.3%	1.2%	0.0%	0.5%	0.4%	0.0%
134	Lighting	Not deemed	No therms	1,489	0.8%	0.8%	0.0%	0.0%	0.0%	0.0%
135	Lighting	Not deemed	No therms	19,716	1.2%	1.6%	0.0%	0.2%	0.4%	0.0%
136	Refrigeration	Deemed	No therms	431	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
137	Refrigeration	Not deemed	Has therms	3,441	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
138	Refrigeration	Not deemed	No therms	1,700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
139	HVAC	Deemed	Has therms	2,142	0.0%	0.0%	0.5%	0.0%	0.0%	0.2%
140	HVAC	Deemed	Has therms	11,361	0.0%	0.0%	0.8%	0.0%	0.0%	0.2%
141	HVAC	Deemed	Has therms	22,931	0.0%	0.0%	0.7%	0.0%	0.0%	0.1%
142	HVAC	Deemed	Has therms	35,643	0.0%	0.0%	0.9%	0.0%	0.0%	0.5%
143	HVAC	Deemed	Has therms	45,639	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
144	HVAC	Deemed	Has therms	57,302	0.0%	0.0%	2.1%	0.0%	0.0%	0.7%
145	HVAC	Deemed	No therms	477	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
146	HVAC	Not deemed	Has therms	7,304	0.7%	0.6%	4.0%	0.0%	0.0%	0.1%
147	HVAC	Not deemed	No therms	3,409	0.7%	3.4%	0.0%	0.0%	0.1%	0.0%
148	Process	Not deemed	No therms	415	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
149	Compressed air, vacuum pumps	Not deemed	No therms	1,987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
150	Waste water treatment	Not deemed	No therms	713	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
151	New construction	Not deemed	Has therms	30,166	0.3%	0.7%	1.0%	0.0%	0.2%	0.1%
152	New construction	Not deemed	No therms	11,842	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
153	Motors & drives	Deemed	No therms	63	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
154	Motors & drives	Not deemed	No therms	1,413	1.3%	0.3%	0.0%	0.0%	0.0%	0.0%
155	CFL	Deemed	No therms	584	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
156	Other	Deemed	Has therms	902	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
157	Other	Deemed	No therms	464	0.3%	0.2%	0.0%	0.1%	0.0%	0.0%
158	Other	Not deemed	Has therms	2,855	0.1%	0.2%	2.5%	0.0%	0.0%	0.0%
159	Other	Not deemed	No therms	3,302	1.0%	0.2%	0.0%	0.0%	0.0%	0.0%
	All	**All**	**All**		**11.6%**	**12.7%**	**28.8%**	**1.2%**	**1.5%**	**5.7%**

During the 18MCP, a working group of Focus on Energy evaluation team members completed a review of self-report program attribution batteries used to determine net program impacts. According to the July 2, 2008, *Framework for Self-Report Net-To-Gross (Attribution) Questions*[56] white paper submitted to the Public Service Commission of Wisconsin, the key objective of this review was to develop a framework to guide the revision of existing survey instruments used for determining attribution. The Business Program's survey instruments were revised for the 18MCP evaluation based in the guidelines laid out in the framework. Further improvements were made for the CY09 evaluation.

The framework paper also called for improved consistency across Focus program areas and improved transparency for the approaches used. This appendix attempts to provide greater transparency in reporting attribution results while maintaining respondent confidentiality. This section discusses the survey responses and the attribution resulting from certain response sequences. Please see Appendix E for a detailed discussion of the attribution calculation methodology.

D.1 OVERVIEW

This section provides a brief overview of attribution sequence responses. First we address the differences between survey responses for deemed and not deemed measures, then we compare the confirmation question answers to the attribution question answers. The third section addresses the attribution received from each sequence of survey responses, and the fourth section addresses supplier surveys and how they affected the results. The fifth section shows a comparison of selected data from CY09 to CY10. The final section contains some of the open-ended question responses gathered during the engineering survey.

The direct attribution sequence is the sequence of questions that are used in the calculation of attribution. The direct attribution sequence is comprised of three sections of questions that determine how the Focus program affected the timing, efficiency, and quantity of the measures that were installed.[57] In CY09 and CY10 Engineering sample participants[58] and CATI sample participants were both asked the direct attribution sequence questions for each measure installed. In the past, the CATI sample respondents were asked the direct attribution sequence questions at the end-use level.

Table D-1 shows the attribution questions from the survey. The questions shown here are paraphrased; for the exact wording, please refer to the survey document in Appendix K and Appendix L. The first question in each section is a screening question to indicate whether Focus

[56] Rick Winch and Tom Talerico, Glacier Consulting Group; Bobbi Tannenbaum, KEMA, Inc.; Pam Rathbun, PA Consulting Group; Ralph Prahl, Ralph Prahl & Associates. Wisconsin Public Service Commission, *Focus on Energy Evaluation: Framework for Self-Report Net-to-Gross (Attribution) Questions.* July 3, 2008.

[57] See Appendix E for a detailed discussion of attribution methodology.

[58] In CY09 and CY10, the CATI sample was exclusively deemed measures, while the engineering sample had custom and some deemed measures. See Section 3 for more details.

had an effect on timing, efficiency, or quantity of the measure. The follow-up questions are used to determine the portion of the timing, efficiency, or quantity that is attributable to Focus. The attribution for each section is a function of the combination of the responses to all of the questions. The three section attributions are combined to determine the overall attribution for the measure. Please see Appendix E for a detailed discussion of the attribution calculation methodology.

Table D-1. Attribution Question Sequence

Number	Question
Timing	
DAT1	Without Focus, how likely is it that you would have installed the same type of equipment at this time?
DAT1a	Without Focus, how different would the timing have been?
DAT1b	Approximately how many months later?
Efficiency	
DAT2	Without Focus, how likely is it that you would have installed the same level of efficiency?
DAT2a	Without Focus, would you have installed the same, greater, or lesser efficiency?
DAT2b	Without Focus, what efficiency would you have installed?
Quantity	
DAT3	Without Focus, how different would the quantity/size have been?
DAT3a	By what percentage did you change the quantity/size because of Focus?

D.1.1 Timing

Respondents are asked a sequence of questions that address the timing of the equipment installation. First, respondents are asked how likely it is that they would have installed the same type of equipment at the same time without Focus (DAT1a). Then respondents are asked how different the timing would have been (DAT1b).

A response of “Same Time” means that the customer would have installed the measure(s) at that time regardless of Focus involvement.

A response of “Later” indicates that they would have waited to install them if Focus had not been there and therefore Focus accelerated the installation of the measure. Respondents who answered “Later” are asked a follow up question (DAT1b) about how much later they would have installed the equipment without Focus.

Table D-2 shows the responses to the DAT1a question for deemed and not deemed measures. The table shows the unweighted number of responses in each category and the associated percentage of overall program energy savings represented by those responses. The number of responses does not reflect any survey weight or relative savings but the percentage of energy savings does.

Table D-2. Responses to the DAT1a Question on Timing

DAT1a. Without Focus, how different would the timing have been?												
	Not Deemed				Deemed				Total			
Response	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same time	59	21%	23%	27%	285	12%	11%	17%	344	34%	34%	44%
Earlier	0	0%	0%	0%	3	0%	0%	0%	3	0%	0%	0%
Later	47	14%	17%	23%	341	24%	21%	11%	388	39%	38%	34%
Never	44	17%	19%	16%	87	9%	7%	3%	131	25%	25%	19%
Don't know/refused	2	0%	0%	0%	32	2%	2%	2%	34	2%	2%	2%
Total	**152**	**52%**	**59%**	**66%**	**748**	**48%**	**41%**	**34%**	**900**	**100%**	**100%**	**100%**

The table shows that 91 of the not deemed respondents and 428 of the deemed respondents answered that they would have installed the equipment later or never without the Focus services and incentives. All of these responses will receive at least partial timing attribution. The not deemed responses of later or never represent 31 percent of population kWh savings, 36 percent of population kW savings, and 39 percent of the population therm savings. For the deemed responses, the kWh, kW, and therm savings represented are 33 percent, 28 percent, and 14 percent respectively. In total, 66 percent of program kWh savings, 65 percent of program kW savings, and 55 percent of program therm savings received at least partial timing attribution.

D.1.2 Efficiency

Respondents are asked a sequence of questions that address the efficiency of the equipment installation. First, respondents are asked how likely it is that they would have installed the same, lesser, or greater efficiency without Focus (DAT2a). Then respondents are asked how different the efficiency would have been (DAT2b).

A response of “Same” means that the customer would have installed the same level of efficiency regardless of Focus involvement.

A response of “Lower” indicates that they would have installed a less efficient piece of equipment if Focus had not been there. Respondents who answered “Lower” are asked a follow up question (DAT2b) about what efficiency of equipment they would have installed without Focus.

Table D-3 shows the responses to the DAT2a question for deemed and not deemed measures. The table includes a response of Not Applicable, which represents measures that do not have variable efficiency themselves, but are added to existing equipment or systems to make the overall operation more efficient. Examples are variable frequency drives, lighting controls, HVAC controls, etc.

Table D-3. Responses to the DAT2a Question on Efficiency

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?												
	Not Deemed				Deemed				Total			
Response	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same	47	11%	9%	20%	237	22%	22%	1%	284	33%	31%	21%
Lower	22	8%	10%	10%	136	9%	8%	1%	158	17%	18%	11%
Higher	1	1%	0%	0%	7	0%	1%	0%	8	1%	1%	0%
Not applicable	78	32%	40%	34%	324	13%	7%	31%	402	45%	46%	65%
Don't know/refused	4	1%	0%	3%	44	3%	3%	0%	48	4%	4%	3%
Total	**152**	**52%**	**59%**	**66%**	**748**	**48%**	**41%**	**34%**	**900**	**100%**	**100%**	**100%**

The table shows that 47 not deemed and 237 deemed respondents would have installed equipment of the same efficiency without the Focus incentives and services. These respondents represent 33 percent of total kWh savings, 31 percent of kW savings, and 21 percent of therm savings. There were a number of measures where efficiency was not applicable, representing 45 percent of kWh savings, 46 percent of kW savings, and 65 percent of therm savings.

The table also shows that 22 not deemed and 136 deemed respondents said that they would have installed Lower efficiency in the absence of the program. These responses represent 17 percent of total kWh savings, 18 percent of kW savings, and 11 percent of therm savings. The measures with the lower response will receive at least partial efficiency attribution.

D.1.3 Quantity

Respondents are asked a sequence of questions that address the quantity of the equipment installed. First, respondents are asked how likely it is that they would have installed the same quantity of equipment without Focus (DAT3). Then respondents are asked how much they changed the quantity (DAT3a).

A response of "Same amount" means that the customer would have installed the same size or quantity regardless of Focus involvement.

A response of "Less" indicates that they would have installed fewer units if Focus had not been there. Respondents who answered "Less" are asked a follow up question (DAT3a) about quantity of equipment they would have installed without Focus.

A response of "More" indicates that they would have installed more units if Focus had not been there. In these cases, the evaluation team assumes that the respondent would have installed a less efficient system without the Focus assistance because it would have been oversized. Respondents who answered "More" are asked the same follow up question (DAT3a) about the quantity of equipment they would have installed without Focus.

Table D-4 shows the responses to the DAT3 question for deemed and not deemed measures. The table includes a response of Not Applicable, which represents measures where varying quantity or size do not make sense in the context of the measure.

Table D-4. Responses to the DAT3 Question on Quantity

DAT3. Without Focus, how different would the quantity/size have been?												
	Not Deemed				Deemed				Total			
Response	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same amount	83	30%	29%	28%	426	25%	22%	21%	509	55%	51%	49%
Less	21	8%	8%	4%	181	14%	11%	8%	202	21%	19%	12%
More	0	0%	0%	0%	24	0%	1%	2%	24	0%	1%	2%
None	31	11%	13%	12%	91	7%	6%	1%	122	18%	19%	13%
Not applicable	16	4%	8%	23%	2	0%	0%	0%	18	4%	9%	23%
Don't know/refused	1	0%	0%	0%	24	1%	1%	1%	25	2%	1%	1%
Total	**152**	**52%**	**59%**	**66%**	**748**	**48%**	**41%**	**34%**	**900**	**100%**	**100%**	**100%**

The table shows that 83 of the not deemed and 426 of the deemed respondents would have installed the same quantity without Focus incentives or services, representing 55 percent of total kWh savings, 51 percent of kW savings, and 49 percent of therm savings.

The table also shows that 52 not deemed and 296 deemed respondents would have installed less, more, or no equipment in the absence of Focus. These responses represent 39 percent of program kWh savings, 39 percent of program kW savings, and 27 percent of program therm savings. These responses will receive at least partial quantity attribution.

D.2 RESULTS BY REPORTING MEASURE GROUP

This section reports the distribution of answers for the three screening questions presented at the reporting measure group level. Table D-5 shows the distribution of responses to the DAT1a timing question by measure group. In the table, the percentage savings reported are a percentage of the total program savings for each energy unit.

Table D-5. Responses to the DAT1a Timing Question by Reporting Measure Group, Percentage of Program Savings

DAT1a. Without Focus, how different would the timing have been?													
		Not Deemed				Deemed				Total			
Response	Reporting Measure Group	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same Time	Boilers & Burners	4	0%	0%	5%	117	0%	0%	13%	121	0%	0%	18%
	Expanded Process	9	6%	4%	3%	0	0%	0%	0%	9	6%	4%	3%
	HVAC	22	5%	11%	8%	46	1%	2%	4%	68	6%	13%	12%
	Non-Small CFL Lighting	5	1%	3%	0%	57	7%	6%	0%	62	8%	9%	0%
	Other	14	6%	3%	11%	24	0%	0%	0%	38	7%	4%	11%
	Refrigeration	5	3%	2%	0%	41	4%	3%	0%	46	6%	4%	0%
Earlier	Boilers & Burners	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	2	0%	0%	0%	2	0%	0%	0%
	Other	0	0%	0%	0%	1	0%	0%	0%	1	0%	0%	0%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Later	Boilers & Burners	4	0%	0%	1%	69	0%	0%	9%	73	0%	0%	10%
	Expanded Process	17	4%	4%	13%	0	0%	0%	0%	17	4%	4%	13%
	HVAC	11	3%	9%	6%	14	0%	0%	2%	25	3%	9%	7%
	Non-Small CFL Lighting	5	3%	2%	0%	195	19%	17%	0%	200	21%	19%	0%
	Other	6	3%	2%	1%	5	0%	0%	0%	11	3%	2%	2%
	Refrigeration	4	1%	1%	2%	58	6%	4%	0%	62	6%	5%	2%
Never	Boilers & Burners	6	0%	0%	4%	8	0%	0%	1%	14	0%	0%	5%
	Expanded Process	13	5%	3%	7%	0	0%	0%	0%	13	5%	3%	7%
	HVAC	8	1%	5%	4%	2	0%	0%	2%	10	1%	5%	6%
	Non-Small CFL Lighting	8	5%	5%	0%	66	7%	6%	0%	74	12%	12%	0%
	Other	6	5%	5%	2%	8	1%	0%	0%	14	6%	5%	2%
	Refrigeration	3	1%	0%	0%	3	0%	0%	0%	6	1%	0%	0%
Don't Know/ Refused	Boilers & Burners	0	0%	0%	0%	12	0%	0%	2%	12	0%	0%	2%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	1	0%	0%	0%	4	0%	0%	0%	5	0%	0%	0%
	Non-Small CFL Lighting	1	0%	0%	0%	12	2%	2%	0%	13	2%	2%	0%
	Other	0	0%	0%	0%	2	0%	0%	0%	2	0%	0%	0%
	Refrigeration	0	0%	0%	0%	2	0%	0%	0%	2	0%	0%	0%
Total	Boilers & Burners	14	0%	0%	10%	206	0%	0%	25%	220	0%	0%	35%
	Expanded Process	39	15%	11%	23%	0	0%	0%	0%	39	15%	11%	23%
	HVAC	42	9%	24%	18%	66	1%	2%	8%	108	10%	27%	26%
	Non-Small CFL Lighting	19	9%	10%	0%	332	35%	31%	0%	351	44%	41%	0%
	Other	26	15%	10%	14%	40	2%	1%	1%	66	16%	11%	14%
	Refrigeration	12	4%	3%	2%	104	10%	7%	0%	116	14%	10%	2%

The table shows that participants in the boilers and burners group were most likely to respond that they would have installed the measure at the same time with 121 responses representing 18 percent of the total therm savings. The majority of the responses were for deemed measures representing 13 percent of the total savings. The four non-deemed responses represent the remaining savings, or five percent. For measures with kWh savings, the HVAC group was most likely to respond that they would have installed the measure at the same time with 68 responses

representing six percent of the total kWh savings. For kW, the largest group was also HVAC representing 13 percent of the kW savings.

For responses of "Later" or "Never" (which receive at least partial timing attribution), the non-small CFL lighting group had the greatest number of responses (274) representing 33 percent of the total kWh savings and 31 percent of the total kW savings. The greatest number of those responses were for deemed measures representing 26 percent of the total kWh savings and 23 percent of the total kW savings. The non-deemed responses had less of an effect, representing eight percent of total kWh and seven percent of total kW savings. For therm measures, the expanded process group had the greatest effect, with 30 responses representing 20 percent of total therm savings. All of those responses were for non-deemed measures.

Table D-6 shows the distribution of responses to the DAT1a timing question by reporting measure group. In the table, the percent savings reported are a percentage of the total measure group savings for each energy unit.

Table D-6. Responses to the DAT1a Timing Question by Reporting Measure Group, Percentage of Measure Group Savings

DAT1a. Without Focus, how different would the timing have been?													
		Not Deemed				Deemed				Total			
Response	Reporting Measure Group	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same Time	Boilers & Burners	4	0%	0%	13%	117	0%	0%	37%	121	0%	0%	50%
	Expanded Process	9	39%	36%	14%	0	0%	0%	0%	9	39%	36%	14%
	HVAC	22	46%	40%	32%	46	13%	9%	16%	68	59%	48%	48%
	Non-Small CFL Lighting	5	3%	7%	0%	57	16%	14%	0%	62	19%	22%	0%
	Other	14	39%	32%	75%	24	2%	2%	2%	38	41%	35%	77%
	Refrigeration	5	20%	15%	0%	41	26%	29%	0%	46	46%	44%	0%
Earlier	Boilers & Burners	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	2	1%	1%	0%	2	1%	1%	0%
	Other	0	0%	0%	0%	1	0%	0%	0%	1	0%	0%	0%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Later	Boilers & Burners	4	0%	0%	3%	69	0%	0%	27%	73	0%	0%	30%
	Expanded Process	17	28%	34%	57%	0	0%	0%	0%	17	28%	34%	57%
	HVAC	11	34%	33%	21%	14	0%	0%	7%	25	34%	33%	29%
	Non-Small CFL Lighting	5	6%	4%	0%	195	43%	42%	0%	200	49%	46%	0%
	Other	6	19%	18%	10%	5	1%	2%	1%	11	20%	19%	11%
	Refrigeration	4	5%	11%	95%	58	39%	39%	0%	62	44%	50%	95%
Never	Boilers & Burners	6	100%	100%	13%	8	0%	0%	3%	14	100%	100%	16%
	Expanded Process	13	32%	29%	29%	0	0%	0%	0%	13	32%	29%	29%
	HVAC	8	7%	18%	14%	2	0%	0%	8%	10	7%	19%	22%
	Non-Small CFL Lighting	8	10%	13%	0%	66	17%	15%	0%	74	28%	28%	0%
	Other	6	32%	45%	11%	8	6%	1%	0%	14	38%	46%	11%
	Refrigeration	3	6%	2%	5%	3	1%	1%	0%	6	7%	2%	5%
Don't Know/ Refused	Boilers & Burners	0	0%	0%	0%	12	0%	0%	5%	12	0%	0%	5%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	1	0%	0%	1%	4	0%	0%	1%	5	0%	0%	2%
	Non-Small CFL Lighting	1	0%	0%	0%	12	4%	4%	0%	13	4%	4%	0%
	Other	0	0%	0%	0%	2	0%	0%	1%	2	0%	0%	1%
	Refrigeration	0	0%	0%	0%	2	3%	3%	0%	2	3%	3%	0%
Total	Boilers & Burners	14	100%	100%	29%	206	0%	0%	71%	220	100%	100%	100%
	Expanded Process	39	100%	100%	100%	0	0%	0%	0%	39	100%	100%	100%
	HVAC	42	87%	91%	68%	66	13%	9%	32%	108	100%	100%	100%
	Non-Small CFL Lighting	19	20%	25%	0%	332	80%	75%	0%	351	100%	100%	100%
	Other	26	91%	95%	96%	40	9%	5%	4%	66	100%	100%	100%
	Refrigeration	12	31%	28%	100%	104	69%	72%	0%	116	100%	100%	100%

The table shows that the "other" measure group has the highest proportion of therm savings represented by "Same Time" responses representing 77 percent of measure group therm

savings. The HVAC measure group has the highest proportion of kWh and kW savings representing 59 percent and 48 percent respectively. The non-small CFL lighting measure group has the lowest proportion of overall savings represented by "Same Time" responses, at 19 percent of kWh, 22 percent of kW, and zero percent of therms.

Table D-7 shows the distribution of responses to the DAT2a efficiency question by reporting measure group. In the table, the percentage savings reported are a percentage of the total program savings for each energy unit.

Table D-7. Responses to the DAT2a Efficiency Question by Reporting Measure Group, Percentage of Program Savings

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?													
		Not Deemed				Deemed				Total			
Response	Reporting Measure Group	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same	Boilers & Burners	3	0%	0%	4%	9	0%	0%	1%	12	0%	0%	5%
	Expanded Process	5	3%	2%	3%	0	0%	0%	0%	5	3%	2%	3%
	HVAC	16	2%	1%	7%	26	1%	2%	0%	42	3%	2%	8%
	Non-Small CFL Lighting	7	2%	3%	0%	166	20%	20%	0%	173	22%	24%	0%
	Other	11	4%	1%	3%	31	0%	0%	1%	42	4%	1%	4%
	Refrigeration	5	1%	1%	2%	5	0%	0%	0%	10	1%	1%	2%
Lower	Boilers & Burners	2	0%	0%	1%	5	0%	0%	1%	7	0%	0%	1%
	Expanded Process	6	2%	2%	2%	0	0%	0%	0%	6	2%	2%	2%
	HVAC	2	1%	4%	1%	8	0%	1%	0%	10	2%	4%	1%
	Non-Small CFL Lighting	4	1%	1%	0%	97	7%	7%	0%	101	7%	8%	0%
	Other	4	1%	2%	6%	4	1%	0%	0%	8	2%	2%	6%
	Refrigeration	4	3%	1%	0%	22	2%	1%	0%	26	5%	2%	0%
Higher	Boilers & Burners	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Non-Small CFL Lighting	1	1%	0%	0%	6	0%	1%	0%	7	1%	1%	0%
	Other	0	0%	0%	0%	1	0%	0%	0%	1	0%	0%	0%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Not Applicable	Boilers & Burners	8	0%	0%	3%	189	0%	0%	24%	197	0%	0%	27%
	Expanded Process	27	10%	7%	16%	0	0%	0%	0%	27	10%	7%	16%
	HVAC	23	6%	20%	9%	27	0%	0%	8%	50	6%	20%	17%
	Non-Small CFL Lighting	7	5%	5%	0%	29	5%	0%	0%	36	10%	6%	0%
	Other	10	10%	7%	4%	2	0%	0%	0%	12	10%	7%	4%
	Refrigeration	3	0%	0%	0%	77	8%	6%	0%	80	8%	7%	0%
Don't Know/ Refused	Boilers & Burners	1	0%	0%	2%	3	0%	0%	0%	4	0%	0%	2%
	Expanded Process	1	0%	0%	1%	0	0%	0%	0%	1	0%	0%	1%
	HVAC	1	0%	0%	0%	5	0%	0%	0%	6	0%	0%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	34	3%	3%	0%	34	3%	3%	0%
	Other	1	0%	0%	0%	2	0%	0%	0%	3	1%	0%	0%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Total	Boilers & Burners	14	0%	0%	10%	206	0%	0%	25%	220	0%	0%	35%
	Expanded Process	39	15%	11%	23%	0	0%	0%	0%	39	15%	11%	23%
	HVAC	42	9%	24%	18%	66	1%	2%	8%	108	10%	27%	26%
	Non-Small CFL Lighting	19	9%	10%	0%	332	35%	31%	0%	351	44%	41%	0%
	Other	26	15%	10%	14%	40	2%	1%	1%	66	16%	11%	14%
	Refrigeration	12	4%	3%	2%	104	10%	7%	0%	116	14%	10%	2%

The table shows that the non-small CFL lighting group was the most likely to have installed the same efficiency, with 173 responses representing 22 percent of total kWh savings and 24 percent of total kW savings. The greatest number of responses were for deemed measures (166) representing 20 percent of total kWh savings and 20 percent of total kW savings. For therms, the greatest portion of savings with a "Same" response were from the HVAC group, representing eight percent of total therm savings.

For responses of "Lower" (which receives at least partial efficiency attribution), the Non-Small CFL Lighting group again had the greatest number of responses (101) representing seven

percent of the kWh savings and eight percent of the kW savings. The non-small CFL lighting projects reporting "Same" have fewer than twice the respondents of "lower," yet represent three times the savings. This is generally because the larger projects report "Same" realizing the large savings potential. The "Other" measure group had the highest therm savings representing six percent.

Table D-8 shows the distribution of responses to the DAT2a efficiency question by reporting measure group. In the table, the percentage savings reported are a percentage of the total measure group savings for each energy unit.

Table D-8. Responses to the DAT2a Efficiency Question by Reporting Measure Group, Percentage of Measure Group Savings

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?													
		Not Deemed				Deemed				Total			
Response	Reporting Measure Group	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same	Boilers & Burners	3	0%	0%	12%	9	0%	0%	2%	12	0%	0%	13%
	Expanded Process	5	17%	22%	13%	0	0%	0%	0%	5	17%	22%	13%
	HVAC	16	16%	2%	28%	26	11%	7%	1%	42	27%	9%	29%
	Non-Small CFL Lighting	7	6%	8%	0%	166	46%	49%	0%	173	51%	58%	0%
	Other	11	23%	8%	24%	31	3%	3%	4%	42	25%	12%	28%
	Refrigeration	5	7%	11%	80%	5	2%	1%	0%	10	8%	12%	80%
Lower	Boilers & Burners	2	3%	0%	2%	5	0%	0%	1%	7	3%	0%	3%
	Expanded Process	6	15%	14%	10%	0	0%	0%	0%	6	15%	14%	10%
	HVAC	2	13%	13%	4%	8	2%	2%	0%	10	16%	15%	4%
	Non-Small CFL Lighting	4	1%	2%	0%	97	15%	17%	0%	101	16%	19%	0%
	Other	4	4%	23%	44%	4	5%	0%	0%	8	10%	23%	44%
	Refrigeration	4	21%	14%	0%	22	11%	9%	0%	26	32%	23%	0%
Higher	Boilers & Burners	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Non-Small CFL Lighting	1	2%	1%	0%	6	1%	1%	0%	7	3%	2%	0%
	Other	0	0%	0%	0%	1	0%	0%	0%	1	0%	0%	0%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Not Applicable	Boilers & Burners	8	97%	100%	10%	189	0%	0%	67%	197	97%	100%	77%
	Expanded Process	27	68%	64%	73%	0	0%	0%	0%	27	68%	64%	73%
	HVAC	23	55%	74%	36%	27	0%	0%	30%	50	55%	74%	66%
	Non-Small CFL Lighting	7	11%	13%	0%	29	12%	1%	0%	36	23%	14%	0%
	Other	10	62%	62%	28%	2	0%	0%	0%	12	62%	63%	29%
	Refrigeration	3	3%	3%	20%	77	56%	62%	0%	80	60%	65%	20%
Don't Know/ Refused	Boilers & Burners	1	0%	0%	6%	3	0%	0%	1%	4	0%	0%	7%
	Expanded Process	1	0%	0%	4%	0	0%	0%	0%	1	0%	0%	4%
	HVAC	1	2%	1%	0%	5	0%	0%	0%	6	2%	2%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	34	7%	7%	0%	34	7%	7%	0%
	Other	1	2%	1%	0%	2	1%	2%	0%	3	3%	3%	0%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Total	Boilers & Burners	14	100%	100%	29%	206	0%	0%	71%	220	100%	100%	100%
	Expanded Process	39	100%	100%	100%	0	0%	0%	0%	39	100%	100%	100%
	HVAC	42	87%	91%	68%	66	13%	9%	32%	108	100%	100%	100%
	Non-Small CFL Lighting	19	20%	25%	0%	332	80%	75%	0%	351	100%	100%	100%
	Other	26	91%	95%	96%	40	9%	5%	4%	66	100%	100%	100%
	Refrigeration	12	31%	28%	100%	104	69%	72%	0%	116	100%	100%	100%

The table shows that the non-small CFL lighting measure group has the highest proportion of savings represented by "Same" responses, at 51 percent kWh and 58 percent kW. The Refrigeration measure group has the highest proportion of therm savings represented by "Same" responses at 80 percent.

In the table, the Other measure group has the greatest proportion of savings represented by "Lower" responses at 10 percent kWh, 23 percent kW, and 44 percent therms. The refrigeration

measure group is also well represented by the "Lower" response at 32 percent kWh, 23 percent kW, but zero percent therms.

Table D-9 shows the distribution of responses to the DAT3 quantity question by reporting measure group. In the table, the percentage savings reported are a percentage of the total program savings for each energy unit.

Table D-9. Responses to the DAT3 Quantity Question by Reporting Measure Group, Percentage of Program Savings

DAT3. Without Focus, how different would the quantity/size have been?													
		Not Deemed				Deemed				Total			
Response	Reporting Measure Group	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same Amount	Boilers & Burners	7	0%	0%	7%	156	0%	0%	19%	163	0%	0%	26%
	Expanded Process	19	8%	6%	4%	0	0%	0%	0%	19	8%	6%	4%
	HVAC	20	5%	10%	11%	45	1%	2%	2%	65	6%	12%	13%
	Non-Small CFL Lighting	15	8%	8%	0%	158	18%	16%	0%	173	26%	24%	0%
	Other	15	7%	3%	3%	25	0%	0%	0%	40	8%	4%	3%
	Refrigeration	7	3%	2%	2%	42	5%	4%	0%	49	8%	5%	2%
Less	Boilers & Burners	2	0%	0%	0%	24	0%	0%	3%	26	0%	0%	3%
	Expanded Process	3	3%	3%	0%	0	0%	0%	0%	3	3%	3%	0%
	HVAC	9	1%	2%	3%	7	0%	0%	5%	16	1%	2%	8%
	Non-Small CFL Lighting	2	1%	2%	0%	90	9%	8%	0%	92	10%	9%	0%
	Other	1	0%	1%	1%	5	0%	0%	0%	6	0%	1%	1%
	Refrigeration	4	1%	1%	0%	55	4%	3%	0%	59	6%	4%	0%
More	Boilers & Burners	0	0%	0%	0%	10	0%	0%	1%	10	0%	0%	1%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	8	0%	0%	1%	8	0%	0%	1%
	Non-Small CFL Lighting	0	0%	0%	0%	6	0%	0%	0%	6	0%	0%	0%
	Other	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
None	Boilers & Burners	3	0%	0%	0%	11	0%	0%	1%	14	0%	0%	1%
	Expanded Process	9	4%	2%	6%	0	0%	0%	0%	9	4%	2%	6%
	HVAC	10	1%	5%	4%	0	0%	0%	0%	10	1%	5%	4%
	Non-Small CFL Lighting	2	0%	0%	0%	69	6%	6%	0%	71	6%	7%	0%
	Other	6	5%	5%	2%	8	1%	0%	0%	14	6%	5%	2%
	Refrigeration	1	0%	0%	0%	3	0%	0%	0%	4	0%	0%	0%
Not Applicable	Boilers & Burners	2	0%	0%	3%	0	0%	0%	0%	2	0%	0%	3%
	Expanded Process	8	0%	0%	12%	0	0%	0%	0%	8	0%	0%	12%
	HVAC	3	2%	7%	0%	0	0%	0%	0%	3	2%	7%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Other	3	2%	1%	8%	1	0%	0%	0%	4	2%	1%	8%
	Refrigeration	0	0%	0%	0%	1	0%	0%	0%	1	0%	0%	0%
Don't Know/ Refused	Boilers & Burners	0	0%	0%	0%	5	0%	0%	1%	5	0%	0%	1%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	6	0%	0%	0%	6	0%	0%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	9	1%	1%	0%	9	1%	1%	0%
	Other	1	0%	0%	0%	1	0%	0%	0%	2	0%	0%	0%
	Refrigeration	0	0%	0%	0%	3	0%	0%	0%	3	0%	0%	0%
Total	Boilers & Burners	14	0%	0%	10%	206	0%	0%	25%	220	0%	0%	35%
	Expanded Process	39	15%	11%	23%	0	0%	0%	0%	39	15%	11%	23%
	HVAC	42	9%	24%	18%	66	1%	2%	8%	108	10%	27%	26%
	Non-Small CFL Lighting	19	9%	10%	0%	332	35%	31%	0%	351	44%	41%	0%
	Other	26	15%	10%	14%	40	2%	1%	1%	66	16%	11%	14%
	Refrigeration	12	4%	3%	2%	104	10%	7%	0%	116	14%	10%	2%

The table shows that the non-small CFL lighting group was the most likely to have installed the same quantity, with 173 responses representing 26 percent of total kWh savings and 24 percent of total kW savings. Again, the greatest number of responses were for deemed measures (158), representing 18 percent of total kWh savings and 16 percent of total kW savings. For therms, the Boilers and Burners group had the greatest number of "Same" responses (163) representing 26 percent of total therm savings.

For responses of "Less," "More," or "None" (which receive at least partial quantity attribution), the non-small CFL lighting group again had the greatest number of responses (169) representing 16 percent of the total kWh savings and 16 percent of the kW savings. For therms, the measure group with the greatest portion of savings in this category was the HVAC group, representing 13 percent of total therm savings.

Table D-10 shows the distribution of responses to the DAT3 quantity question by reporting measure group. In the table, the percentage savings reported are a percentage of the total measure group savings for each energy unit.

Table D-10. Responses to the DAT3 Quantity Question by Reporting Measure Group, Percentage of Measure Group Savings

DAT3. Without Focus, how different would the quantity/size have been?													
		Not Deemed				Deemed				Total			
Response	Reporting Measure Group	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms
Same Amount	Boilers & Burners	7	3%	0%	21%	156	0%	0%	53%	163	3%	0%	75%
	Expanded Process	19	51%	56%	20%	0	0%	0%	0%	19	51%	56%	20%
	HVAC	20	46%	37%	42%	45	11%	8%	9%	65	57%	45%	50%
	Non-Small CFL Lighting	15	17%	19%	0%	158	42%	39%	0%	173	59%	58%	0%
	Other	15	43%	31%	22%	25	3%	3%	2%	40	46%	35%	24%
	Refrigeration	7	20%	15%	80%	42	35%	38%	0%	49	55%	53%	80%
Less	Boilers & Burners	2	0%	0%	0%	24	0%	0%	8%	26	0%	0%	8%
	Expanded Process	3	21%	23%	0%	0	0%	0%	0%	3	21%	23%	0%
	HVAC	9	15%	8%	11%	7	0%	0%	18%	16	15%	8%	29%
	Non-Small CFL Lighting	2	2%	4%	0%	90	21%	18%	0%	92	23%	23%	0%
	Other	1	2%	6%	6%	5	1%	1%	0%	6	3%	7%	7%
	Refrigeration	4	11%	12%	20%	55	30%	29%	0%	59	40%	42%	20%
More	Boilers & Burners	0	0%	0%	0%	10	0%	0%	3%	10	0%	0%	3%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	8	2%	1%	4%	8	2%	1%	4%
	Non-Small CFL Lighting	0	0%	0%	0%	6	1%	1%	0%	6	1%	1%	0%
	Other	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
None	Boilers & Burners	3	97%	100%	0%	11	0%	0%	4%	14	97%	100%	4%
	Expanded Process	9	25%	21%	28%	0	0%	0%	0%	9	25%	21%	28%
	HVAC	10	9%	18%	15%	0	0%	0%	0%	10	9%	18%	15%
	Non-Small CFL Lighting	2	0%	1%	0%	69	14%	15%	0%	71	15%	16%	0%
	Other	6	32%	45%	11%	8	6%	1%	0%	14	38%	46%	11%
	Refrigeration	1	0%	0%	0%	3	1%	1%	0%	4	1%	1%	0%
Not Applicable	Boilers & Burners	2	0%	0%	8%	0	0%	0%	0%	2	0%	0%	8%
	Expanded Process	8	3%	0%	52%	0	0%	0%	0%	8	3%	0%	52%
	HVAC	3	17%	27%	1%	0	0%	0%	0%	3	17%	27%	1%
	Non-Small CFL Lighting	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Other	3	11%	11%	57%	1	0%	0%	0%	4	11%	11%	57%
	Refrigeration	0	0%	0%	0%	1	3%	3%	0%	1	3%	3%	0%
Don't Know/ Refused	Boilers & Burners	0	0%	0%	0%	5	0%	0%	2%	5	0%	0%	2%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	6	0%	0%	1%	6	0%	0%	1%
	Non-Small CFL Lighting	0	0%	0%	0%	9	3%	2%	0%	9	3%	2%	0%
	Other	1	2%	1%	0%	1	0%	0%	1%	2	2%	1%	1%
	Refrigeration	0	0%	0%	0%	3	1%	1%	0%	3	1%	1%	0%
Total	Boilers & Burners	14	100%	100%	29%	206	0%	0%	71%	220	100%	100%	100%
	Expanded Process	39	100%	100%	100%	0	0%	0%	0%	39	100%	100%	100%
	HVAC	42	87%	91%	68%	66	13%	9%	32%	108	100%	100%	100%
	Non-Small CFL Lighting	19	20%	25%	0%	332	80%	75%	0%	351	100%	100%	100%
	Other	26	91%	95%	96%	40	9%	5%	4%	66	100%	100%	100%
	Refrigeration	12	31%	28%	100%	104	69%	72%	0%	116	100%	100%	100%

The table shows that the non-small CFL lighting measure group has the highest proportion of savings represented by "Same" responses, at 59 percent kWh and 58 percent kW. The refrigeration (55 percent kWh, 53 percent kW) and HVAC (57 percent kWh, 45 percent kW)

groups were similar. The refrigeration measure group has the highest proportion of therm savings represented by “Same” responses at 80 percent.

D.2.1 Comparison questions

The evaluation framework requires formalized confirmation questions that are used to confirm the responses to the attribution analysis questions. The current survey uses a number of questions to confirm the responses to the attribution questions. The comparison methodology is different for the engineering and CATI surveys.

a. ENGINEERING SURVEY

The engineering survey is delivered by expert interviewers trained to observe and resolve inconsistencies while the survey is being delivered. As a result, there are very few standardized and easily-reported confirmation questions in the engineering survey.

Once the survey is completed, a senior KEMA engineer reads the surveys to ensure that the answers throughout are consistent. The engineer compares answers in the Measure Group section to the attribution responses to make sure they are consistent. She also compares the attribution question answers to a number of open-ended questions asked in the attribution section. Changes are made as warranted. The reviewer makes every effort to be consistent across all surveys.

There is one closed question in the attribution section that is used to verify the attribution analysis answers. Table D-11 shows the responses to the DAT0 question in the engineering survey.

Table D-11. DAT0 Comparison Question

DAT0. Without Focus, what would you say the likelihood of installing was?				
Response	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**
Very likely	82	23%	20%	24%
Somewhat likely	74	13%	16%	26%
Not very likely	129	33%	31%	24%
Very unlikely	99	30%	32%	22%
Don't know/refused	16	1%	1%	4%

The table shows that the kWh and kW savings tend to fall in the “Not very likely” and “Very unlikely” responses. The therm savings are fairly evenly distributed across the four response categories.

b. CATI SURVEY

The CATI survey was delivered by a survey house. Though the surveyors are well trained in proper survey delivery techniques, their energy efficiency knowledge is unknown. As a result, KEMA designed the CATI survey with built-in, automatic confirmation questions to verify the answers to the attribution questions.

During the survey, KEMA used the response to the DAT0 question to confirm the answers to the attribution questions where inconsistencies appeared to be possible. An example of the process is DAT3_conf1, shown below.

DAT3_conf1: "I'd just like to confirm; you said that without Focus, you were very unlikely to install the equipment at all and that you would have done the same amount? Is that correct?"

DAT3_conf1 is asked if the answer to DAT0 is "Very Unlikely" and the answer to DAT3 (the quantity attribution question) is "Same Amount". If the respondent answers "No" to DAT3_conf1, the surveyor returns to the DAT3 question and asks it again. For this round of data collection, 16 respondents provided answers that triggered one of the four automatic confirmation questions. Not one of the respondents answered "No."

KEMA also did one post-delivery confirmation check on the timing attribution sequence using question M56c_timing in the Measure Group section of the survey.

M56c_timing: "How did the Focus on Energy advisor influence the project timing? Did their influence accelerate the project timing, decelerate the project timing, or have no effect on the project timing?"

For respondents who indicated that the Energy Advisor had accelerated the measure timing, KEMA reviewed the DAT1a timing attribution answers to confirm that they were consistent with M56c_timing. If the original answer to DAT1a was "Same Time", KEMA changed the response to "Later" and set the DAT1b response ("How much later?") to "Don't Know." This combination of responses will provide for some timing attribution for those respondents.

D.3 DETERMINING ATTRIBUTION

Appendix E explains, in great detail, how the attribution components are determined. In this section we review the survey responses that are used to calculate attribution and show the frequency of responses that would produce a given attribution answer.

D.3.1 Overall

Table D-12 shows the distribution of responses across the timing attribution sequence (DAT1a and DAT1b). The table includes a column to indicate the timing attribution that would result from each response combination.

Table D-12. Determining Timing Attribution

DAT1a. Without Focus, how different would the timing have been?						
DAT1b. Approximately how many months later?						
DAT1a Response	**DAT1b Response**	**Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Timing Attribution**
Same time	N/A	344	34%	34%	44%	0
Earlier	N/A	3	0%	0%	0%	0
Later	Months < 48	294	30%	32%	17%	Months / 48
	Months >= 48	21	4%	3%	6%	100%
	Don't know/refused	73	5%	4%	11%	Average of DAT1b
Never	N/A	131	25%	25%	19%	100%
Don't know/refused	N/A	34	2%	2%	2%	Average of DAT1a

The table shows that 347 of the respondents would have not received any timing attribution, representing 34 percent of kWh savings, 34 percent of kW savings, and 44 percent of therm savings. A smaller number of respondents indicated 100 percent attribution (152) but they represent a comparable portion of the savings with 29 percent of kWh savings, 28 percent of kW savings, and 25 percent of therm savings.

Table D-13 shows the distribution of responses across the efficiency attribution sequence (DAT2a and DAT2b).

Table D-13. Determining Efficiency Attribution

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?						
DAT2b. Without Focus, what efficiency would you have installed?						
DAT2a Response	**DAT2b Response**	**# Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Efficiency Attribution**
Same	N/A	284	33%	31%	21%	0%
Lower	Standard Efficiency	129	12%	10%	3%	100%
	Slightly > Standard	4	0%	0%	0%	70%
	Between Standard and High	6	3%	5%	0%	50%
	Slightly < High	9	1%	1%	1%	30%
	Don't know/refused	10	1%	3%	7%	Average of DAT2b
Higher	N/A	8	1%	1%	0%	0%
Not applicable	N/A	402	45%	46%	65%	-
Don't know/refused	N/A	48	4%	4%	3%	Average of DAT2a

Efficiency was not applicable for 402 measures representing 45 percent of the kWh savings, 46 percent of the kW savings, and 65 percent of the therm savings. As mentioned in the previous section, efficiency attribution does not apply to all measures. The “Not Applicable” measures are most likely variable frequency drive or tune-up measures. If the “Not Applicable” measures are disregarded, then the majority of the respondents indicate that Focus did not influence the efficiency of the equipment that was installed, representing 33 percent of kWh savings, 31 percent of kW savings, and 21 percent of therm savings. One hundred and twenty-nine responses indicated 100 percent efficiency attribution, representing 12 percent of kWh savings, 10 percent of kW savings, and three percent of therm savings.

Table D-14 shows the distribution of responses across the quantity attribution sequence (DAT3 and DAT3a).

Table D-14. Determining Quantity Attribution

DAT3. Without Focus, how different would the quantity/size have been?						
DAT3a. By what percentage did you change the amount installed because of Focus?						
DAT3 Response	**DAT3a Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Quantity Attribution**
Same amount	N/A	509	55%	51%	49%	0%
Less	Value < 100%	62	6%	5%	3%	Value < 50%
	Value >= 100%	114	13%	11%	7%	Value > 50%
	Don't know/refused	26	3%	4%	2%	Average of DAT3a
More	Value < 100%	20	0%	0%	2%	Value < 100%
	Value >= 100%	0	0%	0%	0%	Value = 100%
	Don't know/refused	4	0%	0%	0%	Average of DAT3a
None	N/A	122	18%	19%	13%	100%
Not applicable	N/A	18	4%	9%	23%	-
Don't know/refused	N/A	25	2%	1%	1%	Average of DAT3

Quantity was not applicable for 18 responses representing four percent of kWh savings, nine percent of kW savings and 23 percent of therm savings. As mentioned in the previous section, quantity attribution does not apply to all measures. The majority of respondents (509) indicated that they would have installed a measure of the same quantity without Focus, representing 55 percent of kWh, 51 percent of kW, and 49 percent of therm savings.

Table D-15 shows the effect of all three attribution components together. In the table, a "Yes" represents responses that received **some** (not necessarily full) attribution while a "No" represents responses that did not receive any attribution.

Table D-15. Simplistic Representation of Overall Attribution

Attribution			Not Deemed				Deemed			
Timing	**Efficiency**	**Quantity**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**
Yes	Yes	Yes	1	0%	0%	1%	87	6%	6%	0%
Yes	No	Yes	14	3%	4%	2%	105	8%	5%	5%
Yes	No	No	25	7%	11%	13%	134	10%	10%	7%
Yes	Yes	No	3	1%	1%	1%	24	1%	1%	0%
No	Yes	Yes	5	2%	1%	1%	44	4%	4%	0%
No	Yes	No	17	6%	7%	11%	25	1%	1%	0%
No	No	Yes	33	14%	16%	12%	84	4%	4%	7%
No	No	No	54	20%	18%	26%	245	13%	11%	13%

The table shows that 54 non-deemed measures did not receive any attribution representing 20 percent of kWh savings, 18 percent of kW savings, and 26 percent of therm savings. Of the deemed measures, 245 did not receive any attribution representing 13 percent of kWh savings, 11 percent of kW savings, and 13 percent of therm savings. Eighty-seven measures received all three forms of attribution, representing six percent of kWh savings, six percent of kW savings, and zero percent of therm savings.

D.3.2 By reporting measure group

Table D-16 through Table D-21 show the distribution of responses across the timing attribution sequence (DAT1a and DAT1b) by reporting measure group. In the tables, the percentage savings represent the percentage of measure group savings.

Table D-16. Timing Attribution by Reporting Measure Group, Boilers and Burners

DAT1a. Without Focus, how different would the timing have been?						
DAT1b. Approximately how many months later?						
DAT1a Response	**DAT1b Response**	**Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Timing Attribution**
Same time	N/A	121	0%	0%	50%	0
Earlier	N/A	0	0%	0%	0%	0
Later	Months < 48	56	0%	0%	21%	Months / 48
	Months >= 48	4	0%	0%	3%	100%
	Don't know/refused	13	0%	0%	6%	Average of DAT1b
Never	N/A	14	100%	100%	16%	100%
Don't know/refused	N/A	12	0%	0%	5%	Average of DAT1a

Table D-17. Timing Attribution by Reporting Measure Group, Expanded Process

DAT1a. Without Focus, how different would the timing have been?						
DAT1b. Approximately how many months later?						
DAT1a Response	**DAT1b Response**	**Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Timing Attribution**
Same Time	N/A	9	39%	36%	14%	0
Earlier	N/A	0	0%	0%	0%	0
Later	Months < 48	9	27%	32%	15%	Months / 48
	Months >= 48	1	0%	0%	6%	100%
	Don't Know/Refused	7	1%	2%	36%	Average of DAT1b
Never	N/A	13	32%	29%	29%	100%
Don't know/refused	N/A	0	0%	0%	0%	Average of DAT1a

Table D-18. Timing Attribution by Reporting Measure Group, HVAC

DAT1a. Without Focus, how different would the timing have been?						
DAT1b. Approximately how many months later?						
DAT1a Response	**DAT1b Response**	**Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Timing Attribution**
Same time	N/A	68	59%	48%	48%	0
Earlier	N/A	0	0%	0%	0%	0
Later	Months < 48	20	23%	33%	18%	Months / 48
	Months >= 48	2	8%	0%	9%	100%
	Don't know/refused	3	2%	0%	1%	Average of DAT1b
Never	N/A	10	7%	19%	22%	100%
Don't know/refused	N/A	5	0%	0%	2%	Average of DAT1a

Table D-19. Timing Attribution by Reporting Measure Group, Non-Small CFL Lighting

DAT1a. Without Focus, how different would the timing have been?						
DAT1b. Approximately how many months later?						
DAT1a Response	**DAT1b Response**	**Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Timing Attribution**
Same time	N/A	62	19%	22%	0%	0
Earlier	N/A	2	1%	1%	0%	0
Later	Months < 48	146	39%	36%	0%	Months / 48
	Months >= 48	12	2%	2%	0%	100%
	Don't know/refused	42	8%	7%	0%	Average of DAT1b
Never	N/A	74	28%	28%	0%	100%
Don't know/refused	N/A	13	4%	4%	0%	Average of DAT1a

Table D-20. Timing Attribution by Reporting Measure Group, Refrigeration

DAT1a. Without Focus, how different would the timing have been?						
DAT1b. Approximately how many months later?						
DAT1a Response	**DAT1b Response**	**Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Timing Attribution**
Same time	N/A	46	46%	44%	0%	0
Earlier	N/A	0	0%	0%	0%	0
Later	Months < 48	54	38%	44%	20%	Months / 48
	Months >= 48	1	0%	0%	75%	100%
	Don't know/refused	7	6%	6%	0%	Average of DAT1b
Never	N/A	6	7%	2%	5%	100%
Don't know/refused	N/A	2	3%	3%	0%	Average of DAT1a

Table D-21. Timing Attribution by Reporting Measure Group, Other

DAT1a. Without Focus, how different would the timing have been?						
DAT1b. Approximately how many months later?						
DAT1a Response	**DAT1b Response**	**Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Timing Attribution**
Same time	N/A	38	41%	35%	77%	0
Earlier	N/A	1	0%	0%	0%	0
Later	Months < 48	9	4%	4%	6%	Months / 48
	Months >= 48	1	16%	15%	0%	100%
	Don't know/refused	1	0%	0%	5%	Average of DAT1b
Never	N/A	14	38%	46%	11%	100%
Don't know/refused	N/A	2	0%	0%	1%	Average of DAT1a

The boilers and burners and HVAC measure groups have the highest portion of savings represented by the “Same Time” response. In the HVAC group, the “Same Time” respondents represent 59 percent of kWh savings, 48 percent of kW savings, and 48 percent of therm savings. In the boilers and burners group, the “Same Time” respondents represent zero percent of kWh savings, zero percent of kW savings, and 50 percent of therm savings. The non-small CFL lighting measure group has the highest proportion of savings that receive 100 percent timing attribution, at 30 percent of kWh, 30 percent of kW, and zero percent of therms.

Table D-22 through Table D-27 show the distribution of responses across the efficiency attribution sequence (DAT2a and DAT2b) by reporting measure group. In the tables, the percentage savings represent the percentage of measure group savings.

Table D-22. Efficiency Attribution by Reporting Measure Group, Boilers and Burners

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?						
DAT2b. Without Focus, what efficiency would you have installed?						
DAT2a Response	**DAT2b Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Efficiency Attribution**
Same	N/A	12	0%	0%	13%	0%
Lower	Standard Efficiency	5	3%	0%	1%	100%
	Slightly > Standard	0	0%	0%	0%	70%
	Between Standard and High	1	0%	0%	0%	50%
	Slightly < High	0	0%	0%	0%	30%
	Don't Know/Refused	1	0%	0%	2%	Average of DAT2b
Higher	N/A	0	0%	0%	0%	0%
Not applicable	N/A	197	97%	100%	77%	-
Don't know/refused	N/A	4	0%	0%	7%	Average of DAT2a

Table D-23. Efficiency Attribution by Reporting Measure Group, Expanded Process

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?						
DAT2b. Without Focus, what efficiency would you have installed?						
DAT2a Response	**DAT2b Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Efficiency Attribution**
Same	N/A	5	17%	22%	13%	0%
Lower	Standard Efficiency	2	5%	9%	6%	100%
	Slightly > Standard	0	0%	0%	0%	70%
	Between Standard and High	2	10%	4%	0%	50%
	Slightly < High	0	0%	0%	0%	30%
	Don't Know/Refused	2	1%	1%	4%	Average of DAT2b
Higher	N/A	0	0%	0%	0%	0%
Not applicable	N/A	27	68%	64%	73%	-
Don't know/refused	N/A	1	0%	0%	4%	Average of DAT2a

Table D-24. Efficiency Attribution by Reporting Measure Group, HVAC

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?						
DAT2b. Without Focus, what efficiency would you have installed?						
DAT2a Response	**DAT2b Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Efficiency Attribution**
Same	N/A	42	27%	9%	29%	0%
Lower	Standard Efficiency	5	0%	1%	4%	100%
	Slightly > Standard	2	0%	0%	0%	70%
	Between Standard and High	2	15%	14%	0%	50%
	Slightly < High	1	0%	0%	0%	30%
	Don't Know/Refused	0	0%	0%	0%	Average of DAT2b
Higher	N/A	0	0%	0%	0%	0%
Not applicable	N/A	50	55%	74%	66%	-
Don't know/refused	N/A	6	2%	2%	0%	Average of DAT2a

Table D-25. Efficiency Attribution by Reporting Measure Group, Non-Small CFL Lighting

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?						
DAT2b. Without Focus, what efficiency would you have installed?						
DAT2a Response	**DAT2b Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Efficiency Attribution**
Same	N/A	173	51%	58%	0%	0%
Lower	Standard Efficiency	89	13%	15%	0%	100%
	Slightly > Standard	1	0%	0%	0%	70%
	Between Standard and High	1	0%	0%	0%	50%
	Slightly < High	5	1%	1%	0%	30%
	Don't Know/Refused	5	1%	1%	0%	Average of DAT2b
Higher	N/A	7	3%	2%	0%	0%
Not applicable	N/A	36	23%	14%	0%	-
Don't know/refused	N/A	34	7%	7%	0%	Average of DAT2a

Table D-26. Efficiency Attribution by Reporting Measure Group, Refrigeration

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?						
DAT2b. Without Focus, what efficiency would you have installed?						
DAT2a Response	**DAT2b Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Efficiency Attribution**
Same	N/A	10	8%	12%	80%	0%
Lower	Standard Efficiency	26	32%	23%	0%	100%
	Slightly > Standard	0	0%	0%	0%	70%
	Between Standard and High	0	0%	0%	0%	50%
	Slightly < High	0	0%	0%	0%	30%
	Don't Know/Refused	0	0%	0%	0%	Average of DAT2b
Higher	N/A	0	0%	0%	0%	0%
Not applicable	N/A	80	60%	65%	20%	-
Don't know/refused	N/A	0	0%	0%	0%	Average of DAT2a

Table D-27. Efficiency Attribution by Reporting Measure Group, Other

DAT2a. Without Focus, would you have installed the same, higher, or lower efficiency?						
DAT2b. Without Focus, what efficiency would you have installed?						
DAT2a Response	**DAT2b Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Efficiency Attribution**
Same	N/A	42	25%	12%	28%	0%
Lower	Standard Efficiency	2	5%	0%	0%	100%
	Slightly > Standard	1	0%	0%	0%	70%
	Between Standard and High	0	0%	0%	0%	50%
	Slightly < High	3	1%	5%	8%	30%
	Don't Know/Refused	2	3%	17%	36%	Average of DAT2b
Higher	N/A	1	0%	0%	0%	0%
Not applicable	N/A	12	62%	63%	29%	-
Don't know/refused	N/A	3	3%	3%	0%	Average of DAT2a

The non-small CFL lighting measure group has the highest proportion of electric savings represented by the “Same” response, with 51 percent of kWh savings and 58 percent of kW savings. For therms, most measure groups have savings in either the “Same” response category or the “Not Applicable” category. The notable exception is the “Other” measure group which has 36 percent of therm savings that will receive attribution equal to the average of DAT2b.Table D-28 through Table D-33 show the distribution of responses across the efficiency attribution sequence (DAT3 and DAT3a) by reporting measure group. In the tables, the percent savings represent the percentage of measure group savings.

Table D-28. Quantity Attribution by Reporting Measure Group, Boilers and Burners

DAT3. Without Focus, how different would the quantity/size have been?						
DAT3a. By what percentage did you change the amount installed because of Focus?						
DAT3 Response	**DAT3a Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Quantity Attribution**
Same amount	N/A	163	3%	0%	75%	0%
Less	Value < 100%	15	0%	0%	6%	Value < 50%
	Value >= 100%	5	0%	0%	0%	Value > 50%
	Don't know/refused	6	0%	0%	2%	Average of DAT3a
More	Value < 100%	10	0%	0%	3%	Value < 100%
	Value >= 100%	0	0%	0%	0%	Value = 100%
	Don't know/refused	0	0%	0%	0%	Average of DAT3a
None	N/A	14	97%	100%	4%	100%
Not applicable	N/A	2	0%	0%	8%	-
Don't know/refused	N/A	5	0%	0%	2%	Average of DAT3

Table D-29. Quantity Attribution by Reporting Measure Group, Expanded Process

DAT3. Without Focus, how different would the quantity/size have been?						
DAT3a. By what percentage did you change the amount installed because of Focus?						
DAT3 Response	**DAT3a Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Quantity Attribution**
Same amount	N/A	19	51%	56%	20%	0%
Less	Value < 100%	1	5%	4%	0%	Value < 50%
	Value >= 100%	1	15%	18%	0%	Value > 50%
	Don't know/refused	1	1%	1%	0%	Average of DAT3a
More	Value < 100%	0	0%	0%	0%	Value < 100%
	Value >= 100%	0	0%	0%	0%	Value = 100%
	Don't know/refused	0	0%	0%	0%	Average of DAT3a
None	N/A	9	25%	21%	28%	100%
Not applicable	N/A	8	3%	0%	52%	-
Don't know/refused	N/A	0	0%	0%	0%	Average of DAT3

Table D-30. Quantity Attribution by Reporting Measure Group, HVAC

DAT3. Without Focus, how different would the quantity/size have been?						
DAT3a. By what percentage did you change the amount installed because of Focus?						
DAT3 Response	**DAT3a Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Quantity Attribution**
Same amount	N/A	65	57%	45%	50%	0%
Less	Value < 100%	5	1%	0%	2%	Value < 50%
	Value >= 100%	9	10%	2%	25%	Value > 50%
	Don't know/refused	2	4%	6%	2%	Average of DAT3a
More	Value < 100%	8	2%	1%	4%	Value < 100%
	Value >= 100%	0	0%	0%	0%	Value = 100%
	Don't know/refused	0	0%	0%	0%	Average of DAT3a
None	N/A	10	9%	18%	15%	100%
Not applicable	N/A	3	17%	27%	1%	-
Don't know/refused	N/A	6	0%	0%	1%	Average of DAT3

Table D-31. Quantity Attribution by Reporting Measure Group, Non-Small CFL Lighting

DAT3. Without Focus, how different would the quantity/size have been?						
DAT3a. By what percentage did you change the amount installed because of Focus?						
DAT3 Response	**DAT3a Response**	**Number of Responses**	**Percent kWh**	**Percent kW**	**Percent Therms**	**Quantity Attribution**
Same amount	N/A	173	59%	58%	0%	0%
Less	Value < 100%	23	7%	6%	0%	Value < 50%
	Value >= 100%	60	13%	15%	0%	Value > 50%
	Don't know/refused	9	3%	2%	0%	Average of DAT3a
More	Value < 100%	2	0%	0%	0%	Value < 100%
	Value >= 100%	0	0%	0%	0%	Value = 100%
	Don't know/refused	4	0%	0%	0%	Average of DAT3a
None	N/A	71	15%	16%	0%	100%
Not applicable	N/A	0	0%	0%	0%	-
Don't know/refused	N/A	9	3%	2%	0%	Average of DAT3

Table D-32. Quantity Attribution by Reporting Measure Group, Refrigeration

DAT3. Without Focus, how different would the quantity/size have been?						
DAT3a. By what percentage did you change the amount installed because of Focus?						
DAT3 Response	DAT3a Response	Number of Responses	Percent kWh	Percent kW	Percent Therms	Quantity Attribution
Same amount	N/A	49	55%	53%	80%	0%
Less	Value < 100%	13	9%	15%	0%	Value < 50%
	Value >= 100%	39	26%	21%	20%	Value > 50%
	Don't know/refused	7	4%	5%	0%	Average of DAT3a
More	Value < 100%	0	0%	0%	0%	Value < 100%
	Value >= 100%	0	0%	0%	0%	Value = 100%
	Don't know/refused	0	0%	0%	0%	Average of DAT3a
None	N/A	4	1%	1%	0%	100%
Not applicable	N/A	1	3%	3%	0%	-
Don't know/refused	N/A	3	1%	1%	0%	Average of DAT3

Table D-33. Quantity Attribution by Reporting Measure Group, Other

DAT3. Without Focus, how different would the quantity/size have been?						
DAT3a. By what percentage did you change the amount installed because of Focus?						
DAT3 Response	DAT3a Response	Number of Responses	Percent kWh	Percent kW	Percent Therms	Quantity Attribution
Same amount	N/A	40	46%	35%	24%	0%
Less	Value < 100%	5	1%	1%	0%	Value < 50%
	Value >= 100%	0	0%	0%	0%	Value > 50%
	Don't know/refused	1	2%	6%	6%	Average of DAT3a
More	Value < 100%	0	0%	0%	0%	Value < 100%
	Value >= 100%	0	0%	0%	0%	Value = 100%
	Don't know/refused	0	0%	0%	0%	Average of DAT3a
None	N/A	14	38%	46%	11%	100%
Not applicable	N/A	4	11%	11%	57%	-
Don't know/refused	N/A	2	2%	1%	1%	Average of DAT3

The non-small CFL lighting measure group has the highest proportion of electric savings in the "Same Amount" response at 59 percent kWh and 58 percent kW. The refrigeration measure group has the highest proportion of therms savings in the "Same Amount" response at 80 percent. The boilers and burners group has the highest proportion of savings in the "None" response at 97 percent of kWh savings, 100 percent of kW savings, and four percent of therm savings.

D.4 SUPPLIER SURVEY EFFECTS

The supplier surveys are conducted to identify measures where the program influences the supplier and the supplier influences the participant as opposed to measures where the program influences the participant directly. In this round, KEMA used post-participant survey analysis to determine when a supplier survey would be completed. Every survey that was completed was reviewed to determine the effect the supplier had on the participant's decision to install a given measure relative to the program's effect. If the participant indicated that the program did not

have an effect on their decision to install high efficiency equipment but the supplier had substantial influence then we attempted to complete a survey with the supplier.

There were 57 supplier surveys completed in this round of evaluation, significantly less than the 114 completed for the last evaluation but consistent with the scope of work identified in the detailed evaluation plans for CY10. To determine attribution for measures with supplier surveys, the attribution received from the participant survey is compared to the attribution received from the supplier survey. The higher of the two values is chosen as the overall attribution for that participant. Of the 57 surveys completed, approximately one-quarter of the supplier surveys had attribution greater than that provided by the customer for an individual measure, representing only one percent of kWh savings, one percent of kW savings, and zero percent of therm savings. However, those that did not have a higher attribution had a greater portion of savings, representing five percent kWh, two percent kW, and six percent therms. Table D-34 shows the breakout.

Table D-34. Breakdown of Completed Supplier Surveys

Supplier Survey Completed	Supplier Attribution Greater	Responses	Percent kWh	Percent kW	Percent Therms
No		843	93%	97%	94%
Yes	No	42	5%	2%	6%
	Yes	15	1%	1%	0%

Table D-35 shows the DAT1a timing attribution responses from the supplier surveys. The table shows that the majority of the respondents indicated that the measures would have been installed at the same time without the program. This represents the greatest portion of electric savings with 52 percent of kWh savings, 45 percent of kW savings, and 37 percent of therms savings. The greatest proportion of therm savings is represented by those respondents who answered “Never” with 62 percent savings.

Table D-35. Timing Attribution, Supplier Surveys

DAT1a	Responses	Percent kWh	Percent kW	Percent Therms
Same time	31	52%	45%	37%
Earlier	0	0%	0%	0%
Later	1	0%	0%	0%
Never	10	31%	25%	62%
Don't know/refused	0	0%	0%	0%

Table D-36 shows the DAT2a efficiency attribution responses from the supplier surveys. The majority of respondents indicated that the same efficiency would have been installed without the program, representing 48 percent of kWh savings, 79 percent of kW savings, and 90 percent of therms savings.

Table D-36. Efficiency Attribution, Supplier Surveys

DAT2a	Responses	Percent kWh	Percent kW	Percent Therms
Same	39	48%	79%	90%
Lower	9	3%	13%	10%
Higher	0	0%	0%	0%
Not applicable	9	49%	7%	0%
Don't know/refused	0	0%	0%	0%

Table D-37 shows the DAT3 quantity attribution responses from the supplier surveys. The overwhelming majority of respondents indicated that the same quantity would have been installed in the absence of the program. The 35 “Same Amount” responses represent 73 percent of kWh savings, 41 percent of kW savings, and 91 percent of therms savings.

Table D-37. Quantity Attribution, Supplier Surveys

DAT3	Responses	Percent kWh	Percent kW	Percent Therms
Same amount	35	73%	41%	91%
Less	7	12%	32%	5%
More	2	0%	0%	3%
None	11	16%	26%	1%
Don't know/refused	2	0%	0%	0%

D.5 ATTRIBUTION COMPARISON, CY09 AND CY10

KEMA compared the CY10 attribution results to the CY09 results to identify changes or trends. Table D-41 shows a comparison of the overall attribution using a similar format to Table D-15 above. The first three columns indicate whether a measure achieved timing, efficiency, or quantity attribution. A “Yes” indicates some level of attribution. A “No” indicates no attribution of that type (timing, efficiency, or quantity) for that measure. The “mix” of attribution responses is shown separately for deemed and not deemed measures. The number of responses for each attribution “mix” of timing, efficiency, and quantity is shown for each period along with the percentage of savings represented by those responses. In this table, the percentage of savings shown is a percentage of the total “Deemed” or “Not Deemed” savings, not a percentage of the savings overall.[59] The “Change” columns show the relative difference from CY09 to CY10 for each attribution category. A negative value indicates a decrease in the percentage savings from CY09 to CY10 and a positive value indicates an increase.

There are very few significant differences from CY09 to CY10. In general, the “Deemed” savings results have remained stable between the two p0065riods. Only four of the 24 “Deemed” energy unit/attribution type categories show changes of greater than five percent with a maximum change of nine percent in the “yes, yes, yes” category for kW. Though the “Not Deemed” projects show greater variation (13 of the 24 categories show changes of greater than 5%), no category resulted in a change of more than 20 percent. The largest change is seen in the “no, no, no” category which has an increase in kWh savings of 16 percent.

[59] Since deemed measures are a greater percentage of the program in CY10, a comparison of overall savings changes simply reflects the overall decrease in Not Deemed savings and overall increase in Deemed savings. This method allows for greater comparison.

A deeper look at the table shows some interesting trends. For not deemed measures, there is a general trend away from Timing attribution, with the change in savings for Timing = Yes decreasing in most categories (9 of 12) and the change in savings generally increasing for Timing = No (9 of 12). For the deemed measures the trend is in the other direction, with 7 of 12 categories showing a positive change for Timing = Yes and 7 of 12 categories showing a negative change for Timing = No.

For deemed measures, there is a general trend away from efficiency attribution, with the change in savings for Efficiency = Yes decreasing in most categories (8 of 12) and the change in savings generally increasing for Efficiency = No (9 of 12).

Table D-38. Overall Attribution Comparison, CY09 to CY10

	Attribution			CY09				CY10				Change		
	Timing	Efficiency	Quantity	# Responses	Percent kWh	Percent kW	Percent Therms	# Responses	Percent kWh	Percent kW	Percent Therms	Percent kWh	Percent kW	Percent Therms
Not Deemed	Yes	Yes	Yes	5	0%	2%	0%	1	0%	0%	1%	0%	-2%	1%
	Yes	No	Yes	18	8%	8%	12%	14	5%	6%	4%	-3%	-2%	-9%
	Yes	No	No	46	24%	25%	21%	25	14%	18%	20%	-10%	-7%	-1%
	Yes	Yes	No	7	7%	7%	0%	3	2%	2%	1%	-6%	-5%	1%
	No	Yes	Yes	7	13%	11%	0%	5	4%	2%	1%	-9%	-9%	1%
	No	Yes	No	15	4%	5%	7%	17	11%	13%	16%	7%	8%	9%
	No	No	Yes	43	21%	13%	23%	33	26%	27%	18%	5%	15%	-5%
	No	No	No	90	22%	29%	36%	54	38%	31%	39%	16%	2%	3%
Deemed	Yes	Yes	Yes	11	5%	5%	0%	87	13%	14%	0%	8%	9%	0%
	Yes	No	Yes	73	15%	11%	22%	105	16%	13%	15%	1%	2%	-7%
	Yes	No	No	96	20%	20%	18%	134	22%	23%	22%	1%	3%	4%
	Yes	Yes	No	13	4%	6%	1%	24	2%	2%	1%	-3%	-4%	0%
	No	Yes	Yes	47	13%	12%	0%	44	9%	9%	0%	-4%	-3%	0%
	No	Yes	No	30	5%	7%	2%	25	3%	3%	1%	-2%	-4%	-1%
	No	No	Yes	78	15%	13%	20%	84	9%	9%	22%	-6%	-4%	2%
	No	No	No	210	23%	27%	37%	245	27%	27%	39%	4%	0%	3%

D.6 OPEN-ENDED SURVEY RESPONSES

The last question in the attribution sequence is DAT4, which asks participants to “summarize the program’s influence on the timing, efficiency, and amount of [equipment type]” that the participant installed. The tables in this section show some of the responses to DAT4 from the engineering and CATI surveys and the yes/no attribution associated with each of them.

The DAT4 answer is collected at the measure level but many participants provide an answer and indicate that it applies to all of the measures they installed during the previous evaluation period. In developing this table, we eliminated duplicate responses from the same participant; therefore, the table does not have one answer for every measure evaluated. Some participants do provide different answers for different measures; therefore, the table does not have only one answer for every participant evaluated. The purpose of this table is to communicate some of the information that the evaluation team receives in the course of conducting the surveys.

The answers in the table were “cleaned” to protect client confidentiality. We removed company names, contact names, energy advisor names, and information that may allow someone to identify the measure from the response. In most cases, we replaced the cleaned word or phrase with a more anonymous word to make sure the comment remained somewhat readable.

Table D-3941 shows the DAT4 responses for measures in the engineering survey that received attribution, and Table D-4042 shows the DAT4 responses for measures in the engineering

survey that did not receive attribution. Table D-41 and Table D-42 provide the same information for the CATI survey respondents.

Table D-39. Open-ended Responses to DAT4, Engineering Measures with Attribution

Open Responses, DAT4, ENGI Survey , With Attribution
Without the incentive, they wouldn't have gone through with this at the timing that they did. Maybe would have done it years later but not sure
It reduces the project cost. So that means we were able to install the most efficient systems at that reduced cost. the incremental rebates made it easy
See data 9
Like I said. We wouldn't have done this w/o focus. they helped us choose the best projects
The program was brought to my attention (FOE) and they said we could get money for a project like that. we still would have done it, just much later
Instrumental to getting it done
See data 9
Focus on Energy allowed projects to get done sooner. No real impact on efficiency, did get done sooner.
Incentives aided in roe allowing projects to be completed sooner at more locations and w/ higher efficiency
Wouldn't have happened now without focus
Like I said. We wouldn't have done this w/o focus. They helped us choose the best projects
Focus on Energy's incentive allowed them to go into a lot of detail with the project and address things they probably would not have afforded
Most likely we would never have taken the first step
Helped
I've fought the battle without focus and never would have won without them
They helped us along- mostly financially
100% influence
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
It wouldn't have happened
Project was made possible by focus
Focus did a great report and gave us some good suggestions for saving gas
Focus kind of got us to do this when we saw we could jump on it. It was a good opportunity
Focus is instrumental in getting this work done. They helped approval and selection of projects
Well we take our extra funds every year and put them into money saving projects that would otherwise be funded. Focus suggested this one- and we liked it so we did it
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
It was very favorable. we would not have found the solved problem. this also has made us aware of other areas for improvements
Like I said. We wouldn't have done this w/o focus. they helped us choose the best projects
Contact found out that incentives were available for measures in the next section of the building, but it would have been completed regardless of FOE.
Focus on Energy is instrumental in getting this work done. they helped approval and selection of projects
Focus on Energy and Alliant allowed projects to get done sooner. no real impact on efficiency, did get done sooner.
Focus definitely helped us get it done. we appreciated the help
Meet with the team, reviewed materials, instructed team (design team), help owner understand and push the team as well.

Open Responses, DAT4, ENGI Survey , With Attribution
Focus program, mainly the incentive, allowed the project to install more of this measure in a shorter time range. there were no efficiency choices
Don't think would've went without it
The focus program accelerated these projects by about 2 years
They just helped out financially really
Timing was perfect, helped us see other projects too
Excellent impact
Been great, everything was good
Focus suggested we do it and offered money. that was enough to give us leverage to get it done
Don't know really
I've fought the battle without focus and never would have won without them
The focus program accelerated these measures by about 2 years
The focus program had an effect on the timing and earlier execution of the project; however, the custom project would have been eventually completed regardless of the focus program, due to an obvious lack of operational efficiency
They were fantastic for us. We would not have been to 50% of these without their help.
The focus program had little influence on the project as a whole. it did accelerate the project by 5 months due to the custom grant approval
What made it happen
See data 9
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
Program incentive made it easier to approve this project cost. without incentive it's a 50/50 call.
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
We would have avoided the purchase as long as possible without focus. they convinced us this was really worth it. so we did it.
Lot of influence, helped us save energy and cut costs
They were involved with the numbers needed the incentives with our limited resources
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
Unlikely it would be done at this time
They definitely helped the timing. able to provide technical assistance which would have had to come from my staff and the whole process went faster
Focus had minor influence on the frequency of our service agreement with the contractor.
Focus on Energy incentives were the catalyst for starting this project
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
We were very pleased, helped. I don't know if everything would have happened the same measure
Instrumental to getting it done
Without the program incentive they would not have installed any standard equipment for several years at the minimum
The incentives were set to expire so they were willing to speed up the project in order to get the $
This project started out as a single measure. Focus told us we could do that and gave us all the details. They worked with us closely. Then they pulled that out and we had to make it work with prescriptive measures.
Big influence, discount made the time frame move up
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
Focus on Energy spent a lot of time really working on the details. They had a great effect
Very influential

Open Responses, DAT4, ENGI Survey , With Attribution
Project was made possible by focus
Like I said. We wouldn't have done this w/o focus. They helped us choose the best projects
The measures were usually staggered amounts of units, and were generally performed in the fall with the Focus on Energy program, all work was done all at once, and were bumped to spring to follow app deadlines
This project started out as a single measure. Focus told us we could do that and gave us all the details. They worked with us closely. Then they pulled that out and we had to make it work with prescriptive measures.
See data 1 he was in a hurry to finish the call at this point so I summed up what he was saying throughout the call
The focus program accelerated these projects by about 2 years
Do more thorough, more often
This project started out as a single measure. Focus told us we could do that and gave us all the details. they worked with us closely. Then they pulled that out and we had to make it work with prescriptive measures.
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
See data 1 he was in a hurry to finish the call at this point so I summed up what he was saying throughout the call
See data 1 he was in a hurry to finish the call at this point so I summed up what he was saying throughout the call
Crucial to the timing, efficiency. no effect on size
Efficiency and quantity the same would have not been done
Focus is instrumental in getting this work done. They helped approval and selection of projects
See data 1 he was in a hurry to finish the call at this point so I summed up what he was saying throughout the call
We would have replaced with the minimum.
Would never have done.
Huge incentive, wouldn't do without it
She thinks she selected the particular products because they were eligible for Focus on Energy rebates. She doesn't remember for sure though
Focus influenced timing and amount of measures to install. Incentives were primary catalyst.
Would never have done.
Without focus, we would never have known the opportunity for savings, so wouldn't have completed the measure.
The validation and partial support of the study, the technical dialogue all very important.
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
Very influential
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
Excellent impact
She thinks she selected the particular measures because they were high efficiency and they were eligible for Focus on Energy rebates. She doesn't remember for sure though
We moved forward faster and did more
We might have gone w/ slightly lower eff.
Focus provided incentives and (some) staffing contribution for this measure without focus assistance, fewer measures would have been installed at a much later time (at least 24 months)
Incentives bumped up project around 2 years, and actually could have been the catalyst for starting the projects at all

Open Responses, DAT4, ENGI Survey , With Attribution
Main thing was equipment, efficiency
Focus money lets us do these projects more often
Well, the guy on our board suggested the work, it made financial since w/ the focus incentive so we went for it
This was a large retro fit project that was accelerated about 12 months because of the incentives being "planned" in the budget allocation
Focus helped us the whole way on this from the idea to working with the contractors
Focus influenced timing and amount of the measure installed. The retrofit project probably would have not occurred without the focus program.
Helped make sure he knew what to decide
Big influence, 90% was because of focus
The work was usually staggered in amounts, and was generally performed in the fall with the Focus on Energy program. All work was done all at once, and were bumped to spring to follow app deadlines
Program incentive was crucial in making this project affordable and possible. it was very expensive and the incentive was needed
Doing it for free made it easier
They were fantastic for us. We would not have been to 50% of these without their help.
Had a lot to do with it probably wouldn’t have done without focus
Wouldn't have had it done without focus but would have cleaned when something broke
Because of incentive, pushed us to get going, would have been informal otherwise
What made it happen
They made the project easy to sell and get funding
Well - first off we wanted this package for its other features. The energy savings package was a bonus.
Encouraged them to do it sooner
Don't know
Incentive gave them payback (which was a lie)
Focus is instrumental in getting this work done. They helped approval and selection of projects
Gave him good info as far as what products would qualify and brought the payback period down to something they could afford
Good incentive to save gas
Made us go ahead early
Was crucial in decision by bringing items to light
Incentive gave them payback (which was a lie)
We know we wanted to do this work
Focus on Energy allowed projects to get done sooner. No real impact on efficiency, did get done sooner.
Incentives aided in roe allowing projects to be completed sooner at more locations and w/ higher efficiency
They helped us get it done quicker
Don’t know really
Focus is instrumental in getting this work done. They helped approval and selection of projects
Focus is instrumental in getting this work done. They helped approval and selection of projects
Would have done the equipment when they broke
Like I said. We were only doing them every 3-4 years. Focus convinced me-and now I have seen that every year is worth while
Focus on Energy just jump started it. we did more research, and we wanted to save more energy

Open Responses, DAT4, ENGI Survey , With Attribution
For this project, the focus incentive sped up the project by about 1 year. didn't have influence on quantity or efficiency selected
Focus is instrumental in getting this work done. They helped approval and selection of projects
Incentive had no impact on number but had impact on timing; installed measure because of incentive.
We wouldn't have done it without them
We know we wanted to do this work
Smaller chunks, might not have done it
Very strong influence
Helped expedite the project
Focus on Energy allowed projects to get done sooner. No real impact on efficiency, did get done sooner.
Focus is instrumental in getting this work done. They helped approval and selection of projects
Focus suggested we do the work and I also think they are a good idea. We wouldn't be able to do it yearly without them
Would not have done it.
This was perceptive. We had a whole pile of ideas, this was just one idea, and made sense.
Focus helped get us to do this work yearly now
Focus is instrumental in getting this work done. They helped approval and selection of projects
Project was made possible by focus
Helped set higher efficiency and sooner
Incentives aided in roe allowing projects to be completed sooner at more stores and w/ higher efficiency
They would have installed the same size and quantity of units without the program however the incentive helped cover the incremental cost for the higher efficiency equipment as opposed to the standard efficiency
Was crucial in decision by bringing items to light
Focus is instrumental in getting this work done. They helped approval and selection of projects
Without focus incentives and staffing grant, this project would have probably died or put on back burner for a long while
Very influential
Incentives aided in ROI allowing projects to be completed sooner at more stores and w/ higher efficiency
Focus let us know we could get an incentive. They helped get it done
The focus program accelerated these projects by about 2 years
Focus on Energy allowed projects to get done sooner. no real impact on efficiency, did get done sooner.
We know we wanted to do this work
Focus is instrumental in getting this work done. They helped approval and selection of projects
Like I said. We wouldn't have done this w/o focus. They helped us choose the best projects
Focus is instrumental in getting this work done. They helped approval and selection of projects
I'm pretty sure focus come on down here and suggested we do this project. I don't think we would have done it otherwise
They made the project easy to sell and get funding
Well the equipment about needed to be replaced, so we would have done that, but we would have done a different technology. Focus got us to go with the savings from using a cheaper technology instead
The ability to do this was because of focus. that was a driver to get this project completed
It obviously helped us identify energy savings. But what I learned about energy efficiency was huge. We had to do something, but working with focus made energy efficiency a focus point. That became what the project was about. It was a huge factor.

Table D-40. Open-ended Responses to DAT4, Engineering Measures without Attribution

Open Responses, DAT4, ENGI Survey , No Attribution
Well they didn't really affect what we were going to do, but the money was appreciated
Their role was limited. I would say no effect on our decisions
The program was not very influential in their decision to install the equipment they did
We were going to build these buildings anyways to accommodate increased capacity. Focus probably didn't have too much impact on the decision to build or efficiency. But, the money was definitely helpful.
Not too much effect. We were gunning for LEED so most decisions were made for that. Money was good though
The program had no influence on the timing, efficiency or quantity of the measure installed
Annual maintenance, no impact
We would have done the measure any way. It was our contractor's suggestion.
Program had no influence on this project at all
The Focus program had little, if any, influence on timing of project. Efficiency and quantity were not influenced by the program
They helped to validate the value of some of the stuff we looked at
The program didn't really effect her decision for the measures
We know we wanted to do this work
The program did not have an influence on the timing efficiency or amount of measure installed. incentives were definitely a perk but project was necessary
Didn't really effect it much
It had some impact. we might not have done the measures
No influence, work is done regardless as part of maintenance. Simply took advantage of incentives this year
Not a lot of influence
Focus had no impact on our decisions to install this
Annual work, no impact
Not much effect- other than the money allowed us to do some other projects we might not have go them too.
No effect really. We appreciate the money, and we use it for other projects, but we always do these measures
The focus program had little, if any, influence on timing of project. Efficiency and quantity were not influenced by the program
Had no influence on timing efficiency or amount of measures installed. This was a small project that was deemed cost effective regardless of focus incentive although incentive helped
Positive and eye-opening experience with how much potential there was
Well they didn't really effect what we were going to do, but the money was appreciated
None
The focus program did not influence the timing, efficiency, or quantity of the equipment installed
The program incentive was helpful but he most likely would have performed the project installation without it
No impact
The program was not very influential in their decision to install the equipment they did
Measures are performed annually, regardless of the focus program, but incentive is helpful
Program had no influence on this project at all

Open Responses, DAT4, ENGI Survey , No Attribution
We know we wanted to do this work
Not much effect- other than the money allowed us to do some other projects we might not have go them too.
Focus on Energy program had no influence on the timing, efficiency, or the amount of equipment installed. This was a custom measure that farm did regardless of incentives
Ten percent of decision making- mostly for reliability
Would have continued with minimal maintenance
We know we wanted to do this work
Not much - we already did this work regularly but now we got a little more money
Focus program had no influence in timing, efficiency, or amount of equipment installed.
These were repair calls to fix new equipment, not an incentivized measure.
Incentives sped up measure (see mid1 above)
Basically no influence
They did not really have an effect. This work is worth it.
Focus program had no effect on the efficiency or amt of the measure in project. It had an indirect and small effect on the timing because incentives were tied in with another upgrade (see comments at end)
She didn't know about the Focus on Energy incentive for this measure until after she selected the equipment was installed
The program did not influence the timing, efficiency, or quantity of equipment purchased
The program had no influence on the timing, efficiency, or amount of equipment installed. This was a new construction project and quality is important
Not much- we already did this work- but now we got a little more money
Didn't really effect it much
Not much effect, we would have done it anyway
The focus incentives had no influence on the timing, efficiency, or amount of work completed. it had influence (very minor) on the logistics and scheduling (all at once instead of spread out over 1-2 months)
They probably would have installed the same equipment because they wanted a high efficiency in there
The old equipment failed so they replaced it with high efficiency, the incentive was helpful but she probably would have installed it without the incentive
Program had no influence on this project at all
Helped establish deadlines, gave them timetables
Would never have done.
Helped out a lot. on this project, focus was a small part

Table D-41. Open-ended Responses to DAT4, CATI Measures with Attribution

Open Responses, DAT4, CATI Survey , With Attribution
With cash back incentives sped up the process
Focus on energy was very efficient on the information they gave to us on recommending the efficiency. also the rebate focus on energy offered helped us get the job funded and completed sooner.
Payback for cost savings made us able to complete
Had a big effect, allowed us to do all the areas in our facility that we wanted to do right away, instead of having to space it out
Timing was perfect to replace rebate was the plus to defer cost
Without the Wisconsin focus on energy incentive program we would not have done the project

Open Responses, DAT4, CATI Survey , With Attribution
We decided that we needed to do it because of quality issues and wouldn't have done as many without focus
I think that we doubled the amount of effort we put in to the measure because of focus on energy's influence.
The timing was excellent.
Energy savings, equipment reliability
Overall, it was because of that program we made the decision, was less costly to do it
Nice incentive program, pushed us along to make right decision
Again , between efficiency and cost savings, the reduced costs that we would have received if we would have installed an unqualifying unit.
Focus on energy made the measure installation very attractive.
Again focus on energy was beneficial at pointing out the proper product to use, and being able to claim the energy efficiency we gained through the process, since we have everything pretty much re energized in our facility, it was through knowledge we gained from focus on energy, our energy cost has been very positive
Rebate cut down our cost
Able to complete projects much quicker, hire outside staff to perform installation. Started realizing savings 2 years earlier
It had a sped up process
They accelerated the timing because it made it easier to get the money.
We were able to do higher efficiency, more of them, and get it done it earlier
Same reason as before because we able to do higher efficiency and more of it
It increased our efficiency and quality of our building
Again, it is the same reason, it increased our efficiency and quality of our building
The timing was everything, without them offering it, I wouldn't have done it, the efficiency I can't say it would have been different. The number of the measure installed might have been different, I can't really say, because the fact is focus was involved, and I got what I wanted
Focus on Energy drove us to get high efficiency
They had a good influence
Without the rebate we would not have done this project at this time
Because of the rebate that was available at the time, we decided to upgrade with this measure
What the program offered energy efficiency and made us want to do it much sooner
Focus didn't have that much influence
Accelerated from replace early to preventative maintenance. Money allowed for a greater number of repairs
The program in its payback made the project a viable, do-it-now because of the energy savings, and therefore the energy costs.
The timing would not have been different, The number wouldn't have been different. The efficiency was higher because of focus on energy.
They convinced me to install the measure when I didn't think I needed any
The incentive is the sole reason we did this upgrade without out it, it wouldn't not have been done.
They were helpful in helping us in getting the project approved
Would not have been done quite as quick
I little bit of influence
When we installed, we got the bonus incentive, which greatly reduced the payback time to pay for the measure.
With the rebate were able to order more and change more than we could have otherwise

Open Responses, DAT4, CATI Survey , With Attribution
We had to have it, did help us complete the project in a timely manner
Moved timing for bonus incentive, upped efficiency for incentive, no impact on quantity
Focus on Energy made organization aware of efficiency products
It probably wouldn't have changed.
Give us more reliable service.
None
It caused us to move it up quite a bit, because of the rebate timing, it helped in paying for it
Without focus on energy providing the rebate we wouldn't have been able to do a project at all.
Accelerated the measure. Money allowed for a greater number of repairs
No
Moved timing for bonus incentive, upped efficiency for incentive, no impact on quantity
Same as the last answer. We put them in to get the bonus rebates last fall.
They were there to provide info on what programs were available for rebates. By getting those rebates, made projects move ahead faster and made decision-making a lot easier. Focus on energy did help us come to those decisions.
The rebate
Did not have to save as much money to do it ourselves
If we didn't have the program, we wouldn't have installed anything at all
The rebate was everything
The rebate
I believe that the program definitely had an influence on the time they put in and probably the efficiency for sure.
Very positive, helped justify us getting it done
It was a welcome improvement, efficiency has increased and we're hoping to see monthly reductions in our electric costs
No effect
We utilized it to do the measure, focus gave us an additional reason to do the work
It was positive starting to get us thinking about checking and getting the work done every year.
Made it worth my while to do it sooner than later, was worth the investment
Moved timing for bonus incentive, upped efficiency for incentive, no impact on quantity
No effect
They were good to work with and the two worked well together. They pointed out all the benefits of the new measures and showed us the energy savings we would receive overall, and they got us the rebate savings
By helping us to realize the cost efficiency and the energy savings
No effect
I guess they didn't have any influence on the timing, possibly the type of measure, but not necessarily, these are all things we were planning on doing regardless
Without the program, we would've probably installed half of them and done it a year later.
Huge effect, without the rebate money this project would have been put off for many years
I feel that our performance is much better, and was able to take the money we saved and put it into programs to save even more money
No effect
The program is very good, without the program, we would not have addressed this measure at all, we were influenced by the incentive that was available
No effect

Open Responses, DAT4, CATI Survey , With Attribution
We only installed them because we could save money on our energy bill because the school is going through a money crunch. After installing them, we would not do it again because the difference was so great that we were moved into a higher pay bracket.
We would've been slightly delayed in doing it without focus on energy helping push us to get the project done to get the incentive. We would've done the same number.
It came at the perfect time.
Good
I think it is a good program, and brings to the surface that these items need to be done to provide good operating equipment.
We probably would have waited without the incentive
The program actually made it happen all in one time instead of stretching it out because of financial assistance. we probably would've done the same thing, it just would've taken a lot longer
The program made us install the measure earlier than we would have, but allowed us to replace everything
Focus on Energy programs help us install them faster. the rebate got us over the economic hurdle
Not much
The timing was good, the amount was comparable because of the one for one. the big incentive was the cost of the rebate incentive
Without the incentive, we wouldn't have done anything.
It had a high effect on the installation
I did more because I had more money available because of the incentive program.
I think it was highly influential on us getting the work done
Sped up process since we had a deadline to meet, we would have done it eventually, but did it quicker because of the rebates being available.
Very important
I think the program allows people to get their return on investment down. That makes it very attractive and makes things happen soon for installation.
No effect
With the program, with the rebate available, we decided to do all six of our units at the same time, so I guess it accelerated how quickly we got the work done
Better lighting and more energy efficient and a payback
Minimal
We've seen higher cost savings than originally projected
Very positive effect for the measure and the outcome was good, it ran more efficiently
Because the incentive was there at the time
None
Well, we were looking at improving quality and the cost to the bill. Because of focus on energy's help, we were able to get the money allocated and also install all measures at once instead of doing it piecemeal as we could afford it.
Accelerated completion of the measure. Money allowed for a greater number of completions
Focus helped bring the program to light, helped to motivate us into doing the measure and also helped in financing the project to help ensure the project would get done
Able to complete projects much quicker, hire outside staff to perform installation. Started realizing savings 2 years earlier
Without the focus on energy incentives, we might not have done the project at all
It was planned maintenance that helped the city maintain efficiency

Open Responses, DAT4, CATI Survey , With Attribution
Without focus on energy we would not have been able to fund the project. We didn't have enough funding to support the project.
Timed before incentive ran out
It has a tremendous effect, it helped us to do more at one time. Especially helpful when fuel rates are going up. it had a great impact on us.
Grateful it's out there. Did shopping around for a contractor that could work with us they helped with the information.
Focus on energy made it more economical. Having the focus rebates was why we went through with it.
We have done quite a few projects we found we can cut our usage and have more efficiency
They were influential on the timing of the lights because of the rebates,
We wouldn't have done it without their assistance
Very much
It was excellent
The amount is the same, We were going to do all or nothing. Timing was important because the rebate program expired at the end of September.
Efficient timely worked out well
The financial incentive gave the school board an additional financial reason to move forward the timing of the purchase and the installation
n/a
We were happy on final results they added a lot of value
The timing, they accelerated the project.
We increased them by 50-75 % because of them.
Everything was good. they did a great job
It was great
We were able to look at more options, maximum amount of dollars for what needed to be done
Rebates helped
It was good, we wouldn't ha e done it without their assistance
It was good and our equipment is better quality
Would've waited until really necessary
I can't say they really had a great impact
The timing was faster because of the incentive, then what we would have done, but the comfort level was there.
It would have been pretty much the same. If you can take advantage of getting the money back, you do.
A better efficient piece of equipment
Had good effect
If we had not gotten an assessment we would not have got the efficiency energy saving equipment
It was considerably helpful
The bonus of the money, frees up money for us to use on other things
It had a great influence on the timing and amount of equipment. Without it we probably would've installed 1 or 2 instead of 20, we would've installed over a 3-4 year period.
The timing was faster because of the incentive.
They gave us deadlines to meet and it helped get it done quicker
I liked that it helped us recoup our money, I always do my pm work
Focus on Energy was very helpful in that respect, they were eager to help us. They definitely motivated us to do more and also be alert in the fact that there are incentives if we continue to do that.
Incentive

Open Responses, DAT4, CATI Survey , With Attribution
They pretty much have it set up. They're offering them at the time when everybody should be working on it. by making them aware, they're getting things set up for the winter months. It's a good catalyst.
It probably accelerated the project by about six months.
We probably would have done it later in the season but by doing it then we saved money overall and received the rebates
I did it because of the rebate.
Extremely helpful and gives our church the kick it needed
Were safer lower bills and the incentive let us get it done faster
They were helpful so we could have the best program because of low funding
The experience was very positive and every question was answered.
Due to the rebate we did it
Without their help and incentives, we would only have about half of our plant done by now
The program allowed the repair to happen sooner rather than later.
Focus had a strong effect, due to the economic situation. the rebate just made it more feasible, without the rebate we would have had to postpone the project
Very satisfied with everything, the project went real well and we're real happy with the rebate
Without the program we would not have gone as far, or as extensive, it really did influence our decision to buy more, our first project we were looking at it for years, and I was going to use up old equipment, but the incentive was so good, that we decided to go ahead with the project, and after we found out that we liked the quality, we decided to continue throughout the whole building
It definitely helped, that's why we stayed strictly with our contractor, because of the incentive money coming back.
It increased the timing, increased the efficiency, and it increased the number of upgrades we did
It increased the timing and efficiency
It was very influential on us doing all of our equipment before the season
It was a significant impact, knowing about the rebates and programs.
It was a significant influence
The effect would be excellent
We would have done the same number of units, because of the program we were able to bring in outside vendors who had the proper equipment. We would have done the work ourselves based on intuition so there wouldn't have been an energy efficient upgrade really.
It allowed us to install them sooner
Up graded sooner,
The amount of incentives, I could not have lowered the amount of equipment.
They were awesome.
The funds that they provided were extremely helpful
They sped up the process. they talked me into buying 6 extra due to the efficiency of the equipment
Very positive, allowed us to do a better job more frequently, than we otherwise would have not done
Amount based on money received back, done for peak performance
We still would have meet the standard for the boiler tune up had we not had focus's involvement but it just would have been delayed.
Helped justify doing it when we did it, within the budget we needed to stay in
It is the same for all of them. They really didn't do anything with the timing or efficiency.
Not sure if it would have been approved without the incentive, may not have been done otherwise
Without the organization, we wouldn't have done anything.
I feel focus on energy's information rebate and help let us to do the project earlier than we would have--if we would have even done it at all.

Open Responses, DAT4, CATI Survey , With Attribution
Again, Focus helped us lay out the project.
They really didn't do anything with the timing or efficiency. We were driven by a project manager . focus helped us lay out the project.
Again. we would have done the work regardless, but this was the extra nice
We planned on doing a lighting upgrade for our complex and focus on energy had available funds, so that's what we decided to do.
A lot more efficient.
Focus introduced me to the measure I had no idea they even existed.
The incentive we are more ready to improve equipment
I don't think they had a tremendous impact on that decision. We needed a certain size to satisfy the need.
Positive effect, I wouldn't have done it and not have saved the money
It was very good, it was very influential. Had the program not been available, it would not have gone as fast.
The opportunity was there, the incentive was there. We do regular work, so on our side, the opportunity was there to look at the equipment that were running. With the incentive that focus had, it made sense that as long as we're tearing these up anyway, why not just invest the money? It's because of the incentive. I think on this project, our payback was 18 months, and we'd have really
Same as the other measure, we did them together to tie the two projects together.
We replaced all the equipment, and the timing, we did due to the incentives, tying them together.
It gave us the financial incentive to do it
It was excellent because we've saved money and have great quality
Accelerated from replace on burnout to preventative maintenance. Money allowed for a greater number of repairs
Was very helpful and moved project along, always surprised how much money is wasted from leaking steam
I guess overall, it's just incentive for us to make sure that we're not letting things fall behind and even though the incentive does not pay the full expense, it does help recoup some of the cost.
Improved the efficiency of the equipment installed, lowered up front capital expenditure
Timing was a factor so we could receive a rebate
The timing I would have held off a couple months as I mentioned, and I probably wouldn't have bought as many, that needed to be done, the timing worked out because of the rebate
Program benefited acceleration of improvement via installation
Program in general has made a big difference because of better quality and efficiency
Without them we wouldn't have been able to complete the project in the same amount of time
Because of the dollars saved by rebate were able to install the measure
It was excellent
We lacked the funding to support the project so without the focus on energy rebate incentive we would not have been able to fund and complete the project.
Based on the rebates at the time it worked out very well for us. We felt it was a wise decision at the time to go with the rebates.
I feel the focus on energy incentives are very helpful and encouraging to implement the changes that we did. I thought that the focus on energy advisor was helpful to getting paperwork done in a timely manner.
Focus on energy between the incentives and advice, convinced us to install the highest efficiency we could.
The incentive
Affected timing to perform maintenance to receive incentive money

Open Responses, DAT4, CATI Survey , With Attribution
Affected measure timing to receive incentive money
Affected timing to perform maintenance to receive incentive money
It did encourage us to do it, and do it faster, the contractor made it very easy to make the decision to do it.
It did cut down on the amount of gas used.
Very good
Already answered this earlier, they helped us be more energy efficient
The work that was done and completed and funded by focus on energy project if it hadn't been for that we wouldn't have been able to identify need. Can't say enough good things about them, they helped us be more energy efficient
Positive
It is the same for everything focus approached us and made us aware of opportunity available.
We appreciate they're support. generally satisfied.
Focus approached us and made us aware of opportunity available, and advised us. it was helpful we did best possible thing we could do at the time. We appreciate they're support. Generally satisfied.
Focus on energy had a great influence in the initial phase of the project, and also had a part in the timing in the project, but did not have an effect on the amount of equipment. the incentive to get it done while the money was still available prompted us to go ahead with the project
With the focus on energy money, it provides the incentive to do it right away rather than waiting.
We still would have had to do the measure without focus on energy's involvement. the rebate focus on energy gave us was just an added bonus.
No effect
None
We were very satisfied
Moved timing for bonus incentive, upped efficiency for incentive, no impact on quantity
Everything focus does saves energy and money
We might not have done the project
It helped us decide to do the project.
Because we only had a limited amount of funds available to spend for this project it was great that focus on energy helped our organization do more and do it a lot quicker with the rebate they gave to us.
We looking forward to having energy savings on our monthly bill
The decision to go with the upgrade was accelerated, the reason for that was the incentive provided by focus on energy. the numbers of fixtures were cut in half, we are experiencing a reduced energy cost because of that.
The same number of equipment, it sped up the process by about 12 months, rebate was benefit return on invest helped
Focus on Energy sped up the process by about 12 months, rebate was benefit return on invest helped
You know it was the incentive to get it done while the money was still available that prompted us to go ahead with the project
We were looking to do something at that time, and we were looking to make improvements and trying to cut cost on energy use in our buildings, and looked at the cost it was going to save us. when they recommended it was effective, that was an incentive for us to do it
Focus on energy helps me make good energy decisions and I use them regularly.
Reps didn't have a huge factor on installation
To summarize, I think it's a good program because it gives you the initiative to get the equipment tested. The contractor surveyed all of our equipment for the last two years. It's nice to have that service done, and we have a sense of urgency because of the rebate, the incentives to get it done as soon as possible, and we save energy and money.

Open Responses, DAT4, CATI Survey , With Attribution
The focus on energy incentive is a good incentive that is attractive for us because you do get savings regarding going to high efficiency equipment. we continue to want to pursue that. it helps us get past some budgetary questions regard going to higher efficiency.
The focus accelerated our efficiency

Table D-42. Open-ended Responses to DAT4, CATI Measures without Attribution

Open Responses, DAT4, CATI Survey , No Attribution
Didn't really for this one, focus was not really involved for this one.
They were very helpful getting us information we needed on efficiency and rebates and how that's going to affect our bottom line in the end.
We were in the process already, focus came in during installation process
I think overall it was a positive influence. We may or may not have done it without that influence, but I think we probably would have.
We were going to do it whether focus on energy is there or not.
As far as the program is concerned, we took advantage of it chiefly because of the incentives. We understood the need because we are a manufacturer, so we didn't need to interface with focus on energy for this project
No effect at all
It was a positive effect, it was an added bonus
No other
The focus on energy program didn't really effect anything as far as the timing and the effect of the programs
They made it smoother, easier and it was less cost to me to do it
Really, it didn't have any effect because it was planned.
It was very good for us and focus helps us every year and gives us more ideas on saving energy
No effect, because we would have done this regardless
No influence at all, we knew about rebates, but they not considered at the time.
The focus on energy program didn't really effect anything as far as the timing and the effect of the programs
I don't think it had any difference
The program didn't have much of an effect
With the installation of this measure, we needed to install a new one, focus on energy's guidelines helped us with the product choice, however, we would have installed that regardless of the incentives.
Focus on energy's involvement holds a service provider more accountable than I can do on my own, it is documented and I have proof of what's done that I can present to the superintendant.
We needed to have it done and it's great way to cut cost and to make sure we get it done
It was very good for us and focus helps us every year and gives us more ideas on saving energy
The rebate allowed us to divert money into other areas
I don't think they, in our case, it didn't make a difference on that part of it. It was nice to get the incentive afterwards
No effect , it came late working with them.
It was very nice to have the incentives they helped knowing the rebates were available
They helped precipitate the whole process

Open Responses, DAT4, CATI Survey , No Attribution
The program is great it's disappointing that they aren't doing it anymore, I've got more schools on board now too. I have loved dealing with them
None
It was a good experience
None
It was great incentive to get this work done I needed to get done
Minimal
Focus on Energy does a lot of informational material and on making sure you keep running at their best efficiency.
The measure really complimented that type of lighting we have, and I say it had less effect on getting it done right away. The measure would've happened whether or not there was a rebate
The program was effective.
We performed this measure on them every year. It's essential to keep the units running efficiently in the winter.
Nothing
Good effect
It would have been nice to get my $ quicker.
It was a good experience for our company
The program was available. We did the two measures we could.
None
I appreciate the information that the focus on energy representative gave me and making me aware of the incentives that are out there.
I think the timing was good, everyone is looking to save where they can.
None
Overall it had no effect, we would have went ahead with it anyway
There really wasn't any influence at all as far as timing is concerned. When it comes to efficiency, the efficiency was the best for the dollar.
We haven't had a chance to check out the numbers yet, we'll know more later on this year.
It happened that when we needed to do the project, focus on energy was there.
It didn't have an effect
It had no effect
We now have better equipment
Able to complete projects much quicker, hire outside staff to perform installation. Started realizing savings 2 years earlier
None at all
I've been very happy. It's nice to sit down and get rewarded for doing the right thing
It was a nice bonus to get the type of equipment that suited my needs offered added value
Really no influence, project would have gone the way it went, regardless of rebates
We were able to install earlier due to focus
Rebates
I think because of focus on energy, we were more inclined to do more extensive work
We would have done the project the same way if there had been incentives or not
Done yearly as part of our yearly maintenance
We do it every year it helped bring to mind what needed to be done. The focus on energy contractor was familiar with paper work, etc. that was helpful
We would not have proceeded as rapidly as we did w/o focus.

Open Responses, DAT4, CATI Survey , No Attribution
Minimal
Helps to get rebates to fund projects
It was great timing
We needed to do these things.
Happy with the program wish they had it every year.
In the long run the rebate allows us to do more in the future
It doesn't make any differences, we'd do the same procedures and work
None
Happy for rebate we do it every year icing on cake
Focus giving our organization the rebate incentive gave us the funds so that we could afford to purchase equipment that ran at such a great efficiency. Focus didn't really have an influence on the amount of equipment or time the project was completed.
The focus grant was beneficial to us because it picks up the cost and frees up money for other projects. I can do a lot with this money. It's a shame the grant was not offered this past winter.
There wasn't any timing or anything on it. That was our normal program to have them semi-annually checked.
Focus had no bearing on what I did whatsoever.
No effect, because we would have done this regardless
The incentive was the only thing
The helped us purchase better equipment and gave us incentives to go thru them
The program is a good program. It's valuable for us to have a focus on energy incentive. it helps with timing. it helps make the decision easier
Listen I didn't really have a lot to do with it, I let the contractor handle everything, and didn't have much contact with focus on energy.
Focus on energy really had no influence because the project had to be done at a certain time. the rebate incentive was just an added bonus for us.
Again it had very little influence, in the fact that it was brought to my attention by my contractor, who should be getting the credit for this.
They had a great effect, they made our equipment have the best efficiency
Had a good effect
None at all
The program treated us fine, helped with paper work, they helped us and we helped them by doing the project
They provide us with the information that is needed, I go to the website if I need anything else, I go to the contractors, and a lot of the time they tell me there is focus money for it.
It had no impact on whether we were going to do the measure because we do this every year but it was nice to get a rebate for it.
There was no influence
Focus on energy had no influence on the timing of the project because the job is usually done in the winter time. The rebate incentive was the only thing that really influence the project getting completed because it helped us out with the cost.
Overall it was great, fine , no problem, assist us in other projects
It was beneficial into making the choice of equipment
It has to be done so the incentive is nice
It fit right in with what we wanted to do as far as our normal work, we just took it one step further, to qualify for the rebate. Focus on energy is a good thing.

Open Responses, DAT4, CATI Survey , No Attribution
I talked to them, I was satisfied, I was happy I talked to the lady she told me what she could and could not do. I'm happy with it
It didn't affect our timing. there was no effect
Focus's influence on the measure, the influence was a matter of picking up the rebates, and the rebates ended in December so it influenced us to start the project soon. we would have done the work regardless, but this was the extra nice
It didn't really affect anything, it was nice to get some money back, but it wouldn't have changed the project at all
None. it's something we would do anyways.
I always do this work, and the contractor just turns it in, I always do it anyways. It is a very good incentive for those people who unlike me. That might not necessarily do the work
Somewhat of an effect since but it was such a small project we would've done it any way
They were very helpful and supportive
They didn't really have any effect on what we do. It's something that was brought to our attention, the contractor brought it to our attention, and it was a great incentive for something we were already doing routinely
No effect
The same as before, really no effect
We do this every year no matter what.
None, we do it every year
Focus made me more aware of the breadth of efficiency options available. We would have already looked at some new efficiency options because we had some in place elsewhere in the district but focus, just short of being pushy, showed and encouraged us to get new efficiency equipment that would be more expensive at the onset but save us money in the long run.
Focus on energy played a part in helping us get the efficiency we are looking for.
I think it had to be fixed, we ran more efficiently after
They had no influence at all. We found out about the incentive after the fact.
It had to be done, and we waited long enough. It needed to get it done, it was way too costly, we spent a lot of money on upgrades.
It is great.
Even if there was no focus on energy, I was still going to do these repairs. I would say it had a 25% factor on to do it and get it accomplished. I'm glad it was done and I'm glad focus on energy supported the update on energy efficiency.
No effect as far as I'm concerned
None
Great rebate, will help on our power bill
Focus on energy really had no influence on the timing, efficiency or the amount of equipment we had installed. At the time we agreed to take the rebate incentive from Focus we had already made our decision.
When the contractor told us the program was available, we decided to do it.
Good timing definitely, helps to get rebates to fund projects
Rebate incentives
None
We just appreciate the help and being able to afford a new piece of equipment
They didn't affect the timing because it had to happen at that time. I was encouraged to get a good efficiency for our space.
We can get better quality. Old equipment was too slow, new equipment comes on right away.

Open Responses, DAT4, CATI Survey , No Attribution
It is an awesome program and we are planning on using them in the future when we install our new water system
It always pays to have things in tip top shape to prevent shut down
We needed to do the project anyways, so it really just was nice to have that incentive, it gave us an extra push to get it done
None
Timing and rebates
No effect
I'm glad that you have the program just make it easier for businesses to access so more energy efficient improvements could occur it's that simple!
Helped us move a little faster, with the incentive, we would have done it any way since the system works better when everything works properly
I'm going to replace my equipment as they go out, it’s not necessarily going to be an energy efficient one
Again, we were able to do higher efficiency and more of it
Focus on Energy programs help us install them faster. The rebate got us over the economic hurdle
Focus on Energy made it more economical. Having the focus rebates was why we went through with it.
It was needed and it was just a bonus at the end
They really didn't do anything with the timing or efficiency. We were driven by a project manager. Focus helped us lay out the project.
It was needed and it was just a bonus at the end
They didn't really have any effect on what we do.
No effect.
They didn't really have any effect
We are happy with the Focus on Energy's programs.

This appendix provides a detailed explanation of the program attribution methodology used in this impact evaluation.[60]

E.1 OVERVIEW OF APPROACH

The attribution analysis uses data collected from the engineering review, on-site visits, participant surveys, and supplier surveys. These data are used to calculate the following adjustment factors:

- **Installation rate.** This factor corresponds to the fraction of measures that were installed. Each measure is assigned a binary factor that identifies whether it was installed or not installed. Adjustments to the number of units installed for a particular measure are included in the engineering verification factor, not in the installation rate.
- **Engineering verification factor.** This is the ratio of the verified gross savings to the tracking estimate of gross savings for installed measures. The engineering verification factor includes corrections to the numbers of units installed, changes in operating hours, changes in operating levels, etc. Starting with this round, the correction is determined both for measures in the engineering sample and measures in the CATI sample and is applied to measures that were installed by participants in both groups, both custom and deemed. Measures in the CATI sample receive the deemed energy savings and adjustments based on the parameters used to calculate total measure savings, such as unit quantity or operating hours.
- **Attribution factors.** These factors are used to determine the proportion of the verified gross savings attributable to the Focus on Energy Business Programs. For non-CFL measures,[61] the attribution factors are determined from the participant's responses to a battery of survey questions designed to determine how influential Focus on Energy Business Programs was in the decision to install a particular measure. For CFL measures, the final attribution is assigned based on market research done to measure the balance between attribution and spillover in the entire state and across sectors.

The three attribution factors that affect the final net savings are timing, efficiency, and quantity attribution. All three attribution factors are based on responses to the attribution questions in the impact evaluation survey. The following is a brief description of each factor:

- **Timing attribution, A_T**: This measures the effect the program had on *when* the equipment was installed. The timing attribution is a linear function of the **Acceleration Period, m_a**, which corresponds to the number of months between when the equipment was actually installed and when it would have been installed in the absence of the

[60] KEMA has developed an alternative attribution analysis methodology (life cycle net savings, or LCNS) that uses the same survey instruments. The results using the LCNS method are provided for comparison only in Appendix H.

[61] For purposes of this discussion, "CFLs" includes small CFLs only; for example, measures described in the program tracking databases as "CFL <= 32W". The standard evaluation attribution battery is used for larger CFL installations (> 32W).

program. For respondents who say they would have installed at the same time or earlier without the program, $m_a = 0$. For those who say they would have installed later, m_a is the number of months later they say they would have installed, up to a maximum of 48.

- **Efficiency attribution, A_E:** This measures the effect the program had on the efficiency of the equipment installed. The efficiency attribution measures the proportion of savings attributable to the program for increasing the efficiency of the equipment above what would have been installed otherwise.
- **Quantity attribution, A_Q:** This measures the effect the program had on the quantity of the equipment installed. The quantity attribution measures the proportion of savings attributable to the program for increasing the quantity of equipment above what would have been installed otherwise.

The complement of attribution is free-ridership. Attribution measures the portion of the savings that result because of the actions of the program. Free-ridership measures the portion of the savings that would have happened in the absence of the program. The free-ridership equivalents of the attribution factors are used to determine program net savings. They are:

- **Timing free-ridership, f_T:** The timing free-ridership is also a linear function of the Acceleration Period, m_a, defined under Timing Attribution above.
- **Efficiency free-ridership, f_E:** This is the fraction of verified gross installed (VGI) savings per unit that would have occurred without the program (free rider efficiency increment). This value is also equivalent to the factor E used in previous attribution analysis reports.
- **Quantity free-ridership, f_Q:** This is the fraction of installed units that would have been installed without the program (free rider quantity factor). This value is also equivalent to the factor Q used in previous attribution analysis reports.

The free-ridership values are easily calculated from the attribution factors.

- $f_T = 1 - A_T$
- $f_E = 1 – A_E$
- $f_Q = 1 – A_Q$

E.2 ATTRIBUTION ANALYSIS

The impact evaluation starts with the program-reported gross savings for a measure. This is the savings value reported by the program in the program tracking database. The verified gross savings are determined by multiplying the tracking savings by the installation rate and the engineering verification factor. The combined installation rate and engineering verification factor is also called the gross savings adjustment factor. These equations are illustrated in Figures E-1 and E-2.

Figure E-1. Gross Savings Adjustment Factor Calculation

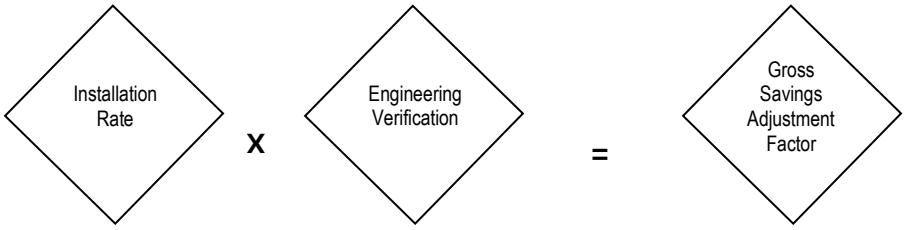
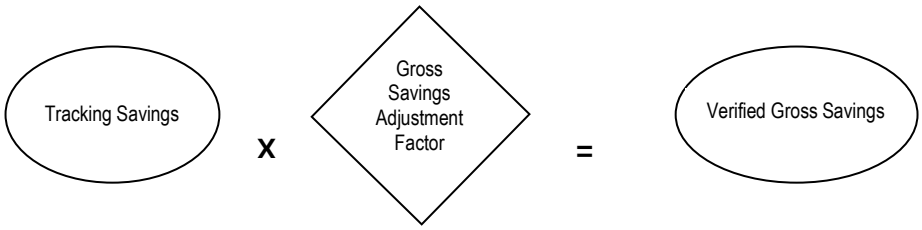
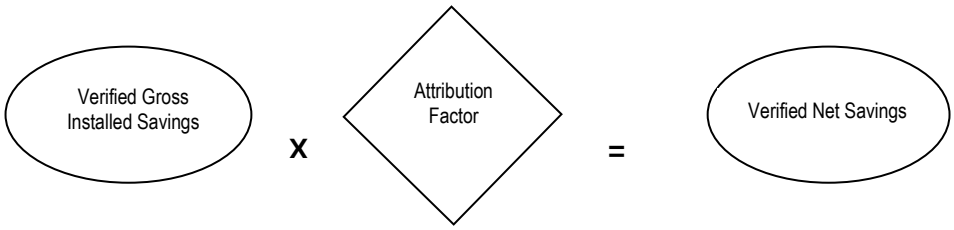


Figure E-2. Verified Gross Savings Calculation



As shown in Figure E-3, the verified net savings for each measure are equal to the VGI savings multiplied by the overall **Attribution Factor, A**.

Figure E-3. Verified Net Savings Calculation



The overall attribution factor is a function of the Simple Program Attribution (SPA) and the timing free-ridership. The SPA is the fraction of VGI savings that are attributable to the program and is a function of the efficiency free-ridership and the quantity free-ridership.

The fraction of VGI savings that would have occurred *without* the program is the product of the fraction of units that would have been installed without the program, f_Q, and the fractional unit savings that these units would have had without the program, f_E.

$$f_{QE} = f_Q f_E$$

For example, if two-thirds as many units would have been installed without the program (f_Q = 2/3), and the savings per unit would have been only half as much (f_E = 1/2), the portion of the savings that would have occurred without the program would be

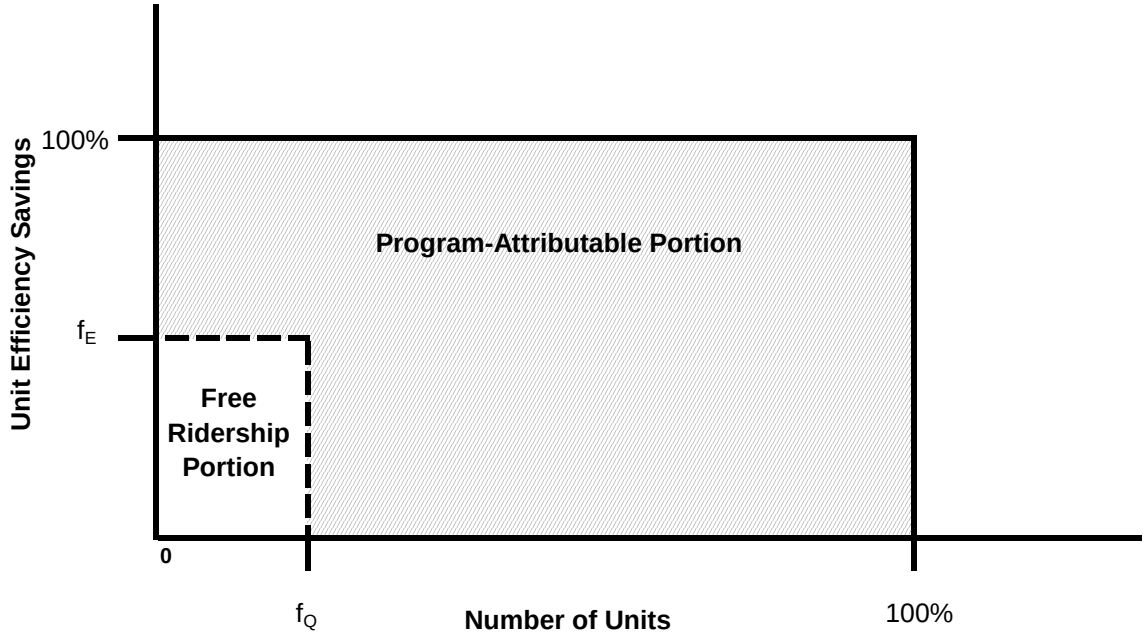
$$f_{QE} = (2/3) \times (1/2) = 1/3.$$

The SPA is the complement of this free rider portion.

$$SPA = 1-f_{QE} = 1- f_Q f_E$$

The relationship is illustrated in Figure E-4.

Figure E-4. Graphical Derivation of the SPA Equation



The timing free-ridership is calculated from the acceleration period using

$$f_T = 1 – m_a/48.$$

The overall attribution factor is

$$A = 1 – f_Q f_E f_T$$

Thus, if the measure was accelerated by more than 48 months, the no-program timing factor f_T is 0 and the attribution is 1, regardless of f_Q and f_E. If the measure was not accelerated at all, f_T = 1, and the simple attribution is the final attribution, A = SPA.

The net savings can be calculated

First-year net savings = VGI Savings * A

E.3 DETERMINING ATTRIBUTION PARAMETERS

The attribution factors defined in the previous section are determined from the participant responses gathered during the survey. This section provides an overview of the survey data and how it is used to determine each attribution factor. It also includes more detailed sections for each factor that show exactly how all survey responses are handled.

E.3.1 General procedure

This section provides an overview of the attribution factors and how they are determined.

- **Timing attribution, A_T:** The timing attribution is determined directly from the acceleration period, m_a, which is in turn provided directly by the respondent. The timing attribution is equal to $A_T = m_a/48$ for values of m_a less than or equal to 48. There is no timing attribution effect for values of m_a greater than 48; in those instances we assume that the measure would never have been installed without the influence of the program.
- **Efficiency attribution, A_E:** The efficiency attribution is based on the answers to questions DAT2a and DAT2b as shown in Table E-1. Respondents who indicate that they would have installed a lesser-efficient piece of equipment in the absence of the program are asked what efficiency they would have installed instead. An efficiency attribution value is assigned based on the response.

Table E-1. Efficiency Attribution Assignments

Efficiency That Would Have Been Installed without Focus		
Coarse Cut (DAT2a)	**Finer Cut (DAT2b)**	**Efficiency Attribution**
Same	NA	0%
Lower	Standard efficiency or according to code	100%
	Slightly higher than standard efficiency	70%
	Between standard efficiency and the efficiency that was installed	50%
	Slightly lower than the high efficiency that was installed	30%
	Don't know/refused	Average of above cases for measure group
Higher	NA	0%
Don't know/refused	NA	Average of all respondents for measure group

- **Quantity attribution, A_Q:** The quantity attribution is based on the percentage change in quantity caused by the program, **Inc**, which is in turn provided directly by the respondent. If the respondent would have installed a smaller measure without the program then the quantity attribution is equal to A_Q = Inc / (Inc + 100%). If the respondent would have installed a larger measure without the program then the quantity attribution is equal to A_Q = Inc.

The next few sections deal with determining the timing, efficiency, and quantity attributions on a more detailed level.

E.3.2 Detailed assignments

This section gives a detailed accounting of how the attribution factors are determined from the survey responses.

a. TIMING

The timing attribution, A_T, is determined from the first set of attribution survey questions. These questions are used to determine whether or not Focus accelerated implementation of a measure or caused it to be implemented before it would have been without the program. The two relevant questions are DAT1a and DAT1b.

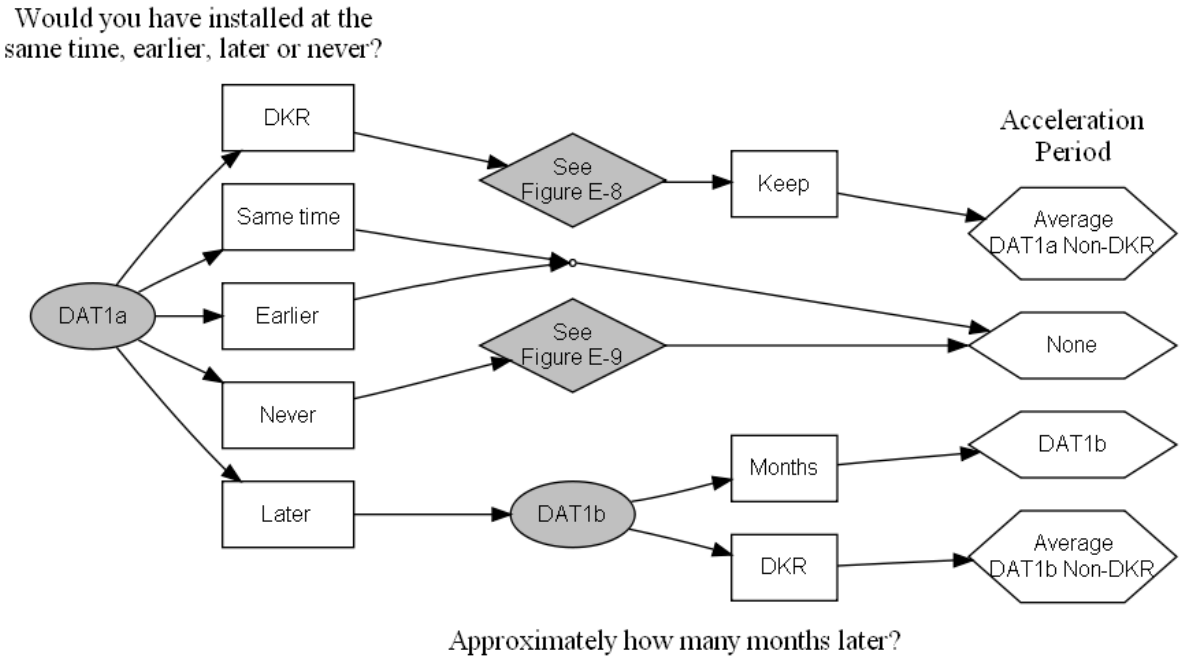
> DAT1a: "Without Focus on Energy, would you have installed <measure> at the same time, earlier, later, or never?"
>
> DAT1b: "Approximately how many months later?" (DAT1b is only asked if DAT1a is "Later.")

Note that these questions ask about the timing of installing equipment, not installation of efficient equipment in particular. For example, if the measure was replacement of a high-efficiency boiler, the question asks when the boiler would have been replaced without Focus. Engineers conducting the interviews are trained to ensure clarity for these questions. Future refinements of the questionnaire will explore further improvements to the accuracy of the timing reports.

b. DETERMINATION OF THE ACCELERATION PERIOD

Figure E-5 shows a decision tree for DAT1a and DAT1b. In the decision tree, "DKR" refers to "Don't Know" and "Refused."

Figure E-5. Decision Tree for the Acceleration Period



The measure is considered accelerated if the respondent indicates that the measure would have been installed less than four years later without the influence of Focus. The acceleration period is determined based on the answer to DAT1b. If the respondent is unable to answer DAT1b, the measure is assigned the average acceleration period across all accelerated measures in the same measure group.

If the respondent answers DAT1a with Earlier or Same Time then there is no acceleration period. If the respondent answers DAT1a with Never and the Quantity and Efficiency sections apply to the measure then the survey skips to the next section and there is no acceleration period. If the respondent answers DAT1a with Don't Know or Refused but does provide answers to inform the Quantity and Efficiency Attributions then the measure is assigned the average Acceleration Attribution for all measures in the same measure group.

c. EFFICIENCY

Efficiency Attribution, A_E, gives the program credit for increasing the efficiency of a measure above what would have been installed in the absence of the program. The two relevant questions are DAT2a and DAT2b.

> DAT2a: "Without Focus on Energy, would you have installed <measure> of the same efficiency as what you installed, lower efficiency, or higher efficiency?"
>
> DAT2b: "Without Focus on Energy, would you have installed <measure> that was "standard efficiency on the market at that time," "slightly higher than standard efficiency," "between standard efficiency and the efficiency that you installed," or "slightly lower than the high efficiency that was installed?" (DAT2b is only asked if DAT2a is "Lesser.")

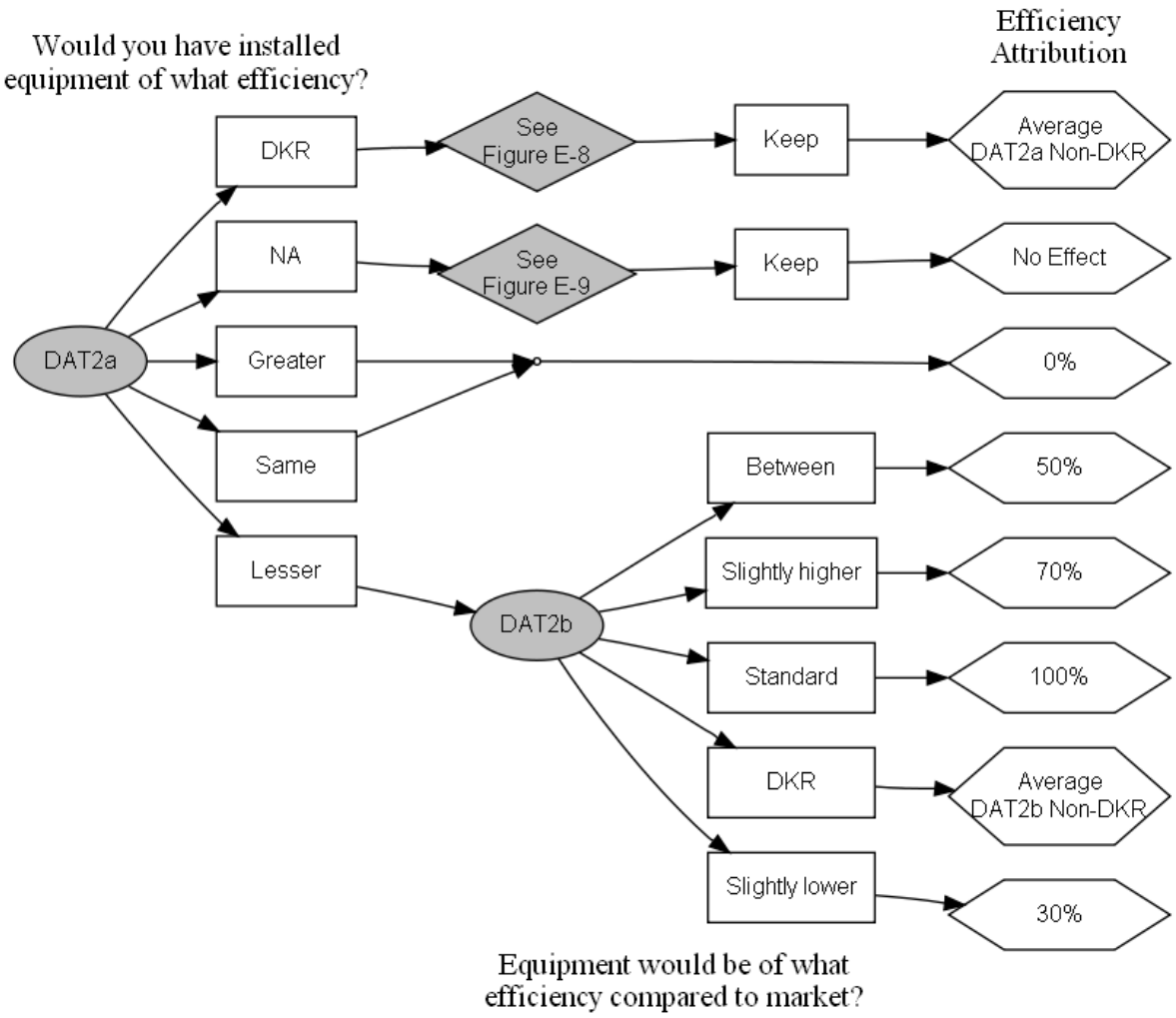
The program receives nonzero Efficiency Attribution if the respondent indicates that they would have installed a less efficient measure without the influence of Focus. The magnitude of the Efficiency Attribution is determined based on the answer to DAT2b, as shown in Table E-2. Figure E-6 shows the corresponding decision tree for DAT2a and DAT2b.

Table E-2. Efficiency Attribution Assignments

Efficiency That Would Have Been Installed without Focus		
Coarse Cut (DAT2a)	**Finer Cut (DAT2b)**	**Efficiency Attribution**
Same	NA	0%
Lower	Standard efficiency or according to code	100%
	Slightly higher than standard efficiency	70%
	Between standard efficiency and the efficiency that was installed	50%
	Slightly lower than the high efficiency that was installed	30%
	Don't know/refused	Average of above cases for measure group
Higher	NA	0%
Don't know/refused	NA	Average of all respondents for measure group

If the respondent answers DAT2a with Greater or Same then the survey skips to the next section and there is zero Efficiency Attribution. If efficiency is not applicable to this measure but quantity is applicable and the measure would have been installed anyway then the survey skips to the next section and the Efficiency Attribution will not affect the Simple Program Attribution. If the respondent answers DAT2a with Don't Know or Refused but does provide answers to inform the Quantity Attribution and Acceleration Period then the measure is assigned the average Efficiency Attribution for all measures in the same measure group.

Figure E-6. Decision Tree for Efficiency Attribution



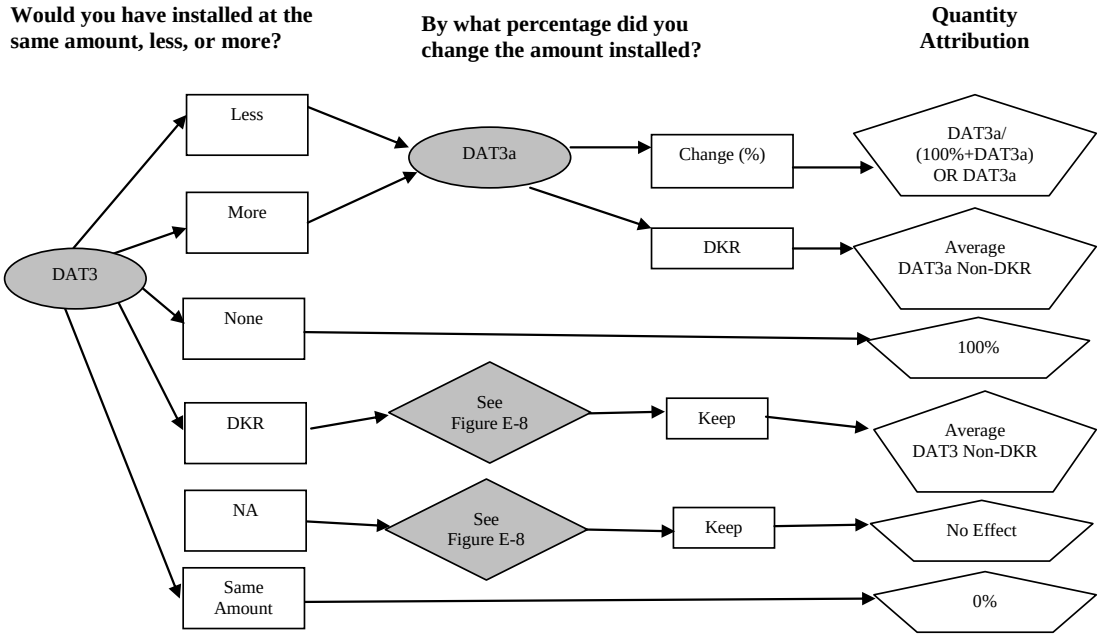
d. QUANTITY

Quantity Attribution, A_Q, gives the program credit for increasing the quantity of a measure above what would have been installed in the absence of the program. The two relevant questions are DAT3 and DAT3a.

> DAT3: "Without Focus on Energy, how different would the <number/size> of the <equipment type> have been? Would you say you would have installed the same amount, less, more, or not have installed anything?"
>
> DAT3a: "By what percentage did you change the amount of <equipment type> installed because of the Focus on Energy Program?" (DAT3a is only asked if DAT3 is "Less" or "More.")

Figure E-7 shows a decision tree for DAT3 and DAT3a.

Figure E-7. Decision Tree for Quantity Attribution



The program receives Quantity Attribution if the respondent indicates that they would have installed a smaller measure without the influence of Focus. The program also receives Quantity Attribution if the respondent indicates that they would have installed a larger measure without the influence of Focus. In these situations, we assume that the program was able to "right-size" the system resulting in greater and attributable energy savings. If the respondent would have installed a smaller measure without Focus then the Quantity Attribution is

$$A_Q = Inc / (Inc + 100\%)$$

where

Inc = percentage change in quantity because of Focus.

If the respondent would have installed a larger measure without Focus, then the Quantity Attribution is

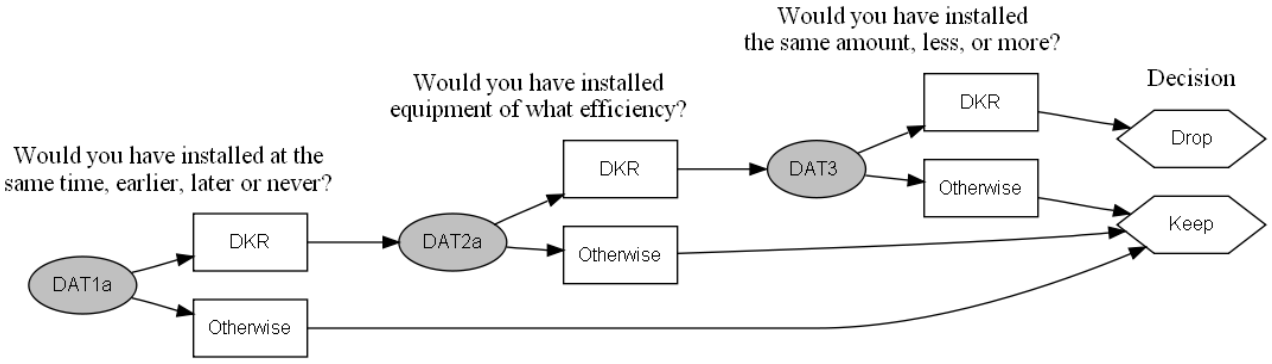
$$A_Q = Inc.$$

If the respondent answers DAT3 with Same Amount or None then the survey skips to the next section and there is zero Quantity Attribution. If quantity is not applicable to this measure but efficiency is applicable and the measure would have been installed anyway then the survey skips to the next section and the Quantity Attribution will not affect the Simple Program Attribution. If the respondent answers DAT3 or DAT3a with Don't Know or Refused but does provide answers to inform the Efficiency Attribution and Acceleration Period then the measure is assigned the average Quantity Effect for all measures in the same measure group.

e. WHAT IF THEY DON'T KNOW OR REFUSE?

Some respondents are unable or unwilling to answer the relevant questions in the survey attribution sequence. If a participant is unable or unwilling to answer any of the attribution questions then the participant is dropped from the attribution analysis. However, the respondent information will still be included as part of the installation rate and the VGI. Figure E-8 shows a decision tree that indicates the relationship between the question responses and how they affect the attribution. If a measure goes to the "Keep" decision then the ultimate resolution of each effect is shown in Figures E-5, E-6, and E-7.

Figure E-8. NTG Case Retention Decision Tree for Don't Know/Refused

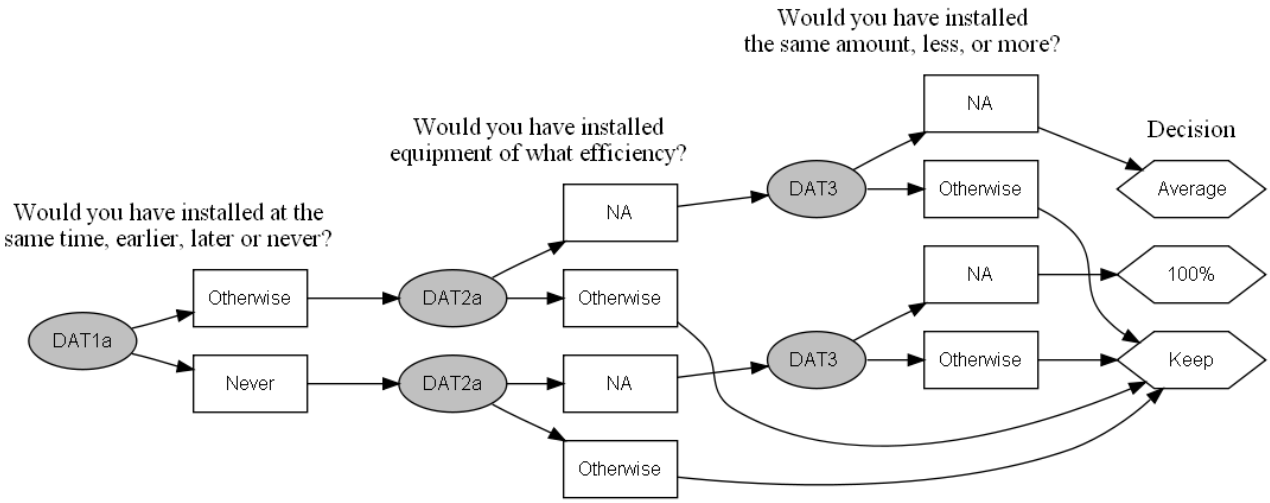


f. WHEN EFFICIENCY AND QUANTITY DON'T APPLY

Quantity and efficiency questions do not apply to all measures. Efficiency questions do not apply if the equipment type is inherently an efficiency improvement; that is, the "standard efficiency" baseline would be not to install anything. Variable frequency drives (VFDs) or heat recovery systems are examples. Quantity questions do not apply when varying quantity or size do not make sense in the context of the measure.

Figure E-9 shows a decision tree that indicates the relationship between the question responses and how they affect attribution. If a respondent indicates that a measure would never have been installed without the program and the DAT2a and DAT3 questions do not apply then the attribution is 100%. If the respondent would have installed the project at the same time, earlier, or later and the DAT2a and DAT3 questions do not apply then the measure is assigned the average savings-weighted attribution across all measures in that measure group.

Figure E-9. Decision Tree for Not Applicable



E.4 INCORPORATING SUPPLIER EFFECT

KEMA currently has two methods for determining when a supplier survey is necessary to supplement the participant survey. They are:

- **Program attribution assignment.** At the beginning of each impact evaluation, we send the Focus on Energy sectors a spreadsheet listing each participant in our CATI and engineering samples. We ask them to categorize each measure into one of four bins. If the sector indicates that there was no energy advisor involvement with a particular measure then we complete a survey with both the supplier and participant for those particular measures.
- **Post-participant engineering survey analysis.** Each survey completed with a participant in our engineering sample is reviewed to determine the effect the supplier had on the participant's decision to install a given measure relative to the program's effect. If a participant indicates that the program did not have an effect on their decision to install high efficiency equipment but the supplier had substantial influence then we will complete a survey with the supplier.

For measures with both participant surveys and supplier surveys, the analysis will produce two separate attribution values. The first reflects the influence that Focus on Energy had on the participant's decision to install the measure. The second reflects the influence that Focus on Energy had on the vendor's business practices and therefore their ability to sell the measure. We choose the higher of the two values as the final program attribution for that measure. That is, if either the supplier or the customer indicates that Focus influenced the decision to install the measure, we conclude that Focus influenced the decision.

This appendix provides the ratio estimation computation KEMA employed to develop estimates of evaluation verified gross and net impacts.

F.1 RATIO ESTIMATION

KEMA used the statistical procedure of ratio estimation to develop estimates of evaluation verified gross and net impacts. There are two basic steps in the process. The first step is to verify energy savings in a sample of measures. KEMA accomplished this first step via engineering reviews, customer interviews, supplier interviews, and on-site visits. The second step is to expand the sample results to the population of measures. This is accomplished by calculating the ratios of verified-to-reported and attributable-to-verified for the sample[62]. The ratios are also referred to in this analysis as adjustment factors. The adjustment factors estimated from the data collection and analysis include:

- **Gross savings adjustment factor.** This factor combines the installation rate and the engineering verification factor. It corresponds to the ratio of the verified gross savings to the tracking estimate of savings.
- **Attribution factors.** This factor adjusts verified gross savings for program attribution. It is the estimated proportion of verified gross savings attributable to the Focus Business Programs. It corresponds to the ratio of net savings to verified gross savings.
- **Realization rate.** This factor combines the gross savings adjustment factor and the attribution factor. It corresponds to the ratio of the net savings to the tracking estimate of savings.

F.1.1 Expansion of sample results to the population via ratio analysis

The calculation of the adjustment factors for tracking system gross and net savings uses appropriate weights corresponding to the sampling rate. The three primary adjustment factors are the installation rate, the engineering verification factor, and the attribution factor. Each of these is calculated as a ratio estimator over the sample of interest (Cochran, 1977, p.165). The formulas for these factors are given below.

Notation: The following terms are used in calculating the adjustment factors:

G_{Tj} = tracking estimate of gross savings for measure *j*

G_{Ij} = tracking estimate of gross savings for measure *j*, adjusted for non-installation

[62] The results of the *Participant Spillover Savings Study* (December 22, 2005) are added to the ratios prior to application to the population. Untracked attributable savings resulting from the Impact Evaluation of the Education and Training program and the CY09 Supply-side Study are then added to the population net savings. Unlike the added spillover savings, the untracked attributable savings are not included in the adjustment factors.

G_{Vj} = verified gross savings for measure *j*

N_{Vj} = net savings determined from the engineering and CATI surveys.

w_{Aj} = weighting factor for measure j used to expand the combined engineering and CATI sample to the full population

F.1.2 Installation rate

The installation rate R_I is calculated using the combined engineering and CATI samples as

$$R_I = \frac{\sum_{j \varepsilon A} G_{Ij} w_{Aj}}{\sum_{j \varepsilon A} G_{Tj} w_{Aj}}.$$

F.1.3 Engineering verification factor

The engineering verification factor R_V is calculated from the engineering and CATI samples as

$$R_v = \frac{\sum_{j \varepsilon A} G_{Vj} w_{Aj}}{\sum_{j \varepsilon A} G_{Ij} w_{Aj}}.$$

F.1.4 Attribution factor

The attribution factor R_{FR} uses data from both the engineering and CATI samples:

$$R_{FR} = \frac{\sum_{j \varepsilon A} N_{Vj} w_{Aj}}{\sum_{j \varepsilon A} G_{Vj} w_{Aj}}.$$

F.1.5 Standard errors

The ratio estimator is calculated using a SAS® macro provided by SAS for ratio estimation by domains. The procedure also returns the standard error of the estimate. The standard error is calculated using two methods.

The first method recognizes the sample as drawn from a finite population: the measures completed within the analysis period with associated energy impacts in the program-tracking database. This calculation uses the Finite Population Correction (FPC) factor. This factor is a reduction to the calculated variance that accounts for the fact that a relatively large fraction of the population of interest has been observed directly and is not subject to uncertainty. It is appropriate to apply precision statistics, such as confidence intervals, based on the standard error calculated in this manner when quantifying the results of the program during the study period only.

The second calculation treats the population of interest as essentially infinite. Thus, the measures completed to date and the sample selected from them is regarded as random instances of a virtually infinite number of measures that could have been completed under

the program. In this case, the FPC is not included. It is appropriate to apply standard errors calculated in this manner when applying the verification factors developed from this study to tracked savings from other years to estimate verified savings in those years.

F.1.6 Gross verification factor and overall realization rate

The gross verification factor is the ratio of verified gross to tracking estimate of gross savings. This factor is calculated by chaining together the installation rate and the engineering verification factor:

$$R_G = R_I R_V = \left[\frac{\sum_{j \in A} G_{Ij} w_{Aj}}{\sum_{j \in A} G_{Tj} w_{Aj}}\right]\left[\frac{\sum_{j \in A} N_{Vj} w_{Aj}}{\sum_{j \in A} G_{Vj} w_{Aj}}\right].$$

This is an example of a chained ratio estimator using a nested sample. The standard error for the chained ratio is approximated by the formula

$$\mathrm{SE}\ \ \mathrm{AB} \simeq \mathrm{AB}\sqrt{\left[\left(\frac{\mathrm{SE(A)}}{\mathrm{A}}\right)^2 + \left(\frac{\mathrm{SE(B)}}{\mathrm{B}}\right)^2\right]}.$$

(This formula overstates the standard error, because it ignores the correlation between the numerator of R_I and the denominator of R_V, which reduces the variance of the product.)

Likewise, the overall realization rate is calculated by chaining together the gross verification factor with the attribution factor. The same approximation formula allows (an over-estimate of) the standard error of the realization rate to be calculated from the two separate standard errors.

APPENDIX G:DETAILED SAMPLING TABLES

This appendix includes stratum level detailed sampling tables by reporting measure group. The first set of tables has the sample disposition by stratum. The second set of tables has the fraction of frame savings by stratum.

The two terms which are used in the “status” columns are defined as follows:

- **Exhausted:** All of the sample available in that strata was used. We either completed a survey with the customer or "killed" the data point for all measures in the sample. Data points are killed if the customer refuses to complete the survey, terminates the survey before the attribution questions are answered, or is called 6 times on different days and at different times of the day without being reached.

Available: We reached the target amount without using all of the sample points in the strata.

Table G-1. Boilers and Burners Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
1	Agriculture	Boilers & burners	Deemed	Has therms	1,023	3	1	2	Exhausted
2	Agriculture	Boilers & burners	Deemed	Has therms	24,040	1	1	-	Exhausted
3	Agriculture	Boilers & burners	Not deemed	Has therms	1,059	1	1	-	Exhausted
4	Agriculture	Boilers & burners	Not deemed	No therms	644	2	1	1	Exhausted
24	Commercial	Boilers & burners	Deemed	Has therms	360	504	9	13	Available
25	Commercial	Boilers & burners	Deemed	Has therms	1,240	183	9	13	Available
26	Commercial	Boilers & burners	Deemed	Has therms	2,472	105	9	25	Available
27	Commercial	Boilers & burners	Deemed	Has therms	5,502	56	9	29	Exhausted
28	Commercial	Boilers & burners	Deemed	Has therms	20,374	20	8	8	Exhausted
29	Commercial	Boilers & burners	Deemed	Has therms	86,798	1	1	-	Exhausted
30	Commercial	Boilers & burners	Not deemed	Has therms	4,201	16	1	2	Exhausted
70	Industrial	Boilers & burners	Deemed	Has therms	935	124	6	11	Available
71	Industrial	Boilers & burners	Deemed	Has therms	3,978	38	6	12	Exhausted
72	Industrial	Boilers & burners	Deemed	Has therms	9,273	18	6	8	Exhausted
73	Industrial	Boilers & burners	Deemed	Has therms	16,374	12	5	6	Exhausted
74	Industrial	Boilers & burners	Deemed	Has therms	29,923	8	5	2	Exhausted
75	Industrial	Boilers & burners	Deemed	Has therms	61,110	2	2	1	Exhausted
76	Industrial	Boilers & burners	Not deemed	Has therms	30,378	14	4	4	Exhausted
77	Industrial	Boilers & burners	Not deemed	No therms	45,536	2	1	2	Exhausted
121	Schools and Government	Boilers & burners	Deemed	Has therms	1,045	229	10	28	Available
122	Schools and Government	Boilers & burners	Deemed	Has therms	3,501	83	10	16	Available
123	Schools and Government	Boilers & burners	Deemed	Has therms	6,693	50	10	22	Exhausted
124	Schools and Government	Boilers & burners	Deemed	Has therms	11,474	32	10	10	Exhausted
125	Schools and Government	Boilers & burners	Deemed	Has therms	20,817	21	10	9	Exhausted
126	Schools and Government	Boilers & burners	Not deemed	Has therms	4,304	79	3	2	Exhausted
127	Schools and Government	Boilers & burners	Not deemed	Has therms	25,882	18	3	3	Exhausted
128	Schools and Government	Boilers & burners	Not deemed	No therms	2,331	11	1	-	Exhausted
	Boilers & burners overall					**1,633**	**142**	**229**	

Table G-2. Small CFL Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
18	Agriculture	CFL	Deemed	No therms	43	3,459	4	1	Exhausted
19	Agriculture	CFL	Deemed	No therms	327	687	3	1	Exhausted
63	Commercial	CFL	Deemed	No therms	109	6,589	5	4	Exhausted
64	Commercial	CFL	Deemed	No therms	1,574	552	5	3	Available
65	Commercial	CFL	Deemed	No therms	17,608	26	5	3	Exhausted
117	Industrial	CFL	Deemed	No therms	234	11	1	3	Exhausted
155	Schools and Government	CFL	Deemed	No therms	584	77	2	6	Available
	Small CFL Overall					**11,401**	**25**	**21**	

Table G-3. HVAC Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
9	Agriculture	HVAC	Deemed	Has therms	9,145	1	1	1	Exhausted
10	Agriculture	HVAC	Deemed	No therms	1,980	77	5	5	Available
11	Agriculture	HVAC	Not deemed	Has therms	1,587	4	1	2	Exhausted
12	Agriculture	HVAC	Not deemed	No therms	3,266	43	2	1	Exhausted
46	Commercial	HVAC	Deemed	Has therms	395	116	4	5	Available
47	Commercial	HVAC	Deemed	Has therms	4,102	18	3	6	Available
48	Commercial	HVAC	Deemed	Has therms	22,130	5	3	3	Exhausted
49	Commercial	HVAC	Deemed	Has therms	203,010	1	1	-	Exhausted
50	Commercial	HVAC	Deemed	No therms	726	172	5	9	Available
51	Commercial	HVAC	Not deemed	Has therms	3,254	111	5	7	Exhausted
52	Commercial	HVAC	Not deemed	Has therms	23,296	22	5	6	Exhausted
53	Commercial	HVAC	Not deemed	Has therms	76,191	9	4	5	Exhausted
54	Commercial	HVAC	Not deemed	Has therms	903,640	1	1	-	Exhausted
55	Commercial	HVAC	Not deemed	No therms	1,255	468	5	4	Exhausted
56	Commercial	HVAC	Not deemed	No therms	15,964	61	4	2	Exhausted
92	Industrial	HVAC	Deemed	Has therms	1,940	12	1	6	Available
93	Industrial	HVAC	Deemed	Has therms	44,401	1	1	-	Exhausted
94	Industrial	HVAC	Deemed	No therms	831	15	2	3	Available
95	Industrial	HVAC	Not deemed	Has therms	9,483	40	3	2	Exhausted
96	Industrial	HVAC	Not deemed	Has therms	90,919	7	3	4	Exhausted
97	Industrial	HVAC	Not deemed	No therms	7,134	70	3	1	Exhausted
139	Schools and Government	HVAC	Deemed	Has therms	2,142	40	4	18	Exhausted
140	Schools and Government	HVAC	Deemed	Has therms	11,361	11	4	3	Exhausted
141	Schools and Government	HVAC	Deemed	Has therms	22,931	5	3	1	Exhausted
142	Schools and Government	HVAC	Deemed	Has therms	35,643	4	3	2	Exhausted
143	Schools and Government	HVAC	Deemed	Has therms	45,639	4	3	-	Exhausted
144	Schools and Government	HVAC	Deemed	Has therms	57,302	6	6	2	Exhausted
145	Schools and Government	HVAC	Deemed	No therms	477	37	2	4	Exhausted
146	Schools and Government	HVAC	Not deemed	Has therms	7,304	120	5	6	Exhausted
147	Schools and Government	HVAC	Not deemed	No therms	3,409	146	3	3	Exhausted
	HVAC overall					**1,627**	**95**	**111**	

Table G-4. Non-small CFL Lighting Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
5	Agriculture	Lighting	Deemed	No therms	393	271	3	3	Available
6	Agriculture	Lighting	Deemed	No therms	2,547	59	3	3	Available
7	Agriculture	Lighting	Not deemed	No therms	529	181	2	1	Exhausted
31	Commercial	Lighting	Deemed	No therms	157	2,853	13	27	Available
32	Commercial	Lighting	Deemed	No therms	884	674	12	26	Available
33	Commercial	Lighting	Deemed	No therms	2,203	323	12	30	Available
34	Commercial	Lighting	Deemed	No therms	5,297	160	12	44	Available
35	Commercial	Lighting	Deemed	No therms	14,846	72	12	30	Exhausted
36	Commercial	Lighting	Not deemed	No therms	1,187	323	5	4	Exhausted
37	Commercial	Lighting	Not deemed	No therms	31,178	22	5	6	Exhausted
78	Industrial	Lighting	Deemed	No therms	457	1,084	13	30	Available
79	Industrial	Lighting	Deemed	No therms	2,724	239	13	20	Available
80	Industrial	Lighting	Deemed	No therms	5,819	131	13	24	Available
81	Industrial	Lighting	Deemed	No therms	11,930	73	13	19	Available
82	Industrial	Lighting	Deemed	No therms	35,011	32	13	7	Exhausted
83	Industrial	Lighting	Deemed	No therms	113,875	1	1	1	Exhausted
84	Industrial	Lighting	Not deemed	No therms	1,422	65	4	1	Exhausted
85	Industrial	Lighting	Not deemed	No therms	14,197	10	3	-	Exhausted
86	Industrial	Lighting	Not deemed	No therms	148,641	1	1	-	Exhausted
129	Schools and Government	Lighting	Deemed	No therms	153	1,200	5	14	Available
130	Schools and Government	Lighting	Deemed	No therms	762	311	5	15	Available
131	Schools and Government	Lighting	Deemed	No therms	1,485	183	5	18	Available
132	Schools and Government	Lighting	Deemed	No therms	2,751	111	4	14	Available
133	Schools and Government	Lighting	Deemed	No therms	6,705	56	4	20	Available
134	Schools and Government	Lighting	Not deemed	No therms	1,489	162	3	4	Exhausted
135	Schools and Government	Lighting	Not deemed	No therms	19,716	20	3	3	Exhausted
	Non-small CFL lighting overall					**8,617**	**182**	**364**	

Table G-5. Expanded Process Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
57	Commercial	Process	Not deemed	Has therms	1,112	2	1	1	Exhausted
58	Commercial	Process	Not deemed	No therms	4,051	6	1	-	Exhausted
98	Industrial	Process	Not deemed	Has therms	20,269	22	3	4	Exhausted
99	Industrial	Process	Not deemed	Has therms	76,486	7	2	3	Exhausted
100	Industrial	Process	Not deemed	Has therms	184,091	4	2	3	Exhausted
101	Industrial	Process	Not deemed	Has therms	424,042	5	5	4	Exhausted
102	Industrial	Process	Not deemed	No therms	31,077	33	5	3	Exhausted
148	Schools and Government	Process	Not deemed	No therms	415	1	1	-	Exhausted
13	Agriculture	Compressed air, vacuum pumps	Not deemed	No therms	707	5	1	1	Exhausted
59	Commercial	Compressed air, vacuum pumps	Not deemed	No therms	2,664	15	1	2	Exhausted
103	Industrial	Compressed air, vacuum pumps	Not deemed	Has therms	7,376	6	1	1	Exhausted
104	Industrial	Compressed air, vacuum pumps	Not deemed	No therms	2,352	237	4	5	Exhausted
105	Industrial	Compressed air, vacuum pumps	Not deemed	No therms	10,129	72	4	2	Exhausted
106	Industrial	Compressed air, vacuum pumps	Not deemed	No therms	28,810	32	3	4	Exhausted
149	Schools and Government	Compressed air, vacuum pumps	Not deemed	No therms	1,987	5	1	-	Exhausted
110	Industrial	Industrial ovens and furnaces	Not deemed	Has therms	22,471	6	2	3	Exhausted
111	Industrial	Industrial ovens and furnaces	Not deemed	No therms	23,482	2	1	-	Exhausted
108	Industrial	Waste water treatment	Not deemed	Has therms	25,249	1	1	1	Exhausted
109	Industrial	Waste water treatment	Not deemed	No therms	29,681	13	2	2	Exhausted
150	Schools and Government	Waste water treatment	Not deemed	No therms	713	1	1	-	Exhausted
	Expanded process overall					**475**	**42**	**39**	

Table G-6. Refrigeration Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
8	Agriculture	Refrigeration	Deemed	No therms	3,153	5	1	1	Available
38	Commercial	Refrigeration	Deemed	No therms	392	533	5	7	Available
39	Commercial	Refrigeration	Deemed	No therms	2,879	101	5	22	Exhausted
40	Commercial	Refrigeration	Deemed	No therms	7,689	46	4	32	Exhausted
41	Commercial	Refrigeration	Deemed	No therms	14,879	27	4	23	Exhausted
42	Commercial	Refrigeration	Deemed	No therms	37,297	13	4	10	Exhausted
43	Commercial	Refrigeration	Not deemed	Has therms	3,205	21	1	1	Exhausted
44	Commercial	Refrigeration	Not deemed	No therms	2,874	92	4	3	Exhausted
45	Commercial	Refrigeration	Not deemed	No therms	38,980	10	4	4	Exhausted
87	Industrial	Refrigeration	Deemed	No therms	12,175	27	4	9	Exhausted
88	Industrial	Refrigeration	Not deemed	Has therms	15,993	1	1	1	Exhausted
89	Industrial	Refrigeration	Not deemed	Has therms	260,710	1	1	1	Exhausted
90	Industrial	Refrigeration	Not deemed	No therms	18,589	8	3	2	Exhausted
91	Industrial	Refrigeration	Not deemed	No therms	157,557	2	2	-	Exhausted
136	Schools and Government	Refrigeration	Deemed	No therms	431	58	1	2	Exhausted
137	Schools and Government	Refrigeration	Not deemed	Has therms	3,441	1	1	-	Exhausted
138	Schools and Government	Refrigeration	Not deemed	No therms	1,700	2	1	-	Exhausted
	Refrigeration Overall					**948**	**46**	**118**	

Table G-7. Other Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
14	Agriculture	Agriculture	Not deemed	Has therms	6,325	44	2	-	Exhausted
15	Agriculture	Agriculture	Not deemed	No therms	694	518	3	-	Exhausted
107	Industrial	Agriculture	Not deemed	Has therms	74,740	4	2	1	Exhausted
16	Agriculture	Motors & drives	Deemed	No therms	67	5	1	1	Exhausted
17	Agriculture	Motors & drives	Not deemed	No therms	1,531	157	2	-	Exhausted
61	Commercial	Motors & drives	Deemed	No therms	150	51	1	3	Exhausted
62	Commercial	Motors & drives	Not deemed	No therms	3,019	129	4	1	Exhausted
113	Industrial	Motors & drives	Deemed	No therms	79	543	2	3	Available
114	Industrial	Motors & drives	Not deemed	No therms	2,289	175	4	2	Exhausted
115	Industrial	Motors & drives	Not deemed	No therms	12,686	41	4	1	Exhausted
116	Industrial	Motors & drives	Not deemed	No therms	45,486	16	4	1	Exhausted
153	Schools and Government	Motors & drives	Deemed	No therms	63	86	1	6	Exhausted
154	Schools and Government	Motors & drives	Not deemed	No therms	1,413	215	2	3	Exhausted
60	Commercial	New construction	Not deemed	Has therms	26,614	22	5	2	Exhausted
112	Industrial	New construction	Not deemed	Has therms	9,167	3	1	-	Exhausted
151	Schools and Government	New construction	Not deemed	Has therms	30,166	10	3	3	Exhausted
152	Schools and Government	New construction	Not deemed	No therms	11,842	1	1	-	Exhausted
20	Agriculture	Other	Deemed	Has therms	430	1	1	-	Exhausted
21	Agriculture	Other	Deemed	No therms	421	1	1	-	Exhausted
22	Agriculture	Other	Not deemed	Has therms	2,069	14	1	-	Exhausted
23	Agriculture	Other	Not deemed	No therms	1,230	103	2	-	Exhausted
66	Commercial	Other	Deemed	Has therms	1,005	83	3	7	Available
67	Commercial	Other	Deemed	No therms	263	237	2	4	Available
68	Commercial	Other	Not deemed	Has therms	1,913	131	2	1	Exhausted
69	Commercial	Other	Not deemed	No therms	4,201	105	3	2	Exhausted
118	Industrial	Other	Deemed	No therms	155	8	1	1	Available
119	Industrial	Other	Not deemed	Has therms	3,261	66	2	2	Exhausted
120	Industrial	Other	Not deemed	No therms	4,646	4	1	1	Exhausted
156	Schools and Government	Other	Deemed	Has therms	902	44	2	6	Available
157	Schools and Government	Other	Deemed	No therms	464	143	3	11	Exhausted
158	Schools and Government	Other	Not deemed	Has therms	2,855	160	4	5	Exhausted
159	Schools and Government	Other	Not deemed	No therms	3,302	63	2	1	Exhausted
	Other overall					**3,183**	**72**	**68**	

G.1 FRACTION OF FRAME SAVINGS

Table G-8. Boilers and Burners Fraction of Frame Savings in Sample by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
						Frame			Sample		
						kWh	kW	Therms	kWh	kW	Therms
1	Agriculture	Boilers & burners	Deemed	Has therms	1,023	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2	Agriculture	Boilers & burners	Deemed	Has therms	24,040	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
3	Agriculture	Boilers & burners	Not deemed	Has therms	1,059	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	Agriculture	Boilers & burners	Not deemed	No therms	644	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
24	Commercial	Boilers & burners	Deemed	Has therms	360	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%
25	Commercial	Boilers & burners	Deemed	Has therms	1,240	0.0%	0.0%	1.2%	0.0%	0.0%	0.1%
26	Commercial	Boilers & burners	Deemed	Has therms	2,472	0.0%	0.0%	1.4%	0.0%	0.0%	0.3%
27	Commercial	Boilers & burners	Deemed	Has therms	5,502	0.0%	0.0%	1.7%	0.0%	0.0%	0.9%
28	Commercial	Boilers & burners	Deemed	Has therms	20,374	0.0%	0.0%	2.2%	0.0%	0.0%	1.0%
29	Commercial	Boilers & burners	Deemed	Has therms	86,798	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%
30	Commercial	Boilers & burners	Not deemed	Has therms	4,201	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
70	Industrial	Boilers & burners	Deemed	Has therms	935	0.0%	0.0%	0.7%	0.0%	0.0%	0.1%
71	Industrial	Boilers & burners	Deemed	Has therms	3,978	0.0%	0.0%	0.9%	0.0%	0.0%	0.3%
72	Industrial	Boilers & burners	Deemed	Has therms	9,273	0.0%	0.0%	1.0%	0.0%	0.0%	0.5%
73	Industrial	Boilers & burners	Deemed	Has therms	16,374	0.0%	0.0%	1.2%	0.0%	0.0%	0.6%
74	Industrial	Boilers & burners	Deemed	Has therms	29,923	0.0%	0.0%	1.5%	0.0%	0.0%	0.4%
75	Industrial	Boilers & burners	Deemed	Has therms	61,110	0.0%	0.0%	0.8%	0.0%	0.0%	0.4%
76	Industrial	Boilers & burners	Not deemed	Has therms	30,378	0.0%	0.0%	2.7%	0.0%	0.0%	0.9%
77	Industrial	Boilers & burners	Not deemed	No therms	45,536	0.3%	0.2%	0.0%	0.3%	0.2%	0.0%
121	Schools and Government	Boilers & burners	Deemed	Has therms	1,045	0.0%	0.0%	1.4%	0.0%	0.0%	0.2%
122	Schools and Government	Boilers & burners	Deemed	Has therms	3,501	0.0%	0.0%	1.8%	0.0%	0.0%	0.3%
123	Schools and Government	Boilers & burners	Deemed	Has therms	6,693	0.0%	0.0%	2.0%	0.0%	0.0%	0.9%
124	Schools and Government	Boilers & burners	Deemed	Has therms	11,474	0.0%	0.0%	2.2%	0.0%	0.0%	0.7%
125	Schools and Government	Boilers & burners	Deemed	Has therms	20,817	0.0%	0.0%	2.6%	0.0%	0.0%	1.0%
126	Schools and Government	Boilers & burners	Not deemed	Has therms	4,304	0.0%	0.0%	2.0%	0.0%	0.0%	0.1%
127	Schools and Government	Boilers & burners	Not deemed	Has therms	25,882	0.0%	0.0%	2.8%	0.0%	0.0%	0.6%
128	Schools and Government	Boilers & burners	Not deemed	No therms	2,331	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
	Boilers & burners overall					**0.5%**	**0.2%**	**32.3%**	**0.3%**	**0.2%**	**9.3%**

Table G-9. Small CFL Fraction of Frame Savings in Sample by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
						Frame			Sample		
						kWh	kW	Therms	kWh	kW	Therms
18	Agriculture	CFL	Deemed	No therms	43	0.5%	0.7%	0.0%	0.0%	0.0%	0.0%
19	Agriculture	CFL	Deemed	No therms	327	0.7%	1.0%	0.0%	0.0%	0.0%	0.0%
63	Commercial	CFL	Deemed	No therms	109	2.0%	3.2%	0.0%	0.0%	0.0%	0.0%
64	Commercial	CFL	Deemed	No therms	1,574	2.5%	3.8%	0.0%	0.0%	0.0%	0.0%
65	Commercial	CFL	Deemed	No therms	17,608	1.4%	1.8%	0.0%	0.1%	0.2%	0.0%
117	Industrial	CFL	Deemed	No therms	234	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
155	Schools and Government	CFL	Deemed	No therms	584	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
	Small CFL overall					**7.3%**	**10.7%**	**0.0%**	**0.2%**	**0.2%**	**0.0%**

Table G-10. HVAC Fraction of Frame Savings in Sample by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
						Frame			Sample		
						kWh	kW	Therms	kWh	kW	Therms
9	Agriculture	HVAC	Deemed	Has therms	9,145	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	Agriculture	HVAC	Deemed	No therms	1,980	0.4%	0.7%	0.0%	0.0%	0.1%	0.0%
11	Agriculture	HVAC	Not deemed	Has therms	1,587	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
12	Agriculture	HVAC	Not deemed	No therms	3,266	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%
46	Commercial	HVAC	Deemed	Has therms	395	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
47	Commercial	HVAC	Deemed	Has therms	4,102	0.0%	0.0%	0.4%	0.0%	0.0%	0.1%
48	Commercial	HVAC	Deemed	Has therms	22,130	0.0%	0.0%	0.6%	0.0%	0.0%	0.4%
49	Commercial	HVAC	Deemed	Has therms	203,010	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%
50	Commercial	HVAC	Deemed	No therms	726	0.3%	0.7%	0.0%	0.0%	0.0%	0.0%
51	Commercial	HVAC	Not deemed	Has therms	3,254	0.2%	0.6%	1.4%	0.0%	0.0%	0.1%
52	Commercial	HVAC	Not deemed	Has therms	23,296	0.6%	0.4%	1.9%	0.2%	0.2%	0.4%
53	Commercial	HVAC	Not deemed	Has therms	76,191	0.6%	0.4%	2.8%	0.5%	0.2%	1.5%
54	Commercial	HVAC	Not deemed	Has therms	903,640	-0.9%	-0.2%	6.0%	0.0%	0.0%	0.0%
55	Commercial	HVAC	Not deemed	No therms	1,255	1.4%	2.9%	0.0%	0.0%	0.0%	0.0%
56	Commercial	HVAC	Not deemed	No therms	15,964	2.1%	5.3%	0.0%	0.0%	0.2%	0.0%
92	Industrial	HVAC	Deemed	Has therms	1,940	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
93	Industrial	HVAC	Deemed	Has therms	44,401	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
94	Industrial	HVAC	Deemed	No therms	831	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
95	Industrial	HVAC	Not deemed	Has therms	9,483	0.2%	0.2%	2.0%	0.0%	0.0%	0.1%
96	Industrial	HVAC	Not deemed	Has therms	90,919	-0.1%	-0.2%	4.2%	-0.1%	-0.1%	3.3%
97	Industrial	HVAC	Not deemed	No therms	7,134	1.1%	2.8%	0.0%	0.0%	0.1%	0.0%
139	Schools and Government	HVAC	Deemed	Has therms	2,142	0.0%	0.0%	0.5%	0.0%	0.0%	0.2%
140	Schools and Government	HVAC	Deemed	Has therms	11,361	0.0%	0.0%	0.8%	0.0%	0.0%	0.2%
141	Schools and Government	HVAC	Deemed	Has therms	22,931	0.0%	0.0%	0.7%	0.0%	0.0%	0.1%
142	Schools and Government	HVAC	Deemed	Has therms	35,643	0.0%	0.0%	0.9%	0.0%	0.0%	0.5%
143	Schools and Government	HVAC	Deemed	Has therms	45,639	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%
144	Schools and Government	HVAC	Deemed	Has therms	57,302	0.0%	0.0%	2.1%	0.0%	0.0%	0.7%
145	Schools and Government	HVAC	Deemed	No therms	477	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
146	Schools and Government	HVAC	Not deemed	Has therms	7,304	0.7%	0.6%	4.0%	0.0%	0.0%	0.1%
147	Schools and Government	HVAC	Not deemed	No therms	3,409	0.7%	3.4%	0.0%	0.0%	0.1%	0.0%
	HVAC overall					**7.9%**	**18.5%**	**31.0%**	**0.8%**	**0.9%**	**7.8%**

Table G-11. Non-Small CFL Lighting Fraction of Frame Savings in Sample by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
						Frame			Sample		
						kWh	kW	Therms	kWh	kW	Therms
5	Agriculture	Lighting	Deemed	No therms	393	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
6	Agriculture	Lighting	Deemed	No therms	2,547	0.6%	0.5%	0.0%	0.0%	0.0%	0.0%
7	Agriculture	Lighting	Not deemed	No therms	529	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
31	Commercial	Lighting	Deemed	No therms	157	1.5%	1.5%	0.0%	0.0%	0.0%	0.0%
32	Commercial	Lighting	Deemed	No therms	884	2.0%	2.1%	0.0%	0.1%	0.1%	0.0%
33	Commercial	Lighting	Deemed	No therms	2,203	2.4%	2.5%	0.0%	0.2%	0.2%	0.0%
34	Commercial	Lighting	Deemed	No therms	5,297	2.8%	2.9%	0.0%	0.8%	0.8%	0.0%
35	Commercial	Lighting	Deemed	No therms	14,846	3.5%	3.8%	0.0%	1.5%	1.5%	0.0%
36	Commercial	Lighting	Not deemed	No therms	1,187	1.3%	1.2%	0.0%	0.0%	0.0%	0.0%
37	Commercial	Lighting	Not deemed	No therms	31,178	2.3%	2.3%	0.0%	0.9%	0.8%	0.0%
78	Industrial	Lighting	Deemed	No therms	457	1.8%	1.4%	0.0%	0.0%	0.0%	0.0%
79	Industrial	Lighting	Deemed	No therms	2,724	2.3%	2.1%	0.0%	0.2%	0.2%	0.0%
80	Industrial	Lighting	Deemed	No therms	5,819	2.7%	2.3%	0.0%	0.5%	0.4%	0.0%
81	Industrial	Lighting	Deemed	No therms	11,930	3.0%	2.8%	0.0%	0.8%	0.7%	0.0%
82	Industrial	Lighting	Deemed	No therms	35,011	4.0%	3.4%	0.0%	0.9%	0.7%	0.0%
83	Industrial	Lighting	Deemed	No therms	113,875	0.4%	0.4%	0.0%	0.4%	0.4%	0.0%
84	Industrial	Lighting	Not deemed	No therms	1,422	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%
85	Industrial	Lighting	Not deemed	No therms	14,197	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%
86	Industrial	Lighting	Not deemed	No therms	148,641	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%
129	Schools and Government	Lighting	Deemed	No therms	153	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%
130	Schools and Government	Lighting	Deemed	No therms	762	0.8%	0.7%	0.0%	0.0%	0.0%	0.0%
131	Schools and Government	Lighting	Deemed	No therms	1,485	0.9%	0.9%	0.0%	0.1%	0.1%	0.0%
132	Schools and Government	Lighting	Deemed	No therms	2,751	1.0%	1.1%	0.0%	0.1%	0.1%	0.0%
133	Schools and Government	Lighting	Deemed	No therms	6,705	1.3%	1.2%	0.0%	0.5%	0.4%	0.0%
134	Schools and Government	Lighting	Not deemed	No therms	1,489	0.8%	0.8%	0.0%	0.0%	0.0%	0.0%
135	Schools and Government	Lighting	Not deemed	No therms	19,716	1.2%	1.6%	0.0%	0.2%	0.4%	0.0%
	Non-small CFL lighting overall					**39.7%**	**37.4%**	**0.0%**	**7.2%**	**6.8%**	**0.0%**

Table G-12. Expanded Process Fraction of Frame Savings in Sample by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
						Frame			Sample		
						kWh	kW	Therms	kWh	kW	Therms
57	Commercial	Process	Not deemed	Has therms	1,112	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
58	Commercial	Process	Not deemed	No therms	4,051	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
98	Industrial	Process	Not deemed	Has therms	20,269	0.1%	0.2%	2.5%	0.0%	0.0%	0.5%
99	Industrial	Process	Not deemed	Has therms	76,486	1.1%	0.6%	1.7%	0.1%	0.0%	0.9%
100	Industrial	Process	Not deemed	Has therms	184,091	0.0%	0.0%	4.6%	0.0%	0.0%	2.7%
101	Industrial	Process	Not deemed	Has therms	424,042	0.2%	0.2%	12.9%	0.2%	0.2%	9.6%
102	Industrial	Process	Not deemed	No therms	31,077	4.0%	2.7%	0.0%	0.2%	0.1%	0.0%
148	Schools and Government	Process	Not deemed	No therms	415	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
13	Agriculture	Compressed air, vacuum pumps	Not deemed	No therms	707	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
59	Commercial	Compressed air, vacuum pumps	Not deemed	No therms	2,664	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
103	Industrial	Compressed air, vacuum pumps	Not deemed	Has therms	7,376	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
104	Industrial	Compressed air, vacuum pumps	Not deemed	No therms	2,352	1.9%	2.0%	0.0%	0.0%	0.1%	0.0%
105	Industrial	Compressed air, vacuum pumps	Not deemed	No therms	10,129	2.8%	2.1%	0.0%	0.1%	0.1%	0.0%
106	Industrial	Compressed air, vacuum pumps	Not deemed	No therms	28,810	3.6%	2.4%	0.0%	0.4%	0.3%	0.0%
149	Schools and Government	Compressed air, vacuum pumps	Not deemed	No therms	1,987	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
110	Industrial	Industrial ovens and furnaces	Not deemed	Has therms	22,471	0.2%	0.1%	0.6%	0.1%	0.1%	0.4%
111	Industrial	Industrial ovens and furnaces	Not deemed	No therms	23,482	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
108	Industrial	Waste water treatment	Not deemed	Has therms	25,249	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
109	Industrial	Waste water treatment	Not deemed	No therms	29,681	1.6%	0.9%	0.0%	0.2%	0.1%	0.0%
150	Schools and Government	Waste water treatment	Not deemed	No therms	713	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Expanded process overall					**16.0%**	**11.7%**	**22.7%**	**1.5%**	**1.0%**	**14.3%**

Table G-13. Refrigeration Fraction of Frame Savings in Sample by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
						Frame			Sample		
						kWh	kW	Therms	kWh	kW	Therms
8	Agriculture	Refrigeration	Deemed	No therms	3,153	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
38	Commercial	Refrigeration	Deemed	No therms	392	0.8%	0.5%	0.0%	0.0%	0.0%	0.0%
39	Commercial	Refrigeration	Deemed	No therms	2,879	1.1%	0.8%	0.0%	0.2%	0.2%	0.0%
40	Commercial	Refrigeration	Deemed	No therms	7,689	1.3%	0.8%	0.0%	0.9%	0.6%	0.0%
41	Commercial	Refrigeration	Deemed	No therms	14,879	1.5%	1.1%	0.0%	1.3%	1.0%	0.0%
42	Commercial	Refrigeration	Deemed	No therms	37,297	1.8%	1.5%	0.0%	1.4%	1.2%	0.0%
43	Commercial	Refrigeration	Not deemed	Has therms	3,205	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
44	Commercial	Refrigeration	Not deemed	No therms	2,874	1.1%	0.6%	0.0%	0.1%	0.0%	0.0%
45	Commercial	Refrigeration	Not deemed	No therms	38,980	1.4%	1.3%	0.0%	0.5%	0.4%	0.0%
87	Industrial	Refrigeration	Deemed	No therms	12,175	1.2%	1.1%	0.0%	0.7%	0.6%	0.0%
88	Industrial	Refrigeration	Not deemed	Has therms	15,993	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
89	Industrial	Refrigeration	Not deemed	Has therms	260,710	0.0%	0.0%	1.6%	0.0%	0.0%	1.6%
90	Industrial	Refrigeration	Not deemed	No therms	18,589	0.5%	0.5%	0.0%	0.2%	0.0%	0.0%
91	Industrial	Refrigeration	Not deemed	No therms	157,557	1.0%	1.4%	0.0%	0.0%	0.0%	0.0%
136	Schools and Government	Refrigeration	Deemed	No therms	431	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
137	Schools and Government	Refrigeration	Not deemed	Has therms	3,441	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
138	Schools and Government	Refrigeration	Not deemed	No therms	1,700	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Refrigeration overall					**11.8%**	**9.6%**	**2.2%**	**5.4%**	**4.1%**	**1.7%**

Table G-14. Other Fraction of Frame Savings in Sample by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
						Frame			Sample		
						kWh	kW	Therms	kWh	kW	Therms
14	Agriculture	Agriculture	Not deemed	Has therms	6,325	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%
15	Agriculture	Agriculture	Not deemed	No therms	694	1.2%	1.4%	0.0%	0.0%	0.0%	0.0%
107	Industrial	Agriculture	Not deemed	Has therms	74,740	0.0%	0.0%	1.9%	0.0%	0.0%	1.0%
16	Agriculture	Motors & drives	Deemed	No therms	67	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
17	Agriculture	Motors & drives	Not deemed	No therms	1,531	0.8%	0.9%	0.0%	0.0%	0.0%	0.0%
61	Commercial	Motors & drives	Deemed	No therms	150	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
62	Commercial	Motors & drives	Not deemed	No therms	3,019	1.6%	0.5%	0.0%	0.0%	0.0%	0.0%
113	Industrial	Motors & drives	Deemed	No therms	79	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
114	Industrial	Motors & drives	Not deemed	No therms	2,289	1.5%	1.2%	0.0%	0.0%	0.0%	0.0%
115	Industrial	Motors & drives	Not deemed	No therms	12,686	2.0%	1.6%	0.0%	0.1%	0.0%	0.0%
116	Industrial	Motors & drives	Not deemed	No therms	45,486	2.8%	2.0%	0.0%	0.1%	0.1%	0.0%
153	Schools and Government	Motors & drives	Deemed	No therms	63	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
154	Schools and Government	Motors & drives	Not deemed	No therms	1,413	1.3%	0.3%	0.0%	0.0%	0.0%	0.0%
60	Commercial	New construction	Not deemed	Has therms	26,614	0.5%	1.4%	1.9%	0.0%	0.2%	0.4%
112	Industrial	New construction	Not deemed	Has therms	9,167	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
151	Schools and Government	New construction	Not deemed	Has therms	30,166	0.3%	0.7%	1.0%	0.0%	0.2%	0.1%
152	Schools and Government	New construction	Not deemed	No therms	11,842	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
20	Agriculture	Other	Deemed	Has therms	430	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
21	Agriculture	Other	Deemed	No therms	421	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
22	Agriculture	Other	Not deemed	Has therms	2,069	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
23	Agriculture	Other	Not deemed	No therms	1,230	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%
66	Commercial	Other	Deemed	Has therms	1,005	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
67	Commercial	Other	Deemed	No therms	263	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
68	Commercial	Other	Not deemed	Has therms	1,913	0.2%	0.3%	1.0%	0.0%	0.0%	0.0%
69	Commercial	Other	Not deemed	No therms	4,201	2.2%	0.2%	0.0%	0.0%	0.0%	0.0%
118	Industrial	Other	Deemed	No therms	155	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
119	Industrial	Other	Not deemed	Has therms	3,261	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%
120	Industrial	Other	Not deemed	No therms	4,646	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
156	Schools and Government	Other	Deemed	Has therms	902	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
157	Schools and Government	Other	Deemed	No therms	464	0.3%	0.2%	0.0%	0.1%	0.0%	0.0%
158	Schools and Government	Other	Not deemed	Has therms	2,855	0.1%	0.2%	2.5%	0.0%	0.0%	0.0%
159	Schools and Government	Other	Not deemed	No therms	3,302	1.0%	0.2%	0.0%	0.0%	0.0%	0.0%
	Other overall					**17.0%**	**11.9%**	**11.9%**	**0.4%**	**0.6%**	**1.7%**

H.1 OVERVIEW

Under the direction of the PSCW, the evaluation team developed an alternative attribution analysis method called the life-cycle net savings (LCNS) method. The life-cycle method provides for a different treatment of accelerated measures and produces lifetime net savings instead of the first-year net savings produced by the current Focus evaluation method (Y1NS). The purpose of this analysis is to explore the viability of the life-cycle method as an alternative net savings methodology that takes a more nuanced approach to program attribution. This effort is part of the evaluation team's continued effort to adapt, adjust and refine the life-cycle method analysis assumptions. To that end, we:

1. Present results by measure group and by sector
2. Compare the life-cycle method and results with those of the first-year method
3. Compare the life-cycle results from CY10 to the life-cycle results from CY09.

We begin with a complete description of the life-cycle methodology and the factors used to calculate program realization rates, largely taken from the memo titled *Business Programs Life Cycle Attribution Analysis Results*.[63] In the next section, we report the results using the life-cycle method by measure group and sector, and compare the results determined using the life-cycle method with the results determined using the first-year method.

H.2 LCNS METHODOLOGY

H.2.1 Defining attribution analysis parameters

The LCNS attribution analysis is based on a number of parameters that are determined from the engineering review and participant survey, many of which are also used in the Y1NS method.

- **Installation rate.** This factor corresponds to the fraction of measures that were installed. Each measure is assigned a binary factor that identifies whether it was installed or not installed. Adjustments to the number of units installed for a particular measure are included in the engineering verification factor, not in the installation rate.
- **Engineering verification factor.** This is the ratio of the verified gross savings to the tracking estimate of gross savings for installed measures. The engineering verification factor includes corrections to the numbers of units installed, changes in operating hours, changes in operating levels, etc. Starting in CY09, the correction is determined both for measures in the engineering sample and measures in the CATI sample and is applied to measures that were installed by participants in both groups, custom and deemed. Measures in the CATI sample

[63] Tammy Kuiken and Shawn McNulty, KEMA. *Business Programs Life Cycle Attribution Analysis Results*. December 2, 2008.

receive the deemed energy savings and adjustments based on the parameters used to calculate total measure savings, such as unit quantity or operating hours.

- **Attribution factors.** These factors are used to determine the proportion of the verified gross savings attributable to the Focus on Energy Business Programs. For non-CFL measures,[64] the attribution factors are determined from the participant's responses to a battery of survey questions designed to determine how influential Focus on Energy Business Programs was in the decision to install a particular measure. For CFL measures, the final attribution is determined based on market research done to measure the balance between attribution and spillover in the entire state and across sectors.

There are two attribution factors and two time periods that affect the final lifetime net savings in the life-cycle method.

- **Acceleration Period, m_a:** This is a measure of the effect the program had on when the equipment was installed. The Acceleration Period corresponds to the number of months between the time the equipment was actually installed and the time it would have been installed in the absence of the program. For respondents who say they would have installed at the same time or earlier without the program, $m_a = 0$. For those who say they would have installed later, m_a is the number of months later the equipment would have been installed, up to a maximum of 48.[65]
- **Measure Life, m_L:** This represents the amount of time a piece of equipment will remain installed and operating before being replaced by a new piece of equipment.
- **Efficiency Attribution, A_E:** This measures the effect the program had on the efficiency of the equipment installed. The efficiency attribution measures the proportion of savings
- **Quantity Attribution, A_Q:** This measures the effect the program had on the quantity of the equipment installed. The quantity attribution measures the proportion of savings attributable to the program for increasing the quantity of equipment above what would have been installed otherwise.

The acceleration period, efficiency attribution, and quantity attribution are based on responses to the attribution questions in the impact evaluation survey.

The complement of attribution is free ridership. Attribution measures the portion of the savings that result because of the actions of the program. Free ridership measures the portion of the savings that would have happened in the absence of the program. The free

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[64] For purposes of this discussion, "CFLs" includes small CFLs only; for example, measures with the description "CFL <= 32W". Larger CFL installations follow the standard Focus on Energy evaluation attribution approach.

[65] More than 48 months of acceleration is functionally the same as a response of "never would have installed." Measures with more than 48 months of acceleration are given full attribution and are not considered "accelerated."

ridership equivalents of the two attribution factors are used to determine the overall program net savings. They are:

- **Efficiency Free ridership, f_E:** This is the fraction of verified gross (VGI) savings per unit that would have occurred without the program (free rider efficiency increment). This value is also equivalent to the factor E used in previous attribution analysis reports.
- **Quantity Free ridership, f_Q:** This is the fraction of installed units that would have been installed without the program (free rider quantity factor). This value is also equivalent to the factor Q used in previous attribution analysis reports.

The free ridership values are easily calculated from the attribution factors.

- $f_E = 1 - A_E$
- $f_Q = 1 - A_Q$

H.2.2 First-year attribution analysis

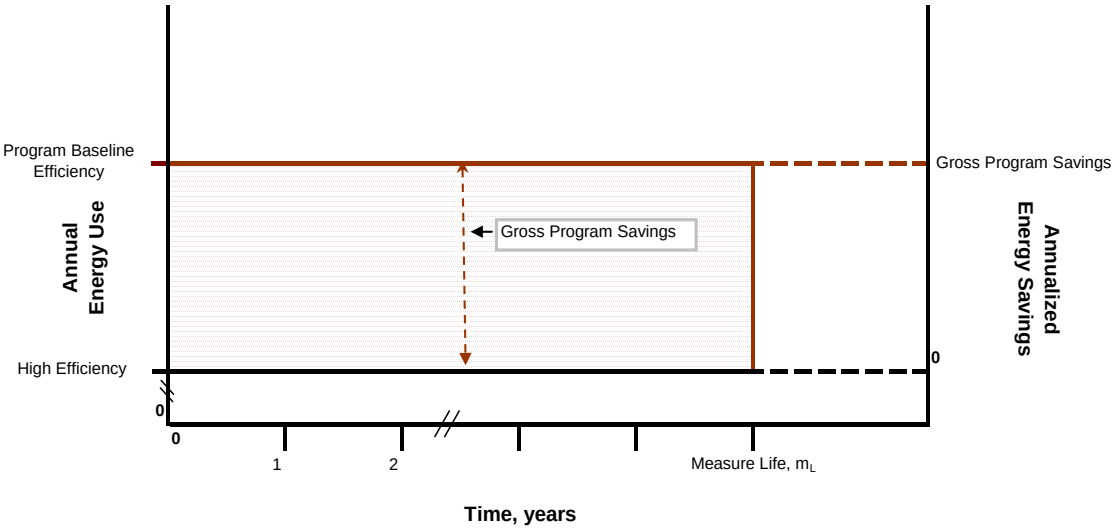
A detailed description of the first year net savings (Y1NS) Focus evaluation attribution methodology is available in Appendix E.

H.2.3 Life-cycle attribution analysis

This section outlines the calculation methods necessary to determine net program savings using the attribution analysis parameters defined above.

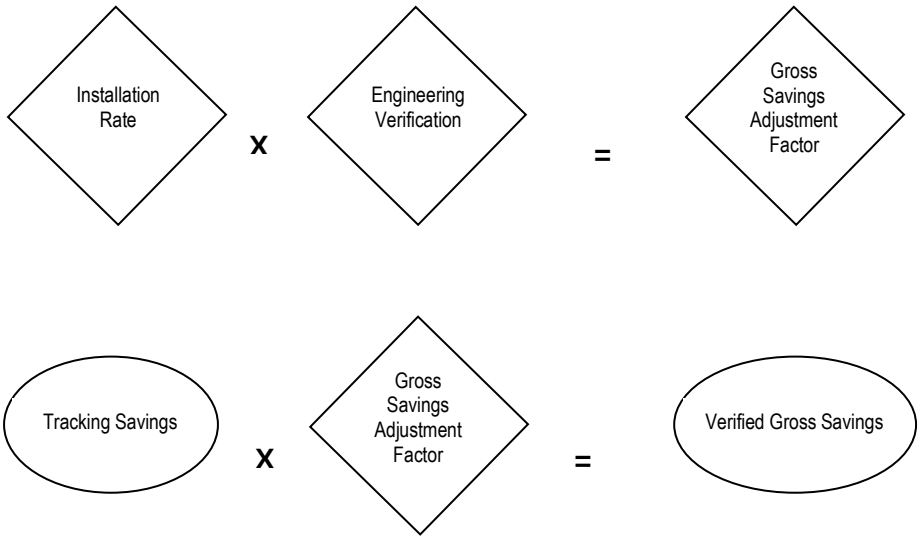
The impact evaluation starts with the program-reported gross savings for a measure. The goal of the new methodology is to produce lifetime net savings as opposed to the first-year net savings produced with the current Focus evaluation methodology. If the program-reported annual gross savings are combined with the measure life, m_L, then the simple lifetime gross savings can be plotted as shown in Figure H-1.

Figure H-1. Simple Lifetime Savings of a Focus on Energy Measure



The simple lifetime savings are simply the first year savings multiplied by the measure life.

The annualized verified gross (VGI) savings are determined by multiplying the annualized tracking savings (from the tracking database) by the installation rate and the engineering verification factor. The combined installation rate and engineering verification factor has also been called the gross savings adjustment factor.



The final net savings are a function of the Simple Program Attribution (SPA) and the acceleration period. The SPA is the fraction of VGI savings that are attributable to the program and is a function of the efficiency free ridership and the quantity free ridership.

The fraction of VGI savings that would have occurred *without* the program is the product of the fraction of units that would have been installed without the program, f_Q, and the fractional unit savings that these units would have had without the program, f_E.

$$f_{QE} = f_Q f_E$$

For example, if two-thirds as many units would have been installed without the program (f_Q = 2/3), and the savings per unit would have been only half as much (f_E = 1/2), the portion of the savings that would have occurred without the program would be

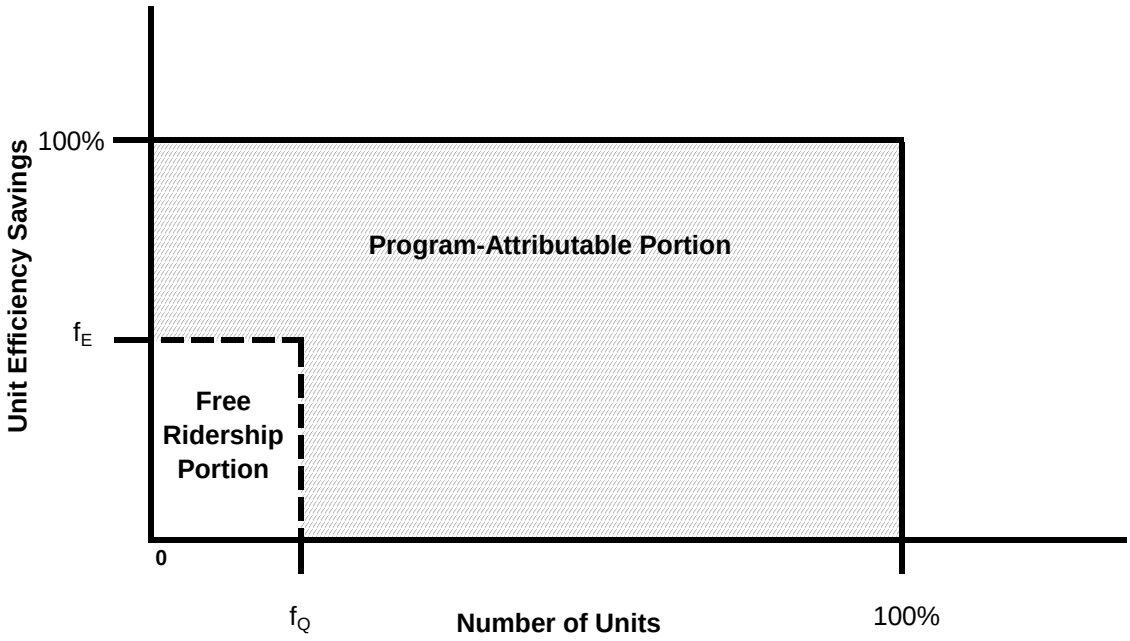
$$f_{QE} = (2/3) \times (1/2) = 1/3.$$

The SPA is the complement of this free rider portion.

$$SPA = 1\text{-}f_{QE} = 1\text{-} f_Q f_E$$

The relationship is illustrated in Figure H-2.

Figure H-2. Graphical Derivation of the SPA Equation



For a replacement measure with acceleration, the program caused the participant to install an energy efficiency measure before they originally intended to install it. During the acceleration period, the energy savings caused by the program are the difference between the energy use of the high efficiency equipment that was installed and the energy use of the equipment that was replaced. We call this value the Acceleration Period Savings.

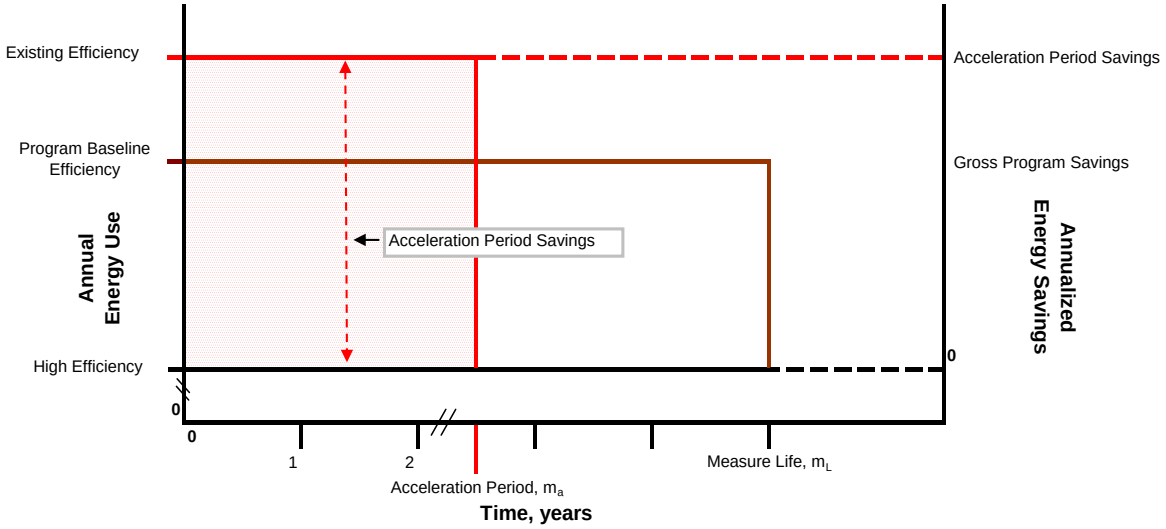
For non-deemed measures in the Engineering Review, the Acceleration Period Savings are determined in the same way as the VGI Savings but by using the existing equipment efficiency as the measure baseline instead of the standard or program-defined efficiency. The evaluating engineer is able to determine the existing equipment efficiency from the

project contact at the participating site. The engineer then uses a number of sources including the documentation provided by the program, other information from the participant contact, and secondary sources to estimate the Acceleration Period Savings for a particular measure.

The Acceleration Period Savings are not based on an adjustment to program-reported savings because the program has not traditionally addressed variations in energy savings over the life of accelerated measures. If the program were to estimate and produce acceleration period savings in the future then we expect that our methodology would adjust to verify both the program-reported Acceleration Period Savings and the program-reported Acceleration Period in the same manner that we now verify installation or gross savings.

Figure H-3 shows the Acceleration Period Savings superimposed over the gross program savings. The lifetime acceleration period savings are the acceleration period savings multiplied by the acceleration period, m_a.

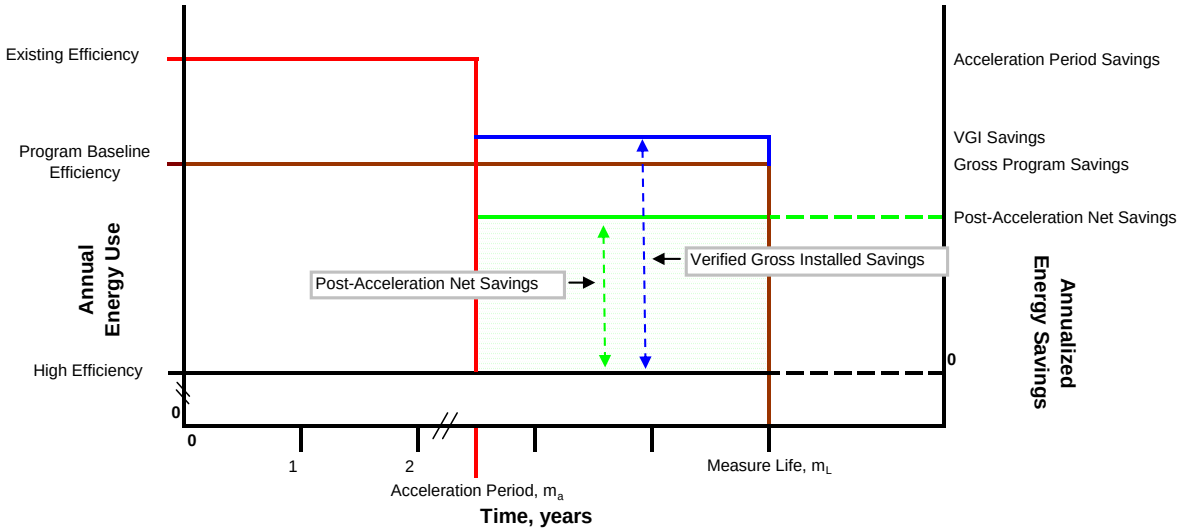
Figure H-3. Acceleration Period Savings



There is no "net" or "gross" associated with the Acceleration Period Savings. The concept of acceleration already incorporates elements of net savings so no further adjustments to acceleration period savings are necessary (essentially Acceleration Period Savings are by definition 100 percent attributable).

The post-acceleration period net savings are shown in Figure H-4. The post-acceleration net savings are equal to the VGI savings times the SPA defined above.

Figure H-4. Post-Acceleration Period Net Savings

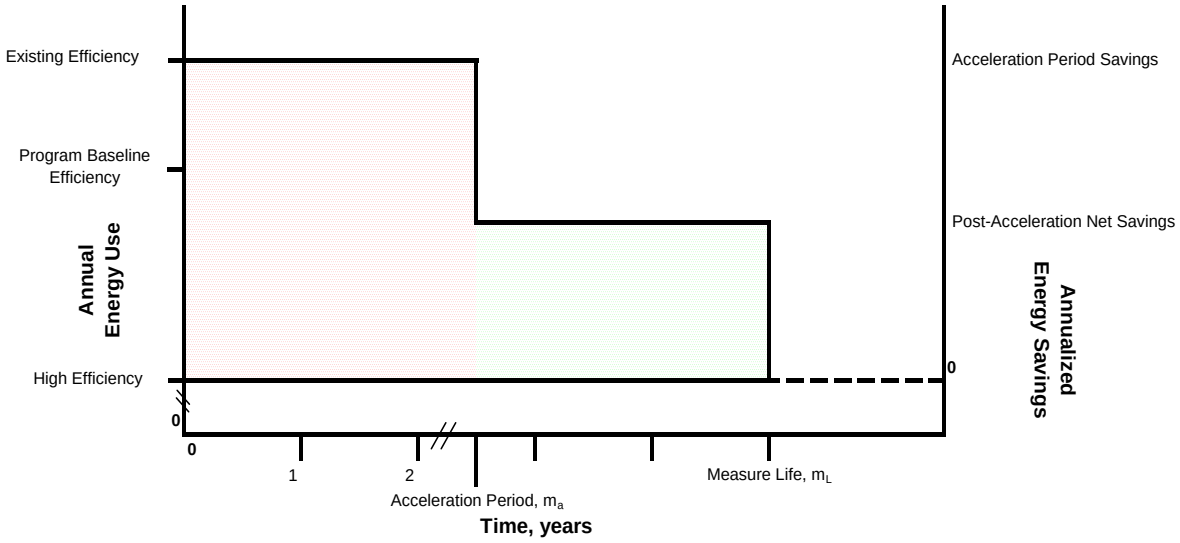


The lifetime net savings for an accelerated measure are the sum of the acceleration period savings and the post-acceleration net savings. This can also be written as

$$\text{Lifetime net savings (accelerated)} = \text{Acceleration Period Savings} + VGI_{\text{post-accel}} * SPA$$

The lifetime net savings are shown graphically in Figure H-5.

Figure H-5. Simple Lifetime Net Savings



H.2.4 Determining attribution parameters

The attribution factors defined above are determined from the participant responses gathered during the survey. The survey questions and procedure for calculating the

Acceleration Period, m_a , Efficiency Attribution, A_E , Quantity Attribution, A_Q, and incorporation of supplier effect is detailed in Appendix E.

H.2.5 Differences between life-cycle and first-year methods

In this section, we describe the important differences between the life-cycle and first-year methods.

a. SUMMARY OF DIFFERENCES

Like the first-year method, the life-cycle method calculates attribution as a ratio of net savings to a ratio of verified gross savings and the realization rate as a ratio of net savings to tracked savings; however, the life-cycle approach has two significant differences in its estimation of verified gross savings and net savings for the measure. First, the life-cycle method looks at the total lifetime savings of the equipment. Second, it increases the annual verified gross savings in the acceleration period for custom measures where the existing equipment had lower than standard efficiency. In the post-acceleration period and for non-accelerated measures the annual verified gross savings are the same as those used in the first-year method. The ratio of annual acceleration period savings to annual post acceleration period savings is referred to in this report as the A/P ratio.[66]

Table H-1 shows the differences in methodology among the first-year method and the life-cycle method.

Table H-1. Methodological Differences between Y1NS Method and LCNS Method

Assumption	LCNS	Y1NS
Type of savings	Lifetime savings	First year savings
Annual acceleration period verified gross savings	The difference between the energy use of the rebated equipment and the energy use of the equipment replaced.	The difference between the energy use of the rebated equipment and the energy use of its standard efficiency replacement.
Annual post-acceleration period verified gross savings	The difference between the energy use of the rebated equipment and the energy use of its standard efficiency replacement.	
Acceleration period net savings	Acceleration period verified gross savings multiplied by the acceleration period.	n/a
Post-acceleration period net savings	Post-acceleration period verified gross savings times the simple program attribution (SPA).	n/a
Net savings calculation	Acceleration period net savings plus post-acceleration period net savings	Verified gross savings times [SPA + (m_a /48)(1-SPA)]

[66] An A/P ratio of one is used for deemed measures. For deemed measures, the evaluation and program teams have stipulated values for the variables that affect the measure savings such as efficiency levels for the high and standard cases, operating hours, operating conditions, etc. These stipulations do not currently include acceleration benefits, but may in the future.

b. DETAILED REVIEW OF EXPECTED EFFECTS

There are two primary differences between the first-year and the life-cycle attribution method. First, the first-year method deals only with first-year savings, not lifetime savings. This means that the first-year method weights savings from long-lived measures the same as savings from short-lived measures.

Second, the first-year method used a simple relationship to determine timing attribution instead of assigning an acceleration period with a potentially different magnitude of savings. In the first-year method, the overall attribution is calculated as a function of timing free ridership as well as efficiency and quantity free riderships as shown below.

$$A_{Y1NS} = 1 - f_Q f_E f_T$$

The timing free ridership is a function of the acceleration period

$$f_T = 1 - m_a/48.$$

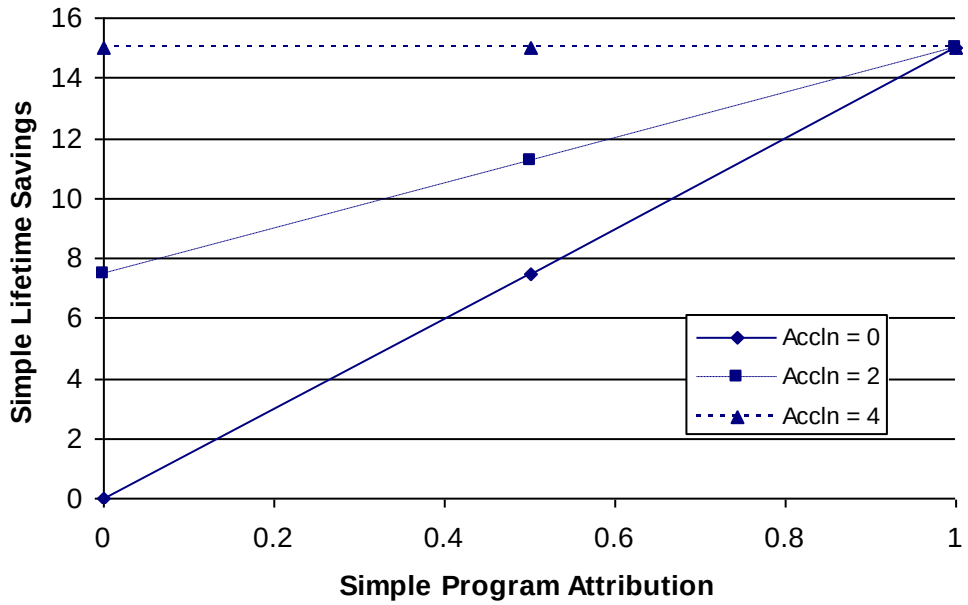
for all acceleration periods less than or equal to 48 months.

c. CHANGING ACCELERATION

Figure H-6 shows a plot of the simple lifetime savings using the first-year method. The values in the plot assume a measure life of 15 years and an A/P Ratio[67] of 1. Savings are shown for acceleration periods of 0, 2, and 4 years. Since the SPA is only a function of the efficiency and quantity free riderships, this plot isolates the effect of acceleration when efficiency and quantity attribution are changing.

[67] The A/P Ratio is the ratio of the Acceleration Period to the Post-Acceleration Period savings (VGI).

Figure H-6. Simple Lifetime Savings, Y1NS Method; A/P Ratio = 1

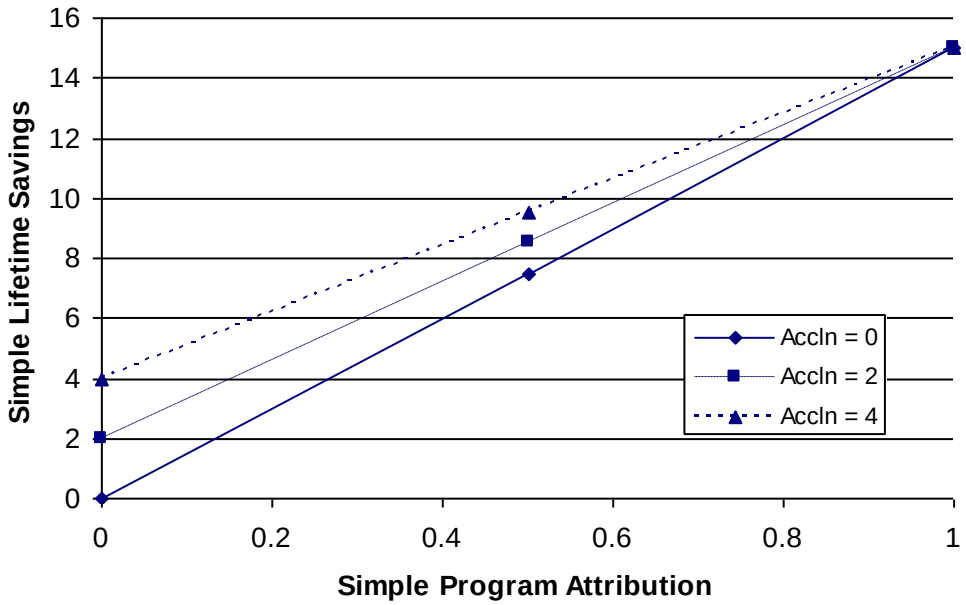


The plot shows that the first-year method produces full savings for all SPA when the acceleration period is four years. Mathematically, an acceleration period of four years produces a timing free ridership of zero ($f_T = 1 – 48/48 = 0$). A timing free ridership of zero produces an overall attribution of 100 percent ($A_{Y1NS} = 1 – f_Q f_E(0) = 1$) regardless of the values of the quantity or efficiency free riderships. When the attribution is 100 percent, the net savings are equal to the VGI savings.

On the other extreme, the plot shows that the simple lifetime savings are solely a function of the SPA when the acceleration period is zero. This is because a zero acceleration period produces 100 percent acceleration free ridership and the effect of acceleration is no longer felt in the overall attribution equation ($(A_{Y1NS} = 1 – f_Q f_E(1) = 1 – f_Q f_E$). In that case, the overall attribution is equal to SPA.

Figure H-7 shows the same plot with the values produced using the life-cycle method.

Figure H-7. Simple Lifetime Savings, LCNS Method; A/P Ratio = 1



The plot of the life-cycle method shows that the final lifetime savings are always dependent on the efficiency and quantity attributions, for any acceleration period that gives less than full attribution. On the other hand, the difference in lifetime savings between no acceleration and an acceleration period of four years is much smaller than it is when using the first-year method.

H.3 ANALYSIS RESULTS

H.3.1 Measure life

To complete the analysis, we assigned measure lives to each measure in our analysis sample. We assigned each measure to one of nine end-use measure type combinations and assigned a measure life based on the sector and end-use group.

Measure lives are taken from the Focus Business Programs Measure Life Study.[68] Table H-2 shows the measure lives assigned in our analysis.

[68] Miriam L. Goldberg, J. Ryan Barry, Brian Dunn, Mary Ackley, Darcy Deangelo-Woolsey, KEMA Inc. *Focus on Energy Evaluation Business Programs: Measure Life Study.* August 25, 2009.

Table H-2. Measure Life in Years

End Use Category	Measure Type	Sector			
		Agriculture	Commercial	Industrial	Schools and Government
Building Shell	Equip or Tech	19	19	19	19
HVAC	Equip or Tech	15	15	15	15
	Service	5	5	5	5
Lighting	Equip or Tech	12	12	12	12
Manufacturing Process	Equip or Tech	11	11	11	11
	Service	2	2	2	2
Other	Equip or Tech	12	12	12	12
CFL	Equip or Tech	7	5	4	5
Motors	Equip or Tech	16	16	16	16

H.3.2 Results by measure group

The LCNS method results in overall attributions of 56, 57, and 45 percent for kWh, kW, and therms respectively as shown in Table H-3. Other than Small CFLs, which have market-based attribution, the highest attribution for kWh is Boilers and Burners with 100 percent. The highest attribution among measure groups with significant kWh savings is Expanded Process with 76 percent. Expanded Process also has the highest therm attribution for measure groups with significant therm savings with 61 percent.

Table H-3. LCNS Attribution by Reporting Measure Group

Reporting Measure Group	kWh				kW				Therms			
	min n	Attribution Ratio	90% CI ±	% Pop Simple Lifetime Savings	min n	Attribution Ratio	90% CI ±	% Pop Simple Lifetime Savings	min n	Attribution Ratio	90% CI ±	% Pop Simple Lifetime Savings
Boilers & burners	3	100%	0%	1%	2	100%	0%	0%	217	31%	15%	26%
Non-CFL lighting	351	53%	6%	42%	318	55%	6%	42%	0			
Refrigeration	115	44%	8%	13%	112	39%	8%	11%	3	92%	30%	2%
HVAC	72	34%	15%	8%	42	48%	22%	17%	74	43%	12%	33%
Expanded process	26	76%	13%	11%	25	72%	16%	8%	20	61%	9%	23%
Small CFLs	21	84%	0%	3%	21	84%	0%	5%	0			
Other	48	67%	28%	22%	40	80%	11%	16%	28	50%	16%	16%
Business Programs overall	**636**	**56%**	**7%**	**100%**	**560**	**57%**	**7%**	**100%**	**342**	**45%**	**7%**	**100%**

Table H-4 shows overall LCNS realization rates of 55, 55, and 43 percent for kWh, kW, and therms respectively. Other than Small CFLs, the highest realization rate for kWh (among those with significant kWh savings) is the Other measure group with 66 percent. Expanded Process has the highest realization rate for therms (among those with significant therm savings) with 60 percent.

Table H-4. LCNS Realization Rate by Reporting Measure Group

Reporting Measure Group	kWh				kW				Therms			
	min n	Realization Rate	90% CI ±	% Pop Simple Lifetime Savings	min n	Realization Rate	90% CI ±	% Pop Simple Lifetime Savings	min n	Realization Rate	90% CI ±	% Pop Simple Lifetime Savings
Boilers & burners	3	97%	9%	1%	2	100%	0%	0%	217	34%	17%	26%
Non-CFL lighting	351	54%	7%	42%	318	51%	6%	42%	0			
Refrigeration	115	51%	10%	13%	112	47%	10%	11%	3	95%	31%	2%
HVAC	72	30%	13%	8%	42	48%	23%	17%	74	38%	11%	33%
Expanded process	26	60%	23%	11%	25	50%	20%	8%	20	60%	10%	23%
Small CFLs	21	84%	0%	3%	21	84%	0%	5%	0			
Other	48	66%	29%	22%	40	76%	21%	16%	27	33%	21%	16%
Business Programs overall	**636**	**55%**	**7%**	**100%**	**560**	**55%**	**7%**	**100%**	**342**	**43%**	**8%**	**100%**

a. COMPARISON TO Y1NS

We expect attributions for most reporting measure groups and savings types to be lower using the LCNS method than using the Y1NS method. This is because measure lives are generally longer than the four-year maximum acceleration period used in the Y1NS method. In a simple example, if a lighting measure was accelerated three years, but had no other attribution (SPA=0), then its attribution under Y1NS is 3/4=75 percent. Under the LCNS method, if the annual acceleration period gross savings are the same as the annual post-acceleration period gross savings (A/P ratio =1) then the attribution on this measure would be the number of years accelerated divided by the measure life, or 3/12=25 percent.

In CY10 most reporting measure groups have lower attributions using LCNS than using the Y1NS method as shown in Table H-5 with four exceptions.

- The Expanded Process group electric savings have a much higher LCNS attribution ratio than their Y1NS method attribution. This is primarily due to having much lower attribution on service measures (measure life of two years) than on equipment installations (measure life of 15 years). The difference in measure life means that service measures make up much more of the Expanded Process annual savings (39%) than they do the lifetime savings (10%) and thus influence the Y1NS ratio more than the LCNS ratio.

- Boilers and Burners therm savings have a slightly higher LCNS attribution than Y1NS for the same reason as Expanded Process electric savings.

- HVAC kW savings have slightly higher LCNS attribution than Y1NS, while HVAC kWh savings have lower LCNS attribution than Y1NS. While most projects that save kWh also save kW, in the HVAC reporting group sample, 30 out of 72 projects with kWh savings had no kW savings. This different mix of projects led to different results for the 2 savings types. Like Expanded Process electric and Boilers and Burners therm savings, HVAC kW savings have higher LCNS attribution than Y1NS due to having lower attribution for short lived service measures than for longer lived equipment installations.

- Other kW savings also showed a slightly higher LCNS attribution than Y1NS. Motors with kW savings in the sample had much higher attributions than the rest of the Other group. Because motors also have a slightly longer measure life than most measures in the Other group, they affect the attribution for Other more in the LCNS than in the Y1NS.

Table H-5. LCNS vs. Y1NS Attribution by Reporting Measure Group

Reporting Measure Group	kWh			kW			Therms		
	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.
Boilers & burners	100%	100%	0%	100%	100%	0%	31%	28%	3%
Non-CFL lighting	53%	60%	-7%	55%	61%	-6%			
Refrigeration	44%	51%	-7%	39%	46%	-8%	92%	95%	-3%
HVAC	34%	40%	-6%	48%	45%	3%	43%	52%	-9%
Expanded process	76%	59%	17%	72%	54%	19%	61%	66%	-4%
Small CFLs	84%	84%	0%	84%	84%	0%			
Other	67%	67%	0%	80%	78%	2%	50%	52%	-1%
Business Programs overall	**56%**	**60%**	**-4%**	**57%**	**59%**	**-2%**	**45%**	**47%**	**-1%**

The realization rates have a similar pattern to the attribution ratios: the same four measure group savings type combinations have higher LCNS realization rates than Y1NS. The other measure group savings type combinations all have lower LCNS ratios than Y1NS as shown in Table H-6.

Table H-6. LCNS vs. Y1NS Realization Rates by Reporting Measure Group

Reporting Measure Group	kWh			kW			Therms		
	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.
Boilers & burners	97%	97%	0%	100%	100%	0%	34%	29%	5%
Non-CFL lighting	54%	60%	-7%	51%	56%	-6%			
Refrigeration	51%	59%	-8%	47%	56%	-10%	95%	98%	-3%
HVAC	30%	35%	-5%	48%	46%	3%	38%	48%	-9%
Expanded process	60%	51%	9%	50%	42%	8%	60%	64%	-4%
Small CFLs	84%	84%	0%	84%	84%	0%			
Other	66%	66%	0%	76%	74%	3%	33%	33%	1%
Business Programs overall	**55%**	**59%**	**-4%**	**55%**	**57%**	**-2%**	**43%**	**44%**	**-1%**

b. COMPARISON TO CY09

CY10 LCNS attribution ratios are lower than CY09 for kWh and therms and higher for kW savings. For kWh, HVAC had the largest decrease in LCNS attribution (52%), while the Other group (30%) and Expanded Process (27%) had the largest decreases for therms. The biggest improvements in LCNS attribution came in Expanded Process (17%) and Other (23%) for kWh, while Refrigeration improved the most for therms (17%).

Table H-7. LCNS: CY10 vs. CY09 Attribution by Reporting Measure Group

Reporting Measure Group	kWh			kW			Therms		
	CY10	CY09	Diff.	CY10	CY09	Diff.	CY10	CY09	Diff.
Boilers & burners	100%	87%	13%	100%	100%	0%	31%	36%	-5%
Non-CFL lighting	53%	51%	2%	55%	52%	4%			
Refrigeration	44%	70%	-26%	39%	67%	-28%	92%	75%	17%
HVAC	34%	86%	-52%	48%	46%	2%	43%	36%	7%
Expanded process	76%	59%	17%	72%	44%	28%	61%	88%	-27%
Small CFLs	84%	89%	-5%	84%	90%	-5%			
Other	67%	44%	23%	80%	46%	34%	50%	80%	-30%
Business Programs overall	**56%**	**60%**	**-4%**	**57%**	**53%**	**3%**	**45%**	**61%**	**-16%**

CY10 LCNS realization rates are lower than CY09 for kWh and therms and higher for kW savings. The differences between years are greater for many measure groups due to differences across years in gross savings adjustments. For example, Expanded Process therms had a gross savings adjustment slightly under 100 percent in CY10, but had an adjustment much higher than 100 percent in CY09.

Table H-8. LCNS: CY10 vs. CY09 Realization Rates by Reporting Measure Group

Reporting Measure Group	kWh			kW			Therms		
	CY10	CY09	Diff.	CY10	CY09	Diff.	CY10	CY09	Diff.
Boilers & burners	97%	86%	11%	100%	100%	0%	34%	35%	-2%
Non-CFL lighting	54%	52%	2%	51%	52%	-1%			
Refrigeration	51%	68%	-17%	47%	64%	-17%	95%	70%	24%
HVAC	30%	97%	-67%	48%	40%	9%	38%	39%	0%
Expanded process	60%	51%	8%	50%	66%	-16%	60%	104%	-44%
Small CFLs	84%	88%	-4%	84%	88%	-4%			
Other	66%	47%	19%	76%	48%	28%	33%	72%	-39%
Business Programs overall	**55%**	**60%**	**-5%**	**55%**	**53%**	**2%**	**43%**	**65%**	**-23%**

H.3.3 Results by sector

Table H-9 shows that the Industrial sector has the highest LCNS attribution ratio for both kWh and therm savings with ratios of 60 and 53 percent respectively. Commercial has the highest LCNS attribution for kW with 64 percent.

Table H-9. LCNS Attribution by Sector

Sector	kWh				kW				Therms			
	min n	Attribution Ratio	90% CI ±	% Pop Simple Lifetime Savings	min n	Attribution Ratio	90% CI ±	% Pop Simple Lifetime Savings	min n	Attribution Ratio	90% CI ±	% Pop Simple Lifetime Savings
Agriculture	20	23%	20%	6%	18	29%	24%	8%	4	9%	21%	2%
Commercial	322	57%	6%	40%	297	64%	11%	42%	129	25%	10%	27%
Industrial	155	60%	8%	41%	137	55%	8%	36%	77	53%	8%	46%
Schools and Gov.	139	52%	27%	13%	108	50%	14%	14%	132	48%	16%	25%
Business Programs overall	**636**	**56%**	**7%**	**100%**	**560**	**57%**	**7%**	**100%**	**342**	**45%**	**7%**	**100%**

Table H-10 shows that the Commercial sector has the highest LCNS realization rate for kWh and kW with 59 and 65 percent, respectively. Industrial has the highest realization rate for therms at 50 percent.

Table H-10. LCNS Realization Rates by Sector

Sector	kWh				kW				Therms			
	min n	Realization Rate	90% CI ±	% Pop Simple Lifetime Savings	min n	Realization Rate	90% CI ±	% Pop Simple Lifetime Savings	min n	Realization Rate	90% CI ±	% Pop Simple Lifetime Savings
Agriculture	20	24%	20%	6%	18	22%	20%	8%	4	9%	21%	2%
Commercial	322	59%	8%	40%	297	65%	12%	42%	129	24%	14%	27%
Industrial	155	58%	9%	41%	137	53%	9%	36%	77	50%	8%	46%
Schools and Gov.	139	50%	26%	13%	108	45%	13%	14%	132	43%	15%	25%
Business Programs overall	**636**	**55%**	**7%**	**100%**	**560**	**55%**	**7%**	**100%**	**342**	**43%**	**8%**	**100%**

a. COMPARISON TO Y1NS

The industrial sector has slightly higher kWh attribution using LCNS than using Y1NS. Schools and Government shows higher attributions for both kW and therms when using LCNS, as Table H-11 shows.

Table H-11. LCNS vs. Y1NS Attribution by Sector

Sector	kWh			kW			Therms		
	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.
Agriculture	23%	33%	-9%	29%	41%	-12%	9%	20%	-11%
Commercial	57%	65%	-8%	64%	66%	-3%	25%	33%	-8%
Industrial	60%	59%	1%	55%	56%	-1%	53%	56%	-3%
Schools and Gov.	52%	56%	-4%	50%	48%	2%	48%	42%	5%
Business Programs overall	**56%**	**60%**	**-4%**	**57%**	**59%**	**-2%**	**45%**	**47%**	**-1%**

Like attribution, the Industrial sector has slightly higher kWh attribution using LCNS than using Y1NS. Schools and Government shows higher attributions for both kW and therms when using LCNS, as shown in Table H-12.

Table H-12. LCNS vs. Y1NS Realization Rates by Sector

Sector	kWh			kW			Therms		
	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.
Agriculture	24%	34%	-10%	22%	31%	-9%	9%	20%	-11%
Commercial	59%	66%	-7%	65%	68%	-3%	24%	30%	-6%
Industrial	58%	57%	1%	53%	54%	-1%	50%	53%	-3%
Schools and Gov.	50%	53%	-4%	45%	43%	2%	43%	40%	3%
Business Programs overall	**55%**	**59%**	**-4%**	**55%**	**57%**	**-2%**	**43%**	**44%**	**-1%**

b. COMPARISON TO CY09

LCNS attributions for electric savings are lower in CY10 than they were in CY09 for both the Agriculture and Commercial sectors and higher for Industrial and Schools and Government. For therms, LCNS attribution is much lower for both Agriculture and Industrial, while it is slightly higher for Commercial and Schools and Government as shown in Table H-13.

Table H-13. LCNS: CY10 vs. CY09 Attribution by Sector

Sector	kWh			kW			Therms		
	CY10	CY09	Diff.	CY10	CY09	Diff.	CY10	CY09	Diff.
Agriculture	23%	50%	-26%	29%	53%	-24%	9%	70%	-61%
Commercial	57%	81%	-24%	64%	68%	-5%	25%	23%	2%
Industrial	60%	48%	12%	55%	45%	10%	53%	75%	-22%
Schools and Gov.	52%	47%	5%	50%	29%	21%	48%	47%	1%
Business Programs overall	**56%**	**60%**	**-4%**	**57%**	**53%**	**3%**	**45%**	**61%**	**-16%**

LCNS Business Programs overall realization rates are lower in CY10 for kWh and therms than they were in CY09. The biggest decreases were Agriculture and Industrial therms which decreased 64 and 33 percent respectively and Agriculture kW which also decreased 33 percent over their CY09 LCNS realization rates as shown in Table H-14.

Table H-14. LCNS: CY10 vs. CY09 Realization Rates by Sector

Sector	kWh			kW			Therms		
	CY10	CY09	Diff.	CY10	CY09	Diff.	CY10	CY09	Diff.
Agriculture	24%	53%	-29%	22%	55%	-33%	9%	73%	-64%
Commercial	59%	89%	-30%	65%	63%	2%	24%	23%	1%
Industrial	58%	46%	11%	53%	48%	5%	50%	84%	-33%
Schools and Gov.	50%	42%	8%	45%	27%	18%	43%	45%	-2%
Business Programs overall	**55%**	**60%**	**-5%**	**55%**	**53%**	**2%**	**43%**	**65%**	**-23%**

H.3.4 Conclusions

The life-cycle method provides a more realistic estimate of the lifetime savings attributable to the program than simply projecting the first-year results forward. We recommend the PSCW consider continued development and refinement of this method in addition to the current Focus (first-year) methods in future evaluations.

Conceptually, there are two key differences between the approaches:

1. The first-year approach treats the reported acceleration period more as an indicator of the likelihood the measure would have been installed without the program rather than as a literal indicator of the time until the measure would have been installed.
2. The first-year approach determines aggregate attribution for a program, sector, or portfolio weighting measures only by first-year savings. The life-cycle approach weights measures according to lifetime savings. The first-year approach gives more weight to shorter-lived measures.

Further work remains to be done on understanding how best to obtain meaningful information on timing of installations absent the program, or conversely on how to interpret self-reported acceleration. However, taking measure life into account in assessing aggregate attribution is important in its own right.

APPENDIX I: SPILLOVER AND UNTRACKED SAVINGS EFFECTS

There are three types of untracked savings that are included in the overall verified gross and net savings for the Focus on Energy Business Programs. They are Spillover, Education & Training Untracked Attributable Savings, and Supply-Side Untracked Attributable savings. These are described in the following three sections.

I.1 SPILLOVER

Since FY06, the impact results have included participant spillover effects for non-CFLs in the attribution estimates. The *Participant Spillover Savings Study*[69] provides a basis for calculating the non-CFL spillover rate. We calculate this rate as the new savings in the current year per unit of tracked savings in a prior year. This rate represents first-year savings implemented in the current year due to all prior program years. This rate is:

0.08% for kWh

0.11% for kW

0.002% for therms.

I.2 EDUCATION AND TRAINING UNTRACKED ATTRIBUTABLE SAVINGS

Starting in 2008, the impact results included Untracked Attributable Savings (UAS) from the E&T program in the total net savings for the program.[70] UAS are defined as savings motivated by the program but not included in program tracking data. In 2008, KEMA conducted an Education and Training (E&T) UAS study that included process and impact evaluations of the Focus on Energy E&T program.[71] The impact evaluation component of the 2008 study resulted in a recommendation to the Public Service Commission of Wisconsin (PSCW) for additional energy savings to be credited to the Focus Business Programs for its E&T activities.

The 2008 report established a methodology for estimating UAS for one-time projects[72] based on averages of trainee counts and savings estimates from the previous four years.

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[69] Miriam L. Goldberg, Christopher Dyson, and Valy T. Goepfrich, KEMA Inc. *Business Programs: Participant Spillover Savings Study*. December 22, 2005.

[70] Untracked attributable savings resulting from the supply-side study completed in April 2010 will be added to the final version of this report.

[71] Christopher Dyson, Ken Agnew, Miriam Goldberg, and Claire Palmgren, KEMA, Inc. *State of Wisconsin, Focus on Energy Evaluation, Business Programs: Impact Evaluation of Education and Training Program*. November 15, 2008.

[72] This appendix uses the terms “one-time projects” and “O&M projects” throughout. One-time projects involve changes to the facility’s energy-using equipment. Examples include installing a different type of lighting or installing a new boiler. O&M projects involve changes in routine operations, building management practices, or equipment maintenance practices. Examples include

The four-year average lessens the effect of year-to-year fluctuations in course attendance as well as other factors that may affect the likelihood of implementing projects after training courses that would result in UAS. The 2008 report based UAS for operations and maintenance (O&M) projects on a single year of data. KEMA used the per-trainee savings estimates from the 2008 report combined with the 2008 course attendance records to estimate 2009 E&T UAS.[73]

Since the 2008 study, changes in program delivery, updated and expanded course offerings, and emphasis on O&M projects have made it necessary to update UAS estimates to reflect this greater emphasis on O&M courses. Due to a shift in course offerings towards O&M-focused courses and a limited evaluation budget for this round of evaluation, we focused data collection on O&M project savings estimates and continued to use the one-time project per-trainee savings estimates from the 2008 report. The primary purpose of the 2010 report was to provide an updated estimate of per-trainee UAS from O&M projects resulting from classes provided by the Focus on Energy E&T program. Other goals of the study were to estimate total E&T UAS estimates for 2010 and to provide a methodology for making similar estimates for courses offered in future years. The *Business Programs: Education and Training Untracked Attributable Savings* report[74] provides the basis for calculating the untracked attributable savings for 2010 and instructions on how to conduct future evaluations.

According to Nancy Giere Associates, implementers of the E&T program training, all courses contain some O&M component, but some courses are more focused on O&M than others. KEMA worked with Nancy Giere Associates to identify courses that were more- and less-O&M focused. The report provides separate UAS estimates for each type of course. These separate UAS estimates should be more representative estimates for future UAS projections than estimates published in previous evaluations that did not separate by course focus.

The evaluation counted energy savings in the year in which the measure was implemented ("first-year savings"). For the one-time measures, we counted the first-year savings in that program year because we knew what year the measure was completed. To be considered attributable, one-time measures must have been completed in the first four years after the training course.

For one-time projects, the analysis methodology reported UAS resulting in year X as the result of cumulative influences of E&T program training in prior years. For example, new measure implementation in 2010 due to E&T program training was the sum of 2006 training influence on adoption four years out, 2007 training influence on adoption three years out, 2008 training influence on adoption two years out, and 2009 training influence on adoption one year out. This savings estimation approach is analogous to counting

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inspecting equipment more often, cleaning equipment more often, and using equipment on a different schedule.

[73] Miriam L. Goldberg, J. Ryan Barry, Tammy Kuiken, Nicole Buccitelli, John Dendy, and Ben Jones; KEMA Inc. *Business Programs Impact Evaluation Report: Last Quarter of the 18-month Contract Period and First Three Quarters of Calendar Year 2009*, March 31, 2010.

[74] Shawn Bodmann, Christopher Dyson, Tammy Kuiken, Miriam Goldberg, KEMA Inc. *Business Programs: Education and Training Untracked Attributable Savings*, October 29, 2010.

tracked energy savings implemented in the current year that were the result of multiple years of the program working with the customer on a measure. The 2010 evaluation used the one-time per-project savings estimates from the 2008 evaluation and applied those savings to projects undertaken in 2006 through 2009 to calculate the one-time savings estimates for 2010.

For O&M projects, the evaluation team computed new per-project estimates for the 2010 evaluation. These per project estimates were based on trainees who took courses in 2008 and 2009 and applied to the 2009 course attendance to generate the 2010 savings estimates. Table I-1 shows UAS estimates for year 2010 by project type (one-time vs. O&M), course type (less- or more-O&M focused) and savings type (kWh, kW, and therms).

Table I-1. Untracked Attributable Savings (UAS) Estimates for 2010 by Project Type, Course Type, and Savings Type

Savings	O&M Projects		One-Time Projects		Total
	Less O&M Focus	More O&M Focus	Less O&M Focus	More O&M Focus	
kWh	2,707,516	7,254,391	3,826,705	1,970,030	15,758,642
kW	845	776	366	341	2,328
Therm	43,179	3,342,470	3,175,331	24,969	6,585,949

We engaged in the following activities to calculate these 2010 UAS estimates:

1. Conducted a computer-aided telephone interview (CATI) survey to discover potential untracked, attributable O&M projects. The subtasks for this task included:
    a. Collected 2008 and 2009 course offering information and training counts from the program.
    b. Filtered trainees to remove program and utility company staff. Also ensured that people who took multiple courses appeared only once in the sample.
    c. Identified courses with more and less O&M focus.
    d. Drew a sample of trainees from 2008 and 2009 courses for participant surveys.
    e. Made survey calls.
2. Conducted an engineering review of projects discovered in the CATI. The subtasks for this task included:
    a. Filtered the list of projects found in the CATI surveys, based on program attribution, whether the project was tracked in WISeerts, and whether the project was an O&M project.
    b. Drew a sample of potential projects for engineering reviews to confirm project type, attribution, and estimate energy savings for these projects.
    c. Estimated 2010 E&T UAS for O&M projects using the data collected in engineering review.

3. Calculated per-trainee savings for O&M projects for more- and less-O&M-focused courses. The subtasks for this task included:
    a. Aggregated engineering estimates to more- and less-O&M-focused course level using data from step 2.
    b. Calculated 2010 O&M total UAS based on per-trainee UAS and 2009 course attendance (after the filtering applied in step 1).
4. Reanalyzed data on 2004–2007 courses (originally reported in the 2008 E&T UAS report) to provide estimates of per-trainee savings for one-time projects for the more- and less-O&M-focused courses. The subtasks for this task included:
    a. Split 2004–2007 courses into more- and less-O&M-focused categories and recalculate per-trainee UAS estimates for one-time projects for each course category.
    b. Estimated 2010 E&T UAS for one-time projects based on 2006–2007 course attendance (as reported in 2008) and 2008–2009 course attendance (after the filtering applied in step 1), and the per course type estimates (step 4a).
5. Calculated total 2010 E&T UAS by summing the 2010 E&T UAS for O&M projects (Step 3) and 2010 E&T UAS for one-time projects (Step 4).

One of the goals of 2010 report was to provide a methodology for computing UAS for future courses. The 2008 report established a methodology for estimating UAS for one-time projects based on averages of trainee counts and savings estimates from the previous four years. The four-year average lessens the effect of year-to-year fluctuations in course attendance as well as other factors that may affect the likelihood of implementing projects after training courses that would result in UAS. Because of the four-year average, to compute total savings for a particular year, one must know the number of attendees in less- and more-O&M-focused courses for the latest year, one year before, two years before, and three years before. The following steps can be followed to compute savings in future evaluations:

1. Obtain course rosters for the latest year and the three previous years.
2. Filter the rosters to remove no shows, cancellations, and utility employees. Assign trainees with duplicate courses to the course with the lowest overall attendance, then remove the other entries for those trainees.
3. Divide the courses into more- and less-O&M-focused categories. Table I-2 categorizes the courses offered since 2004. This table can be used to identify the O&M focus of future courses. If a course does not appear on this list, the evaluator should work with Nancy Giere Associates, or the current implementer of the training program, to identify whether the course is more- or less-O&M-focused.
4. There will be eight categories: more- and less-O&M focused courses for each of the four years. Count the number of (post-filtering) trainees in each of these categories.
5. Multiply the number of trainees in each of the eight categories in step 4 by the per-trainee one-time savings estimates that correspond to those categories. Table

I-3 summarizes the per-trainee savings estimates for each year, course type, and project type.

6. Sum the eight products calculated in step 5 to compute total one-time project savings.
7. Multiply the number of trainees in less- and more-O&M-focused courses in the latest year by the per-trainee O&M savings estimate that corresponds to each category. O&M savings only use the latest year.
8. Sum the two products calculated in step 7 to compute total O&M project savings.
9. Sum the sums from step 6 and step 8 to compute total savings.

In the 2010 report, KEMA recommended that Focus on Energy collect company size information from attendees of future E&T courses. This information will help future evaluations weight results according to estimates of energy use at facilities, rather than treating all trainees in a particular course equally. Weighting according to energy use estimates should yield more accurate UAS estimates. We recommended that training administrators ask attendees to provide the number of employees and the primary economic activity at the facility where they are most likely to make changes based due to the course. This information can be used to compute a facility's energy use by cross-referencing to surveys from the Department of Energy (Manufacturing Energy Consumption Survey (MECS) and Commercial Buildings Energy Consumption Survey (CBECS)) which provide estimates of per employee energy use based on economic activity.

Table I-2. More- and Less-O&M Focused Courses Offered 2004–2009[75]

Less-O&M-focused courses	More-O&M-focused courses
Best Practices in Industrial Lighting	Building Operator Certification
Best Practices in Industrial Lighting Efficiency	Building Operator Certification - Level II
Bottom Line Results	Commercial Practical Energy Management
Compressed Air Best Practices	Energy Efficient Swimming Pool Operation and Maintenance
Compressed Air Leak Detection	Hotel Energy Management
Compressed Air Systems Best Practices Training	Industrial Practical Energy Management
Fan System Assessment (Co-Sponsored by the Department of Energy)	Practical Energy Management - Commercial
Fan System Assessment (Sponsored by U.S. Department of Energy)	Practical Energy Management - Industrial
Fan System Specialist Qualification (Co-Sponsored by the Department of Energy)	Practical Energy Management Implementation Series
Industrial Refrigeration Best Practices	Preventative Operations and Maintenance - Schools and Government
Industrial Ventilation Systems Best Practices Overview	School's Practical Energy Management
Industrial Ventilation Systems Best Practices Training	Smart Strategies for Healthcare
Pumping System Assessment	Smart Strategies for Hotels
Pumping System Specialist Qualification	
Pumping System Specialist Qualification (Co-Sponsored by U.S. Department of Energy)	
Retrocommissioning for Large Commercial Buildings	
Steam Specialist Qualification (Co-Sponsored by U.S. Department of Energy)	
Steam System Assessment (Co-Sponsored by U.S. Department of Energy)	
Steam System Specialist Qualification	
Steam Systems Assessment (Sponsored by U.S. Department of Energy)	
Steam Systems Best Practices for Industrial Customers	
Steam Systems Best Practices for Schools & Government	
Steam Systems Best Practices Training	
Strategic Business Solutions: Surviving the Energy Price Shock	

[75] This table contains all course names used since 2004. It is included as a reference to help future evaluations categorize courses. Course names have evolved over the years, so courses with similar names may not have occurred in the same calendar year. In the evaluations referenced in this appendix, courses with similar names that occurred in the same year were aggregated for purposes of UAS estimations.

Table I-3. Per-trainee Savings Estimates by Course, Year, and Project Type

Project Type	Course Focus	Metric	Latest Year Minus 3	Latest Year Minus 2	Latest Year Minus 1	Latest Year
One-time	Less O&M	kWh	7,534	2,117	2,401	7,379
		kW	0.73	0.20	0.23	0.69
		Therms	6,959	1,509	2,139	4,299
	More O&M	kWh	1,767	1,864	1,199	1,246
		kW	0.31	0.30	0.21	0.23
		Therms	24	17	15	19
O&M[76]	Less O&M	kWh				27,349
		kW				8.53
		Therms				436
	More O&M	kWh				17,956
		kW				1.92
		Therms				8,273

I.3 SUPPLY-SIDE UAS

In April 2010 the evaluation team issued a report that estimated Untracked Attributable Savings (UAS) based on supply-side market effects from Focus BP. This report—the Focus on Energy Evaluation Business Programs: Supply-Side Evaluation—estimated UAS for a number of measures including high-bay fluorescents, high-performance T8s, high-efficiency rooftop air conditioners, modulating hot water boilers, and boiler tune-ups.[77] It should be noted that these UAS are separate from those that will be credited to Focus BP as a result of their Education and Training program.

In determining how much UAS to credit Focus BP with from the supply-side market effects, we reviewed our methodologies (different methodologies were used for different measures), the robustness of the sample sizes, the level of program attribution, and other considerations to determine which UAS estimates we had the greatest confidence in. Based on this review, we proposed to the Public Service Commission of Wisconsin (PSCW) to award UAS to Focus BP for the high-bay fluorescents and high-performance T8s. These two measures accounted for the bulk of the estimated UAS for kWh and kW. The PSCW agreed with this decision in January 2011.

The April 2010 supply-side report had calculated UAS estimates for Calendar Year 2009 (CY09) Focus BP activities. Since the supply-side study that been scheduled to cover Calendar Year 2010 (CY10) program activities had been canceled in 2010 for budgetary reasons, we had to determine how the UAS estimates from the April 2010 supply-side report could be applied to CY10 Focus BP activities. We decided that the most straightforward way to do this was to take the ratio of CY09 UAS to CY09 gross tracked

[76] Per-trainee savings for O&M projects are only estimated for a single year. Therefore, estimates only appear in the last column of the table.

[77] Christopher Dyson, Shawn Bodmann, Karen Rothkin, Maggie Pinckard, Erika Morgan, Ryan Barry, Miriam Goldberg, KEMA Inc. *Business Programs: Supply-Side Evaluation.* April 22, 2010.

savings (kWh and kW) for the high-bay fluorescents and high-performance T8s and apply these ratios to the CY10 gross tracked savings for these same measures. The formula for this would be:

(CY09 UAS x CY10 gross tracked savings)/CY09 gross tracked savings = CY10 UAS

We proposed this approach to the PSCW and in January 2011 they agreed. The following table shows the CY10 UAS estimates for kW and kWh using this approach.

I-4. Supply-Side Untracked Attributable Savings

Measure	CY09 Gross Tracked Savings		CY09 UAS		CY10 Gross Tracked Savings		CY10 UAS	
	kWh	kW	kWh	kW	kWh	kW	kWh	kW
High Bay Fluorescent	141,126,197	29,554	47,788,940	9,751	14,796,137	3,115	5,010,350	1,028
High Performance T8	10,625,229	2,274	2,868,783	596	89,177,068	17,677	24,077,566	4,633
Total	151,751,426	31,828	50,657,723	10,347	103,973,205	20,793	29,087,917	5,661

APPENDIX J: FOCUS ON ENERGY DEEMED SAVINGS

The following tables show Focus on Energy deemed savings for all sectors combined and for each of the four Business Program sectors (Industrial, Commercial, Schools and Government, and Agriculture).

For the newest round of deemed savings approved November 13, 2009, Non-lighting measures are shown in Table J-1 and lighting measures in Table J-2. For the previous round of deemed savings, Non-lighting measures are shown in Table J-3 and lighting measures in Table J-4.

Table J-1. Focus on Energy Demand Savings by Business Program Sector
Approved Nov. 13 2009 (Non-Lighting)

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
1.0710.085	Boilers & Burners	Controls	Boiler oxygen trim controls, per hp	0	0	11
1.0711.085	Boilers & Burners	Controls	Linkageless Boiler Control, per hp	0	0	25
1.1300.430	Boilers & Burners	Boiler	Boiler Tune-up - service buy down	0	0	0.356
1.1412.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, <50 psig steam (Industrial Only)	0	0	196
1.1414.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, 50-125 psig steam (Industrial Only)	0	0	756
1.1416.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, 126-225 psig steam (Industrial Only)	0	0	1084
1.1418.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, >225 psig steam (Industrial Only)	0	0	2075
1.2700.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 85.0%-85.9%)(>300, <=1000 MBh input)	0	0	1.430
1.2701.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 86.0%-86.9%)(>300, <=1000 MBh input)	0	0	1.671
1.2702.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 87.0%-87.9%)(>300, <=1000 MBh input)	0	0	1.906
1.2703.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 88.0%-88.9%)(>300, <=1000 MBh input)	0	0	2.135
1.2704.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 89.0%-89.9%)(>300, <=1000 MBh input)	0	0	2.360
1.2705.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 90.0%-90.9%)(>300, <=1000 MBh input)	0	0	2.579
1.2706.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 91.0%-91.9%)(>300, <=1000 MBh input)	0	0	2.794
1.2707.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 92.0%-92.9%)(>300, <=1000 MBh input)	0	0	3.004

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
1.2708.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 93.0%-93.9%)(>300, <=1000 MBh input)	0	0	3.210
1.2709.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 94.0%-94.9%)(>300, <=1000 MBh input)	0	0	3.411
1.2710.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 95.0%-95.9%)(>300, <=1000 MBh input)	0	0	3.608
1.2711.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 96.0%-96.9%)(>300, <=1000 MBh input)	0	0	3.801
1.2712.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 97.0%-97.9%)(>300, <=1000 MBh input)	0	0	3.990
1.2790.040	Boilers & Burners	Boiler	Boiler, hot water, high efficiency modulating, for space heating (AFUE >= 90%)	0	0	3.108
1.2791.040	Boilers & Burners	Boiler	Boiler, hot water, high efficiency modulating, for space heating (AFUE >= 90%)(175 - 300 MBh)	0	0	3.108
1.3801.085	Boilers & Burners	Controls	Outside air temperature boiler reset/cutout controls, per input MBh	0	0	1.674
14.1100.180	Food Service	Fryer	Fryer, Electric, ENERGY STAR	0.2000	983	0
14.1200.180	Food Service	Fryer	Fryer, Gas, ENERGY STAR	0	0	396
14.1301.180	Food Service	Fryer	Fryer, Large Vat, Electric, High Efficiency	0.4000	1789	0
14.1302.180	Food Service	Fryer	Fryer, Large Vat, Gas, High Efficiency	0	0	577
14.2103.395	Food Service	Steamer	Steamer, Electric, 3 pan - ENERGY STAR	2.5000	11188	0
14.2104.395	Food Service	Steamer	Steamer, Electric, 4 pan - ENERGY STAR	2.5000	12459	0
14.2105.395	Food Service	Steamer	Steamer, Electric, 5 pan - ENERGY STAR	2.5000	13831	0
14.2106.395	Food Service	Steamer	Steamer, Electric, 6 pan - ENERGY STAR	2.5000	15170	0
14.2107.395	Food Service	Steamer	Steamer, Gas, 5 pan - ENERGY STAR	0	0	1900
14.2206.395	Food Service	Steamer	Steamer, Gas, 6 pan - ENERGY STAR	0	0	2084
14.3000.225	Food Service	Hot Holding Cabinet	Hot Food Holding Cabinet - ENERGY STAR	0.6375	4654	0
14.3101.290	Food Service	Oven	Oven, Convection, Electric, ENERGY STAR - per cavity	0.5000	1879	0
14.3102.290	Food Service	Oven	Oven, Convection, Gas, ENERGY STAR - per cavity	0	0	306
14.3112.290	Food Service	Oven	Oven, Rack Type, Gas, Single Compartment, High Efficiency	0	0	1034
14.3122.290	Food Service	Oven	Oven, Rack Type, Gas, Double Compartment, High Efficiency	0	0	2113
14.3131.290	Food Service	Oven	Oven, Combination Type, Electric, High Efficiency	4.2000	18432	0
14.3132.290	Food Service	Oven	Oven, Combination Type, Gas, High Efficiency	0	0	403
14.3501.210	Food Service	Griddle	Griddle, Electric, ENERGY STAR	0.1490	651	0
14.3502.210	Food Service	Griddle	Griddle, Gas, ENERGY STAR	0	0	62
14.4110.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, < 20 cu ft, ENERGY STAR	0.0430	372	0
14.4120.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, 20-48 cu ft, ENERGY STAR	0.0610	537	0
14.4130.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, > 48 cu ft, ENERGY STAR	0.0960	838	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
14.4135.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Commercial, CEE Tier 2 efficiency, < 20 cu ft	0.0970	847	0
14.4136.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Commercial, CEE Tier 2 efficiency, 20-48 cu ft	0.1450	1274	0
14.4137.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Commercial, CEE Tier 2 efficiency, >48 cu ft	0.2350	2057	0
14.4210.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, < 20 cu ft, ENERGY STAR	0.0370	320	0
14.4220.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, 20-48 cu ft, ENERGY STAR	0.0350	307	0
14.4230.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, > 48 cu ft, ENERGY STAR	0.0320	283	0
14.4235.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Commercial, CEE Tier 2 efficiency, <20 cu ft	0.1140	995	0
14.4236.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Commercial, CEE Tier 2 efficiency, 20-48 cu ft	0.2020	1770	0
14.4237.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Commercial, CEE Tier 2 efficiency, >48 cu ft	0.3640	3192	0
14.4240.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Vertical, Glass Door, < 15 cu ft, ENERGY STAR	0.1831	1604	0
14.4241.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Vertical, Glass Door, 15-29 cu ft, ENERGY STAR	0.2284	2001	0
14.4242.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Vertical, Glass Door, 30-49 cu ft, ENERGY STAR	0.5333	4672	0
14.4243.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Vertical, Glass Door, 50+ cu ft, ENERGY STAR	0.8725	7643	0
14.4244.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Vertical, Solid Door, < 15 cu ft, ENERGY STAR	0.0573	502	0
14.4245.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Vertical, Solid Door, 15-29 cu ft, ENERGY STAR	0.0992	869	0
14.4246.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Vertical, Solid Door, 30-49 cu ft, ENERGY STAR	0.2407	2109	0
14.4247.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Vertical, Solid Door, 50+ cu ft, ENERGY STAR	0.4773	4181	0
14.4248.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Vertical, Glass Door, < 15 cu ft, ENERGY STAR	0.0823	721	0
14.4249.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Vertical, Glass Door, 15-29 cu ft, ENERGY STAR	0.0767	672	0
14.4250.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Vertical, Glass Door, 30-49 cu ft, ENERGY STAR	0.0890	780	0
14.4251.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Vertical, Glass Door, 50+ cu ft, ENERGY STAR	0.1049	919	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
14.4252.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Vertical, Solid Door, < 15 cu ft, ENERGY STAR	0.0300	263	0
14.4253.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Vertical, Solid Door, 15-29 cu ft, ENERGY STAR	0.0584	512	0
14.4254.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Vertical, Solid Door, 30-49 cu ft, ENERGY STAR	0.0983	861	0
14.4255.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Vertical, Solid Door, 50+ cu ft, ENERGY STAR	0.1390	1218	0
14.5100.235	Food Service	Ice Machine	Ice Machines, < 500 lbs, High Efficiency	0.3200	1200	0
14.5200.235	Food Service	Ice Machine	Ice Machines, 500-1000 lbs, High Efficiency	0.4800	1750	0
14.5300.235	Food Service	Ice Machine	Ice Machines, > 1000 lbs, High Efficiency	1.2800	4870	0
14.5320.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, ice-making head, <300 lb/day	0.0598	524	0
14.5321.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, ice-making head, >=1000 lb/day	0.1364	1195	0
14.5323.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, ice-making head, 300-449 lb/day	0.0598	524	0
14.5324.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, ice-making head, 450-499 lb/day	0.1364	1195	0
14.5325.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, ice-making head, 500-999 lb/day	0.1364	1195	0
14.5326.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, remote-condensing w/ remote compressor, >=1000 lb/day	0.1440	1261	0
14.5328.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, remote-condensing w/ remote compressor, 300-499 lb/day	0.0985	863	0
14.5329.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, remote-condensing w/ remote compressor, 500-933 lb/day	0.0985	863	0
14.5330.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, remote-condensing w/ remote compressor, 934-999 lb/day	0.1440	1261	0
14.5331.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, remote-condensing w/o remote compressor, >=1000 lb/day	0.1599	1401	0
14.5333.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, remote-condensing w/o remote compressor, 300-499 lb/day	0.0978	856	0
14.5334.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, remote-condensing w/o remote compressor, 500-999 lb/day	0.0978	856	0
14.5335.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, self-contained, <175 lb/day	0.0290	254	0
14.5336.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, self-contained, 175-299 lb/day	0.0326	286	0
14.5337.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, self-contained, 300-499 lb/day	0.0326	286	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
14.5338.235	Food Service	Ice Machines, Commercial	Ice Machine, ENERGY STAR, self-contained, 500-999 lb/day	0.0326	286	0
14.5400.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Electric Heat, Electric Booster, Door Type	1.5450	13530	0
14.5401.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Electric Heat, Electric Booster, Multi Tank Conveyor	3.7270	32650	0
14.5402.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Electric Heat, Electric Booster, Single Tank Conveyor	2.0320	17800	0
14.5403.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Electric Heat, Electric Booster, Under Counter	0.8150	7140	0
14.5404.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Electric Booster, Door Type	0.5750	5040	334
14.5405.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Electric Booster, Multi Tank Conveyor	1.3550	11870	818
14.5406.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Electric Booster, Single Tank Conveyor	0.8170	7160	419
14.5407.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Electric Booster, Under Counter	0.2970	2600	179
14.5408.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Gas Booster, Door Type	0.0220	190	525
14.5409.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Gas Booster, Multi Tank Conveyor	0	0	1285
14.5410.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Gas Booster, Single Tank Conveyor	0.1230	1080	658
14.5411.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Gas Booster, Under Counter	0	0	281
14.5413.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Electric Heat, Door Type	1.3240	11600	0
14.5414.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Electric Heat, Multi Tank Conveyor	1.9060	16700	0
14.5416.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Electric Heat, Single Tank Conveyor	1.2420	10880	0
14.5417.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Electric Heat, Under Counter	0.1320	1160	0
14.5419.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Gas Heat, Door Type	0	0	457
14.5420.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Gas Heat, Multi Tank Conveyor	0	0	657
14.5422.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Gas Heat, Single Tank Conveyor	0	0	428
14.5423.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Gas Heat, Under Counter	0	0	46

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
17.0500.465	Plug Loads	Vending Machine	Vending Machine, ENERGY STAR, Cold Beverage, Not Software Activated	0.0000	1754	0
17.0501.465	Plug Loads	Vending Machine	Vending Machine, ENERGY STAR, Cold Beverage, Software Activated	0.0000	2231	0
17.0510.085	Plug Loads	Controls	Vending Machine Controls, occupancy based, on cold beverage machine	0.0000	1633	0
17.0515.086	Plug Loads	Controls	Vending Machine Controls, occupancy based, on cold beverage machine - Direct Install	0.0000	1633	0
17.0517.086	Plug Loads	Controls	Vending Machine Controls, sales based, on cold beverage machine	0.0000	1243	0
17.0520.085	Plug Loads	Controls	Snack Machine - Install VendingMiser Controller	0.0000	343	0
17.0525.086	Plug Loads	Controls	Beverage Cooler Controls	0.0000	1209	0
17.1500.085	Plug Loads	Controls	Engine Block Heater - Timer (Ag only)	0.0000	576	0
3.0906.430	Refrigeration	Tune-up / Repair / Commissioning	Commercial refrigeration equipment tune-up, not self-contained reach-in or walk-in, medium-temp, per ton	0.0990	537	0
3.0907.430	Refrigeration	Tune-up / Repair / Commissioning	Commercial refrigeration equipment tune-up, self-contained cooler, per hp	0.1048	569	0
3.0908.430	Refrigeration	Tune-up / Repair / Commissioning	Commercial refrigeration equipment tune-up not self-contained reach-in or walk-in, low-temp, per ton	0.1910	1338	0
3.0909.430	Refrigeration	Tune-up / Repair / Commissioning	Commercial refrigeration equipment tune-up, self-contained freezer, per hp	0.0877	614	0
3.1197.085	Refrigeration	Controls	Anti-sweat heater controls, on freezer case with low-heat door	0.0220	1431	0
3.1198.085	Refrigeration	Controls	Anti-sweat heater controls, on freezer case with no-heat door	0.0090	575	0
3.1199.085	Refrigeration	Controls	Anti-sweat heater controls, on freezer case with standard door	0.0310	2060	0
3.1200.085	Refrigeration	Controls	Anti-sweat heater controls, on refrigerated case with standard door	0.0360	1339	0
3.1201.085	Refrigeration	Controls	Anti-sweat heater controls, on refrigerated case with low-heat or no-heat doors	0.0200	740	0
3.1220.510	Refrigeration	Refrigerated Case Door	Case door, freezer, low heat	0.0870	762	0
3.1221.510	Refrigeration	Refrigerated Case Door	Case door, freezer, no heat	0.2060	1800	0
3.1225.510	Refrigeration	Refrigerated Case Door	Case door, refrigerated, no heat	0.0140	121	0
3.1410.270	Refrigeration	Motor	ECM (electronically commutated) motor replacing shaded-pole motor in refrig/freezer case	0.1030	904	0
3.1420.270	Refrigeration	Motor	PSC (permanent split capacitor) motor replacing shaded-pole motor in refrig/freezer case	0.0820	715	0
3.1430.270	Refrigeration	Motor	ECM (electronically commutated) evaporator fan motor replacing shaded-pole motor, <1/20 hp, in walk-in cooler	0.1113	935	0
3.1431.270	Refrigeration	Motor	ECM (electronically commutated) evaporator fan motor replacing shaded-pole motor, >=1/20 hp, <1hp, in walk-in cooler	0.2422	2033	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
3.1432.270	Refrigeration	Motor	ECM (electronically commutated) evaporator fan motor replacing PSC motor, >=1/10 hp, <1hp, in walk-in cooler	0.0697	585	0
3.1440.270	Refrigeration	Motor	ECM (electronically commutated) evaporator fan motor replacing shaded-pole motor, <1/20 hp, in walk-in freezer	0.1411	1184	0
3.1441.270	Refrigeration	Motor	ECM (electronically commutated) evaporator fan motor replacing shaded-pole motor, >=1/20 hp, <1hp, in walk-in freezer	0.3068	2576	0
3.1442.270	Refrigeration	Motor	ECM (electronically commutated) evaporator fan motor replacing PSC motor, >=1/10 hp, <1hp, in walk-in freezer	0.0882	741	0
3.2401.510	Refrigeration	Refrigerated Case Door	Night Curtains for Open Coolers, per linear foot	0	156	0
4.0736.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 36"	0.2061	700	0
4.0742.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 42"	0.2399	815	0
4.0748.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 48"	0.2737	930	0
4.0750.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 50"	0.3053	1037	0
4.0751.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 51"	0.3053	1037	0
4.0752.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 52"	0.3053	1037	0
4.0754.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 54"	0.3053	1037	0
4.0755.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 55"	0.3053	1037	0
4.0760.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 60"	0.3053	1037	0
4.0772.150	HVAC	Fan	Agricultural Exhaust Fan, High Efficiency - 72"	0.3053	1037	0
4.1000.390	HVAC	Steam Trap	Repair leaking steam trap, building space conditioning system	0	0	910
4.1697.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 54.675 - 60.749 MBh	0.0000	592	182
4.1698.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 60.750 - 67.499 MBh	0.0000	658	203
4.1699.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 67.5 - 74.9 MBh	0.0000	731	225
4.1701.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 75.0 - 82.5 MBh	0.0000	808	249
4.1702.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 82.5 - 90.75 MBh	0.0000	889	274
4.1703.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 90.76 - 99.82 MBh	0.0000	978	301
4.1704.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 99.83 - 109.8 MBh	0.0000	1076	331
4.1705.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 109.9 - 120.7 MBh	0.0000	1184	364
4.1706.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 120.8 - 132.9 MBh	0.0000	1302	401
4.1707.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 133.0 - 146.1 MBh	0.0000	1432	441

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.1708.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 146.2 - 160.8 MBh	0.0000	1575	485
4.3530.365	HVAC	Rooftop Unit / Split System AC	A/C Split System < 65 MBh SEER 14	0.4810	255	0
4.3540.365	HVAC	Rooftop Unit / Split System AC	A/C Split System < 65 MBh SEER 15	0.7090	387	0
4.3550.365	HVAC	Rooftop Unit / Split System AC	A/C Split System < 65 MBh SEER 16 or greater	0.9090	502	0
4.3805.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, <8000 Btuh, ≥12.1 EER, Retrofit Application	0.1188	105	0
4.3806.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, <8000 Btuh, ≥12.1 EER, New Construction	0.0478	42	0
4.3810.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, 8000 - 9999 Btuh, ≥11.5 EER, Retrofit Application	0.1052	93	0
4.3811.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, 8000 - 9999 Btuh, ≥11.5 EER, New Construction	0.0549	49	0
4.3815.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, 10000-12999 Btuh, ≥10.9 EER, Retrofit Application	0.2083	185	0
4.3816.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, 10000-12999 Btuh, ≥10.9 EER, New Construction	0.0719	64	0
4.3820.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, ≥13000 Btuh, ≥9.8 EER, Retrofit Application	0.2770	246	0
4.3821.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, ≥13000 Btuh, ≥9.8 EER, New Construction	0.0657	58	0
4.3822.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, <8000 Btuh, ≥12.1 EER, Retrofit Application	0.0710	1652	0
4.3823.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, <8000 Btuh, ≥12.1 EER, New Construction	0.0641	1646	0
4.3824.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, 8000 - 9999 Btuh, ≥11.5 EER, Retrofit Application	0.1307	2098	0
4.3825.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, 8000 - 9999 Btuh, ≥11.5 EER, New Construction	0.0582	2033	0
4.3826.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, 10000-12999 Btuh, ≥10.9 EER, Retrofit Application	0.2408	2847	0
4.3827.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, 10000-12999 Btuh, ≥10.9 EER, New Construction	0.0989	2722	0
4.3830.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, ≥13000 Btuh, ≥9.8 EER, Retrofit Application	0.2853	3471	0
4.3831.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, ≥13000 Btuh, ≥9.8 EER, New Construction	0.0863	3294	0
4.5000.085	HVAC	Controls	Guest Room Energy Management Controls - Electric heat PTAC systems only	0.1000	1507	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.5110.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.6	0.0220	16	0
4.5111.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.7	0.0290	21	0
4.5112.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.8	0.0360	26	0
4.5113.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.9	0.0423	31	0
4.5114.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.0	0.0496	36	0
4.5115.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.1	0.0562	41	0
4.5116.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.2	0.0627	45	0
4.5117.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.3	0.0691	50	0
4.5118.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.4	0.0753	54	0
4.5119.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.5	0.0816	59	0
4.5120.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.6	0.0877	63	0
4.5121.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.7	0.0937	68	0
4.5122.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.8	0.0996	72	0
4.5123.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.9	0.1054	76	0
4.5124.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 13.0	0.1111	80	0
4.5125.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 13.1	0.1167	84	0
4.5126.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.5	0.0973	70	0
4.5127.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.6	0.1045	75	0
4.5128.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.7	0.1115	80	0
4.5129.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.8	0.1185	85	0

Table J-2. Focus on Energy Demand Savings by Business Program Sector
Approved November 13, 2009 (Lighting)

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0200.260	Lighting	Light Emitting Diode (LED)	LED Exit Lighting - for specially targeted early replacement only	0.0341	298	0.0341	298	0.0341	298	0.0341	298
2.0300.165	Lighting	Fluorescent, Compact (CFL)	CFL <= 30 Watts, replacing incandescent	0.0373	136	0.0427	208	0.0429	264	0.0359	180
2.0301.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 31-115 Watts, replacing incandescent	0.0903	331	0.1034	504	0.1040	641	0.0869	437
2.0302.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 116-149 Watts, replacing metal halide	0.0670	470	0.0770	373	0.0770	475	0.0640	324
2.0303.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 150-199 Watts, replacing metal halide	0.0972	681	0.1117	541	0.1117	688	0.0928	470
2.0305.060	Lighting	Cold Cathode	CFL Cold Cathode Screw-In, replacing incandescent	0.0141	51	0.0161	78	0.0162	100	0.0135	68
2.0307.165	Lighting	Fluorescent, Compact (CFL)	CFL reflector flood lamps replacing incandescent reflector flood lamps	0.0327	120	0.0374	182	0.0376	232	0.0314	158
2.0310.165	Lighting	Fluorescent, Compact (CFL)	CFL Direct Install, replacing incandescent, WPS Hometown Checkup	0.0373	136	0.0427	208	0.0429	264	0.0359	180
2.0400.165	Lighting	Fluorescent, Compact (CFL)	CFL Fixture, replacing incandescent fixture	0.0373	136	0.0427	208	0.0429	264	0.0359	180
2.0505.085	Lighting	Controls	Occupancy Sensors - Wall Mount <= 200 Watts	0.0000	289	0.0000	229	0.0000	292	0.0000	199
2.0506.085	Lighting	Controls	Occupancy Sensors - Wall Mount >= 201 Watts	0.0000	674	0.0000	535	0.0000	681	0.0000	465
2.0507.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount <= 500 Watts	0.0000	674	0.0000	535	0.0000	681	0.0000	465
2.0508.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount 501-1000 Watts	0.0000	1445	0.0000	1147	0.0000	1459	0.0000	996

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0509.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount >= 1001 Watts	0.0000	2311	0.0000	1835	0.0000	2335	0.0000	1594
2.0515.085	Lighting	Controls	High / low control for 320W PSMH, per fixture controlled	0.0000	540	0.0000	429	0.0000	546	0.0000	256
2.0520.085	Lighting	Controls	Daylighting Controls - Automatic stepped, minimum 3 lighting levels (per kW controlled)	0.6700	1879	0.7700	1492	0.7700	1482	0.6400	1296
2.0530.085	Lighting	Controls	Daylighting Controls - Automatic dimming ballasts (per kW controlled)	0.6030	1879	0.6930	1492	0.6930	1482	0.5760	1296
2.0810.170	Lighting	Fluorescent, Linear	T8 4L-4-4ft High Performance Replacing T12 2L-8 ft	0.0156	110	0.0179	87	0.0180	111	0.0150	75
2.0811.170	Lighting	Fluorescent, Linear	T8 4L-4ft High Performance Replacing T12HO/VHO 2L-8 ft	0.0797	560	0.0912	444	0.0918	565	0.0767	386
2.0821.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0080	56	0.0092	45	0.0092	57	0.0077	39
2.0822.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0143	101	0.0165	80	0.0165	102	0.0137	69
2.0823.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0242	170	0.0278	135	0.0278	172	0.0231	117
2.0824.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0297	208	0.0341	165	0.0341	210	0.0284	143
2.0831.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0072	50	0.0082	40	0.0082	51	0.0068	35
2.0832.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0103	72	0.0119	57	0.0119	73	0.0099	50
2.0833.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0184	129	0.0212	103	0.0212	130	0.0176	89
2.0834.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0216	151	0.0248	120	0.0248	153	0.0206	104
2.0841.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0053	37	0.0060	29	0.0060	37	0.0050	25
2.0842.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0096	67	0.0110	53	0.0110	68	0.0091	46

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0843.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0170	119	0.0196	95	0.0196	121	0.0163	82
2.0844.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0202	142	0.0232	112	0.0232	143	0.0193	98
2.0851.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 25 Watts	0.0059	41	0.0068	33	0.0068	42	0.0056	29
2.0852.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 28 Watts	0.0044	31	0.0051	25	0.0051	31	0.0042	21
2.0853.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 30 Watts	0.0031	22	0.0036	18	0.0036	22	0.0030	15
2.0856.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp 8 ft - 54 Watts	0.0034	23	0.0039	19	0.0039	24	0.0032	16
2.0860.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Hi Lumen Lamp with Low BF	0.0040	28	0.0046	22	0.0046	28	0.0038	19
2.0870.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Hi Lumen Lamp with Low BF	0.0076	54	0.0088	43	0.0088	54	0.0073	37
2.0880.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Hi Lumen Lamp with Low BF	0.0143	101	0.0165	80	0.0165	102	0.0137	69
2.0890.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Hi Lumen Lamp with Low BF	0.0180	126	0.0206	100	0.0206	127	0.0172	87
2.0895.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0027	19	0.0031	15	0.0031	19	0.0026	13
2.0896.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0060	42	0.0069	34	0.0069	43	0.0058	29
2.0897.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0114	80	0.0131	63	0.0131	81	0.0109	55
2.0898.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0147	103	0.0169	82	0.0169	104	0.0141	71
2.0900.170	Lighting	Fluorescent, Linear	T5 2L - F28T5 Fixture, Recessed Indirect 2x4, replacing 3LT8 or 4LT12	0.0201	141	0.0231	112	0.0231	142	0.0192	97
2.0970.260	Lighting	Light Emitting Diode (LED)	LED recessed downlight - ENERGY STAR qualified	0.0350	246	0.0403	195	0.0403	248	0.0335	169
2.2110.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH) Ceramic 20-100 Watts - Replaces Incandescent	0.0874	613	0.1005	487	0.1005	619	0.0835	423

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.2115.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH) Ceramic 25 Watts - Replaces 75-90 Watts Incandescent	0.0385	270	0.0443	214	0.0443	273	0.0368	186
2.2150.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Pulse Start, 320W replacing 400W HID	0.0630	442	0.0724	351	0.0724	446	0.0602	304
2.2155.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Pulse Start - 750W replacing 1000W MH	0.1910	1339	0.2195	1063	0.2195	1352	0.1824	923
2.2170.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Electronic Ballast Pulse Start - 250W replacing 400W HID	0.1213	850	0.1394	675	0.1394	859	0.1158	586
2.2171.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Electronic Ballast Pulse Start - 320W replacing 400W HID	0.0764	536	0.0878	425	0.0878	541	0.0730	369
2.3100.260	Lighting	Light Emitting Diode (LED)	LED Reach-In Refrigerated Case Lighting replaces T12 or T8	0.0455	398	0.0455	398	0.0455	398	0.0455	398
2.5170.170	Lighting	Fluorescent, Linear	T8 4 lamp or T5HO 2 lamp Replacing 250-399 W HID	0.1010	709	0.1156	563	0.1163	716	0.0972	489
2.5180.170	Lighting	Fluorescent, Linear	T8 6 lamp or T5HO 4 lamp Replacing 400-999 W HID	0.1648	1157	0.1886	919	0.1898	1169	0.1586	798
2.5182.170	Lighting	Fluorescent, Linear	T8 8 lamp or T5HO 6 lamp Replacing 400-999 W HID	0.0693	486	0.0793	386	0.0798	491	0.0666	335
2.5185.170	Lighting	Fluorescent, Linear	T8/T5HO <= 500 Watts Replacing >=1000 W HID	0.4797	3368	0.5490	2674	0.5523	3402	0.4615	2322
2.5186.170	Lighting	Fluorescent, Linear	T8 or T5HO <= 800W, Replacing >=1000 W HID	0.3650	2563	0.4178	2035	0.4203	2589	0.3512	1767
2.5200.085	Lighting	Controls	Occupancy sensor for high bay fluorescent fixtures (per controlled fixture), Gymnasium	0.0344	517	0.0344	348	0.0344	442	0.0344	302

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.5201.085	Lighting	Controls	Occupancy sensor for high bay fluorescent fixtures (per controlled fixture), Industrial	0.0427	591	0.0427	398	0.0427	506	0.0427	346
2.5202.085	Lighting	Controls	Occupancy sensor for high bay fluorescent fixtures (per controlled fixture), Retail	0.0142	197	0.0142	133	0.0142	169	0.0142	115
2.5203.085	Lighting	Controls	Occupancy sensor for high bay fluorescent fixtures (per controlled fixture), Warehouse	0.0427	701	0.0427	472	0.0427	600	0.0427	409
2.5204.085	Lighting	Controls	Occupancy sensor for high bay fluorescent fixtures (per controlled fixture), Public Assembly	0.0284	618	0.0284	416	0.0284	529	0.0284	361
2.5205.085	Lighting	Controls	Occupancy sensor for high bay fluorescent fixtures (per controlled fixture), Other	0.0325	525	0.0325	353	0.0325	449	0.0325	307
2.0901.170	Lighting	Fluorescent, Linear	T8 2L - HPT8 Fixture or Retrofit Module, Recessed Direct or Indirect 2x4, replacing 3L or 4L T8 or T12	0.0310	218	0.0355	173	0.0357	220	0.0299	150
2.1061.170	Lighting	Fluorescent, Linear	BOUNTY - T5 2L replacing T12	0.0341	240	0.0391	190	0.0393	242	0.0328	165
2.1062.170	Lighting	Fluorescent, Linear	BOUNTY - T8 1L replacing T12	0.0054	38	0.0061	30	0.0062	38	0.0051	26
2.1063.170	Lighting	Fluorescent, Linear	BOUNTY - T8 2L replacing T12	0.0064	45	0.0074	36	0.0074	46	0.0062	31
2.1064.170	Lighting	Fluorescent, Linear	BOUNTY - T8 3L replacing T12	0.0118	83	0.0135	66	0.0136	84	0.0113	57
2.1065.170	Lighting	Fluorescent, Linear	BOUNTY - T8 4L replacing T12 4ft	0.0128	90	0.0147	72	0.0148	91	0.0124	62
2.1066.170	Lighting	Fluorescent, Linear	BOUNTY - T8 4L replacing T12 8ft	0.0000	0	0.0000	0	0.0000	0	0.0000	0

Table J-3. Focus on Energy Demand Savings by Business Program Sector
Approved November 2008 (Non-Lighting)

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
1.0710.085	Boilers & Burners	Controls	Boiler oxygen trim controls, per hp	0	0	13 per hp
1.0711.085	Boilers & Burners	Controls	Linkageless Boiler Control, per hp	0	0	27 per hp
1.1300.430	Boilers & Burners	Boiler	Boiler Tune-up - service buy down	0	0	0.679 per MBh
1.1412.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, <50 psig steam (Industrial Only)	0	0	196
1.1414.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, 50-125 psig steam (Industrial Only)	0	0	756
1.1416.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, 126-225 psig steam (Industrial Only)	0	0	1084
1.1418.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, >225 psig steam (Industrial Only)	0	0	2075
1.2700.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 85.0%-85.9%)(>300, <=1000 MBh input)	0	0	1.430 per MBh
1.2701.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 86.0%-86.9%)(>300, <=1000 MBh input)	0	0	1.671 per MBh
1.2702.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 87.0%-87.9%)(>300, <=1000 MBh input)	0	0	1.906 per MBh
1.2703.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 88.0%-88.9%)(>300, <=1000 MBh input)	0	0	2.135 per MBh
1.2704.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 89.0%-89.9%)(>300, <=1000 MBh input)	0	0	2.36 per MBh

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
1.2705.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 90.0%-90.9%)(>300, <=1000 MBh input)	0	0	2.579 per MBh
1.2706.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 91.0%-91.9%)(>300, <=1000 MBh input)	0	0	2.794 per MBh
1.2707.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 92.0%-92.9%)(>300, <=1000 MBh input)	0	0	3.004 per MBh
1.2708.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 93.0%-93.9%)(>300, <=1000 MBh input)	0	0	3.21 per MBh
1.2709.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 94.0%-94.9%)(>300, <=1000 MBh input)	0	0	3.411 per MBh
1.2710.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 95.0%-95.9%)(>300, <=1000 MBh input)	0	0	3.608 per MBh
1.2711.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 96.0%-96.9%)(>300, <=1000 MBh input)	0	0	3.801 per MBh
1.2712.040	Boilers & Burners	Boiler	Boiler, hot water, for space heating (thermal efficiency 97.0%-97.9%)(>300, <=1000 MBh input)	0	0	3.99 per MBh
1.2790.040	Boilers & Burners	Boiler	Boiler, hot water, high efficiency modulating, for space heating (AFUE >= 90%)	0	0	3.108 per MBh
1.2791.040	Boilers & Burners	Boiler	Boiler, hot water, high efficiency modulating, for space heating (AFUE >= 90%)(175 - 300 MBh)	0	0	3.108 per MBh
14.1100.180	Food Service	Fryer	Fryer, Electric, ENERGY STAR	0.2 per frypot	983 per frypot	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
14.1200.180	Food Service	Fryer	Fryer, Gas, ENERGY STAR	0.0000	0	396 per frypot
14.1301.180	Food Service	Fryer	Fryer, Large Vat, Electric, High Efficiency	0.4 per frypot	1789 per frypot	0
14.1302.180	Food Service	Fryer	Fryer, Large Vat, Gas, High Efficiency	0.0000	0	577 per frypot
14.2103.395	Food Service	Steamer	Steamer, Electric, 3 pan - ENERGY STAR	2.5000	11188	0
14.2104.395	Food Service	Steamer	Steamer, Electric, 4 pan - ENERGY STAR	2.5000	12459	0
14.2105.395	Food Service	Steamer	Steamer, Electric, 5 pan - ENERGY STAR	2.5000	13831	0
14.2106.395	Food Service	Steamer	Steamer, Electric, 6 pan - ENERGY STAR	2.5000	15170	0
14.2107.395	Food Service	Steamer	Steamer, Gas, 5 pan - ENERGY STAR	0.0000	0	1900
14.2206.395	Food Service	Steamer	Steamer, Gas, 6 pan - ENERGY STAR	0.0000	0	2084
14.3000.225	Food Service	Hot Holding Cabinet	Hot Food Holding Cabinet - ENERGY STAR	0.6375	4654	0
14.3101.290	Food Service	Oven	Oven, Convection, Electric, High Efficiency	0.2000	2262	0
14.3102.290	Food Service	Oven	Oven, Convection, Gas, High Efficiency	0.0000	0	323
14.3112.290	Food Service	Oven	Oven, Rack Type, Gas, Single Compartment, High Efficiency	0.0000	0	1034
14.3122.290	Food Service	Oven	Oven, Rack Type, Gas, Double Compartment, High Efficiency	0.0000	0	2113
14.3131.290	Food Service	Oven	Oven, Combination Type, Electric, High Efficiency	4.2000	18432	0
14.3132.290	Food Service	Oven	Oven, Combination Type, Gas, High Efficiency	0.0000	0	403
14.3501.210	Food Service	Griddle	Griddle, Electric, High Efficiency	0.4000	1637	0
14.3502.210	Food Service	Griddle	Griddle, Gas, High Efficiency	0.0000	0	88
14.4110.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, < 20 cu ft, ENERGY STAR	0.0430	372	0
14.4120.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, 20-48 cu ft, ENERGY STAR	0.0610	537	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
14.4130.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, > 48 cu ft, ENERGY STAR	0.0960	838	0
14.4135.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Commercial, CEE Tier 2 efficiency, < 20 cu ft	0.0970	847	0
14.4136.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Commercial, CEE Tier 2 efficiency, 20-48 cu ft	0.1450	1274	0
14.4137.340	Food Service	Refrigerator / Freezer, Commercial	Refrigerator, Commercial, CEE Tier 2 efficiency, >48 cu ft	0.2350	2057	0
14.4210.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, < 20 cu ft, ENERGY STAR	0.0370	320	0
14.4220.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, 20-48 cu ft, ENERGY STAR	0.0350	307	0
14.4230.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, > 48 cu ft, ENERGY STAR	0.0320	283	0
14.4235.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Commercial, CEE Tier 2 efficiency, <20 cu ft	0.1140	995	0
14.4236.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Commercial, CEE Tier 2 efficiency, 20-48 cu ft	0.2020	1770	0
14.4237.340	Food Service	Refrigerator / Freezer, Commercial	Freezer, Commercial, CEE Tier 2 efficiency, >48 cu ft	0.3640	3192	0
14.5100.235	Food Service	Ice Machine	Ice Machines, < 500 lbs, High Efficiency	0.3200	1200	0
14.5200.235	Food Service	Ice Machine	Ice Machines, 500-1000 lbs, High Efficiency	0.4800	1750	0
14.5300.235	Food Service	Ice Machine	Ice Machines, > 1000 lbs, High Efficiency	1.2800	4870	0
14.5400.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Electric Heat, Electric Booster, Door Type	1.5450	13530	0
14.5401.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Electric Heat, Electric Booster, Multi Tank Conveyor	3.7270	32650	0
14.5402.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Electric Heat, Electric Booster, Single Tank Conveyor	2.0320	17800	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
14.5403.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Electric Heat, Electric Booster, Under Counter	0.8150	7140	0
14.5404.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Electric Booster, Door Type	0.5750	5040	334
14.5405.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Electric Booster, Multi Tank Conveyor	1.3550	11870	818
14.5406.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Electric Booster, Single Tank Conveyor	0.8170	7160	419
14.5407.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Electric Booster, Under Counter	0.2970	2600	179
14.5408.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Gas Booster, Door Type	0.0220	190	525
14.5409.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Gas Booster, Multi Tank Conveyor	0.0000	0	1285
14.5410.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Gas Booster, Single Tank Conveyor	0.1230	1080	658
14.5411.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, High Temp, Gas Heat, Gas Booster, Under Counter	0.0000	0	281
14.5413.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Electric Heat, Door Type	1.3240	11600	0
14.5414.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Electric Heat, Multi Tank Conveyor	1.9060	16700	0
14.5416.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Electric Heat, Single Tank Conveyor	1.2420	10880	0
14.5417.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Electric Heat, Under Counter	0.1320	1160	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
14.5419.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Gas Heat, Door Type	0.0000	0	457
14.5420.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Gas Heat, Multi Tank Conveyor	0.0000	0	657
14.5422.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Gas Heat, Single Tank Conveyor	0.0000	0	428
14.5423.120	Food Service	Dishwasher, Commercial	Dishwasher, ENERGY STAR, Low Temp, Gas Heat, Under Counter	0.0000	0	46
17.0500.465	Plug Loads	Vending Machine	Vending Machine, ENERGY STAR, Cold Beverage, Not Software Activated	0.0000	1754	0
17.0501.465	Plug Loads	Vending Machine	Vending Machine, ENERGY STAR, Cold Beverage, Software Activated	0.0000	2231	0
17.0520.085	Plug Loads	Controls	Snack Machine - Install VendingMiser Controller	0.0000	343	0
3.1197.085	Refrigeration	Controls	Anti-sweat heater controls, on freezer case with low-heat door	0.0220	1431	0
3.1198.085	Refrigeration	Controls	Anti-sweat heater controls, on freezer case with no-heat door	0.0090	575	0
3.1199.085	Refrigeration	Controls	Anti-sweat heater controls, on freezer case with standard door	0.0310	2060	0
3.1200.085	Refrigeration	Controls	Anti-sweat heater controls, on refrigerated case with standard door	0.0360	1339	0
3.1201.085	Refrigeration	Controls	Anti-sweat heater controls, on refrigerated case with low-heat or no-heat doors	0.0200	740	0
3.1220.510	Refrigeration	Refrigerated Case Door	Case door, freezer, low heat	0.0870	762	0
3.1221.510	Refrigeration	Refrigerated Case Door	Case door, freezer, no heat	0.2060	1800	0
3.1225.510	Refrigeration	Refrigerated Case Door	Case door, refrigerated, no heat	0.0140	121	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
3.1410.270	Refrigeration	Motor	ECM (electronically commutated) motor replacing shaded-pole motor in refrig/freezer case	0.1030	904	0
3.1420.270	Refrigeration	Motor	PSC (permanent split capacitor) motor replacing shaded-pole motor in refrig/freezer case	0.0820	715	0
3.2401.510	Refrigeration	Refrigerated Case Door	Night Curtains for Open Coolers, per linear foot	0	156 per foot	0
4.0736.150	HVAC	Fan	Ventilation Fans, High Efficiency - 36"	0.3221	1094	0
4.0742.150	HVAC	Fan	Ventilation Fans, High Efficiency - 42"	0.3961	1483	0
4.0748.150	HVAC	Fan	Ventilation Fans, High Efficiency - 48"	0.4701	1872	0
4.0750.150	HVAC	Fan	Ventilation Fans, High Efficiency - 50"	0.6638	2553	0
4.0751.150	HVAC	Fan	Ventilation Fans, High Efficiency - 51"	0.6638	2553	0
4.0752.150	HVAC	Fan	Ventilation Fans, High Efficiency - 52"	0.6638	2553	0
4.0754.150	HVAC	Fan	Ventilation Fans, High Efficiency - 54"	0.6638	2553	0
4.0755.150	HVAC	Fan	Ventilation Fans, High Efficiency - 55"	0.6638	2553	0
4.0760.150	HVAC	Fan	Ventilation Fans, High Efficiency - 60"	0.6638	2553	0
4.1000.390	HVAC	Steam Trap	Repair leaking steam trap, building space conditioning system	0.0000	0	718
4.1697.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 54.675 - 60.749 MBh	0.0000	592	182
4.1698.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 60.750 - 67.499 MBh	0.0000	658	203
4.1699.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 67.5 - 74.9 MBh	0.0000	731	225
4.1701.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 75.0 - 82.5 MBh	0.0000	808	249
4.1702.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 82.5 - 90.75 MBh	0.0000	889	274

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.1703.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 90.76 - 99.82 MBh	0.0000	978	301
4.1704.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 99.83 - 109.8 MBh	0.0000	1076	331
4.1705.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 109.9 - 120.7 MBh	0.0000	1184	364
4.1706.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 120.8 - 132.9 MBh	0.0000	1302	401
4.1707.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 133.0 - 146.1 MBh	0.0000	1432	441
4.1708.190	HVAC	Furnace	Furnace, with ECM fan motor, for space heating (AFUE >= 90%), 146.2 - 160.8 MBh	0.0000	1575	485
4.3530.365	HVAC	Rooftop Unit / Split System AC	A/C Split System < 65 MBh SEER 14	0.4810	255	0
4.3540.365	HVAC	Rooftop Unit / Split System AC	A/C Split System < 65 MBh SEER 15	0.7090	387	0
4.3550.365	HVAC	Rooftop Unit / Split System AC	A/C Split System < 65 MBh SEER 16 or greater	0.9090	502	0
4.3805.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, <8000 Btuh, ≥12.1 EER, Retrofit Application	0.1188	105	0
4.3806.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, <8000 Btuh, ≥12.1 EER, New Construction	0.0478	42	0
4.3810.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, 8000 - 9999 Btuh, ≥11.5 EER, Retrofit Application	0.1052	93	0
4.3811.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, 8000 - 9999 Btuh, ≥11.5 EER, New Construction	0.0549	49	0
4.3815.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, 10000-12999 Btuh, ≥10.9 EER, Retrofit Application	0.2083	185	0
4.3816.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, 10000-12999 Btuh, ≥10.9 EER, New Construction	0.0719	64	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.3820.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, ≥13000 Btuh, ≥9.8 EER, Retrofit Application	0.2770	246	0
4.3821.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTAC, ≥13000 Btuh, ≥9.8 EER, New Construction	0.0657	58	0
4.3822.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, <8000 Btuh, ≥12.1 EER, Retrofit Application	0.0710	1652	0
4.3823.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, <8000 Btuh, ≥12.1 EER, New Construction	0.0641	1646	0
4.3824.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, 8000 - 9999 Btuh, ≥11.5 EER, Retrofit Application	0.1307	2098	0
4.3825.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, 8000 - 9999 Btuh, ≥11.5 EER, New Construction	0.0582	2033	0
4.3826.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, 10000-12999 Btuh, ≥10.9 EER, Retrofit Application	0.2408	2847	0
4.3827.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, 10000-12999 Btuh, ≥10.9 EER, New Construction	0.0989	2722	0
4.3830.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, ≥13000 Btuh, ≥9.8 EER, Retrofit Application	0.2853	3471	0
4.3831.295	HVAC	Packaged Terminal Unit (PTAC, PTHP)	PTHP, ≥13000 Btuh, ≥9.8 EER, New Construction	0.0863	3294	0
4.5000.085	HVAC	Controls	Guest Room Energy Management Controls - Electric heat PTAC systems only	0.1000	1507	0
4.5110.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.6	= 0.0220 * Ton	= 16 * Ton	0
4.5111.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.7	= 0.029 * Ton	= 21 * Ton	0
4.5112.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.8	= 0.036 * Ton	= 26 * Ton	0
4.5113.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.9	= 0.0423 * Ton	= 31 * Ton	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.5114.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.0	= 0.0496 * Ton	= 36 * Ton	0
4.5115.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.1	= 0.0562 * Ton	= 41 * Ton	0
4.5116.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.2	= 0.0627 * Ton	= 45 * Ton	0
4.5117.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.3	= 0.0691 * Ton	= 50 * Ton	0
4.5118.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.4	= 0.07534 * Ton	= 54 * Ton	0
4.5119.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.5	= 0.0816 * Ton	= 59 * Ton	0
4.5120.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.6	= 0.0877 * Ton	= 63 * Ton	0
4.5121.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.7	= 0.0937 * Ton	= 68 * Ton	0
4.5122.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.8	= 0.0996 * Ton	= 72 * Ton	0
4.5123.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 12.9	= 0.1054 * Ton	= 76 * Ton	0
4.5124.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 13.0	= 0.1111 * Ton	= 80 * Ton	0
4.5125.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 13.1	= 0.1167 * Ton	= 84 * Ton	0
4.5126.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.5	= 0.0973 * Ton	= 70 * Ton	0
4.5127.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.6	= 0.1045 * Ton	= 75 * Ton	0
4.5128.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.7	= 0.1115 * Ton	= 80 * Ton	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.5129.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.8	= 0.1185 * Ton	= 85 * Ton	0
4.5130.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 11.9	= 0.1253 * Ton	= 90 * Ton	0
4.5131.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.0	= 0.132 * Ton	= 95 * Ton	0
4.5132.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.1	= 0.1387 * Ton	= 100 * Ton	0
4.5133.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.2	= 0.1452 * Ton	= 105 * Ton	0
4.5134.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.3	= 0.1516 * Ton	= 109 * Ton	0
4.5135.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.4	= 0.1578 * Ton	= 114 * Ton	0
4.5136.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.5	= 0.164 * Ton	= 118 * Ton	0
4.5137.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.6	= 0.1701 * Ton	= 123 * Ton	0
4.5138.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.7	= 0.1761 * Ton	= 127 * Ton	0
4.5139.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.8	= 0.182 * Ton	= 131 * Ton	0
4.5140.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 12.9	= 0.1879 * Ton	= 135 * Ton	0
4.5141.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 13.0	= 0.1936 * Ton	= 140 * Ton	0
4.5142.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 13.1	= 0.1992 * Ton	= 144 * Ton	0
4.5143.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 65 to 134 MBh, EER = 13.2	= 0.2048 * Ton	= 148 * Ton	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.5144.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 11.5	= 0.1549 * Ton	= 112 * Ton	0
4.5145.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 11.6	= 0.1621 * Ton	= 117 * Ton	0
4.5146.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 11.7	= 0.1692 * Ton	= 122 * Ton	0
4.5147.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 11.8	= 0.1761 * Ton	= 127 * Ton	0
4.5148.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 11.9	= 0.183 * Ton	= 132 * Ton	0
4.5149.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.0	= 0.1897 * Ton	= 137 * Ton	0
4.5150.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.1	= 0.1963 * Ton	= 142 * Ton	0
4.5151.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.2	= 0.2028 * Ton	= 146 * Ton	0
4.5152.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.3	= 0.2092 * Ton	= 151 * Ton	0
4.5153.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.4	= 0.2155 * Ton	= 155 * Ton	0
4.5154.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.5	= 0.2217 * Ton	= 160 * Ton	0
4.5155.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.6	= 0.2278 * Ton	= 164 * Ton	0
4.5156.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.7	= 0.2338 * Ton	= 169 * Ton	0
4.5157.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.8	= 0.2397 * Ton	= 173 * Ton	0
4.5158.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 12.9	= 0.2455 * Ton	= 177 * Ton	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.5159.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 135 to 239 MBh, EER = 13.0	= 0.2512 * Ton	= 181 * Ton	0
4.5160.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 10.5	= 0.0962 * Ton	= 69 * Ton	0
4.5161.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 10.6	= 0.1049 * Ton	= 76 * Ton	0
4.5162.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 10.7	= 0.1133 * Ton	= 82 * Ton	0
4.5163.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 10.8	= 0.1216 * Ton	= 88 * Ton	0
4.5164.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 10.9	= 0.1298 * Ton	= 94 * Ton	0
4.5165.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.0	= 0.1378 * Ton	= 99 * Ton	0
4.5166.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.1	= 0.1457 * Ton	= 105 * Ton	0
4.5167.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.2	= 0.1534 * Ton	= 111 * Ton	0
4.5168.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.3	= 0.161 * Ton	= 116 * Ton	0
4.5169.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.4	= 0.1684 * Ton	= 121 * Ton	0
4.5170.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.5	= 0.1757 * Ton	= 127 * Ton	0
4.5171.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.6	= 0.1829 * Ton	= 132 * Ton	0
4.5172.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.7	= 0.19 * Ton	= 137 * Ton	0
4.5173.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.8	= 0.197 * Ton	= 142 * Ton	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.5174.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 11.9	= 0.2038 * Ton	= 147 * Ton	0
4.5175.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, 240 to 759 MBh, EER = 12.0	= 0.2105 * Ton	= 152 * Ton	0
5.2010.360	Process	Specialty Pulp & Paper	Extraction plate for repulper rotor	0	0	0
6.0498.380	Domestic Hot Water	Showerhead	Showerhead, <=1.75gpm, natural gas - direct install (S&G Only)	0	0	86
6.0499.380	Domestic Hot Water	Showerhead	Showerhead, <=1.75gpm, electric - direct install (S&G Only)	0	2148	0
6.0500.380	Domestic Hot Water	Showerhead	Showerhead, <=1.75gpm, natural gas - direct install (Commercial Only)	0	0	27
6.0510.380	Domestic Hot Water	Showerhead	Showerhead, <=1.75gpm, electric - direct install (Commercial Only)	0	682	0
6.0900.005	Domestic Hot Water	Aeration	Low Flow Faucet Aerators, Direct Install, Natural Gas (Commercial Only)	0	0	8
6.0910.005	Domestic Hot Water	Aeration	Low Flow Faucet Aerators, Direct Install, Electric (Commercial Only)	0	187	0
6.0913.005	Domestic Hot Water	Aeration	Low Flow Faucet Aerators, Direct Install, Natural Gas (S&G Only)	0	0	36
6.0914.005	Domestic Hot Water	Aeration	Low Flow Faucet Aerators, Direct Install, Electric (S&G Only)	0	885	0
6.0920.005	Domestic Hot Water	Aeration	Low Flow Faucet Aerators, Direct Install, Natural Gas, Kitchen	0	0	202
6.0930.005	Domestic Hot Water	Aeration	Low Flow Faucet Aerators, Direct Install, Electric, Kitchen	0	5029	0
6.1001.315	Domestic Hot Water	Pre-Rinse Sprayer	Pre-Rinse Sprayer, Low Flow, Natural Gas, commercial application	0.0000	0	42
6.1002.315	Domestic Hot Water	Pre-Rinse Sprayer	Pre-Rinse Sprayer, Low Flow, Electric, commercial application	0.2180	957	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
6.1007.315	Domestic Hot Water	Pre-Rinse Sprayer	Pre-Rinse Sprayer, Low Flow, Natural Gas - direct install	0.0000	0	42
6.1008.315	Domestic Hot Water	Pre-Rinse Sprayer	Pre-Rinse Sprayer, Low Flow, Electric - direct install	0.2180	957	0
61.0111.270	Motors	Motor	Motor NEMA premium efficiency 1.0 hp	0.0177	= kw * hr/yr	0
61.0112.270	Motors	Motor	Motor NEMA premium efficiency 1.5 hp	0.0221	= kw * hr/yr	0
61.0113.270	Motors	Motor	Motor NEMA premium efficiency 2.0 hp	0.0291	= kw * hr/yr	0
61.0114.270	Motors	Motor	Motor NEMA premium efficiency 3.0 hp	0.0381	= kw * hr/yr	0
61.0115.270	Motors	Motor	Motor NEMA premium efficiency 5.0 hp	0.0546	= kw * hr/yr	0
61.0116.270	Motors	Motor	Motor NEMA premium efficiency 7.5 hp	0.0863	= kw * hr/yr	0
61.0117.270	Motors	Motor	Motor NEMA premium efficiency 10 hp	0.1075	= kw * hr/yr	0
61.0118.270	Motors	Motor	Motor NEMA premium efficiency 15 hp	0.1214	= kw * hr/yr	0
61.0119.270	Motors	Motor	Motor NEMA premium efficiency 20 hp	0.1926	= kw * hr/yr	0
61.0120.270	Motors	Motor	Motor NEMA premium efficiency 25 hp	0.1769	= kw * hr/yr	0
61.0121.270	Motors	Motor	Motor NEMA premium efficiency 30 hp	0.2025	= kw * hr/yr	0
61.0122.270	Motors	Motor	Motor NEMA premium efficiency 40 hp	0.2202	= kw * hr/yr	0
61.0123.270	Motors	Motor	Motor NEMA premium efficiency 50 hp	0.3470	= kw * hr/yr	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
61.0124.270	Motors	Motor	Motor NEMA premium efficiency 60 hp	0.3817	= kw * hr/yr	0
61.0125.270	Motors	Motor	Motor NEMA premium efficiency 75 hp	0.4056	= kw * hr/yr	0
61.0126.270	Motors	Motor	Motor NEMA premium efficiency 100 hp	0.4874	= kw * hr/yr	0
61.0127.270	Motors	Motor	Motor NEMA premium efficiency 125 hp	0.5385	= kw * hr/yr	0
61.0128.270	Motors	Motor	Motor NEMA premium efficiency 150 hp	0.5784	= kw * hr/yr	0
61.0129.270	Motors	Motor	Motor NEMA premium efficiency 200 hp	0.9505	= kw * hr/yr	0

Table J-4. Focus on Energy Demand Savings by Business Program Sector
Approved November 2008 (Lighting)

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0200.260	Lighting	Light Emitting Diode (LED)	LED Exit Lighting - for specially targeted early replacement only	0.0341	298	0.0341	298	0.0341	298	0.0341	298
2.0300.165	Lighting	Fluorescent, Compact (CFL)	CFL <= 30 Watts, replacing incandescent	0.0510	199	0.0500	175	0.0480	323	0.0380	161
2.0301.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 31-115 Watts, replacing incandescent	0.1215	590	0.1215	497	0.1215	618	0.0959	432

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0302.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 116-149 Watts, replacing metal halide	0.0900	437	0.0900	368	0.0900	458	0.0710	320
2.0303.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 150-199 Watts, replacing metal halide	0.1305	633	0.1305	534	0.1305	664	0.1030	464
2.0305.060	Lighting	Cold Cathode	CFL Cold Cathode Screw-In, replacing incandescent	0.0189	92	0.0189	77	0.0189	96	0.0149	67
2.0307.165	Lighting	Fluorescent, Compact (CFL)	CFL reflector flood lamps replacing incandescent reflector flood lamps	0.0495	192	0.0495	172	0.0495	336	0.0391	178
2.0310.165	Lighting	Fluorescent, Compact (CFL)	CFL Direct Install, replacing incandescent, WPS Hometown Checkup	0.0510	199	0.0500	175	0.0480	323	0.0380	161
2.0400.165	Lighting	Fluorescent, Compact (CFL)	CFL Fixture, replacing incandescent fixture	0.0510	199	0.0500	175	0.0720	488	0.0380	161
2.0505.085	Lighting	Controls	Occupancy Sensors - Wall Mount <= 200 Watts	0.0000	269	0.0000	226	0.0000	281	0.0000	197

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0506.085	Lighting	Controls	Occupancy Sensors - Wall Mount >= 201 Watts	0.0000	627	0.0000	528	0.0000	657	0.0000	459
2.0507.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount <= 500 Watts	0.0000	627	0.0000	528	0.0000	657	0.0000	459
2.0508.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount 501-1000 Watts	0.0000	1343	0.0000	1132	0.0000	1407	0.0000	984
2.0509.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount >= 1001 Watts	0.0000	2149	0.0000	1811	0.0000	2251	0.0000	1574
2.0515.085	Lighting	Controls	High / low control for 320W PSMH, per fixture controlled	0.0000	502	0.0000	423	0.0000	526	0.0000	253
2.0520.085	Lighting	Controls	Daylighting Controls - Automatic stepped, minimum 3 lighting levels (per kW controlled)	0.9000	1,747	0.9000	1,472	0.9000	1,414	0.7100	1,280

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0530.085	Lighting	Controls	Daylighting Controls - Automatic dimming ballasts (per kW controlled)	0.8100	1,747	0.8100	1,472	0.8100	1,414	0.6390	1,280
2.0810.170	Lighting	Fluorescent, Linear	T8 4L-4-4ft High Performance Replacing T12 2L-8 ft	0.0234	114	0.0234	96	0.0234	119	0.0185	83
2.0811.170	Lighting	Fluorescent, Linear	T8 4L-4ft High Performance Replacing T12HO/VHO 2L-8 ft	0.1008	489	0.1008	412	0.1008	513	0.0795	358
2.0821.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0126	61	0.0126	52	0.0126	64	0.0099	45
2.0822.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0214	104	0.0214	88	0.0214	109	0.0169	76
2.0823.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0365	177	0.0365	149	0.0365	186	0.0288	130
2.0824.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0442	214	0.0442	181	0.0442	225	0.0349	157
2.0831.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0114	55	0.0114	47	0.0114	58	0.0090	41

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0832.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0161	78	0.0161	66	0.0161	82	0.0127	57
2.0833.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0287	139	0.0287	117	0.0287	146	0.0227	102
2.0834.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0333	162	0.0333	136	0.0333	169	0.0263	118
2.0841.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0089	43	0.0089	36	0.0089	45	0.0070	32
2.0842.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0150	73	0.0150	61	0.0150	76	0.0118	53
2.0843.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0268	130	0.0268	110	0.0268	136	0.0212	95
2.0844.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0314	153	0.0314	129	0.0314	160	0.0248	112
2.0851.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 25 Watts	0.0079	38	0.0079	32	0.0079	40	0.0062	28
2.0852.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 28 Watts	0.0059	29	0.0059	24	0.0059	30	0.0047	21
2.0853.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 30 Watts	0.0042	21	0.0042	17	0.0042	22	0.0033	15

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0856.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp 8 ft - 54 Watts	0.0045	22	0.0045	18	0.0045	23	0.0036	16
2.0860.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Hi Lumen Lamp with Low BF	0.0072	35	0.0072	29	0.0072	37	0.0057	26
2.0870.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Hi Lumen Lamp with Low BF	0.0124	60	0.0124	51	0.0124	63	0.0098	44
2.0880.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Hi Lumen Lamp with Low BF	0.0232	113	0.0232	95	0.0232	118	0.0183	83
2.0890.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Hi Lumen Lamp with Low BF	0.0284	138	0.0284	116	0.0284	145	0.0224	101
2.0895.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0036	17	0.0036	15	0.0036	18	0.0028	13
2.0896.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0081	39	0.0081	33	0.0081	41	0.0064	29
2.0897.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0153	74	0.0153	63	0.0153	78	0.0121	54
2.0898.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0198	96	0.0198	81	0.0198	101	0.0156	70

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.0900.170	Lighting	Fluorescent, Linear	T5 2L - F28T5 Fixture, Recessed Indirect 2x4, replacing 3LT8 or 4LT12	0.0270	131	0.0270	110	0.0270	137	0.0213	96
2.0970.260	Lighting	Light Emitting Diode (LED)	LED recessed downlight - ENERGY STAR qualified	0.0471	228	0.0471	192	0.0471	239	0.0371	167
2.2110.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH) Ceramic 20-100 Watts - Replaces Incandescent	0.1175	570	0.1175	480	0.1175	597	0.0927	418
2.2115.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH) Ceramic 25 Watts - Replaces 75-90 Watts Incandescent	0.0518	251	0.0518	212	0.0518	263	0.0408	184
2.2150.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Pulse Start, 320W replacing 400W HID	0.0846	411	0.0846	346	0.0846	430	0.0667	301
2.2155.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Pulse Start - 750W replacing 1000W MH	0.2565	1245	0.2565	1049	0.2565	1304	0.2024	912

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.2170.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Electronic Ballast Pulse Start - 250W replacing 400W HID	0.1629	791	0.1629	666	0.1629	828	0.1285	579
2.2171.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Electronic Ballast Pulse Start - 320W replacing 400W HID	0.1026	498	0.1026	420	0.1026	522	0.0809	365
2.3100.260	Lighting	Light Emitting Diode (LED)	LED Reach-In Refrigerated Case Lighting replaces T12 or T8	0.0455	398	0.0455	398	0.0455	398	0.0455	398
2.5170.170	Lighting	Fluorescent, Linear	T8 4 lamp or T5HO 2 lamp Replacing 250-399 W HID	0.1345	653	0.1345	550	0.1345	684	0.1061	478
2.5180.170	Lighting	Fluorescent, Linear	T8 6 lamp or T5HO 4 lamp Replacing 400-999 W HID	0.2120	1029	0.2120	867	0.2120	1078	0.1672	754
2.5182.170	Lighting	Fluorescent, Linear	T8 8 lamp or T5HO 6 lamp Replacing 400-999 W HID	0.1437	697	0.1437	587	0.1437	731	0.1133	511
2.5185.170	Lighting	Fluorescent, Linear	T8/T5HO <= 500 Watts Replacing >=1000 W HID	0.5589	2713	0.5589	2285	0.5590	2842	0.4409	1987

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
2.5186.170	Lighting	Fluorescent, Linear	T8 or T5HO <= 800W, Replacing >=1000 W HID	0.4244	2060	0.4244	1735	0.4244	2158	0.3348	1509
2.5192.085	Lighting	Controls	Occupancy sensor for high bay fluorescent fixtures, per fixture controlled	0.0000	676	0.0000	569	0.0000	708	0.0000	341
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 14 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0510	199	0.0500	175	0.0480	323	0.0380	161
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 20 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0510	199	0.0500	175	0.0480	323	0.0380	161
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 14 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0510	199	0.0500	175	0.0480	323	0.0380	161

WISeerts Tech Code	Group Description	Category Description	Measure Description	Agriculture		Commercial		Industrial		Schools / Gov't	
				Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh	Deemed kW	Deemed kWh
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 20 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0510	199	0.0500	175	0.0480	323	0.0380	161
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 23 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0510	199	0.0500	175	0.0480	323	0.0380	161
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent spotlight lamps with 16 Watt spotlight compact fluorescent lamps, WPS Hometown Checkup	0.0510	199	0.0500	175	0.0480	323	0.0380	161

FOCUS ON ENERGY
BUSINESS PROGRAMS
CATI SURVEY
REVISED – 7/28/2010

SURVEY HOUSE INSTRUCTIONS

1. Text in **bold** should be read.
2. Text in brackets [ ] are instructions for interviewer, minor programming such as skips, or answer choices and should NOT be read.
3. Text in carrots < > are database variables that should be filled in on a case-by-case basis.
4. Text in double-carrots << >> are larger blocks of text that will change on a case-by-case basis based on database variables.
5. Text in gray boxes is major programming instruction.
6. Unless specifically noted, do NOT read answer choices. Don't know and Refused should NEVER be read.

DATABASE VARIABLES

Variable	Definition
	(Unless otherwise noted, the database can contain more than one of each variable per respondent)
cont1, cont2, ... cont*x*	Contact name(s).
m1, m2, ..., m*n*	Energy efficiency measures installed. (Text identifier).

m1_code, m2_code, ..., m*n*_code	Numeric code for measure. Follows this mapping

m1	m1_code
Boiler	1
Boiler controls	2
Boiler tune-up	3
CFL	4
CFL fixture	5
CFL flood lamp	6
Commercial freezer	7
Commercial refrigerator	8
Daylighting controls	9
Energy star freezer	10
Energy star fryer	11
Energy star hot holding cabinet	12
Energy star refrigerator	13
Energy star steamer	14
Energy star vending machine	15
Faucet aerator	16
Freezer case door	17
Fryer	18
Furnace	19
Griddle	20
Guest room energy management controls	21
Ice machine	22
LED refrigerator light	23
Lighting controls	24
Low flow showerhead	25
Metal halide lamp	26
NEMA motor	27
night curtains	28
Occupancy sensors	29
Oven	30
Pre-rinse sprayer	31
PTAC unit	32
PTHP unit	33
Recessed LED downlight	34
Refrigeration controls	35
Refrigerator case door	36
Refrigerator electric commutated motor (ECM)	37
Refrigerator Permanent Split Capacitor (PSC)	38
Rooftop AC unit	39
Split AC system	40
Steam trap repair	41
T5 fixture	42
T8 lamp	43
Vending machine controls	44
Ventilation fans	45
CFL greater than 30 watts	46
Cold cathode screw-in CFL	47
Refrigeration tune-up (hp)	48
Refrigeration tune-up (tons)	49
Energy star dishwasher	50
Extraction plate for repulper rotor	51
LED Exit light	52
T8 Fixture	53

m1_address, m2_address, ..., m*n*_address	Address where measure was installed.
m1_city, m2_city, ..., m*n*_city	City where measure was installed.
m1_qty1, m2_qty1, ..., m*n*_qty1	The number of this measure that were installed.
m1_qty2, m2_qty2, ..., m*n*_qty2	The capacity/size/rating per measure that were installed
m1_qty3, m2_qty3, ..., m*n*_qty3	The number * size/capacity/rating per measure that were installed.
m1_binary, m2_binary, ..., m*n*_binary	0 if measure has various levels of efficiency 1 if measure does not have any levels of efficiency
m1_rebate, m2_rebate, ..., m*n*_rebate	The rebate received for the measure.
mgroup1, mgroup2, ..., mgroup*y*	Measure group. There can be multiple measures under a single measure group, so the number of measure groups may not equal the number of measures. Measure group could be any of the following: **Value for Survey** **Boiler** **CFL** **Water Heater** **Food Service Equipment** **HVAC** **Lighting** **Motor** **Refrigeration** **Vending machine**
mgroup1_equip, mgroup2_equip, ..., mgroup*y*_equip	0 if mgroup does NOT include any equipment 1 if mgroup does include equipment Database has one per mgroup
mgroup1_tuneups, mgroup2_tuneups, ..., mgroup*y*_tuneups	0 if mgroup does not include any tuneups 1 if mgroup includes tuneups If an mgroup is tuneups then it is not binary
Totalreb	Total amount of rebate customer received for all measures installed (one per respondent)
Joint	Boolean variable that specifies whether participant is part of the joint program
st_facility	Boolean variable that specifies whether respondent is a state facility

1 INFORMED RESPONDENT (INF)

Section 1 can be repeated multiple times, once for each contact (cont1, cont2, ..., cont*n*) in the database and each contact obtained from INF3a.
The contact name inserted into INF1 should be changed each time to list the person we are currently trying to get.
<<program_first>> IF <joint> THEN <<program_first>> = **Focus on Energy and Alliant Energy – Wisconsin Power and Light's Shared Savings** ELSE <<program_first>> = **Focus on Energy**
<<program_and>> IF <joint> THEN <<program_and>> = **Focus on Energy and Shared Savings** ELSE <<program_and>> = **Focus on Energy**
<<energy advisor>> IF <joint> THEN <<energy advisor>> = **Energy advisor and/or Alliant Energy account manager** ELSE <<energy advisor>> = **Energy advisor**

Inf1. **Hello, may I please speak with** <cont1>?

[Contact available]..... 1
[Contact currently unavailable]..... 2 [ARRANGE CALL BACK]
[No contact]..... 3

Inf2. **Hello, my name is _____ and I'm calling from KEMA on behalf of the** <<program_first>> **program(s)**.
I would like to ask you a few questions regarding some energy efficiency improvements your organization recently made. This is not a sales or marketing call. We're calling to help the <<program_first>> **programs, which either helped your organization with these energy efficiency improvements or the company that supplied the improvements.** <<program_and>> **is(are) required by the state of Wisconsin to conduct this type of research. Your responses will be kept entirely confidential.**
According to <<program_and>> **records, sometime between October 31, 2009 and June 30, 2010, your organization made the following energy efficiency improvements:** [READ LIST OF IMPROVEMENTS BY LOCATION]

<m1>**s at** <m1_address> <m1_city>
<m2>**s at** <m2_address> <m2_city>
...
<m*n*>**s at** <m*n*_address> <m*n*_city>

Are you familiar with your organization's decision to make these energy efficiency improvements?

[Yes (all or some)] 1.....
[No] 2..... [SKIP TO INF3]
[Don't know] –97... [SKIP TO INF3]
[Refused] –98... [SKIP TO INF3]

Inf2b. [RECORD RESPONDENT'S NAME] _____ [SKIP TO NEXT SECTION]

Inf3. Do you know who is likely to be familiar with your organization's decision to make these energy efficiency improvements?

[Yes]	1.....
[No]	2... [SKIP TO INF3b]
[Don't know]	-97 ... [SKIP TO INF4]
[Refused]	-98 ... [SKIP TO INF4]

Inf3a. Who could I speak to?

[RECORD ADDITIONAL CONTACT NAMES AND NUMBERS]_____

Inf3b. Is there someone else who might know the right person for me to speak to?

[Yes]	1.....
[No]	2..... [SKIP TO INF4]
[Don't know]	-97 ... [SKIP TO INF4]
[Refused]	-98 ... [SKIP TO INF4]

Inf3c. Who could I speak to?

[RECORD ADDITIONAL CONTACT NAMES AND NUMBERS]_____

Inf4. [CHECK TO MAKE SURE ALL CONTACTS HAVE BEEN TRIED]

[Not all contacts have been tried].....	1 [GOTO INF1 AND USE NEXT CONTACT]
[All contacts have been tried]	2

Inf5. Thank you very much for your time today. Those are all the questions I have.

No one familiar with decision 1[TERMINATE]

2 VERIFY MEASURE INSTALLATION (V) .....

V0. First, I want to confirm that the energy efficiency improvements I just named were made.

V1a_1 through V2e_1 must be repeated for each measure <m1>, <m2>, ... <m*n*> the respondent has in the database.

Most respondents have a single measure.

Each time through, increment the number after the _. So the 2nd time through, the numbers will be V1a_2, V1d_2, ... The third time, V1a_3, V1d_3, ... etc. This applies to the skips and anywhere the <m1> variable appears as well.

<<V1a_txt>>
IF <m1> = steam trap repair
boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<V1a_txt>> = **a** <m1> **or something similar performed**
ELSE IF <m1_binary> = 1
THEN <<V1a_txt>> = **a/an** <m1> **or something similar installed**
ELSE (<m1_binary> = 0)
ELSE <<V1a_txt>> = **an energy efficient** <m1> **or something similar installed**

V1a_1. Was/Were <<V1a_txt>> **at** <m1_address>, <m1_city>**?**

[Yes]	1.....
[No]	2...[SKIP TO V2b_1]
[Don't know]	-97[LOOP TO V1a_2]
[Refused]	-98[LOOP TO V1a_2]

IF <m1_rebate> = 0, THEN SKIP TO V1d_1

V1b_1. Our records show that you received an incentive of <m1_rebate> **dollars for this energy efficiency improvement. Is that correct?**

[Yes]	1...[SKIP TO V1d_1]
[No]	2.....
[Don't know]	-97 .[SKIP TO V1d_1]
[Refused]	-98 .[SKIP TO V1d_1]

V1c_1. How much incentive did you receive?

[RECORD VERBATIM]_____	dollars
[Don't know]	-97
[Refused]	-98

V1d_1. What was the total cost of this measure?

[RECORD VERBATIM]_____	dollars
[Don't know]	-97
[Refused]	-98

<<V1e_txt>>

IF <m1> =	THEN <<V1e_txt>> =
Daylighting controls	**installed daylighting sensors that control** <m1_qty1> **lighting kilowatts. Is** <m1_qty1> **kilowatts correct?**
Recessed LED downlight	**installed <m1_qty1> LED recessed downlights in refrigerator or freezer cases. Is <m1_qty1> LEDs correct?**
Lighting controls	**installed occupancy sensors that control** <m1_qty1> **of fixtures. Is** <m1_qty1> **fixtures correct?**
Boiler controls	**Our records show that you installed controls on <m1_qty1> boilers each with <m1_qty2> horsepower output capacity. Is that number of boilers correct?**
Boiler tune-up	**Our records show that you paid to service <m1_qty1> boilers each with <m1_qty2> Btu per hour input capacity. Is that number of boilers correct?**
Boiler	**Our records show that you installed <m1_qty1> boilers each with <m1_qty2> Btu per hour input capacity. Is that number of boilers correct?**
Energy star Fryer	**Our records show that you installed <m1_qty1> fryers with <m1_qty2> frypots each. Is that the correct number of fryers?**
Fryer	
Night curtains	**installed** <m1_qty1> **linear feet of night curtains. Is that length correct?**
Rooftop AC unit	**Our records show that you installed <m1_qty1> rooftop air conditioner with <m1_qty2> tons of cooling capacity each. Is that number of rooftop units correct?**
Steam trap repair	**replaced** <m1_qty1> **leaking steam traps. Is that number correct?**
Faucet aerator	**had** <m1_qty1> <m1>**s installed. Is that quantity correct?**
NEMA Motor	**Installed <m1_qty1> motors each with <m1_qty2> horsepower. Is that number of motors correct?**
Refrigeration tune-up (hp)	**Our records show that you paid to service <m1_qty1> coolers, refrigerators, or freezers each with a <m1_qty2> horse power rating. Is that number of units correct?**
Refrigeration tune-up (tons)	**Our records show that you paid to service <m1_qty1> coolers, refrigerators, or freezers with <m1_qty2> tons cooling capacity each. Is that number of units correct?**
Any other	**installed** <m1_qty1> <m1>**s. Is that quantity correct?**

V1e_1. Our records show that your organization <<V1e_txt>>

[Yes]	1. [SKIP TO V1ey_1]
[No]	2.....
[Don't know]	-97 [LOOP TO V1a_2]
[Refused]	-98 [LOOP TO V1a_2]

<<V1f_txt>>

IF <m1> =	THEN <<V1f_txt>> =
Daylighting controls	**How many kilowatts do the daylighting sensors control?**
Recessed LED downlight	**How many LEDs did you install?**
Lighting controls	**How many fixtures do the occupancy sensors control?**
Boiler controls	**How many boilers did you install controls on?**
Boiler tune-up	**How many boilers did you service?**
Boiler	**How many boilers did you install?**
Energy star Fryer	**How many fryers did you install?**
Fryer	
Night curtains	**How many linear feet did you install?**
Rooftop AC unit	**How many rooftop units did you install?**
Steam trap repair	**How many leaking steam traps did you replace?**
NEMA motor	**How many motors did you install?**
Refrigeration tune-up (hp) Refrigeration tune-up (tons)	**How many units did you service?**
Any other	**How many were installed?**

V1f_1. <<V1f_txt>>**?**

[RECORD NUMBER] _____.....
[Don't know] -97 .....
[Refused] -98 .....

<<V1ey_txt>>

IF <m1> =	THEN <<V1e_txt>> =
Boiler controls	**Is <m1_qty2> horsepower output per boiler correct?**
Boiler tune-up	**Is <m1_qty2> BTU per hour input correct?**
Boiler	**Is <m1_qty2> BTU per hour input correct?**
Energy star Fryer	**Is <m1_qty2> the correct number of frypots per fryer?**
Fryer	
Rooftop AC unit	**Is <m1_qty2> tons per AC unit correct?**
Refrigeration tune-up (hp)	**Is <m1_qty2> horsepower per unit correct?**
Refrigeration tune-up (tons)	**Is <m1_qty2> tons per unit correct?**
NEMA Motors	**Is <m1_qty2> horsepower per motor correct?**
Any other	Skip to V1g_1

V1ey_1. <<V1ey_txt>>

[Yes] 1...[SKIP TO V1g_1]
[No] 2.....
[Don't know] -97[LOOP TO V1a_2]
[Refused] -98[LOOP TO V1a_2]

<<V1fy_txt>>

IF <m1> =	THEN <<V1e_txt>> =
Boiler controls	**horsepower output of each boiler?**
Boiler tune-up	**input of each unit, in BTUs per hour?**
Boiler	**input of each unit, in BTUs per hour?**
Energy star Fryer	**number of frypots per fryer?**
Fryer	
Rooftop AC unit	**tons per unit?**
Refrigeration tune-up (hp)	**horsepower per unit?**
Refrigeration tune-up (tons)	**tons per unit?**
NEMA Motors	**Horsepower per motor?**

V1fy_1. What is the correct <<V1f_txt>>**?**

[RECORD NUMBER] _____.....
[Don't know] -97 .....
[Refused] -98 .....

IF <m1> = NEMA motor, READ V1g_1
IF <m1> ≠ NEMA motor AND V1e_1 = 1 THEN LOOP TO V1a_2
IF <m1> ≠ NEMA motor AND V1e_1 ≠ 1 THEN SKIP TO V1h_1

V1g_1. How many hours do the motors operate per year?

[RECORD VERBATIM]_____# of hours[IF V1e_1 = 1 LOOP TO V1a_2]
[Don't know] -97[IF V1e_1 = 1 LOOP TO V1a_2]
[Refused] -98[IF V1e_1 = 1 LOOP TO V1a_2]

Ask V1h if V1e = 2 (no)
<<V1h_txt>>

IF <m1> =	THEN <<V1h_txt>> =
Daylighting controls	**did you install the controls on a different amount of kilowatts?**
Recessed LED downlight	**did you install a different number of LEDs?**
Lighting controls	**did you install controls on a different number of fixtures?**
Boiler controls	**was the number of boilers different?**
Boiler tune-up Boiler	**was the number of boilers different?**
Energy star Fryer	**was the number of fryers different?**
Fryer	
Night curtains	**was the amount of linear feet different?**
Rooftop AC unit	**was the number of rooftop units different?**
Steam trap repair	**was the number of steam traps different?**
NEMA motor	**was the total horsepower different?**
Refrigeration tune-up (hp)	**Was the number of refrigeration units different?**

Refrigeration tune-up (tons)	**Was the number of refrigeration units different?**
NEMA Motors	**Was the number of motors different?**
Any other	**was the amount of** <m1> **different?**

V1h_1. Why <<V1h_txt>>**?**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98 .....

Ask V1hy if V1ey = 2 (no); else loop to V1a_2
<<V1hy_txt>>

IF <m1> =	**THEN <<V1h_txt>> =**
Boiler controls	**was the output capacity different?**
Boiler tune-up Boiler	**was the input capacity different?**
Energy star Fryer	**was the number of frypots different?**
Fryer	
Rooftop AC unit	**was the capacity different?**
Refrigeration tune-up (hp)	**Was the horserpower per unit different?**
Refrigeration tune-up (tons)	**Was the tonnage per unit different?**
NEMA Motors	**Was the horsepower per motor different**

V1hy_1. Why <<V1hy_txt>>**?**
[RECORD RESPONSE VERBATIM]_____ [Loop to V1a_2]
[Don't know] -97 ...[Loop to V1a_2]
[Refused] -98 ...[Loop to V1a_2]

<<V2b_txt>>
IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<V2b_txt>> = **maintenance performed**
ELSE <<V2b_txt>> = **equipment installed**

V2b_1. Why wasn't this <<V2b_txt>>**?**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98 .....

<<V2c_txt>>
IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<V2c_txt>> = **perform this maintenance**
ELSE <<V2c_txt>> = **install this equipment**

V2c_1. Do you plan to <<V2c_txt>>**?**
[Yes] 1.....
[No] 2...[SKIP TO V2e_1]
[Don't know] -97[LOOP TO V1a_2]
[Refused] -98[LOOP TO V1a_2]

<<V2d_txt>>
IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up
THEN <<V2d_txt>> = **do**
ELSE <<V2d_txt>> = **install**

V2d_1. When do you plan to <<V2d_txt>> **it?**

V2d_1_month [RECORD MONTH] _____
V2d_1_year [RECORD YEAR] _____..... [LOOP TO V1a_2]
[Don't know] -97[LOOP TO V1a_2]
[Refused] -98[LOOP TO V1a_2]

V2e_1. Why not?

[RECORD RESPONSE VERBATIM]_____..... LOOP TO V1a_2]
[Don't know] -97[LOOP TO V1a_2]
[Refused] -98[LOOP TO V1a_2]

Once this section has been asked for all measures, move on to next section.

If none of the measures were installed (V1a_1 ... V1a_*n* ALL = 2) then TERMINATE survey.

If the respondent doesn't know about or refuses to talk about all the measures (V1a_1 to V1a_*n* ALL = -97 don't know or -98 refused) then end survey with this respondent and start the survey over again with the next contact.

4 GENERAL QUESTIONS (G).....

<<program>>
IF <joint> THEN <<program>> = **Focus on Energy or Shared Savings**
ELSE <<program>> = **Focus on Energy**

G40. Next, I would like to get some information about you and your role in the decisions to make these energy efficiency improvements.

G41a. What is your job title?
[RECORD RESPONSE VERBATIM]_____.....
[Don't know] -97 .....
[Refused] -98 .....

G41b.What are your general responsibilities?
[RECORD RESPONSE VERBATIM]_____.....
[Don't know] -97 .....
[Refused] -98 .....

G42a. Which of the following best describes your role in making decisions regarding the purchase of energy using equipment? [READ OPTIONS, SELECT ONE]
Sole responsibility for decisions..... 1
Part of a group that makes decisions 2
Provide recommendations to decision makers..... 3
Not involved in making decisions 4
[Other] [Specify_____]..... 5
[Don't know]..... -97
[Refused]..... -98

G43a. Which of the following best describes your company's policy regarding the purchase of energy using equipment? [READ OPTIONS, SELECT ONE]
The company has no formal or informal policy about the purchase of energy using equipment..... 1 [SKIP TO G44]

The company has an informal policy to consider energy efficiency when we make purchases 2

The company has a formal, written policy to consider energy efficient equipment..... 3

The company has a formal, written policy that requires the purchase of energy efficient equipment that meet certain criteria..... 4

[Other] [Specify_____]..... 5
[Don't know]..... -97 [SKIP TO G44]
[Refused]..... -98 [SKIP TO G44]

G43b. How did these policies apply to this (these) project(s)?

[RECORD RESPONSE VERBATIM]_____.....
[Don't know] -97 .....
[Refused] -98 .....

G44a. Which of the following best describes your role in the purchase of the equipment we are discussing?

[READ OPTIONS, SELECT ONE]
Sole responsibility for decision..... 1 [SKIP TO G46a]
Part of a group that made decision 2
Provided recommendations to decision makers..... 3
Not involved in making decision 4
[Other] [Specify_____]..... 5
[Don't know]..... -97
[Refused] ..... -98

G45. Who else was involved in making the final decision regarding the purchase of this equipment?

[RECORD RESPONSE VERBATIM]_____.....
[Don't know] -97 .....
[Refused] -98 .....

G46a. Did your organization receive financial assistance, such as rebates or tax credits, from any sources other than <<program>> **for the project(s) we're discussing?**

[Yes] 1
[No] 2.... [SKIP TO M510]
[Don't know] -97 .. [SKIP TO M510]
[Refused] -98 .. [SKIP TO M510]

How much did you receive and from what sources?

G46b_s1. [SOURCE #1] _____
G46c_a1. [AMOUNT FROM SOURCE #1] $_____
G46b_s2. [SOURCE #2] _____
G46c_a2. [AMOUNT FROM SOURCE #2] $_____
G46b_s3. [SOURCE #3] _____
G46c_a3. [AMOUNT FROM SOURCE #3] $_____
G46b_s4. [SOURCE #4] _____
G46c_a4. [AMOUNT FROM SOURCE #4] $_____

Program Awareness

Order of these items may look out of place, but this order is intentional.

M510.How did you first hear about Focus on Energy?

[DO NOT READ OPTIONS. CHOOSE ALL THAT APPLY]

[From a previous project] 1
[Contractor/vendor/supplier].....2
[Focus on Energy representative] 3
[Utility].....4
[Alliant Energy].....5
[Alliant Energy Account Manager].....6
[University extension agent].....7
[Colleague within my organization].....8
[Someone outside organization].....9
[Internet] 10
[Other] [Specify_____].....11
[Don't know].....-97
[Refused] .....-98

IF not <joint> SKIP TO NEXT SECTION

P2. Before today, had you heard of Alliant Energy's Shared Savings program?

[Yes] .....1 [SKIP TO M510b]
[No].....2
[Don't know].....-97
[Refused] .....-98

P2b. The Shared Savings program offers low cost financing for the purchase and installation of energy efficient equipment and processes. Alliant Energy-Wisconsin Power and Light operates the Shared Savings program to help its business customers use energy more efficiently and save money.
Have you ever heard of this program?

[Yes] 1
[No].....2 [SKIP TO M51_1]
[Don't know].....-97 [SKIP TO M51_1]
[Refused] .....-98 [SKIP TO M51_1]

M510b. How did you first hear about the Shared Savings program?
[DO NOT READ OPTIONS. CHOOSE ALL THAT APPLY]

[From a previous project] 1
[Contractor/vendor/supplier].....2
[Focus on Energy representative] 3
[Utility].....4
[Alliant Energy].....5
[Alliant Energy Account Manager].....6
[University extension agent].....7
[Colleague within my organization].....8
[Someone outside organization].....9
[Internet] 10
[Other] [Specify_____].....11
[Don't know].....-97
[Refused] .....-98

5 MEASURE GROUP QUESTIONS (M).....

M52_1 through M513_1 must be repeated for each measure group (<mgroup1>, <mgroup2>, ..., <mgroup*y*>). Each time through, increment the number after the _. So the first time through (<mgroup1>) the numbers are M51_1, M51a_1, etc. The 2nd time through (<mgroup2>), M51_2, M51a_2, etc. This applies to skips and anywhere the <mgroup1> variable appears as well.

Most respondents have a single measure group.

M51_mg1. **I'd like to understand how your organization made the decision to make these energy efficiency upgrades. When did your organization start thinking about doing this** <mgroup1> **project?**
M51_mg1_month [RECORD MONTH] ____
M51_mg1_year [RECORD YEAR] ____ .....
[Don't know] -97 .....
[Refused] -98 .....

M53_mg1. **Why did you decide to do this project? Was it...** [READ OPTIONS. SELECT ALL THAT APPLY.]
New construction or a major addition 1
A renovation or planned upgrade 2
To replace failed or broken equipment 3
To improve equipment efficiency 4
To Improve operational efficiency 5
Planned maintenance 6
To comply with a State or Governor mandate to improve energy efficiency 7
Part of an agricultural rewiring or errant voltage project8
Part of a retro-commissioning project 9
[Other] [Specify_____] 10
[Don't know] -97 .....
[Refused] -98 .....

IF <mgroup1_binary> = 1 THEN SKIP TO M56_mg1
IF <mgroup1_equip> = 0 AND <mgroup1_tuneups> = 0 THEN SKIP TO M56_mg1
ELSE IF <mgroup1_equip> = 0 AND <mgroup1_tuneups> = 1 THEN SKIP TO M54c_mg1

M54_mg1. **Did you consider options for this** <mgroup1> **equipment that were lower efficiency than what you installed?**
[Yes] 1.....
[No] 2..... [Skip to M54c]
[Don't know] -97 ..... [Skip to M54c]
[Refused] -98 ..... [Skip to M54c]

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1, 3, 2)

M54b_mg1. Which, if any, of the following efficiency levels did you consider?
[READ OPTIONS, CHOOSE ALL THAT APPLY]
Standard efficiency on the market at the time 1
The efficiency you installed 3
Or something in between? 2
[Don't know] -97 .....
[Refused] ..... -98

[If <mgroup1_tuneups> = 0 then skip to M56_mg1]

M54c_mg1. Did you consider options for this <mgroup1> **service that were less extensive than what you performed?**
[Yes] 1.....
[No] 2
[Don't know] -97 .....
[Refused] -98 .....

If <mgroup1> = refrigeration, skip to M54e_mg1
THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1, 3, 2)

M54d_mg1. Which, if any, of the following service levels did you consider?
[READ OPTIONS, CHOOSE ALL THAT APPLY]
Actions you could perform with in-house staff 1
Hiring an outside contractor to do the work 3
Or something in between? 2
[Don't know] -97
[Refused] ..... -98

If <mgroup1> = boilers, skip to M56_mg1

M54e_mg1. Which, if any, of the following service levels did you consider?
[READ OPTIONS, CHOOSE ALL THAT APPLY]
Cleaning the equipment and coils only 1
Cleaning the equipment and coils AND checking the pressures and temperatures 3
Or something in between? 2
[Don't know] -97
[Refused] ..... -98

M56_mg1. With whom, if anyone, did you discuss options for this project? Did you talk to...
[READ OPTIONS, CHOOSE ALL THAT APPLY]
People internal to your organization 1
A Focus on Energy advisor or representative 2
A utility representative or account manager 3
A University extension agent 4
or a supplier, vendor, or contractor? 5
[None of the above] 10
[Don't know] -97 .....
[Refused] -98 .....

IF M56_mg1 DOES NOT INCLUDE 1 (PEOPLE INTERNAL TO ORGANIZATION), SKIP TO M56c_timing_mg1

M56b_timing_mg1. **How did the people in your organization influence the project timing? Did their influence...**
[READ OPTIONS, CHOOSE ONE]
Accelerate the project timing 1
Decelerate the project timing 2
Or have no effect on the project timing 3
[Other] [Specify_____] 4
[Don't know] -97 .....
[Refused] -98 .....

IF <mgroup1_binary> = 1 THEN SKIP TO M56b_focus_mg1

IF <mgroup1_equip> = 0 THEN THEN SKIP TO M56b_tuneup1_mg1

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1,3,2)

M56b_equip_mg1. **What equipment options, if any, did the people in your organization recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]
Standard efficiency on the market at the time 1
The efficiency you installed 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M56b_focus_mg1

If <mgroup1> = refrigeration, skip to M56b_tuneup2_mg1

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1, 3, 2)

M56b_tuneup1_mg1. **What service level options, if any, did the people in your organization recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]
Actions you could perform with in-house staff 1
Hiring an outside contractor to do the work 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M56b_focus_mg1

If <mgroup1> = boilers, skip to M56b_focus_mg1

M56b_tuneup2_mg1. **What service level options, if any, did the people in your organization recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]
Cleaning the equipment and coils only 1
Cleaning the equipment and coils AND checking the pressures and temperatures 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

M56b_focus_mg1. **Did the people in your organization give you information about Focus on Energy incentives or services?**
[Yes] 1.....
[No] 2
[Don't know] -97 .....
[Refused] -98 .....

M56b_infl_mg1. **How much did the people in your organization influence your decision to do the** <mgroup1> **project? Were they...** [READ OPTIONS]
a *very important* factor in your decision to do the project 1
a *somewhat important* factor 2
Made no difference 3
Or made you *less* inclined to do the project 4
[Other] [Specify_____]..... 5
[Don't know] -97
[Refused] -98

IF M56_mg1 DOES NOT INCLUDE 2 (FOCUS ON ENERGY ADVISOR), SKIP TO M56d_timing_mg1

M56c_timing_mg1. **How did the Focus on Energy advisor influence the project timing? Did their influence...**
[READ OPTIONS, CHOOSE ONE]
Accelerate the project timing..... 1
Decelerate the project timing..... 2
Or have no effect on the project timing 3
[Other] [Specify_____]..... 4
[Don't know] -97 .....
[Refused] -98 .....

IF <mgroup1_binary> = 1 THEN SKIP TO M56c_focus_mg1

IF <mgroup1_equip> = 0 THEN THEN SKIP TO M56c_tuneup1_mg1

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1,3,2)

M56c_equip_mg1. **What equipment options, if any, did the Focus on Energy advisor recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]
Standard efficiency on the market at the time..... 1
The efficiency you installed..... 3
Or something in between?..... 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M56c_focus_mg1

If <mgroup1> = refrigeration, skip to M56c_tuneup2_mg1

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1, 3, 2)

M56c_tuneup1_mg1. **What service level options, if any, did the Focus on Energy advisor recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]

Actions you could perform with in-house staff 1
Hiring an outside contractor to do the work 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M56c_focus_mg1
If <mgroup1> = boilers, skip to M56b_focus_mg1

M56c_tuneup2_mg1. **What service level options, if any, did the Focus on Energy advisor recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]

Cleaning the equipment and coils only 1
Cleaning the equipment and coils AND checking the pressures and temperatures 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

M56c_focus_mg1. **Did the Focus on Energy advisor give you information about Focus on Energy incentives or services?**

[Yes] 1 .....
[No] 2
[Don't know] -97 .....
[Refused] -98 .....

M56c_infl_mg1. **How much did the Focus on Energy advisor influence your decision to do the** <mgroup1> **project? Were they...** [READ OPTIONS]

A *very important* factor in your decision to do the project 1
A *somewhat important* factor 2
Made no difference 3
Or made you *less* inclined to do the project 4
[Other] [Specify_____].....5
[Don't know] -97
[Refused] -98

IF M56_mg1 DOES NOT INCLUDE 3 (UTILITY REPRESENTATIVE/ACCOUNT MANAGER), SKIP TO M56e_timing_mg1

M56d_timing_mg1. **How did the Utility representative influence the project timing? Did their influence...**

[READ OPTIONS, CHOOSE ONE]

Accelerate the project timing.....1
Decelerate the project timing.....2
Or have no effect on the project timing 3
[Other] [Specify_____].....4
[Don't know] -97 .....
[Refused] -98 .....

IF <mgroup1_binary> = 1 THEN SKIP TO M56d_focus_mg1

IF <mgroup1_equip> = 0 THEN SKIP TO M56d_tuneup1_mg1

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1,3,2)

M56d_equip_mg1. What equipment options, if any, did the Utility representative recommend? Did they recommend ... [READ OPTIONS, CHOOSE ALL THAT APPLY]

Standard efficiency on the market at the time 1
The efficiency you installed 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M56d_focus_mg1

If <mgroup1> = refrigeration, skip to M56d_tuneup2_mg1

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1, 3, 2)

M56d_tuneup1_mg1. What service level options, if any, did the utility representative recommend? Did they recommend ... [READ OPTIONS, CHOOSE ALL THAT APPLY]

Actions you could perform with in-house staff 1
Hiring an outside contractor to do the work 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M56d_focus_mg1

If <mgroup1> = boilers, skip to M56d_focus_mg1

M56d_tuneup2_mg1. What service level options, if any, did the utility representative recommend? Did they recommend ... [READ OPTIONS, CHOOSE ALL THAT APPLY]

Cleaning the equipment and coils only 1
Cleaning the equipment and coils AND checking the pressures and temperatures 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

M56d_focus_mg1. Did the Utility representative give you information about Focus on Energy incentives or services?

[Yes] 1.....
[No] 2
[Don't know] -97 .....
[Refused] -98 .....

M56d_infl_mg1. **How much did the utility representative influence your decision to do the** <mgroup1> **project? Were they...** [READ OPTIONS]

A *very important* factor in your decision to do the project 1
A *somewhat important* factor 2
Made no difference 3
Or made you *less* inclined to do the project 4
[Other] [Specify_____].....5
[Don't know] -97
[Refused] -98

IF M56_**mg**1 DOES NOT INCLUDE 4 (university extension representative), SKIP TO M57_timing_**mg**1

M56e_timing_mg1. **How did the University extension agent influence the project timing? Did their influence...**
[READ OPTIONS, CHOOSE ONE]
Accelerate the project timing..... 1
Decelerate the project timing..... 2
Or have no effect on the project timing 3
[Other] [Specify_____]..... 4
[Don't know] -97 .....
[Refused] -98 .....

IF <mgroup1_binary> = 1 THEN SKIP TO M56e_focus_mg1

IF <mgroup1_equip> = 0 THEN SKIP TO M56e_tuneup1_mg1

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1,3,2)

M56e_equip_mg1. **What equipment options, if any, did the University extension agent recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]
Standard efficiency on the market at the time 1
The efficiency you installed 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M56e_focus_mg1

If <mgroup1> = refrigeration, skip to M56e_tuneup2_mg1
THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1, 3, 2)

M56e_tuneup1_mg1. **What service level options, if any, did the university extension agent recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]
Actions you could perform with in-house staff..... 1
Hiring an outside contractor to do the work..... 3
Or something in between?..... 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M56e_focus_mg1

If <mgroup_1> = boilers, skip to M56e_focus_mg1

M56e_tuneup2_mg1. **What service level options, if any, did the university extension agent recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]

Cleaning the equipment and coils only 1
Cleaning the equipment and coils AND checking the pressures and temperatures 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

M56e_focus_mg1. **Did the University extension agent give you information about Focus on Energy incentives or services?**

[Yes] 1.....
[No] 2
[Don't know] -97 .....
[Refused] -98 .....

M56e_infl_mg1. **How much did the university extension agent influence your decision to do the** <mgroup1> **project? Were they...** [READ OPTIONS]

A *very important* factor in your decision to do the project 1
A *somewhat important* factor 2
Made no difference 3
Or made you *less* inclined to do the project 4
[Other] [Specify_____].....5
[Don't know] -97
[Refused] -98

IF M56_mg1 DOES NOT INCLUDE 5 (supplier, contractor, or vendor), SKIP TO M58_mg1

M57_timing_mg1. **How did your supplier, vendor, or contractor influence the project timing? Did their influence...**

[READ OPTIONS, CHOOSE ONE]

Accelerate the project timing 1
Decelerate the project timing 2
Or have no effect on the project timing 3
[Other] [Specify_____] 4
[Don't know] -97 .....
[Refused] -98 .....

IF <mgroup1_binary> = 1 THEN SKIP TO M57_focus_mg1

IF <mgroup1_equip> = 0 THEN SKIP TO M57_tuneup1_mg1

THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1,3,2)

M57_equip_mg1. **What equipment options, if any, did your supplier, vendor, or contractor recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]

Standard efficiency on the market at the time 1
The efficiency you installed 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M57_focus_mg1
If <mgroup1> = refrigeration, skip to M57_tuneup2_mg1
THE ORDER OF OPTIONS AND NUMBERS ASSOCIATED ARE CORRECT (1, 3, 2)

M57_tuneup1_mg1. **What service level options, if any, did the contractor recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]

Actions you could perform with in-house staff 1
Hiring an outside contractor to do the work 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <mgroup1_tuneups>=0 then skip to M57_focus_mg1
If <mgroup1> = boilers, skip to M57_focus_mg1

M57_tuneup2_mg1. **What service level options, if any, did the contractor recommend? Did they recommend ...** [READ OPTIONS, CHOOSE ALL THAT APPLY]

Cleaning the equipment and coils only 1
Cleaning the equipment and coils AND checking the pressures and temperatures 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

M57_focus_mg1. **Did your supplier, vendor, or contractor give you information about Focus on Energy incentives or services?**

[Yes] 1.....
[No] 2
[Don't know] -97 .....
[Refused] -98 .....

M57_infl_mg1. **How much did your supplier, vendor, or contractor influence your decision to do the** <mgroup1> **project? Were they...** [READ OPTIONS]

***A very important* factor in your decision to do the project** 1
***A somewhat important* factor** 2
Made no difference 3
Or made you *less* inclined to do the project.....4
[Other] [Specify_____].....5
[Don't know] -97
[Refused] -98

M58_mg1. **Prior to the** <mgroup1> **project, did your organization make similar energy efficiency improvements at this or a different location?**

[Yes] 1
[No] 2.....
[Don't know] -97 .....
[Refused] -98 .....

FOCUS INVOLVEMENT

<<M59_txt>>
IF <mgroup1> = CFL
THEN <<M59_txt>> = <mgroup1>
ELSE <<M59_txt>> = **energy efficient** <mgroup1>

M59_mg1. **Did your organization receive incentives from Focus on Energy for any** <<M59_txt>> **projects completed before the one we're discussing?**

[Yes] 1.....
[No] 2
[Don't know] -97 .....
[Refused] -98

<<M511_txt>>
IF <mgroup1_equip> = 0
THEN <<M511_txt>> = **maintenance**
ELSE <<M511_txt>> = **equipment**

M511_mg1. **For the** <mgroup1> **project, did you become aware of Focus on Energy incentives and services. . .**
[READ ENTIRE LIST BEFORE ACCEPTING A RESPONSE AND CHOOSE ONE RESPONSE]
Before starting the project 1
As soon as you began exploring <<M511_txt>> **options**.....2
While exploring <<M511_txt>> **options, but before making a decision** 3
After making a decision.....4
or After completing the project?.....5
[Don't know] ..... -97
[Refused] ..... -98

<<M512_txt>>
IF <mgroup1_equip> = 0
THEN <<M512_txt>> = **maintenance**
ELSE <<M512_txt>> = **equipment**

M512_mg1. **When did Focus first get involved in this project? Was it...**
[READ ENTIRE LIST BEFORE ACCEPTING A RESPONSE AND CHOOSE ONE RESPONSE]
Before the project started..... 1
As soon as you began exploring <<M512_txt>> **options**..... 2
While you were exploring <<M512_txt>> **options, but before making a decision** 3
After making a/an <<M512_txt>> **decision**..... 4
After you completed the project 5
[Focus was not involved] 6
[Don't know] -97 .....
[Refused] -98 .....

<<M513_txt>>
IF <mgroup1_equip> = 0
THEN <<M513_txt>> = **perform the** <mgroup1> **maintenance**
ELSE <<M513_txt>> = **install the** <mgroup1> **equipment**

M513_mg1. **What role, if any, did Focus on Energy play in helping your organization select and** <<M513_txt>> **at this location?**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98 .....

M513c_mg1. **On a five point scale where 1 is not at all valuable and 5 is extremely valuable, how would you rate the overall value provided by the Focus on Energy Advisor with regards to the installation of you new equipment**

[1, not at all valuable] 1
[2] 2
[3] 3
[4] 4
[5, extremely valuable] 5
[Don't know] -97 .....
[Refused] -98 .....

SHARED SAVINGS INVOLVEMENT

IF not <joint> THEN SKIP TO M514_**mg**1
IF <P2> ≠ 1 AND <P2b> ≠ 1 THEN SKIP TO M514_**mg**1
<<M59b_txt>>
IF <mgroup1> = CFL
THEN <<M59b_txt>> = <mgroup1>
ELSE <<M59b_txt>> = **energy efficient** <mgroup1>

M59b_mg1. **Did your organization receive incentives from Shared Savings for any** <<M59b_txt>> **projects completed before the one we're discussing?**

[Yes] 1.....[SKIP TO P4b_mg1]
[No] 2
[Don't know] -97 .....
[Refused] -98 .....

P3b_mg1. **Before now, did you know that the Shared Savings program offers low-cost financing to support energy efficiency projects like the** <mgroup1> **project for which you received a Focus on Energy rebate for?**

[Yes] 1.....
[No] 2..... [SKIP TO M511b_mg1]
[Don't know] -97 .....
[Refused] -98 .....

P4b_mg1. **Did an Alliant Energy account representative discuss the Shared Savings program with you for the** <mgroup1> **project?**

[Yes] 1.....
[No] 2.....[SKIP TO P5b_mg1]
[Don't know] -97 .....
[Refused] -98 .....

P4bb_mg1. **Did an Alliant Energy account representative provide financial details about the Shared Savings program for the** <mgroup1> **project?**

[Yes] 1.....
[No] 2.....[SKIP TO P5b_mg1]
[Don't know] -97 .....[SKIP TO P5b_mg1]
[Refused] -98 .....[SKIP TO P5b_mg1]

P4bc_mg1. **Was the information provided to you by the Alliant Energy account representative on the financial details of the Shared Savings offer clear?**

[Yes]	1	[SKIP TO P4be_mg1]
[No]	2	
[Don't know]	-97	[SKIP TO P4be_mg1]
[Refused]	-98	[SKIP TO P4be_mg1]

P4bd_mg1. **What was unclear?**

[Record response verbatim]_____

[Don't know]	-97	
[Refused]	-98	

P4be_mg1. **Was the information provided in a timely manner?**

[Yes]	1	
[No]	2	
[Don't know]	-97	
[Refused]	-98	

P5b_mg1. **Did a *Focus on Energy Advisor* discuss the Shared Savings program with you for the** <mgroup1> **project?**

[Yes]	1	
[No]	2	[SKIP TO P6b_mg1]
[Don't know]	-97	
[Refused]	-98	

P5bb_mg1. **Did a Focus on Energy Advisor provide financial details about the Shared Savings program for the** <mgroup1> **project?**

[Yes]	1	
[No]	2	[SKIP TO P6b_mg1]
[Don't know]	-97	[SKIP TO P6b_mg1]
[Refused]	-98	[SKIP TO P6b_mg1]

P5bc_mg1. **Was the information provided to you by the Focus on Energy Advisor on the financial details of the Shared Savings offer clear?**

[Yes]	1	[SKIP TO P5be_mg1]
[No]	2	
[Don't know]	-97	[SKIP TO P5be_mg1]
[Refused]	-98	[SKIP TO P5be_mg1]

P5bd_1. What was unclear?

[Record response verbatim]_____

[Don't know]	-97	
[Refused]	-98	

P5be_mg1. **Was the information provided in a timely manner?**

[Yes]	1	
[No]	2	
[Don't know]	-97	
[Refused]	-98	

IF <P4b_**mg**1> = 2 AND <P5b_**mg**1> = 2 THEN SKIP TO M511b_**mg**1

P6b_mg1. **I'd like to know how seriously your company considered using the Shared Savings Financing. Using a one to five scale where one means "not at all" and five means "very seriously" how seriously did your company consider using Shared Savings financing for the** <mgroup1> **project?**

[1, not at all] 1
[2] 2
[3] 3
[4] 4
[5, very seriously] 5
[Don't know] ..... -97
[Refused] ..... -98

P7b_mg1. **For what reasons did your company decide to take the Focus incentives instead of the Shared Savings financing for the** <mgroup1> **project?**

[RECORD RESPONSE VERBATIM]_____ .....
[Don't know] -97 .....
[Refused] -98 .....

IF <P3b_**mg**1> = 2 THEN SKIP TO M512b_**mg**1

<<M511b_txt>>
IF <mgroup1_equip> = 0
THEN <<M511b_txt>> = **maintenance**
ELSE <<M511b_txt>> = **equipment**

M511b_mg1. **For the** <mgroup1> **project, did you become aware of Shared Savings incentives and services. . .**
[READ ENTIRE LIST BEFORE ACCEPTING A RESPONSE AND CHOOSE ONE RESPONSE]
Before starting the project 1
As soon as you began exploring <<M511b_txt>> **options** 2
While exploring <<M511b_txt>> **options, but before making a decision** 3
After making a decision 4
or After completing the project? 5
[Don't know] ..... -97
[Refused] ..... -98

<<M512b_txt>>
IF <mgroup1_equip> = 0
THEN <<M512b_txt>> = **maintenance**
ELSE <<M512b_txt>> = **equipment**

M512b_mg1. **When did Shared Savings first get involved in this project? Was it...**
[READ ENTIRE LIST BEFORE ACCEPTING A RESPONSE AND CHOOSE ONE RESPONSE]
Before the project started 1
As soon as you began exploring <<M512b_txt>> **options** 2
While you were exploring <<M512b_txt>> **options, but before making a decision** 3
After making a/an <<M512b_txt>> **decision** 4
After you completed the project 5
[Shared Savings was not involved] 6
[Don't know] -97 .....
[Refused] -98 .....

<<M513b_txt>>
IF <mgroup1_equip> = 0
THEN <<M513b_txt>> = **perform the** <mgroup1> **maintenance**
ELSE <<M513b_txt>> = **install the** <mgroup1> **equipment**

M513b_mg1. **What role, if any, did Shared savings play in helping your organization select and** <<M513b_txt>> **at this location?**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98 .....

M513cb_mg1. **On a five point scale where 1 is not at all valuable and 5 is extremely valuable, how would you rate the overall value provided by the Alliant**

Energy Account Manager with regards to the installation of you new equipment

[1, not at all valuable] 1
[2] 2
[3] 3
[4] 4
[5, extremely valuable] 5
[Don't know] -97 .....
[Refused] -98 .....

CHALLENGES FACED

M514_mg1. **What challenges, if any, did you encounter getting this** <mgroup1> **project approved and completed?**

[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98 .....

M515_mg1. **What did you or others do to overcome these challenges?**

[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98 .....

M516_mg1. **What assistance, if any, did** <<program>> **provide to help you overcome these challenges?**

[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98 .....

M518_mg1. **What additional information or assistance could have been provided by** <<program>>**?**

[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98 .....

6 DIRECT ATTRIBUTION (DAT).....

DAT_INTRO. **The** <<program>> **program(s) provided you with financial assistance and may have provided you with other services. Now that we've talked about your decision-making process, I'd like you to think about the effect that the** <<program>> **services and incentives had on your decision to make energy efficiency improvements.**

IF <st_facility> = TRUE, add to DAT_INTRO
"**If your energy efficiency projects were done to comply with the governor's executive order, I'd still like you to think about how the <<program>> program may have helped you select and/or purchase specific equipment..**"

DAT0_1 through DAT4_1 must be repeated for each measure (<m1>, <m2>, ..., <m*n*>). Each time through, increment the number after the _. So the first time through (<m1>) the numbers are DAT0_1, DAT1_1, etc. The 2nd time through (<m2>), DAT0_2, DAT1_2, etc. This applies to skips and to anywhere the <m1> variable appears as well.

Most respondents have a single measure

IF <m1> = CFL (measure code 4)
CFL Fixture (measure code 5)
THEN skip entire section for that measure. GOTO DAT0 for the next measure.

OVERALL INFLUENCE

<<DAT0_txt>>
IF <m1> = steam trap repair,
boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<DAT0_txt>> = **performing the** <m1>
ELSE IF <m1_binary> = 1
THEN <<DAT0_txt>> = **installing the** <m1>
ELSE (<m1_binary> = 0) <<DAT0_txt>> = **installing the energy efficient** <m1>

DAT0_1. **Without the** <<program>> **program(s), would you say the likelihood of** <<DAT0_txt>> **at** <m1_address> **was…** [READ OPTIONS]

Very likely 1
Somewhat likely 2
Not very likely 3
Or very unlikely 4
[Don't know] 97
[Refused] 98

TIMING

<<DAT1a_txt>>
IF <m1> = steam trap repair,
boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<DAT1a_txt>> = **perform the** <m1> ***when you did.*** **Without** <<program>>**, would you have performed the** <m1> **at the same time, earlier, later, or never?**
ELSE IF <m1_binary> = 1
THEN <<DAT1a_txt>> = **install the** <m1> ***when you did.*** **Without** <<program>>**, would you have installed the** <m1> **at the same time, earlier, later, or never?**

ELSE (<m1_binary> = 0) <<DAT1a_txt>> = **install the** <m1> ***when you did.*** **I'm referring to your decision to install any** <m1> **not necessarily a high-efficiency** <m1>. **Without** <<program>>**, would you have installed the** <m1> **at the same time, earlier, later, or never?**

DAT1a_1. **I'd like to know about the effect, if any, that** <<program>> **incentives and services had on your decision to** <<DAT1a_txt>>

[Same time]..... 1
[Earlier] 2
[Later] 3
[Never] 4
[Don't know] 97
[Refused] 98

IF DAT0_1 = 4 very unlikely AND DAT1a_1 = 1 same time, THEN ASK DAT1a_conf1_1

For these confirmation questions, if the respondent does not confirm (does not answer yes to the question) we need to repeat DAT1a_ for whatever measure they are currently on so that they can change their answer.

<<DAT1a_conf_txt>>
IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<DAT1a_conf_txt>> = **perform the** <m1>
ELSE <<DAT1a_conf_txt>> = **install the** <m1>

DAT1a_conf1_1. **I'd just like to confirm, you said that without** <<program>>**, you were very unlikely to** <<DAT1a_conf_txt>> **at all and that you would have done it at the same time? Is that correct?**

[Yes]..... 1 [SKIP TO DAT1a_O_1]
[No] ..... 2 [GOTO DAT1a_1]
[Don't know] ..... 97 [GOTO DAT1a_1]
[Refused]..... 98 [GOTO DAT1a_1]

IF DAT0_1 = 1 very likely AND DAT1a_1 = 4 never, THEN ASK DAT1a_conf2_1

DAT1a_conf2_1. **I'd just like to confirm, you said that without** <<program>>**, you were very likely to** <<DAT1a_conf_txt>> **and that you would never have done it? Is that correct?**

[Yes]..... 1 [SKIP TO DAT1a_O_1]
[No] ..... 2 [GOTO DAT1a_1]
[Don't know] ..... 97 [GOTO DAT1a_1]
[Refused]..... 98 [GOTO DAT1a_1]

<<DAT1a_O_txt>>
IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons) THEN
IF DAT1a_1 = 1 "same time" THEN <<DAT1a_O_txt>> = **performed the** <m1> **at the same time?**
IF DAT1a_1 = 2 "earlier" THEN <<DAT1a_O_txt>> = **performed the** <m1> **earlier?**
IF DAT1a_1 = 3 "later" THEN <<DAT1a_O_txt>> = **performed the** <m1> **later?**
IF DAT1a_1 = 4 "never" THEN <<DAT1a_O_txt>> = **never performed** <m1>?
ELSE
IF DAT1a_1 = 1 "same time" THEN <<DAT1a_O_txt>> = **installed the** <m1> **at the same time?**
IF DAT1a_1 = 2 "earlier" THEN <<DAT1a_O_txt>> = **installed the** <m1> **earlier?**
IF DAT1a_1 = 3 "later" THEN <<DAT1a_O_txt>> = **installed the** <m1> **later?**
IF DAT1a_1 = 4 "never" THEN <<DAT1a_O_txt>> = **never installed** <m1>?

DAT1a_O_1. **Why do you say that you would have** <<DAT1a_O_txt>>**?**

[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98

IF DAT1a_1 ≠ 3 LATER, SKIP TO DAT2a_1

DAT1b_1. **Approximately how many months later?**
[RECORD # MONTHS]_____
[Don't know] -97 .....
[Refused] -98

EFFICIENCY

<<DAT2a_txt>>

IF <m1_binary> = 1 THEN SKIP TO DAT3_1

ELSE IF <m1> = boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons) then
SKIP TO DAT2ab_1

ELSE IF <m1> = Energy star dishwasher THEN <<DAT2a_txt>> = dishwasher
ELSE IF <m1> = Energy star refrigerator THEN <<DAT2a_txt>> = refrigerator
ELSE IF <m1> = Energy star freezer THEN <<DAT2a_txt>> = freezer
ELSE IF <m1> = energy star fryer THEN <<DAT2a_txt>> = fryer
ELSE IF <m1> = energy star hot holding cabinet THEN <<DAT2a_txt>> = hot holding cabinet
ELSE IF <m1> = energy star steamer THEN <<DAT2a_txt>> = steamer
ELSE IF <m1> = energy star vending machine THEN <<DAT2a_txt>> = vending machine
ELSE IF <m1> = NEMA motor THEN <<DAT2a_txt>> = motor
ELSE IF <m1> = LED refrigerator light THEN <<DAT2a_txt>> = refrigerator light
ELSE IF <m1> = T5 fixture THEN <<DAT2a_txt>> = fixture
ELSE IF <m1> = CFL flood lamp
CFL greater than 30 watts
Cold cathode screw-in CFL
Metal halide lamp
Recessed LED downlight
T8 lamp
THEN <<DAT2a_txt>> = lamp

ELSE <<DAT2a_txt>> = <m1>

DAT2a_1. **Next, I'd like to know about the effect, if any, that** <<program>> **incentives and services had on your decision to install a *high efficiency*** <<DAT2a_txt>>**.**

Without <<program>> **would you have installed a** <<DAT2a_txt>> **of the same efficiency, lesser efficiency, or greater efficiency?**
[Same efficiency]..... 1
[Lesser efficiency] 2
[Greater efficiency]..... 3
[Don't know] 97
[Refused] 98

DAT2a_O_1. **Why do you say that?**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98

IF DAT2a_1 ≠ 2 LESSER EFFICIENCY, SKIP TO DAT3_1

DAT2b_1. **Without** <<program>>**, would you have installed a** <<DAT2a_txt>> **that was "standard efficiency on the market at that time," "slightly higher than standard efficiency", "between standard efficiency and the efficiency that you installed," or "slightly lower than the high efficiency that was installed?"**
[standard efficiency on the market at time] ..... 1 [Skip to DAT3_1]
[slightly higher than standard efficiency] ..... 2 [Skip to DAT3_1]
[between standard efficiency and what installed] ..... 3 [Skip to DAT3_1]
[slightly lower than the high efficiency installed] ..... 4 [Skip to DAT3_1]
[Don't know] -97 ..... [Skip to DAT3_1]
[Refused] -98 ..... [Skip to DAT3_1]

IF <m1> = boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
DAT2ab, DAT2ab_O, DAT2bb, DAT2bc are for non-binary service buydown measures

DAT2ab_1. **Next, I'd like to know about the effect, if any, that** <<program>> **incentives and services had on how extensive the** <m1> **was.**

Without <<program>> **would you have performed a** <m1> **that was more extensive, less extensive, or the same as what you did?**
[Same as what you did] 1
[Less extensive] 2
[More extensive] 3
[Don't know] 97
[Refused] 98

DAT2ab_O_1. **Why do you say that?**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98

IF DAT2ab_1 ≠ 2 LESS EXTENSIVE, SKIP TO DAT3_1

If <m1> = refrigeration tune-up (hp) or refrigeration tune-up (tons), skip to _DAT2bc_1

DAT2bb_1. **Without** <<program>>**, would you have performed a** <m1> **that required...**
[READ OPTIONS, CHOOSE ALL THAT APPLY]
Actions you could perform with in-house staff 1
Hiring an outside contractor to do the work 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

If <m1> = boiler tuneup, skip to DAT3_1

DAT2bc_1. **Without** <<program>>**, would you have performed a** <m1> **that required...**
[READ OPTIONS, CHOOSE ALL THAT APPLY]
Cleaning the equipment and coils only 1
Cleaning the equipment and coils AND checking the pressures and temperatures 3
Or something in between? 2
[Don't know] -97
[Refused] -98 .....

QUANTITY

IF <m1> = boiler controls, CFL, faucet aerator, pre-rinse sprayer, low flow showerhead, energy star freezer, energy star fryer, griddle, energy start hot holding cabinet, ice machine, oven, energy star refrigerator, energy star steamer, ventilation fan, CFL fixture, CFL flood lamp, metal halide fixture, daylighting controls, LED light, metal halide lamp, occupancy sensor, T5 fixture, T8 lamp, motor, refrigeration controls, freezer case door, refrigerator case door, ECM, vending machine controls
THEN
<<DAT3_txt>> = **how many** <m1> **you installed. Without** <<program>>**, how different would the number of** <m1>**s have been? Would you have installed the same number, less, more or not have installed anything?**

IF <m1> = boiler, commercial freezer, split AC system, furnace, PTAC unit, PTHP unit, rooftop AC unit
THEN
<<DAT3_txt>> = **how much** <m1> **you installed. Without** <<program>>**, how different would the size of the** <m1> **have been? Would you have installed the same size, smaller, larger, or not have installed anything?**

IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN
<<DAT3_txt>> = **how many** <m1> **you performed. Without** <<program>>**, how different would the number of** <m1>**s have been? Would you have performed the same number, less, more or not have installed anything?**

DAT3_1. **Finally, I'd like to know about the effect, if any, that** <<program>> **incentives and services had on** <<DAT3_txt>>
[same number/size] 1
[fewer/smaller] 2
[more/larger] 3
[none at all] 4
[Don't know] -97
[Refused] -98

IF DAT0_1 = 4 very unlikely AND DAT3_1 = 1 same number/size THEN ASK DAT3_conf1_1

For these confirmation questions, if the respondent does not confirm (does not answer yes to the question) we need to repeat DAT3_ for whatever measure they are currently on so that they can change their answer.

<<DAT3_conf_txt>>
IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<DAT3_conf_txt>> = **perform the** <m1>
ELSE <<DAT3_conf_txt>> = **install the** <m1>

DAT3_conf1_1. **I'd just like to confirm, you said that without** <<program>>**, you were very unlikely to** <<DAT3_conf_txt>> **at all and that you would have done the same amount? Is that correct?**

[Yes].....1 [SKIP TO DAT3_O_1]
[No] .....2 [GOTO DAT3_1]
[Don't know] .....97 [GOTO DAT3_1]
[Refused].....98 [GOTO DAT3_1]

IF DAT0_1 = 1 very likely AND DAT3_1 = 4 none at all, THEN ASK DAT3_conf2_1

DAT3_conf2_1. **I'd just like to confirm, you said that without** <<program>>**, you were very likely to** <<DAT3_conf_txt>> **and that you would not have done anything at all? Is that correct?**

[Yes].....1 [SKIP TO DAT3_O_1]
[No] .....2 [GOTO DAT3_1]
[Don't know] .....97 [GOTO DAT3_1]
[Refused].....98 [GOTO DAT3_1]

<<DAT3_O_txt>>
IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons) THEN
IF DAT3_1 = 1 "same number" THEN <<DAT3_O_txt>> = **performed the same number of** <m1>**s?**
IF DAT3_1 = 2 "fewer" THEN <<DAT3_O_txt>> = **performed fewer** <m1>**s?**
IF DAT3_1 = 3 "more" THEN <<DAT3_O_txt>> = **performed more** <m1>**s?**
IF DAT3_1 = 4 "none" THEN <<DAT3_O_txt>> = **not performed any** <m1>**s?**
ELSE IF <m1> = boiler, commercial freezer, split AC system, furnace, PTAC unit, PTHP unit, rooftop AC unit
IF DAT3_1 = 1 "same size" THEN <<DAT3_O_txt>> = **installed the same size of** <m1>**?**
IF DAT3_1 = 2 "smaller" THEN <<DAT3_O_txt>> = **installed a smaller** <m1>**?**
IF DAT3_1 = 3 "larger" THEN <<DAT3_O_txt>> = **installed a larger** <m1>**?**
IF DAT3_1 = 4 "none" THEN <<DAT3_O_txt>> = **not installed any** <m1>**s**?
ELSE
IF DAT3_1 = 1 "same number" THEN <<DAT3_O_txt>> = **installed the same number of** <m1>**s?**
IF DAT3_1 = 2 "fewer" THEN <<DAT3_O_txt>> = **installed fewer** <m1>**s?**
IF DAT3_1 = 3 "more" THEN <<DAT3_O_txt>> = **installed more** <m1>**s?**
IF DAT3_1 = 4 "none" THEN <<DAT3_O_txt>> = **not installed any** <m1>**s?**

DAT3_O_1. **Why do you say that you would have** <<DAT3_O_txt>>**?**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98

IF DAT3_1 = 1 same number/size or 4 none at all, SKIP TO DAT4_1

IF <m1> = boiler, furnace, PTAC unit, PTHP unit, rooftop AC unit, split AC system
THEN <<DAT3a_txt>> = **the size of the** <m1> **that you installed**

ELSE IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<DAT3a_txt>> = the number of <m1>s that you performed

ELSE <<DAT3a_txt>> = **the number of** <m1>**s that you installed**

DAT3a_1. **By what percentage did you change** <<DAT3a_txt>> **because of the** <<program>> **program(s)?**
[RECORD RESPONSE VERBATIM]_____%
[Don't know] -97 .....
[Refused] -98

IF <m1> = boiler, furnace, PTAC unit, PTHP unit, rooftop AC unit, split AC system
THEN <<DAT4_txt>> = <m1> **that you installed**

ELSE IF <m1> = steam trap repair, boiler tune-up, refrigeration tune-up (hp), refrigeration tune-up (tons)
THEN <<DAT4_txt>> = <m1>**s that you performed**

ELSE <<DAT4_txt>> = <m1>**s that you installed**

DAT4_1. **We've just discussed the different effects that** <<program>> **had on your organization's decisions regarding the** <m1> **that you installed. I'd like you to summarize the programs' influence on the timing, efficiency and amount of** <m1> **that you installed.**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98

DAT5. Do you have any additional comments about these projects or the <<program>> **program(s)?**
[RECORD RESPONSE VERBATIM]_____
[Don't know] -97 .....
[Refused] -98

7 Firmographics (F).....

The next questions I have for you are about the facility at which your organization made the energy efficiency improvements we discussed earlier. Just to remind you, all of your responses will remain confidential.

F1. What is the principal activity of your organization at this location?

Agricultural:		
e.g. production crops, livestock, agricultural services	1	[SKIP TO F3]
Water or wastewater treatment facility	2	[SKIP TO F3]
Industrial: manufacturing/industrial process	3	
Warehouse nonrefrigerated	4	[SKIP TO F3]
Warehouse refrigerated	5	[SKIP TO F3]
Education: including preschool, daycare	6	[SKIP TO F3]
Food service: e.g., restaurant, bar, fast food, cafeteria	7	[SKIP TO F3]
Food sales: e.g., grocery store	8	[SKIP TO F3]
Enclosed mall	9	[SKIP TO F3]
Strip mall	10	[SKIP TO F3]
Retail excluding enclosed or strip mall:		
e.g. auto dealership, showroom, store	11	[SKIP TO F3]
Public order and safety:		
including courthouse, probation office, jail	12	[SKIP TO F3]
Nursing home/Assisted living (Skilled nursing)	13	[SKIP TO F3]
Lodging:		
e.g. hotel/motel/inn/resort/dormitory/fraternity/sorority	14	[SKIP TO F3]
Lodging: residential	15	[SKIP TO F3]
Health care inpatient: e.g., hospital	16	[SKIP TO F3]
Health care outpatient: e.g., doctor/dentist office, clinic	17	[SKIP TO F3]
Laboratory	18	[SKIP TO F3]
Religious worship	19	[SKIP TO F3]
Public assembly: incl. theater, nightclub, library,		
museum, gym, bowling alley	20	[SKIP TO F3]
Service: e.g., auto service/repair,		
dry cleaner/laundromat, repair shop, post office	21	[SKIP TO F3]
Office/Professional: including bank, government	22	[SKIP TO F3]
Other [SPECIFY F3_o]_____	23	[SKIP TO F3]
[Don't know]	-97	[SKIP TO F3]
[Refused]	-98	[SKIP TO F3]

F2. Briefly describe what is done at this location. [Accept multiple responses]

Textile manufacturing	1
Wood manufacturing	2
Plastics manufacturing	3
Food manufacturing	4
Metal manufacturing	5
Goods manufacturing	6
Assembly	7
Other [Specify_____]	96
[Don't know]	-97
[Refused]	-98

F3. How many full-time employees work for your organization at this location?
[Record number of employees]_____
[Don't know]....-97
[Refused]....-98

F4. How many part-time employees work for your organization at this location?
[Record number of employees]_____
[Don't know]....-97
[Refused]....-98

F5. What is the total enclosed square footage of the space your organization occupies at this location? Your best estimate is fine.
[RECORD # SQ FT] ..... _____
[Don't know]....-97
[Refused]....-98

F6. At this location, does your organization [READ LIST]
Own all of the space it occupies? 1
Lease all of the space it occupies?....2
Or own some and lease some of the space it occupies? 3
[Don't know]....-97
[Refused]....-98

F7. Thank you for taking the time to talk with me today. Would it be okay if I called you back to clarify my notes, if necessary?
[Yes] 1
[No] 2
[Don't know] –97
[Refused] –98

F8. What is your name?
[RECORD RESPONSE]_____

Focus on Energy
Business Programs
Engineer Impact Evaluation Survey
Updated – 9/10/2010

Interviewer name:
Company id:
Program/s:
Company name:
Focus-Only Survey:
Joint Program Survey:
Supplier Survey Needed:
State Facility:
Unique ID:

CALL LOG

Contact Name: _____ phone: _____
alternate phone: _____ email:_____

Call #	Date	Time	Notes (include message left, best time to call, best way to contact, and whether survey was completed)
1			
2			
3			
4			
5			
6			

Additional Contacts:
Name: _____ Phone: _____
Name: _____ Phone: _____
Notes:

1 Informed Respondent (Inf)

Inf1. Hello, may I please speak with ?

Contact available.....[Skip to Inf2] 1
Contact currently unavailable ..... [Arrange call back] 2
No contact 3

Inf2. Hello, my name is _____ and I'm calling from KEMA on behalf of the Focus on Energy Program.
I would like to ask you a few questions regarding some energy efficiency improvements your organization recently made. This is not a sales or marketing call. We're calling to help the Focus on Energy Program, which either helped your organization with these energy efficiency improvements or the company that supplied the improvements.
Focus on Energy is required by the state of Wisconsin to conduct this type of research. Your responses will be kept entirely confidential.
According to Focus on Energy records, sometime between Oct. 31 2009 and July 30 2010, your organization made the following energy efficiency improvements:

At <Address> in <City>, Wisconsin: (Measure_Description)

Are you familiar with your organization's decision to make these energy efficiency improvements?

Yes (all or some)[Record name below then skip to Section 2] 1
Respondent Name

_____

No	2
Don't know	–97
Refused	–98

[If respondent asks who is KEMA: **KEMA is a consulting firm that specializes in the energy industry.]**

Inf3. Do you know who is likely to be familiar with your organization's decision to make these energy efficiency improvements?

Yes[Record name and number below then start over again with Inf1] 1
Additional Contacts (Name and Number)

_____
_____
_____

No	[Goto Inf3b] 2
Don't know	[Skip to Inf4] -97
Refused	[Skip to Inf4] -98

Inf3b. Is there someone else who might know the right person for me to speak to?

Yes[Record name and number below then start over again with Inf1] 1
Additional Contacts (Name and Number)

_____

_____

_____

No 2
Don't know -97
Refused -98

Inf4. [Check to make sure all contacts have been tried.]
Not all contacts have been tried [Start over again with Inf1] 1
All contacts have been tried 2

Inf5.Thank you very much for your time today. Those are all the questions I have.
No one familiar with decision[End Interview] 1

[Once you have the right person on the phone, read one of these three lines]

[If respondent received monetary incentives only:]
Based on Focus on Energy records, your organization received [] of incentives from Focus on Energy during the period we are discussing.

[If respondent received non-monetary assistance only:]
Based on Focus on Energy records, your organization received [summarize non-monetary assistance] **from Focus on Energy during the period we are discussing.**

[If respondent received both:]
Based on Focus on Energy records, your organization received [ ] **of incentives and** [summarize non-monetary assistance] **from Focus on Energy during the period we are discussing.**

2 Verify Measure Installation (V)

The purpose of this section is to verify the measures were installed and remind the respondent about how much $ they got from Focus and get the total cost. If they correct the measure or the reward amount to you on the phone, update it here, but you don't have to explicitly get them to verify the reward amount. If they verify the measure was installed, ask engineering questions. If no, go to V2.

V1. **I'd like to ask you about the equipment at** " <ADDRESS>, <CITY>,Wisconsin**.**

V1a. **According to Focus on Energy records, you were provided with $**<reward amt> **to install** <equipment type>**. Did you install** <equipment type> **or something similar at this location?**

V1b. **What was the total cost (equipment and labor) of this measure before the Focus incentive?**

Date	<M_ID>	<Address>	<City>	<equipment type>	<reward amount>	Measure installed V1a_#	Correct Rwd amt V1c_#	Total Cost V1d_#	M_ID#
						Y…1 DK..-97 N….2 Ref..-98			1
						Y…1 DK..-97 N….2 Ref..-98			2
						Y…1 DK..-97 N….2 Ref..-98			3
						Y…1 DK..-97 N….2 Ref..-98			4

V2. (# refers to M_ID#)

V2a_#	**V2b_#**	**V2c_#**	**V2d_#**	**V2e_#**
M_ID# s	**Why not installed?**	**Do you plan to install?**	**When?** [mo/yr]	**If not, why not?**
		Y…1 DK..-97 N….2 Ref..-98		
		Y…1 DK..-97 N….2 Ref..-98		

BASE

3 Engineering Review Questions

To be prepared by the engineer for each specific customer. For engineering review questions see separate engineering review sheet.

Ask engineering review questions only for those M_IDs that were implemented. If no M_IDs were implemented, skip to next section 4 General Questions (G).

If the current respondent cannot answer some of the engineering review questions, find out who can. Enter contact information below.

Name _____ Title _____
Telephone _____ Other _____

4 General Questions (G)

The following questions are about the respondent, their role in the decision, and how the organization made decisions about selecting the equipment and approving the expenditures. This section also gets at prior experience with Focus. The interviewer should record the responses to each question.

These questions are designed for the interviewer to understand the:

- Respondent's role in the purchase and selection process (and identify if they have independent discretion or if interviewer needs to talk to additional people at this organization)
- Organization's policies regarding equipment purchases
- Respondent's role in this particular purchase
- Organization's process for obtaining approval for this specific project

Next, I would like to get some information about you and your role in the decisions to make these energy efficiency improvements.

G41a. What is your job title?

G41b. What are your general job responsibilities? [probes: how long worked at this organization, had these responsibilities, etc.]

DRAFT

G42. What is your role in making decisions regarding the purchase of energy using equipment? [probes: primary decision maker, one of the primary decision makers, recommends only, etc.]

G43. What, if any, policies does your organization have regarding equipment purchases? [probe: rate of return or payback requirements, specific energy efficiency requirements, annual limits on equipment replacement, schedules for replacements, is this a franchise location and corporate HQ has mandated some policies]

G43b. How did these policies apply to this (these) project(s)?

G44. What was your role and involvement in the purchase of the equipment we are discussing? [probes: when got involved, interaction with people within and outside the organization - who and interactions regarding what.]

G45. Who else was involved in making the final decision regarding the purchase of this equipment? [probes: number of people, process, board approval required, etc., understand roles regarding selecting equipment and roles regarding approval of expenditures, understand whether this is a franchise location and corporate HQ mandated or was involved in decision. Try to get contact info (name, phone number)]

G46a. Did your organization receive financial assistance, such as rebates or tax credits, from any sources other than Focus on Energy for the project(s) we're discussing?

[Yes]	1	
[No]	2	[SKIP TO NEXT SECTION]
[Don't know]	-97	[SKIP TO NEXT SECTION]
[Refused]	-98	[SKIP TO NEXT SECTION]

G46b. From what sources did you receive assistance?
G46c. How much did you receive?

BASE

Source	Amount$
G46b_1.	G46c_1:
G46b_2.	G46c_2:
G46b_3.	G46c_3:
G46b_4.	G46c_4:

5 Measure Group Questions (M)

Group the measures into the categories below to ask the following series of questions related to the measure types installed. All applicable questions must be asked for all measure groups. The interviewer may choose to either ask all questions in order for a single measure group and then start again for the next measure group, or to ask each question for all measure groups and then move on to the next question.

Section M questions should be very conversational. Fill in what the customer tells you and then probe if there are unanswered questions. If a customer has already answered a question, you may simply verify the answer and fill it in as previously stated.

Equipment referenced in Section M should always be at the measure group level.

The type of info we're trying to get from this section:

- whether they did previous installs of similar equipment with/without Focus help
- figure out when in the process respondent heard about and started talking to Focus
- get the condition of replaced equipment
- assess whether respondent was aware of different efficiency options
- assess how much different people (esp. contractor) influenced the equipment decision
- learn about major obstacles/barriers faced and how they were overcome

Group Description	ID	Group Description	ID
Boilers & Burners	1	Waste Water Treatment	11
Lighting	2	Industrial Ovens & Furnaces	12
Refrigeration	3	Pools	13
HVAC	4	Food Service	14
Process	5	Information Technology	16
Domestic Hot Water	6	Vending, Plug Loads	17
Building Shell	7	Motors & Drives	61
Laundry	8	CFL	77
Compressed Air, Vacuum Pumps	9	New construction	15
Agriculture	10	Other	70

[Create Measure Groups which describe or correspond to measures taken by respondent.]

Group Number	M_IDs in Group	Group Description from above	Category ID from above
MG1			
MG2			
MG3			
MG4			

M51. I'd like to understand how your organization made the decision to install this particular equipment at this time. When did your organization start thinking about purchasing this equipment?

	Month/Year
M51_MG1	
M51_MG2	
M51_MG3	
M51_MG4	

M52. Why did you decide to [install this equipment / perform this maintenance]
[record response and probe: any other reasons]

	Reasons why decided to install
M52_MG1	
M52_MG2	
M52_MG3	
M52_MG4	

BASE

M53. Was this project... [READ LIST, CIRCLE ALL THAT APPLY]

Response	M53_MG1	M53_MG2	M53_MG3	M53_MG4
New construction or a major addition	1	1	1	1
A Renovation or planned upgrade	2	2	2	2
To replace failing or broken equipment	3	3	3	3
To improve equipment efficiency	4	4	4	4
To improve operational efficiency	5	5	5	5
Planned maintenance	6	6	6	6
To comply with State/Governor mandate to improve energy efficiency	7	7	7	7
Part of an agricultural rewiring / errant voltage project	8	8	8	8
Part of a retro-commission project	9	9	9	9
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

[Ask M55 if they had maintenance or service buydown measures in the measure group.]

M55. Do you perform regular preventive maintenance? [if yes] **How often?**
[Probe: Was the service that you received with assistance from Focus equivalent to your regular maintenance? Did Focus incentives cause you to perform maintenance more frequently than you would have without it?]

M55_MG1:_____
M55_MG2:_____
M55_MG3:_____
M55_MG4:_____

M54. Did you consider equipment with different efficiency levels than what you eventually installed? [Did you consider different levels of service than what you eventually performed?]

[Yes] 1
[No] ..... [Skip to M56] 2
[Don't Know] ..... [Skip to M56] -97
[Refused] ..... [Skip to M56] -98

M54a. What options did you consider? [Probe: Did you consider equip./service not eligible for incentive?]

M54a_MG1:_____
M54a_MG2:_____
M54a_MG3:_____
M54a_MG4:_____

BASE

M56. With whom, if anyone, did you discuss this project? [Probe: anyone else? Probe for Energy Advisor by name and others listed below by type. If they tell you a Dept of Energy assessor or advisor, try to get the name and determine whether it is really a Focus advisor.]

[Energy Advisor(s)**:**	

[Circle all that apply]

Type	**M56_MG1**	**M56_MG2**	**M56_MG3**	**M56_MG4**
People internal to organization	1	1	1	1
Focus on Energy Advisor/representative	2	2	2	2
Supplier/Vendor/Contractor	3	3	3	3
Utility Representative	4	4	4	4
Extension Agent	5	5	5	5
[Other] (specify)_____	6	6	6	6

[For each person indicated above, ask the following. The goal is to determine how much this person influenced the decision to select the equipment that was selected.]

What did they tell you?

[Probes:

Timing: Influenced project timing? How ?

Equipment: Equipment recommended? Identify equipment eligible for incentive? Equipment NOT eligible? First time you heard of the option? Provide technical details? Feasibility details?

Focus: Inform about Focus? Provide info about Focus? What info?

Influence: What influence did the person(s) have on your decision? What did the person(s) influence? *How much did this person influence the decision to select the equipment that was selected?*]

M56b_type. Who? (circle type) 1 2 3 4 5 6
M56b_MG. WhichMGs? (circle) MG1 MG2 MG3 MG4

_____

_____

_____

_____

M56c_type. Who? (circle type) 1 2 3 4 5 6
M56c_MG. WhichMGs? (circle) MG1 MG2 MG3 MG4

_____

_____

_____

_____

_

M56d_type. Who? (circle type) 1 2 3 4 5 6
M56d_MG. WhichMGs? (circle) MG1 MG2 MG3 MG4

_____

_____

_____

_____

_

BASE

Ask M57 if the role of their contractor is not clearly answered by M56.
The goal of this question is to assess how much the contractor influenced the decision to select the equipment that was selected.

M57. What role, if any, did your contractor play in helping you select <measure group**> [equipment / service]?**

Probes:

Timing: Influenced project timing? How ?

Equipment: Equipment recommended? Identify equipment eligible for incentive? Equipment NOT eligible? First time you heard of the option? Provide technical details? Feasibility details?

Focus: Inform about Focus? Provide info about Focus? What info?

Influence: What influence did the person(s) have on your decision? What did the person(s) influence? *How much did this person influence the decision to select the equipment that was selected?*]

M57_MG1_____
_____
_____**M57_MG2**__
_____
_____
_____**M57_MG3**_____
_____
_____
_____**M57_MG4**_____
_____
_____
_____**M58. Before the project we're discussing, had your organization installed <**measure group**> at the same energy efficiency level at this or another location?** [Circle one answer.]

RESPONSE	M58_MG1	M58_MG2	M58_MG3	M58_MG4
[Yes]	1	1	1	1
[No]	2	2	2	2
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

Focus Involvement

M59. Did your organization receive incentives from Focus on Energy for installing energy efficient <measure group**> for any projects completed before the project we're discussing?**

RESPONSE	M59_MG1	M59_MG2	M59_MG3	M59_MG4
Yes	1 [Goto M59b]	1 [Goto M59b]	1 [Goto M59b]	1 [Goto M59b]
No	2	2	2	2
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

BASE

M59b. [Specify which projects they completed before the ones you're asking about.]

M59b_MG1:_____
M59b_MG2:_____
M59b_MG3:_____
M59b_MG4:_____

M510.How did you first hear about Focus on Energy? [Probe: any others?] [Circle all that apply.]

Response	M510
From a previous project	1
From contractor/vendor/supplier	2
From Focus on Energy Representative	3
From utility	4
From extension agent	5
From colleague within my organization	6
From colleague or someone else outside my organization	7
From the internet	8
Other (specify:_____)	9
[Don't know]	-97
[Refused]	-98

M511. For the <measure group> project, did you become aware of Focus on Energy incentives and services. . . ?
[Read entire list before accepting a response and circle one response]

Response	M511_MG1	M511_MG2	M511_MG3	M511_MG4
Before starting the project	1	1	1	1
As soon as you began exploring equipment options	2	2	2	2
While exploring equipment options, but before making equipment decision	3	3	3	3
After making an equipment decision	4	4	4	4
After installing the equipment	5	5	5	5
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

Measure	Impact Statement?
1:	
2:	

Measure	Impact Statement?
3:	
4:	

Summarize from Impact Statement response to following question and use for probing. 1. Briefly explain how you (Energy Advisor) got involved with the customer and project.

BASE

M512. When did Focus first get involved in this project? Was it ...
[Read entire list before accepting a response and circle one response]

Response	M512_MG1	M512_MG2	M512_MG3	M512_MG4
Before the project started	1	1	1	1
As soon as you began exploring equipment options	2	2	2	2
While exploring equipment options, but before making a decision	3	3	3	3
After making an equipment decision	4	4	4	4
After installing the equipment	5	5	5	5
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

M513. What role, if any, did Focus on Energy play in your organization's decision to install this equipment at this location? [probe based on Energy Advisor write-up: incentives, provided information, prepared materials for internal sale, helped estimate savings, ROI or payback, feasibility study, other. Probe: how important was Focus help in making decision about EE equipment? Use this question to remind them that Focus may have helped them to identify projects and select equipment even if they were using their own budget money and/or reacting to a state/governor mandate to get more energy efficient]

M513_MG1: _____

M513_MG2: _____

M513_MG3: _____

M513_MG4: _____

BASE

Challenges Encountered

Check items that are checked or discussed on the Impact Statement:
2. Briefly explain your understanding of the largest customer barriers preventing the project's implementation.

____ Payback
____ Confidence in realizing estimated savings
____ Unknown technology or process
____ Lack of time/unwilling to make time to understand what efficiency options make sense for facility/research and select a vendor to implement equipment
____ Lack of credibility/legitimacy. Customer needs a third party reference
____ Permit barriers
____ Internal bureaucracy/inability to gain decision maker's attention
____ Lack of access to financing
____ Competition for funding with other internal projects
____ Other _____

M514. What challenges, if any, did you encounter getting this project approved and completed? [probe: for items in table above if not mentioned by respondent, for new construction, probe specifically about problems with maintaining the high efficiency of the equipment, anything else?]

M514 MG1: _____

M514 MG2: _____

M514 MG3: _____

M514 MG4: _____

Summarize from IS responses to following two questions and use for probing.
3. Briefly explain what type of assistance you provided to the customer with regards to this project.

4. Briefly describe how this assistance overcame the customer's barriers.

M515. What did you or others do to overcome these challenges? [probe: who helped you overcome these challenges? In what way?]

M515_MG1: _____

M515_MG2: _____

M515_MG3: _____

M515_MG4: _____

[Ask if not addressed above:]

M516. What assistance, if any, did Focus on Energy provide to help you overcome these challenges? [probes: incentives, feasibility study, Focus representative, program information, other]

M516_MG1: _____

M516_MG2: _____

M516_MG3: _____

M516_MG4: _____

BASE

6 Direct Attribution (DAT)

The engineer needs to group the measures (and if possible, projects) in a way that will work for the attribution. In other words, the likelihood needs to be very high that the efficiency, timing and quantity responses will be the same for the group. You can ask questions for each grouping but need to record responses individually by M_ID. Responses are recorded by M_ID# so that savings calculations and attribution can be determined at the measure level.

Equipment referenced in the DAT section should always be at the measure level (which is more specific than the measure group level).

In giving the introduction to this section, be sure to emphasize that you are discussing advice, analysis, documentation, etc… that Focus gave them, not just money.

Now that we've talked about your decision-making process, I'd like you to think about the effect that the Focus services and Focus incentives had on your decision to install <measure>.

The Focus on Energy Program provided you with [summarize assistance discussed in Section 5]

If you are talking to a state facility, make sure to remind them that Focus may have helped them identify projects and/or select equipment even if they use their own budget money and/or if the state/governor mandated EE improvements. Add the following text:

If your energy efficiency projects were done to comply with the governor's executive order, I'd still like you to think about how the Focus on Energy program may have helped you select and/or purchase specific equipment.

OVERALL INFLUENCE

DAT0. Without the Focus on Energy Program, would you say the likelihood of [installing / performing] the <measure> was… [READ LIST]

RESPONSE	DAT0_MID1	DAT0_MID2	DAT0_MID3	DAT0_MID4
Very likely	1	1	1	1
Somewhat likely	2	2	2	2
Not very likely	3	3	3	3
Or very *un*likely	4	4	4	4
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

BASE

TIMING

DAT1a. I'd like to know about the effect, if any, that Focus on Energy incentives and other Focus services had on your decision to install <measure> *when you did*.

I'm referring to your decision to install any <measure> not necessarily high-efficiency <measure>

Without Focus on Energy, would you have installed <measure> at the
same time,
earlier,
later
or never?

Response	DAT1a_MID1	DAT1a_MID2	DAT1a_MID3	DAT1a_MID4
Same time	1	1	1	1
Earlier	2	2	2	2
Later	3 [Ask Dat1b]	3 [Ask Dat1b]	3 [Ask Dat1b]	3 [Ask Dat1b]
Never	4	4	4	4
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

DAT1a_O. Why do you say that? [RECORD VERBATIM]

DAT1a_O_MID1: _____
DAT1a_O_MID2: _____
DAT1a_O_MID3: _____
DAT1a_O_MID4: _____

[IF DAT1a ≠ LATER, SKIP TO DAT2a]

DAT1b. Approximately how many months later?
[Try to get a number. Try bracketing if necessary by beginning with more or less than four years later.]

	DAT1b_MID1	DAT1b_MID2	DAT1b_MID3	DAT1b_MID4
[RECORD # OF MONTHS	_____	_____	_____	_____
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

DRAFT

EFFICIENCY

This section applies for any measure where there is a standard efficiency option. For example, variable frequency drives do not have a "standard efficiency" option, so you should skip this section for VFDs even though installing a VFD will result in energy savings. Heat recovery, lighting controls, and steam trap replacement also fall into this category. Circle "4" not applicable for the measure in the table below and skip to DAT3.

DAT2a. **Next, I'd like to know about the effect, if any, that Focus on Energy incentives and other Focus services had on your decision to install *high efficiency* <measure>**

Without Focus on Energy would you have installed <measure> of the
same efficiency as what you installed,
lower efficiency,
or higher efficiency?

[If measure is a boiler tune-up or a refrigeration tune-up:]
Next, I'd like to know about the effect, if any, that Focus on Energy incentives and services had on how extensive the <measure> **was.**

Without Focus on Energy would you have performed a <measure> **that was more extensive, less extensive, or the same as what you did?**

Response	DAT2a_MID1	DAT2a_MID2	DAT2a_MID3	DAT2a_MID4
Same	1	1	1	1
Lower	2 [Read Dat2b]	2 [Read Dat2b]	2 [Read Dat2b]	2 [Read Dat2b]
Higher	3	3	3	3
[Not applicable]	4	4	4	4
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

DAT2a_O. Why do you say that? [RECORD VERBATIM]

DAT2a_O_MID1: _____
DAT2a_O_MID2: _____
DAT2a_O_MID3: _____
DAT2a_O_MID4: _____

BASL

[IF DAT2a ≠ LOWER, SKIP TO DAT3]

DAT2b. Without Focus on Energy, would you have installed <measure> that was:

Response	DAT2b_ MID1	DAT2b_ MID2	DAT2b_ MID3	DAT2b_ MID4
Standard efficiency or according to code	1	1	1	1
Slightly higher than standard efficiency	2	2	2	2
Between standard efficiency and the efficiency that was installed	3	3	3	3
Slightly lower than the high efficiency that was installed	4	4	4	4
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

QUANTITY

DAT3. Finally, I'd like to know about the effect, if any, that Focus on Energy incentives and other Focus services had on how much <measure> you installed.

Without Focus on Energy, how different would the <number/size> of the <measure> have been? Would you have installed:

Response	DAT3_MID1	DAT3_MID2	DAT3_MID3	DAT3_MID4
Same amount	1	1	1	1
Less	2 Read Dat3a	2 Read Dat3a	2 Read Dat3a	2 Read Dat3a
More	3 Read Dat3a	3 Read Dat3a	3 Read Dat3a	3 Read Dat3a
Would not have installed any	4	4	4	4
[Not Applicable]	5	5	5	5
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

DAT3_O. Why do you say that?

DAT2c_O_MID1: _____

DAT2c_O_MID2: _____

DAT2c_O_MID3: _____

DAT2c_O_MID4: _____

[IF DAT3 = SAME or NOT INSTALLED ANY, SKIP TO DAT4]

BASE

DAT3a. By what percentage did you *change* the amount of <measure> installed because of the Focus on Energy Program?

Calculate percent: abs([(amount installed) / (amount would have installed)] - 100%)

The response can be greater or less than 100 percent. Two examples:

- Example 1. Organization installed 8, but would have installed 2 without the program. Change is 300 percent.
- Example 2. Organization installed 4, would have installed 3 without the program. Change is 33 percent.

Record a positive % even if they decreased the amount that they installed.

- Example 3. Organization installed 8 but would have installed 10 w/out the program. Change is 20 percent.
- Example 4. Organization installed 4 but would have installed 6 without the program. Change is 33 percent.

	DAT3a_MID1	DAT3a_MID2	DAT3a_MID3	DAT3a_MID4
[RECORD %]	_____%	_____%	_____%	_____%
Don't know	-9997	-9997	-9997	-9997
Refused	-9998	-9998	-9998	-9998

DAT4. We've just discussed the different effects that Focus on Energy had on your organization's decisions regarding the <measure> that you installed. I'd like you to summarize the program's influence on the timing, efficiency and amount of <measure> that you installed.

[If response is inconsistent with previous responses attempt to resolve. Please note any final inconsistencies.]

DAT4_MID1: _____

DAT4_MID2: _____

DAT4_MID3: _____

DAT4_MID4: _____

DAT5. Do you have any additional comments about these projects or the Focus on Energy program? [Record Verbatim]

_____

_____

_____

DAT7. [To be filled out by interviewer: Vendor surveys are required if the respondent indicates that the program did not have an effect on efficiency (DAT2a = 1 or 3) AND

the respondent indicates that the vendor had substantial influence on the efficiency of the installed equipment.
Is a vendor survey required?]

Yes	1
No	2

DAT8. [To be filled out by interviewer: Note any unresolved inconsistencies.]

None	1
Some (enter below)	2

DAT9. [To be filled out by interviewer: Summarize the project and impact that the program had on the purchase. If you have noted unresolved inconsistencies in DAT8, summarize what you know at this point. Be sure to cover timing, quantity, and efficiency and why.]

BASE

7 Firmographics (F)

[Do not ask these questions if no measures were installed.]

The next questions I have for you are about the facility at which your organization made the energy efficiency improvements we discussed earlier. As a reminder, your responses will remain confidential.

F1. What is the principal activity of your organization at this location?

Agricultural	(1)
Water or wastewater treatment	(2)
Industrial	(3)
Warehouse nonrefrigerated	(4)
Warehouse refrigerated	(5)
Education: incl. preschool/daycare	(6)
Food service	(7)
Food sales: e.g., grocery store	(8)
Enclosed mall	(9)
Strip mall	(10)
Retail NOT enclosed/strip mall	(11)
Public order and safety: including courthouse, probation office, jail	(12)
Nursing home/Assisted living	(13)

Lodging: e.g., hotel/motel/inn/resort, dormitory/fraternity/sorority	(14)
Lodging: residential	(15)
Health care inpatient	(16)
Health care outpatient	(17)
Laboratory	(18)
Religious worship	(19)
Public assembly: incl. theater, nightclub, library, museum, gym, bowling alley	(20)
Service: e.g., auto service, laundromat, repair shop, post office	(21)
Office/Professional	(22)
Other _____	(23)
[Don't know]	(-97)
[Refused]	(–98)

[For all answers BUT industrial, skip to F3 after asking]

F2. Briefly describe what is done at this location. [Accept multiple responses]

Textile manufacturing	(1)
Wood manufacturing	(2)
Plastics manufacturing	(3)
Food manufacturing	(4)
Metal manufacturing	(5)
Goods manufacturing	(6)

Assembly	(7)
Other _____ (96)	
[Don't know]	(-97)
[Refused]	(-98)

F3. How many full-time employees work for your organization at this location?

[Record number of employees]_____
[Don't know].....-97
[Refused].....-98

F4. How many part-time employees work for your organization at this location?

[Record number of employees]_____
[Don't know].....-97
[Refused].....-98

DRAFT

F5. What is the total enclosed square footage of the space your organization occupies at this location? Your best estimate is fine.

[RECORD # SQ FT]..... _____
[Don't know]..... -97
[Refused]..... -98

F6. At this location, does your organization... [READ LIST]

Own all of the space it occupies?..... 1
Lease all of the space it occupies? 2
Or own some and lease some of the space it occupies? 3
[Don't know]..... -97
[Refused]..... -98

F7. Thank you for taking the time to talk with me today. Would it be okay if I called you back to clarify my notes, if necessary?

Yes	1
No	2
Don't know	–97
Refused	–98

BASE

APPENDIX M: SUPPLIER SURVEY

Instructions:
Read **bold** text. [Do NOT read text in brackets.] Only read lists when instructed to do so. Never read "Don't Know" and "Refused."
If applicable, review the Energy Advisor Survey for each project prior to administering this survey.

Interviewer Name:
Supplier Contact Info.:
Additional Info.: _____
Contact Log:

Call #	Date	Time	Disposition (i.e.: Complete, Left Message)
1			
2			
3			
4			
5			
6			

Customer-Project Info:
Customer (Company) Name:
Customer Contact:

Measure ID	Type of Project	Address

BASE

Hi, my name is _____ and I'm calling from KEMA Inc. on behalf of the Public Service Commission of Wisconsin for the Focus on Energy Program. I'd like to ask you a few questions about your company's involvement with the Focus on Energy Program. According to program records, Focus on Energy has helped your company supply energy efficiency improvements to businesses in Wisconsin. Your responses will be kept confidential.

[If they ask how long it will take] **It should take about 10 minutes.**

[Set up call back if currently unavailable]

1 Interaction with Focus on Energy

S1. **I'd like to start off with a little information about your company. What are your company's main products and services?**

[Don't know] ..... -97
[Refused]..... -98

S2. **How has your company been involved with Focus on Energy?** [Contacts were provided by Focus; however if respondent is unaware of Focus or their company's involvement with Focus then ask to speak with someone familiar with Focus and their company's involvement with Focus.]

[Don't know] ..... -97
[Refused]..... -98

S3. **How *long* has your company been involved with Focus on Energy?**

_____[RECORD NUMBER OF YEARS]
[Don't know] .....-97
[Refused].....-98

S4. **I'm going to read some benefits your company may have received from Focus. For each of these, please tell me yes or no.**

S4a.	**Have you or your customers received rebates or other financial incentives from Focus?**	[Use these categories for all questions in this table] [Yes] .....1 [No] .....2 [Don't know] ..-97 [Refused] .....-98
S4b	**Have you received customer leads from Focus?**	

.		
S4c.	**Have you used Focus marketing materials to help promote energy efficiency products and services?**	
S4f.	**Has Focus introduced you to new energy-efficient technologies?**	
S4g.	**Have your received any other assistance from Focus?**	

S4h. [If respondent said "Yes" to S4g (other assistance) record details here]

S5. **Have you or any of your employees received training from Focus or attended any workshops sponsored by Focus?**

[Yes] 1
[No] ..... 2 [SKIP TO S6]
[Don't know] ..... -97 [SKIP TO S6]
[Refused] ..... -98 [SKIP TO S6]

S5b. **What workshops or training did you or your employees attend?**

[Don't know] ..... -97
[Refused] ..... -98

S6. **Has the Focus on Energy program provided you with technical assistance about energy-efficient products and services?**

[Yes] 1
[No] ..... 2 [SKIP TO S7]
[Don't know] ..... -97 [SKIP TO S7]
[Refused] ..... -98 [SKIP TO S7]

S7. **Again excluding financial incentives, has Focus provided you with tools or sales techniques that have helped convince customers to implement energy-efficient measures?**

Yes 1
No ..... [SKIP TO S8] 2
[Don't know] ..... [SKIP TO S8] -97
[Refused] ..... [SKIP TO S8] -98

S7b. **How helpful are tools and techniques provided by Focus? Use a 1 to 5 scale where 1 means "not at all helpful" and 5 means "very helpful."**

[1, Not at all helpful] 1
[2] 2
[3] 3
[4] 4
[5, Very helpful] 5
[Don't know] ..... -97
[Refused] ..... -98

S8. **Does Focus on Energy's endorsement of energy-efficient products help you sell them?**

Yes 1
No ..... [SKIP TO S9] 2
[Don't know] ..... [SKIP TO S9] -97
[Refused] ..... [SKIP TO S9] -98

S8a. **How helpful was Focus on Energy's endorsement? Use a scale one to five scale, where one means "not at all helpful" and five means "very helpful".**

[1, Not at all helpful] 1
[2] 2
[3] 3
[4] 4
[5, Very helpful] 5
[Don't know] ..... -97
[Refused] ..... -98

S9. **Now thinking ONLY about Focus on Energy customer rebates and other financial incentives, how much have the incentives helped convince customers to implement energy-efficient measures? Use the same one to five scale.**

[1, Not at all helpful] 1
[2] 2
[3] 3
[4] 4
[5, Very helpful] 5
[Don't know] ..... -97
[Refused] ..... -98

2 Without Focus on Energy

W1a. **Without Focus on Energy, would you offer different products and services than you currently do?**

Yes 1
No ..... [SKIP TO W2a] 2
[Don't know] ..... [SKIP TO W2a] -97
[Refused] ..... [SKIP TO W2a] -98

W1b. **How would the products and services you provide differ?**

[Don't know] ..... -97
[Refused] ..... -98

W2a. **Without Focus on Energy, would your company's sales volume of energy efficient equipment and services be different than it is today?**

Yes 1
No ..... [SKIP TO W3] 2
[Don't know] ..... [SKIP TO W3] -97
[Refused] ..... [SKIP TO W3] -98

W2b. **How would your company's sales volume differ?**

[Don't know] ..... -97
[Refused] ..... -98

Now I'm going to read you some statements that other people have made about Focus on Energy. Please tell me how much you disagree or agree with each one. Use a one to five scale where one means "strongly disagree" and five means "strongly agree".

W3. **Without Focus, many of the energy efficiency projects I do for customers would not be economically feasible.**

[1, Strongly disagree] 1
[2] 2
[3] 3
[4] 4
[5, Strongly agree] 5
[Don't know] ..... -97
[Refused] ..... -98

W4. **The statewide Focus program helps legitimize energy-efficient products and services.**

[1,Strongly disagree]..... 1
[2] 2
[3] 3
[4] 4
[5, Strongly agree] 5
[Don't know]..... -97
[Refused]..... -98

3 Project Specific Questions

Now I'm going to ask you a few questions about one of your customers that received help from the Focus on Energy Program sometime between October 2008 and September 2009.

Customer name: _____

Project description: _____

[Mention name of customer and project information that will help the supplier remember the project. If the supplier does not remember this customer/project then continue with this sequence referring to the type of measures included in this project.

If there are more than one customers/projects then indicate when responses are different – we need to be able to tie these answers back to the engineering surveys done for each customer.]

P1. **Did your company work with this customer before this project?**

Yes.....1
No ..... [SKIP TO P3] 2
[Don't know] ..... [SKIP TO P3] -97
[Refused]..... [SKIP TO P3] -98

P2. **Did you sell (install) energy efficiency improvements to this customer before this project?**

Yes 1
No.....2
[Don't know]..... -97
[Refused] ..... -98

P3. **Did a Focus Energy Advisor refer this customer to you?**

Yes.....1
No 2
[Don't know] ..... -97
[Refused]..... -98

DAT0. **Without the Focus on Energy program, how likely is it that you would have offered the same energy efficiency services and/or technologies to this customer? Is it...** [READ LIST]

Very likely.....1
Somewhat likely.....2
Not very likely 3
or Very unlikely.....4
[Don't know]..... -97
[Refused] ..... -98

DAT1a. **I'd like to know about the effect, if any, that Focus on Energy incentives and other Focus services had on the timing of this project. Without Focus on Energy, would your customer have undertaken the project...** [READ CHOICES]

At the Same time.....[SKIP TO DAT2a] 1
Earlier .....[SKIP TO DAT2a] 2
Later.....3
or never? .....[SKIP TO DAT2a] 4
[Don't know].....[SKIP TO DAT2a] -97
[Refused] .....[SKIP TO DAT2a] -98

DAT1b. **How many months later?**

_____[RECORD NUMBER OF MONTHS]
[Don't know]..... -97
[Refused] ..... -98

DAT2a. [Ask only if efficiency level is applicable to the project type]
Next, I'd like to know about the effect, if any, that Focus on Energy incentives and other Focus services had on the level of efficiency you recommended for this project. Without Focus on Energy, would the equipment efficiency been... [READ CHOICES]

The Same.....[SKIP TO DAT3] 1
Lower.....2
or Higher?.....[SKIP TO DAT3] 3
[Not applicable].....[SKIP TO DAT3] 4
[Don't know].....[SKIP TO DAT3] -97
[Refused] .....[SKIP TO DAT3] -98

[If measure is a boiler tune-up or a refrigeration tune-up:]

Next, I'd like to know about the effect, if any, that Focus on Energy incentives and services had on how extensive the tune-up was. Without Focus on Energy would you have recommended a tune-up that was more extensive, less extensive, or the same as what you did?

[Same] .....[SKIP TO DAT3] 1
[Less extensive] 2
[More extensive] .....[SKIP TO DAT3] 3
[Not applicable] .....[SKIP TO DAT3] 5
[Don't know] .....[SKIP TO DAT3] -97
[Refused] .....[SKIP TO DAT3] -98

DAT2b. **Without Focus on Energy, what type of equipment would you have recommended…** [READ LIST]

Standard efficiency on the market at the time.....1
Slightly higher than standard efficiency.....2
Between standard and the high efficiency that was installed 3
or Slightly lower than the high efficiency that was installed 4
[Don't know]..... -97
[Refused]..... -98

DAT3. [Ask only if quantity is applicable to project (i.e.: lighting projects)]
Finally, I'd like to know about the effect, if any, that Focus on Energy incentives and other Focus services had on how much <measure> you recommended. Without Focus on Energy, would you have recommended ...
[READ LIST]

The Same (amount/size) ..... [SKIP TO DAT4] 1
Less..... 2
More 3
Or not recommended anything..... 4
[Not applicable]..... [Skip to DAT4] 5
[Don't know] ..... [SKIP TO DAT4] -97
[Refused]..... [SKIP TO DAT4] -98

DAT3a. **What percent of the quantity installed would you have recommended**?

Calculate percent: abs([(amount installed) / (amount would have installed)] - 100%)

The response can be greater or less than 100 percent. Two examples:

- Example 1. Organization installed 8, but would have installed 2 without the program. Change is 8/2 - 100% = 300 percent.
- Example 2. Organization installed 4, would have installed 3 without the program. Change is 4/3-100% = 33 percent.

Record a positive % even if they decreased the amount that they installed.

- Example 3. Organization installed 8 but would have installed 10 w/out the program. Change is abs(8/10-100%) = 20 percent.
- Example 4. Organization installed 4 but would have installed 6 without the program. Change is abs(4/6-100%) = 33 percent.

_____[RECORD PERCENT]
[Don't know] .....-97
[Refused].....-98

DAT4. [CONFIRMATION QUESTION]
We've just discussed the different effects that Focus on Energy had on your ability to sell these specific energy efficiency improvements. Could you summarize the program's influence on the customer's timing, and the efficiency and amount of <measure> you recommended/offered to this customer?
[Don't know].....-97
[Refused].....-98

Those are all the questions I have for you today. Thank you for your time and cooperation.

DAT9. [To be filled out by interviewer: Summarize the impact that the program had on the supplier and the project. If you have noted unresolved inconsistencies, summarize what you know at this point. Be sure to cover timing, quantity, and efficiency and why.