State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

Business Programs Impact Evaluation Report: Last Quarter of the 18-month Contract Period and First Three Quarters of Calendar Year 2009

March 31, 2010

Evaluation Contractor: PA Consulting Group Inc.

Prepared by: Miriam L. Goldberg, J. Ryan Barry, Tammy Kuiken,
Nicole Buccitelli, John Dendy, and Ben Jones; KEMA Inc.

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Acknowledgment: Ralph Prahl, Prahl & Associates, contributed critical review and analysis.

This report is the property of the state of Wisconsin, Public Service Commission of Wisconsin, and was funded through the Wisconsin Focus on Energy Program.

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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 Business Programs measures implemented during the last quarter of the 18-month Contract Period[1] (October 1, 2008, through December 31, 2008) and the first three quarters of Calendar Year 2009[2] (January 1, 2009, through September 30, 2009). 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 on Energy Business Programs. Since the start of the program, the evaluation team has implemented twelve rounds of data collection and document review to estimate net energy savings for Business Programs (BP).

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 that installed energy efficient equipment during Contract Year 2009 (CY09).[3] 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 Step 1 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*

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[1] The "18-month Contract Period" refers to program implementation between July 1, 2007, and December 31, 2008.

[2] "Calendar Year 2009" refers to program implementation between January 1, 2009 and December 31, 2009.

[3] Throughout this report, we refer to the current evaluation as the "Contract Year 2009" evaluation or the "CY09" evaluation for simplicity, though the evaluation period covers one quarter of the 18-month Contract Period (18MCP) and three quarters of CY09.

Study[4] were added to the ratios and they were then applied to the population. Untracked attributable savings (UAS) resulting from the impact evaluation of the Education and Training Program were then added to the population net savings.[5]

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

KEMA implemented a new sampling process for this round of evaluation. Instead of sampling data at the customer level as we have in the past, this round we designed a sampling process that selects units at the measure level. 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 new sampling method uses a tool new to KEMA[6] 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. 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. In none of the groupings shown did we fail to meet our targeted number of completes. For a detailed strata-by-strata look at the population, targets, and completed sample by strata, see Appendix G.

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

[5] Unlike the added spillover savings, the untracked attributable savings resulting from the impact evaluation of the Education and Training program are not included in the adjustment factors.

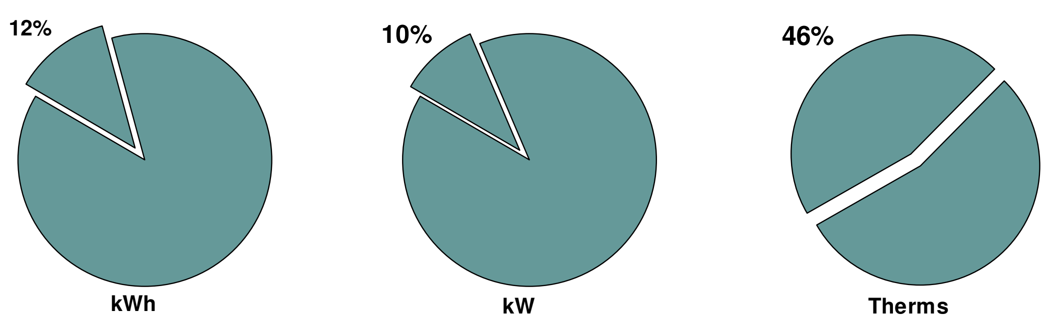
[6] Former RLW Analytics staff with expertise using the sampling tool have joined the BP impact evaluation team.

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	7,504	131	287	42%	36%	0%	5%	4%	0%
HVAC	2,457	109	145	15%	30%	19%	1%	2%	7%
Process	178	36	39	7%	3%	32%	2%	1%	25%
Boilers & Burners	1,327	91	171	0%	0%	38%	0%	0%	11%
CFLs	15,101	34	54	12%	15%	0%	1%	1%	0%
Compressed Air, Vacuum Pumps	390	14	18	8%	5%	1%	0%	0%	0%
Refrigeration	733	21	49	5%	4%	0%	2%	1%	0%
Agriculture	1,045	12	14	2%	2%	2%	0%	0%	1%
New Construction	27	7	9	1%	2%	2%	1%	1%	0%
Industrial Ovens and Furnaces	11	5	5	0%	0%	3%	0%	0%	1%
Waste Water Treatment	83	7	9	2%	1%	0%	0%	0%	0%
Motors & Drives	991	19	45	1%	1%	0%	0%	0%	0%
Other	1,176	26	46	4%	1%	4%	0%	0%	0%
Business Programs Overall	**31,023**	**512**	**891**	**100%**	**100%**	**100%**	**12%**	**10%**	**46%**

During data collection, KEMA obtained 891 sample completes (measures) in the engineering and CATI samples. Figure 1-1 shows the percentage of population savings included in the sample. We completed surveys representing 12 percent of kWh savings, 10 percent of kW savings, and 46 percent of therm savings. Though we surveyed a smaller proportion of the savings in CY09 than in the 18MCP (24, 20 and 50 percent for kWh, kW and therms respectively), we were able to target measure groups more accurately in order to provide reliable results beyond the sector level. The new sample design allows us to select a smaller proportion of overall savings that still represent the population and produce results within meaningful precision levels.

Figure 1-1. Percent of CY09 Tracking Gross Savings Included in Sample



Each of the adjustment factors 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. Measure groups with relative errors greater than 40 percent for their primary savings type were allocated into other measure groups. The reporting measure groups include Non-Small CFL Lighting, HVAC, Expanded Process, Boilers & 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	7,504	131	287	42%	36%	0%	5%	4%	0%
HVAC	2,457	109	145	15%	30%	19%	1%	2%	7%
Expanded Process	662	62	71	17%	9%	36%	2%	1%	27%
Boilers & Burners	1,327	91	171	0%	0%	38%	0%	0%	11%
Small CFLs	15,101	34	54	12%	15%	0%	1%	1%	0%
Refrigeration	733	21	49	5%	4%	0%	2%	1%	0%
Other	3,239	64	114	8%	6%	7%	1%	1%	1%
Business Programs Overall	**31,023**	**512**	**891**	**100%**	**100%**	**100%**	**12%**	**10%**	**46%**

1.3 KEY FINDINGS

Overall, the Business Programs achieved kWh, kW, and therm realization rates of 68.1 percent, 60.7 percent, and 62.9 percent respectively. The increases between the CY09 kWh and therms realization rates and those of 18MCP are statistically significant at the 95 percent confidence level but the increase in the kW realization rate is not statistically different. The realization rate is the ratio of achieved attributable savings to gross reported savings. As in the 18MCP, the realization rates include the effects of the *Participant Spillover Savings Study*[7].

Following are key results from this study:

- CY09 net verified energy savings for the evaluation period amounted to 349,627,610 kWh/year, 70,764 kW, and 20,002,027 therms/year. This is the second evaluation period that has included the untracked attributable savings resulting from the impact evaluation of the Education and Training Program[8] in the net verified energy savings. These are the energy savings that would not have occurred in the absence of the programs.[9]

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

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

[9] Unlike the added spillover savings, the untracked attributable savings resulting from the impact evaluation of the Education and Training program are not included in the adjustment factors.

- The CY09 attribution rates for kWh, kW, and therms are 66.6 percent, 59.1 percent, and 59.5 percent respectively. The increase in the CY09 kWh attribution factor over the 18MCP is statistically different from the 18MCP results at the 95 percent confidence interval but the increases in the kW and therm 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 CY09 gross savings adjustment factors for kWh, kW, and therms are 102.3 percent, 102.8 percent, and 105.8 percent respectively. The increases in the CY09 kWh, kW, and therm adjustment factors over the 18MCP are statistically different from the 18MCP results at the 95 percent confidence interval. 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 WATTS and WISeerts.

1.3.1 Comparison across years

Figures 1-1 through 1-3 show the gross savings, attribution and realization rates over time. These charts incorporate 12 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 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.

- A revised survey instrument has been developed based on the recent evaluation framework paper.[10] Changes to the instrument were made for both the 18MCP and the CY09 evaluations.
- 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

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[10] 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.

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[11] were used for all low wattage (<30 W) CFLs. These attribution rates were 93 percent for the Commercial sector and 67 percent for the Agricultural sector. This is the second evaluation that uses separate adjustment factors for the Commercial and Agriculture sectors[12].
- 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.[13] 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[14] with the 18MCP.
- The CY09 evaluation is the first to include data from the CATI survey to 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 fiscal year's result is statistically significant at the 95 percent level of confidence.

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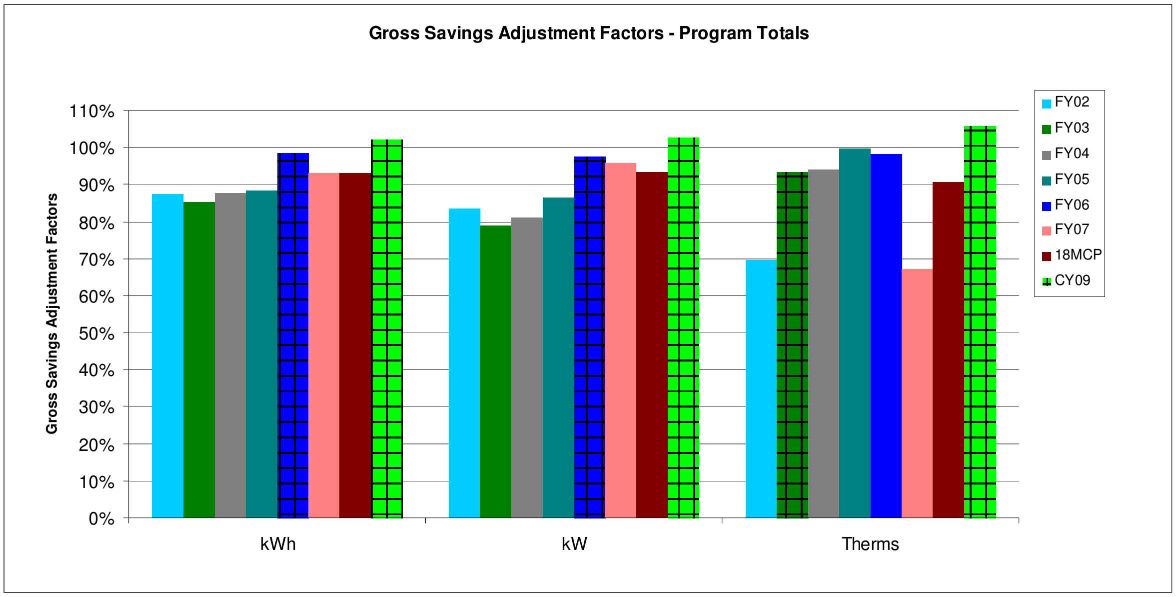
[11] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. Forthcoming.

[12] The Commercial value of 93 percent attribution was applied to CFLs in the CATI sample that fell under the Industrial or Schools & Government sectors.

[13] 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.

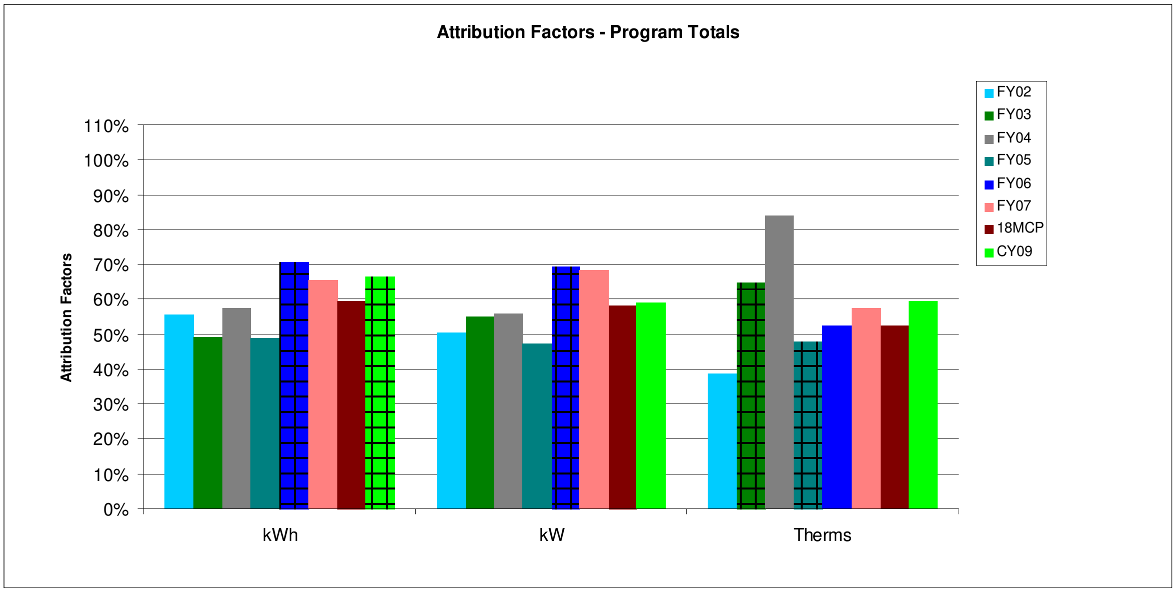
[14] The statistical comparison to FY07 is not based solely on the FY07 data collected as part of the FY07 Abbreviated Impact Evaluation. It is based on a combination of FY06 and FY07 data. For more details on the abbreviated approach, see the *Focus on Energy Evaluation Abbreviated FY07 Business Programs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

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



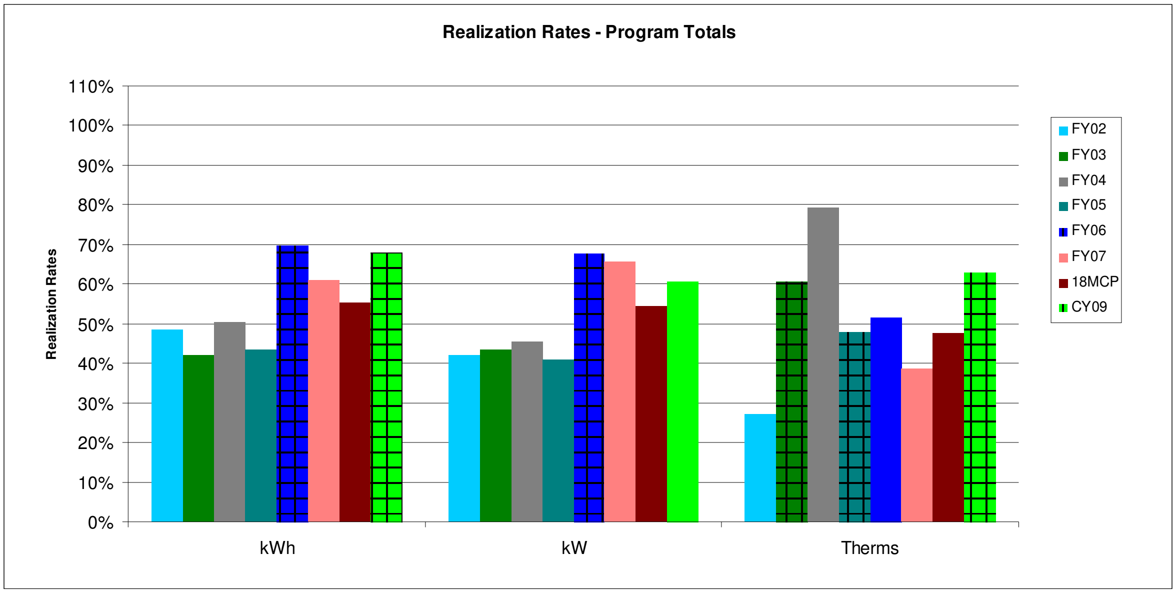
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

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 savings for the engineering sample for this evaluation and compares it to the last 2 evaluation periods.[15] In CY09, the percentage of adjusted measures is remarkably consistent across energy units. Verified savings are equal to reported savings for 68 percent of kWh and kW measures and for 67 percent of therm measures with applicable savings for those energy units. These values are greater than those for any of the recent evaluations, meaning that a lesser percentage of measures were adjusted in this evaluation than in the recent past.

[15] Discrepancies shown in Table 1-3 show 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. In CY09, the percentage of adjusted measures is remarkably consistent across energy units. Verified savings are equal to reported savings for 68 percent of kWh and kW measures and for 67 percent of therm measures with applicable savings for those energy units. These values are greater than those for any of the recent evaluations, meaning that a lesser percentage of measures were adjusted in this evaluation than in the recent past.

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		FY07 #	FY07 %	18MCP Rounds 1 and 2 #	18MCP Rounds 1 and 2 %	CY09 #	CY09 %
kWh	Not Installed	0	0%	4	1%	1	0%
	Verified equal reported	25	51%	319	46%	213	68%
	Verified not equal reported	24	49%	368	53%	102	32%
	Engineering sample		49		691		315
kW	Not Installed	0	0%	3	0%	1	0%
	Verified equal reported	25	60%	325	51%	190	68%
	Verified not equal reported	17	40%	368	58%	91	32%
	Engineering sample		42		635		281
Therm	Not Installed	0	0%	1	1%	0	0%
	Verified equal reported	9	23%	74	47%	94	67%
	Verified not equal reported	31	78%	81	52%	47	33%
	Engineering sample		40		156		141
Total Engineering Sample			**50**		**801**		**410**

There were three changes to the verified gross savings analysis for this round that would affect the comparison across evaluation years.

- This evaluation marks the first round that data has been collected from the CATI survey to inform the gross savings adjustment for measures other than CFLs. In this round, 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 previous evaluations, discrepancies were not reported unless they were an adjustment of 10 percent or more. In this evaluation, all discrepancies were reported, regardless of the degree of change from the tracking estimate.
- This is the second 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 number of analysis changes between the 18MCP and CY09 limits the ability to compare gross savings adjustment results across years.

1.4 CONCLUSIONS AND RECOMMENDATIONS

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

Several key observations emerge from the findings.

- In general, the program has maintained or improved on performance from the 18MCP. The CY09 kW realization rate is consistent with the 18MCP estimate. The kWh realization rate increased from 55.4 percent in the 18MCP to 68.1 percent in CY09. The therm realization rate increased from 47.6 percent in the

18MCP to 62.9 percent in CY09. Both changes are statistically significant at the 95 percent confidence interval.

- The program has done an effective job of estimating gross savings resulting from energy efficiency measures. All three CY09 gross savings adjustment factors are greater in CY09 than they were in the 18MCP and all three changes are statistically significant at the 95 percent confidence interval. For kWh, the gross savings adjustment factor increased from 93.0 percent in the 18MCP to 102.3 percent in CY09. For kW, the gross savings adjustment factor increased from 93.3 percent in 18MCP to 102.8 percent in CY09. For therms, the gross savings adjustment factor increased from 90.8 percent in the 18MCP to 105.8 percent in CY09.
- The attribution factor estimates have maintained or improved over the 18MCP. The kWh attribution factor has increased from 59.5 percent in the 18MCP to 66.6 percent in CY09. The kW and therm attribution factors are statistically consistent with the 18MCP results.
- Service buydown measures have a lower attribution than non-service buydown measures for the kW and therms energy units. The kW attribution factor for service buydown measures is 37.0 percent and for non-service buydown measures it is 65.7 percent. The therms attribution factor for service buydown measures is 34.6 percent and for non-service buydown measures it is 71.8 percent. The differences for kW and therms are statistically significant at the 95 percent confidence interval. The kWh attribution factor for service buydowns is statistically consistent with non-service buydown measures.
- New construction measures have a lower attribution than non-new construction measures for the therms energy unit. The therm attribution factor for new construction measures is 16.5 percent and for non-new construction measures it is 60.2 percent. This result is statistically significant at the 95 percent confidence interval. The kWh and kW new construction attribution factors are statistically consistent with the non-new construction factors.

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.
- Review chiller service buydown gross savings estimates and make changes as appropriate. Based on recent meetings between the evaluation team and program staff, this analysis is already planned by the program. The evaluation team supports the review.
- Review service buydown measures and offerings and determine whether a change in program approach is warranted.
- Review new construction measures and offerings and determine whether a change in program approach is warranted.

2. INTRODUCTION

This report presents the results of the impact evaluation of the statewide Focus on Energy Business Programs measures implemented during the last quarter (October 1, 2008, through December 31, 2008) of the 18-month Contract Period (18MCP) and the first three quarters (January 1, 2009, through September 30, 2009) of the 2009 Calendar Year (CY09).[16]

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 twelve rounds of data collection and document review to estimate net energy savings for Business Programs (BP).

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 that installed energy efficient equipment during CY09.[17] 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.
- **Expand sample results to the population of customers.** The sample results obtained in Step 1 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*

[16] The "18-month Contract Period" refers to program implementation between July 1, 2007, and December 31, 2008. The "2009 Calendar Year" refers to program implementation between January 1, 2009, and December 31, 2009.

[17] Throughout this report, we refer to this evaluation period as "CY09" despite the fact that a portion of the 18MCP is included in the analysis.

Study[18] were added to the ratios and they were then applied to the population. Untracked attributable savings (UAS) resulting from the impact evaluation of the Education and Training Program were then added to the population net savings.[19]

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 were made to the sampling method and report organization for this round of evaluation. KEMA moved from a customer-based sample design to a measure-based sample design. We used the Model Based Statistical Sampling (MBSS) tool to develop a design that would produce 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 the priorities communicated by the program and the PSCW. Once the data was 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, sampling plan, and a brief description of major changes to the impact evaluation since the 18MCP.

Section 4 of the report is a summary of the adjustment factors presented in this report followed by the energy savings results. The CY09 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.

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

[19] Unlike the added spillover savings, the untracked attributable savings resulting from the impact evaluation of the Education and Training program are not included in the adjustment factors.

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.

Following Section 5 is a series of appendices containing:

- Appendix A: Series of tables and charts showing the CY09 installation and engineering verification factors at the reporting measure group level and all five adjustment factors at the sample 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 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.
- Appendix J: A complete list of the deemed savings measures and their values for the time period covered by this evaluation.
- Appendix K: 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.[20] For the majority of the analysis we used approaches and protocols developed in the evaluation work conducted so far. However, the CY09 evaluation included 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 and a discussion of the other changes made for this round of evaluation.

3.1 APPROACH AND DEFINITIONS

The evaluation team has implemented 12 rounds of data collection and document review to estimate net energy savings for Business Programs. Each evaluation has included a telephone survey of Wisconsin Focus on Energy (Focus) Business Programs participants who installed measures in the appropriate time frame. Table 3-1 shows the fiscal or calendar year and the implementation time 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, 2008, and September 30, 2009, according to the Business Programs' tracking systems (WISeerts and Rebates databases).

Table 3-1. Twelve 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	C2009[c]	April 2008–September 2008
12	C2008 & C2009	October 2008–September 2009

The survey addresses measure installation and characteristics (e.g., quantities, equipment efficiencies, 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

[20] 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.

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.[21] The results of the survey, engineering review, and on-site data are combined to create several adjustment factors described below.

3.1.1 Adjustment factors defined

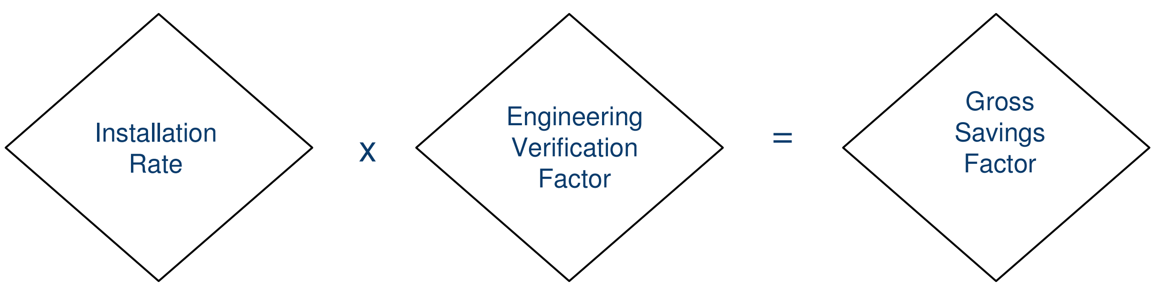
The adjustment factors estimated from the data collection and analysis are as follows:

- **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 factor.

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

[21] We performed two site visits during the CY09 evaluation. We also utilized on-site data and reports provided by the Focus M&V team.

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*[22] 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 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.[23] The attribution factor for this report is based on the results presented in the memorandum "2008 Sector-based CFL Net-to-Gross Analysis" dated February 2010. This is the most recent study to produce attribution results for the Commercial and Agricultural sectors separate from the Residential Program. These attribution rates were 93 percent and 67 percent respectively.[24] The Commercial value of 93 percent attribution was applied to CFLs that fell under the Industrial or Schools & Government sectors.

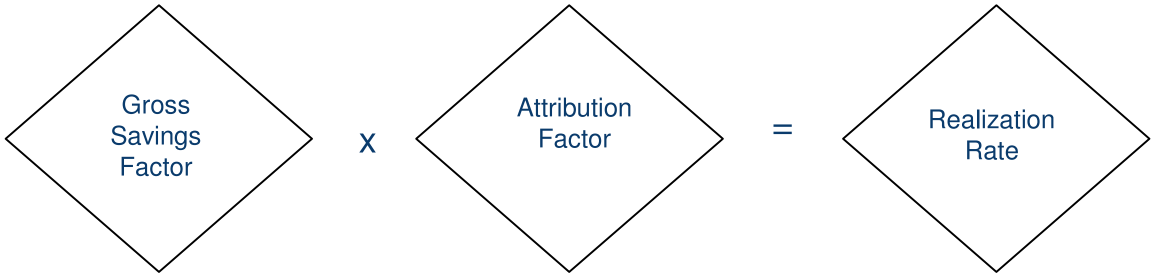
- **Realization rate.** This factor combines the gross savings adjustment factor and the attribution factor as shown in Figure 3-2. It corresponds to the ratio of the net savings to the tracking estimate of savings.

[22] 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.

[23] 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.

[24] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. Forthcoming.

Figure 3-2. Realization Rate Calculation



3.2 SAMPLING

The CY09 adjustment factors are based on one round of data collection and documentation review that covers energy efficiency measures installed between October 1, 2008, and September 30, 2009. 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 the 18MCP and the first three quarters of CY09. This determination is made based on the "WECCAuthorizedDt" variable entered in the WISeerts database.[25] If the variable value is on or between October 1, 2008, and September 30, 2009, then the measure is considered to have been installed during the evaluation period.

3.2.1 Sampling process

KEMA implemented a new sampling process for this round of evaluation. In the past, we have 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 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, for this round we have designed a sampling process that selects units at the measure level, not the customer level. This should allow for the estimation of net energy savings for selected measure types.

Sampling at the measure level will require more customer contacts to determine the impacts from the same number of sample measures. This will raise the per-measure evaluation cost but will also allow 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

[25] This evaluation period covers the first months of 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.

result in slightly lower precisions at the portfolio level when compared to customer level sampling.

The new sampling method uses a tool new to KEMA[26] 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 that 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. A key challenge with the method of sampling at the measure level is that it does not allow us to tie the evaluation sample to the evaluation budget as tightly as was done with the previous method. We were able to work around this limitation, however, and designed the sample to use relatively the same budget as the last impact evaluation.

3.2.2 Sample design

As in previous years, KEMA designed the sample to achieve our primary objective of a relative precision of ± 10 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:

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

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[26] Former RLW Analytics staff with expertise using the sampling tool have joined the BP impact evaluation team.

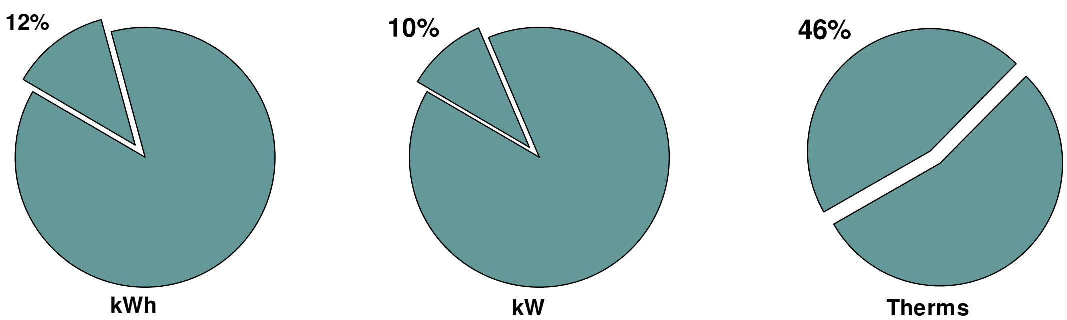
Our goal was to identify measure categories that make up a large portion of program savings and attempt to sample them at a rate that would provide meaningful precision. At the same time, we sought to balance WECC and PSCW measure group priorities with the primary objective of the study and the achievement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

KEMA distributed the draft sample design[27] for comment on October 16. After receiving initial feedback, we met with the program and the PSCW on October 26 to discuss and brainstorm alternative sample allocations and primary analysis breakouts for purposes of determining final net energy impacts. After that meeting, KEMA received a list of measure group priorities from the program and incorporated them along with the priorities of the PSCW into the final sample design, which was distributed in a November 4, 2009, memo titled *Business Programs Final Sample Design*.

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 that installed large measures refuse or are unable to participate in the study, the precision of the estimates decrease because a large fraction of energy savings is not included in the sample.

The percent of savings for which we completed surveys is shown in Figure 3-3. Though we surveyed a smaller proportion of the savings in CY09 than in the 18MCP (24, 20, and 50 percent for kWh, kW, and therms respectively), we were able to target measure groups more accurately in order to provide reliable results beyond the sector level. The new sample design allows us to select a smaller proportion of overall savings that still represent the population and produce results within meaningful precision levels.

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



[27] The draft sample design was based on data downloaded from the WISeerts database on August 22, 2009, and from the Rebates database on August 28, 2009. The final sample design was based on data downloaded from both databases on October 15, 2009.

3.2.3 CATI vs. engineering samples

The sample has two components: an engineering sample and a computer-assisted telephone interview (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:[28]

1. Each measure was assigned to a sampling stratum based on its sector, its measure group,[29] whether it was deemed or not, whether it had therm impacts or not, and the magnitude of its avoided costs.
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.
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 strata 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 strata, 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 custom 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.

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[28] 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.

[29] Some measure groups with limited savings impacts in the frame were combined into an “Other” category for the purposes of sampling.

7. All customers with measures in the 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 then 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 (gave them a sampling weight of 1) 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 1) and not other measures in the same strata. It allows us to use the extra information collected without biasing our sample.
8. CFL cases drawn for the CATI sample receive only telephone interviews 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. In none of the groupings shown did we fail to meet our targeted number of completes. 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. 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
Non-Small CFL Lighting	7,504	131	287	42%	36%	0%	5%	4%	0%
HVAC	2,457	109	145	15%	30%	19%	1%	2%	7%
Process	178	36	39	7%	3%	32%	2%	1%	25%
Boilers & Burners	1,327	91	171	0%	0%	38%	0%	0%	11%
Small CFLs	15,101	34	54	12%	15%	0%	1%	1%	0%
Compressed Air, Vacuum Pumps	390	14	18	8%	5%	1%	0%	0%	0%
Refrigeration	733	21	49	5%	4%	0%	2%	1%	0%
Agriculture	1,045	12	14	2%	2%	2%	0%	0%	1%
New Construction	27	7	9	1%	2%	2%	1%	1%	0%
Industrial Ovens and Furnaces	11	5	5	0%	0%	3%	0%	0%	1%
Waste Water Treatment	83	7	9	2%	1%	0%	0%	0%	0%
Motors & Drives	991	19	45	1%	1%	0%	0%	0%	0%
Other	1,176	26	46	4%	1%	4%	0%	0%	0%
Business Programs Overall	**31,023**	**512**	**891**	**100%**	**100%**	**100%**	**12%**	**10%**	**46%**

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	21,802	299	656	32%	31%	18%	6%	5%	10%
Not Deemed	9,221	213	235	68%	69%	82%	6%	5%	36%
Business Programs Overall	31,023	512	891	100%	100%	100%	12%	10%	46%

3.3 REPORTING FORMAT

Each of the adjustment factors 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. 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. The reporting measure groups include Non-Small CFL Lighting, HVAC, Expanded Process, Boilers & 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 & 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	Motors & Drives
Other	Agriculture
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	7,504	131	287	42%	36%	0%	5%	4%	0%
HVAC	2,457	109	145	15%	30%	19%	1%	2%	7%
Expanded Process	662	62	71	17%	9%	36%	2%	1%	27%
Boilers & Burners	1,327	91	171	0%	0%	38%	0%	0%	11%
Small CFLs	15,101	34	54	12%	15%	0%	1%	1%	0%
Refrigeration	733	21	49	5%	4%	0%	2%	1%	0%
Other	3,239	64	114	8%	6%	7%	1%	1%	1%
Business Programs Overall	**31,023**	**512**	**891**	**100%**	**100%**	**100%**	**12%**	**10%**	**46%**

The adjustment factors shown in the tables in the results section are based on data from CY09 data collection and documentation review. This covered measures implemented during the last quarter (October 1, 2008, through December 31, 2008) of the 18-month Contract Period (18MCP) and the first three quarters (January 1, 2009, through September 30, 2009) of the 2009 Calendar Year (CY09)[30] for a total of four 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 and measure groups of interest to the PSCW and the program.

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 rate adjustment factors.

Major changes affecting the impact evaluation methodology during CY09 are summarized in the following sections.

3.4.1 Change to sampling and reporting units

For this round of evaluation, KEMA changed from a customer-level sampling design to a measure-level sampling design. We also changed from reporting results at the sector level

[30] The "18-month Contract Period" refers to program implementation between July 1, 2007, and December 31, 2008. The "2009 Calendar Year" refers to program implementation between January 1, 2009, and December 31, 2009.

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 several changes to both the engineering and CATI survey instruments.

A. ENGINEERING SURVEY

KEMA made several updates to the engineering survey instrument.[31] Our goal was to reduce redundancy and streamline the survey while still meeting the guidelines set out in the *Framework for Self-report Net-to-gross (Attribution) Questions*[32] and collect data comparable to previous Business Programs evaluations. We made the following changes:

- **Removed the entire incremental costs section.** We removed this section because the data were unreliable and did not justify the additional respondent burden. KEMA recently completed an incremental cost study[33] that provided specific and more reliable data for prescriptive lighting and HVAC measures. We have recommended a separate incremental cost study to cover custom measures.
- **Removed redundant questions from attribution section.** The previous version of the survey included the following questions:

  DAT1. I'd like to know about the effect, if any, that Focus on Energy incentives and other Focus assistance had on your decision to install [equipment type] *at this time*. If Focus on Energy didn't exist, would you say that it was "*very* likely," "*somewhat* likely," "*not* very likely," or "not at all likely" that you would have installed [equipment type] at this time?

  DAT2. I'd like to know about the effect, if any, that Focus on Energy incentives and other Focus assistance had on your decision to install *high efficiency* [equipment type]. If Focus on Energy didn't exist, would you say that it was "*very* likely," "*somewhat* likely," "*not* very likely," or "*not at all* likely" that you would have installed [equipment type] of the same *efficiency* as what you did install?

  DAT1 and DAT2 were included in the survey instrument to confirm the answers to DAT1a and DAT2a, which are used in the attribution calculation. However, respondents felt that the questions were redundant. Therefore, we removed

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[31] Appendix L contains the entire instrument.

[32] Rick Winch and Tom Talerico, Glacier Consulting Group; Bobbi Tannenbaum, KEMA Inc.; Pam Rathbun, PA Consulting Group. *Framework for Self-report Net-to-gross (Attribution) Questions.* January 29, 2008.

[33] Miriam Goldberg, J, Ryan Barry, Brian Dunn, Matt Pettit, KEMA, Inc. *Focus on Energy Evaluation, Business Programs: Incremental Cost Study, Final Report*. October 28, 2009.

DAT1 and DAT2 from the survey. Open-ended questions (i.e. "Why do you say that?") were relied on to confirm the answers to the attribution questions.

- **Updated wording on attribution questions.** As in previous rounds, KEMA used the feedback from the last round of evaluation to update the wording of the attribution questions. We continuously strive to craft the question in a way that is understood by the respondent and will provide the data needed for the evaluation.
- **Collapsed several redundant questions in the measure group section.** The previous version of the survey included the following questions:

M53. Why did you decide to install this equipment?

M53a. [Probe for any answers below that were not discussed above. Circle all responses that apply, whether provided in open-ended response or as a result of probe.]

[Ask M54. only if answers not provided in M53. and M53a. above.]

M54. And why were you [installing, replacing, renovating] the equipment at this time? [record response, probe: Why now? OR Why now and not later or earlier?, any other reasons]

Response
New construction or major addition
Renovation or planned upgrade
Replace failing or broken equipment
To improve equipment efficiency
To improve operational efficiency
[Don't know]
[Refused]

We collapsed these three questions into a single question and expanded the answer choices based on discussions with WECC.

M53. Was this project... [READ LIST, CIRCLE ALL THAT APPLY]

Response
New construction or a major addition
A renovation or planned upgrade
To replace failing or broken equipment
To improve equipment efficiency
To improve operational efficiency
Planned maintenance
To comply with State/Governor mandate to improve energy efficiency
Part of an agricultural rewiring/errant voltage project
Part of a retro-commission project
[Don't know]
[Refused]

- **Removed franchise and headquarters questions.** We also removed the following franchise and headquarters questions from the Firmographics section of the survey because they were not used in any analysis.

  D7. Does your organization operate at a single location, at multiple locations, or is it a franchise organization?

  D8. Is your organization headquartered in Wisconsin?

- **Added questions on other funding and other equipment considered.** KEMA also added a few questions to more effectively cover topics suggested in the *Framework for Self-report Net-to-gross (Attribution) Questions*. We added a set of questions that asked participants if and how much financial incentive they received from sources other than Focus on Energy for the relevant measures. We also added a question that asked the participants whether they considered less efficient equipment than what they eventually installed.

  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?

  G46b. From what sources did you receive assistance?

  G46c. How much did you receive?

M54. Did you consider equipment with different efficiency levels than what you eventually installed?

M54a. What options did you consider? [Probe: Did you consider equip. not eligible for incentive?]

B. CATI SURVEY

The CATI (computer aided telephone interview) survey received a major overhaul to make it consistent with the engineering survey. KEMA made extensive revisions to the engineering survey instrument for the 18MCP that were not included in the CATI instrument at that time. We made the two instruments consistent for this round of evaluation except for minor changes to the format of some questions. These format changes consisted of providing a list of close-ended responses to many of the open-ended questions in the engineering survey. We closed the open-ended questions to make it easier for untrained operators (as opposed to trained engineers) to deliver the survey.

For example, the engineering survey included the following question:

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.]

This question was changed to the following for the CATI survey:

G42a. Which of the following best describes your role in making decisions regarding the purchase of energy using equipment? [READ OPTIONS, SELECT ONE]

Response
Sole responsibility for decisions
Part of a group that makes decisions
Provides recommendations to decision makers
Not involved in making decisions
Other (specify)
[Don't know]
[Refused]

Also, for the first time, the CY09 CATI survey includes a gross savings verification section for all non-CFL deemed measures. In this section, the inputs to the deemed savings calculation are verified with the customer. If the participant was unsure of the details of the installation, we assumed that the tracking data was correct.

3.4.3 Deemed measures

A number of measures used deemed savings or deemed algorithms to determine savings. Measures installed before February 13, 2009, were given deemed savings according to the list approved in June of 2008. Measures installed after February 13, 2009, were given deemed savings according to the list approved in February 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.

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*[34] (see 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*[35] (see Appendix I) beginning in the 18MCP. All three effects were included in this round of evaluation.

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

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

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 on Energy 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.

4. ENERGY SAVINGS RESULTS

The primary objective of this evaluation is to calculate energy and demand savings attributable to the program for CY09. This section of the report provides a brief description of the impact evaluation's key indices, the results of the CY09 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 two specific population cuts: service buydowns and new construction.

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 due to 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.
- **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.

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 the 18MCP and the first three quarters of CY09. The adjustment factors presented in this report will be used for further impact evaluation reporting until the next revised estimates are developed. The next revised estimates will be developed during the next impact evaluation, currently scheduled to begin in July 2010.

4.2 INTERPRETING THE RESULTS

The next few sections provide the results of the CY09 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.
- **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 CY09 results tables

The CY09 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 101.8 percent and the 90 percent confidence interval is ± 39.2 percentage points (i.e., 101.8% ± 39.2%).[36] The HVAC measure group accounted for 14.5 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, 2008–September 30, 2009) 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 12 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 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.

- A revised survey instrument has been developed based on the recent evaluation framework paper.[37] Changes to the instrument were made for both the 18MCP and the CY09 evaluations.
- 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

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[36] 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.

[37] 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.

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[38] were used for all low wattage (<30 W) CFLs. These attribution rates were 93 percent for the Commercial sector and 67 percent for the Agricultural sector. This is the second evaluation that uses separate adjustment factors for Commercial and Agriculture[39].
- 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.[40] 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[41] with 18MCP.
- The CY09 evaluation is the first to include data from the CATI survey to determine the engineering verification factor.

4.3 GROSS SAVINGS ADJUSTMENT FACTORS

Table 4-1 shows the CY09 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. The gross savings adjustment factor is greater than 100 percent for all three energy units, indicating that the program is doing an effective job of estimating gross energy savings and may be slightly underestimating savings. All of the measure-group-level gross savings adjustment factors are above 90 percent.

The Expanded Process measure group has the highest gross savings adjustment factor for all three energy units, with factors of 109.9 percent, 145.1 percent, and 117.7 percent for kWh, kW, and therms respectively. The high gross savings adjustments are largely a result

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[38] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. Forthcoming.

[39] The Commercial value of 93 percent attribution was applied to CFLs in the CATI sample that fell under the Industrial or Schools & Government sectors.

[40] 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.

[41] 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.

of engineering reviews that produced verified gross savings that were significantly greater than the tracking savings. Two measures in particular (one Process and one Compressed Air) had a strong impact on the high adjustment factors in that measure group.

The precision of the kWh estimate for the HVAC measure group is poor relative to some of the other groups, particularly in relation to the number of sample points in that group. The primary reason is the wide variability in the gross savings adjustment for the individual measures, which saw very large positive and very large negative adjustments resulting from the engineering review.

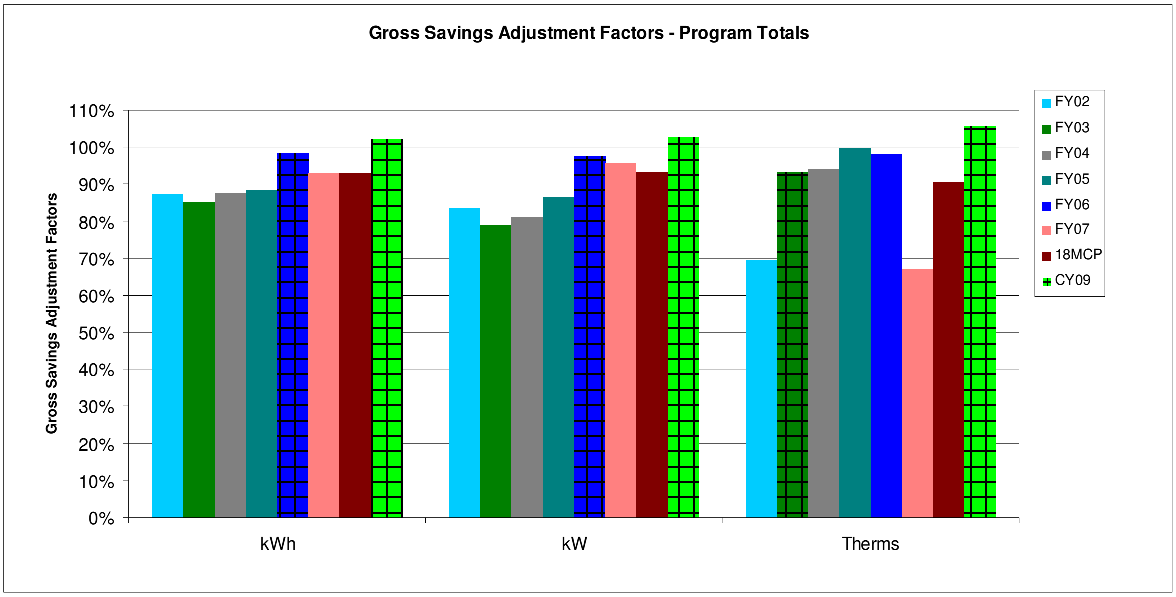
The precisions for the Expanded Process group are also poor. The kWh and kW precisions are likely low because many of the large and complex projects in the Expanded Process sample had a wide variation in individual gross savings adjustment factors.

Table 4-1. Gross Savings Adjustment Factors by Reporting Measure Group Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	kWh				kW				Therms			
Measure Group	**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	7	99.1%	2.3%	0.5%	1	100.0%	<0.1%	0.2%	164	99.1%	0.8%	38.1%
Non-Small CFL Lighting	283	101.0%	1.6%	42.5%	259	101.5%	1.9%	36.5%	-	-	-	-
Refrigeration	47	96.3%	9.0%	5.5%	46	95.2%	9.6%	3.6%	3	94.1%	24.8%	0.3%
HVAC	90	101.8%	39.2%	14.5%	71	95.6%	9.9%	30.0%	76	105.9%	7.5%	19.1%
Expanded Process	51	109.9%	25.2%	17.0%	44	145.1%	37.8%	9.4%	31	117.7%	16.5%	35.7%
Small CFLs	52	98.8%	1.5%	12.0%	52	98.9%	1.4%	14.7%	-	-	-	-
Other	89	106.2%	15.4%	8.1%	75	112.5%	15.8%	5.7%	38	91.3%	8.7%	6.8%
Business Programs Overall	**619**	**102.3%**	**6.5%**	**100.0%**	**549**	**102.8%**	**4.2%**	**100.0%**	**312**	**105.8%**	**5.3%**	**100.0%**

Figure 4-1 shows the overall program gross savings adjustment factors by energy unit for FY02 through CY09. The CY09 adjustment factors are greater than previous program years for all energy units. The cross-hatching indicates that the difference in adjustment factors between the 18MCP and CY09 is statistically significant at the 95 percent confidence level.

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



4.4 ATTRIBUTION FACTORS

Table 4-2 shows the attribution adjustment factors by reporting measure group. For the kWh energy unit, the attribution adjustment factors at the measure group level are above 50 percent for all but the Other measure group which accounts for 8.1 percent of the overall kWh tracking savings. For the kW energy unit, the attribution adjustment factors are above 50 percent for all but the HVAC measure group, which accounts for 30 percent of the overall kW tracking savings. For the therms energy unit, the attribution adjustment factors are above 50 percent for all but the Boilers and Burners (38.1 percent of overall therm tracking savings) and HVAC (19.1 percent of overall therm tracking savings) measure groups.

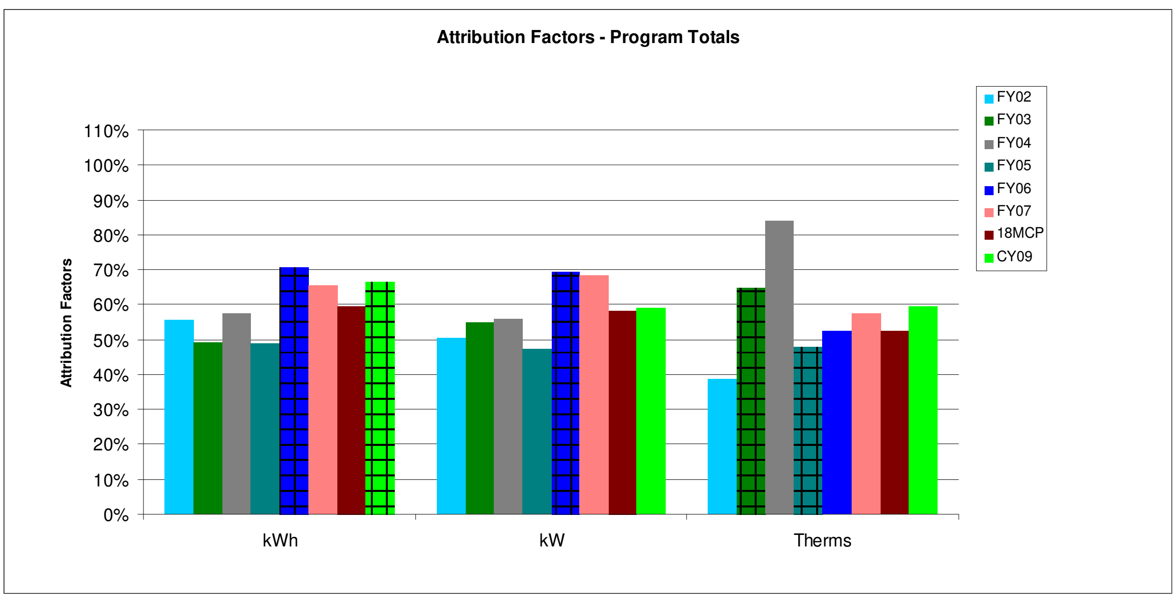
The low attribution for the Boilers and Burners measure group is primarily a function of boiler service buydowns, which make up a significant portion of the therm savings in this group and generally received poor attribution.

Table 4-2. Attribution Factors by Reporting Measure Group Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09[42]

Measure 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
Boilers & Burners	7	89.3%	14.6%	0.5%	-	-	-	-	159	33.3%	13.0%	38.1%
Non-Small CFL Lighting	267	59.6%	8.2%	42.5%	244	60.8%	8.7%	36.5%	-	-	-	-
Refrigeration	44	75.6%	10.2%	5.5%	43	72.4%	12.4%	3.6%	3	77.4%	43.5%	0.3%
HVAC	84	77.1%	27.0%	14.5%	64	37.9%	18.8%	30.0%	72	44.0%	19.5%	19.1%
Expanded Process	50	66.2%	17.8%	17.0%	43	58.3%	20.2%	9.4%	31	89.6%	6.7%	35.7%
Small CFLs	52	90.2%	0.9%	12.0%	52	90.4%	0.9%	14.7%	-	-	-	-
Other	85	48.3%	16.3%	8.1%	71	53.9%	20.4%	5.7%	37	79.1%	14.5%	6.8%
Business Programs Overall	**589**	**66.6%**	**5.7%**	**100.0%**	**518**	**59.1%**	**7.3%**	**100.0%**	**302**	**59.5%**	**8.1%**	**100.0%**

Figure 4-2 shows the overall program attribution by energy unit for FY02 through CY09. The CY09 adjustment factor for kWh is greater than for the 18MCP and is statistically significant, indicated by the cross-hatching. The kW and therms estimates are statistically consistent with the 18MCP.

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



[42] The kW results for the Boilers & Burners group were suppressed for confidentiality reasons. There is only one participant in this category.

4.5 REALIZATION RATES

Table 4-3 shows the CY09 realization rates by reporting measure group. The realization rates combine the effect of the gross savings adjustment factors and the attribution factors. The kWh realization rate is greater than 50 percent for all measure groups, with the Other group the lowest at 51.3 percent representing 8.1 percent of program tracking kWh savings. The kW realization rate is greater than 50 percent for all measure groups except HVAC with a realization rate of 36.3 percent, representing 30.0 percent of program tracking kW savings. The therms realization rate is greater than 50 percent for all measure groups except Boilers and Burners (33.0 percent realization rate; 38.1 percent of tracking savings) and HVAC (46.6 percent realization rate; 19.1 percent of tracking savings).

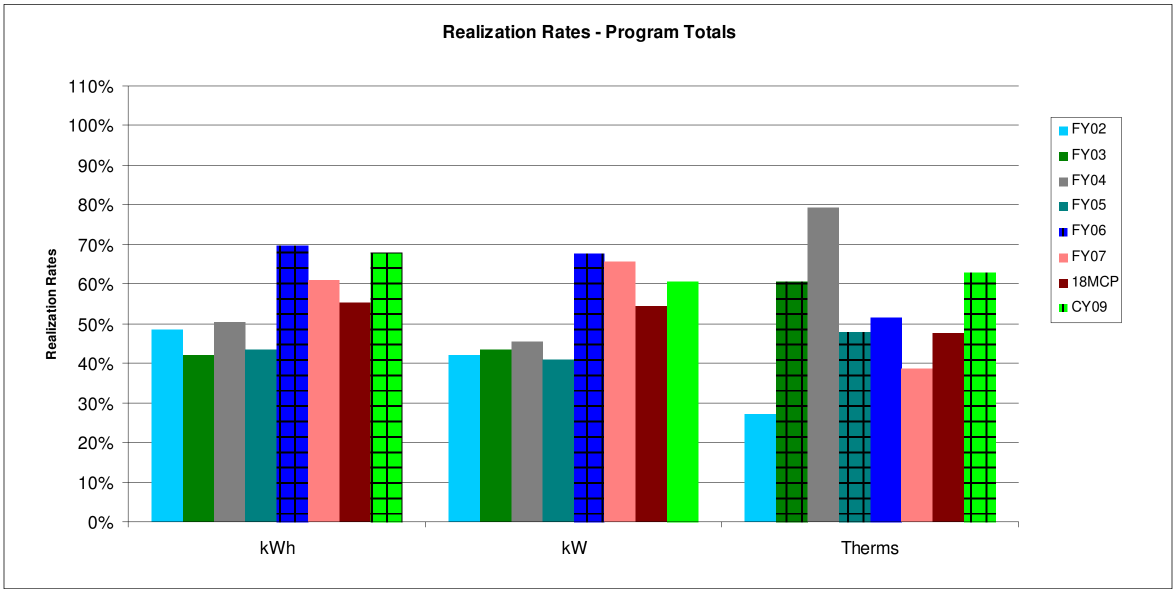
Table 4-3. Realization Rates by Reporting Measure Group[43]
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

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	7	88.6%	14.6%	0.5%	-	-	-	-	159	33.0%	12.9%	38.1%
Non-Small CFL Lighting	267	60.2%	8.3%	42.5%	244	61.7%	8.9%	36.5%	-	-	-	-
Refrigeration	44	72.8%	12.0%	5.5%	43	68.9%	13.7%	3.6%	3	72.8%	45.2%	0.3%
HVAC	84	78.5%	40.8%	14.5%	64	36.3%	18.3%	30.0%	72	46.6%	20.9%	19.1%
Expanded Process	50	72.8%	25.7%	17.0%	43	84.6%	36.7%	9.4%	31	105.5%	16.7%	35.7%
Small CFLs	52	89.1%	1.7%	12.0%	52	89.4%	1.5%	14.7%	-	-	-	-
Other	85	51.3%	18.8%	8.1%	71	60.6%	24.5%	5.7%	37	72.3%	14.9%	6.8%
Business Programs Overall	**589**	**68.1%**	**7.2%**	**100.0%**	**518**	**60.7%**	**7.9%**	**100.0%**	**302**	**62.9%**	**9.1%**	**100.0%**

Figure 4-3 shows the overall program realization rate by energy unit for FY02 through CY09. The CY09 kWh and therms adjustment factors are greater than the 18MCP factors and statistically significant, indicated by the cross-hatching. The kW estimate is statistically consistent with the 18MCP.

[43] The kW results for the Boilers & Burners group were suppressed for confidentiality reasons. There is only one participant in this category.

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



4.6 SERVICE BUYDOWNS

At the request of the PSCW, the evaluation team designed our sample to include enough service buydown measures to allow us to analyze the adjustment factors specifically for this portion of the population. Table 4-4 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 31.7 percent. They make up a smaller portion of kWh and kW savings at 12.8 percent and 25.6 percent respectively. For the kWh and kW energy units, the service buydown adjustment factor is greater than the non-service buydown value; however, the difference is only statistically significant[44] for the kW factors. For therms, the service buydown adjustment factor is slightly lower than the non-service buydown. The therms difference is not statistically significant at the 95 percent confidence interval but it is close (p-value = 0.059).

Table 4-4. Gross Savings Adjustment Factors, Service Buydowns Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	kWh				kW				Therms			
Measure Group	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	30	105.9%	29.4%	12.8%	30	120.2%	12.3%	25.6%	185	99.6%	0.4%	31.7%
Not Service	589	101.8%	6.1%	87.2%	519	98.5%	4.2%	74.4%	127	108.9%	8.1%	68.3%
Business Programs Overall	**619**	**102.3%**	**6.5%**	**100.0%**	**549**	**102.8%**	**4.2%**	**100.0%**	**312**	**105.8%**	**5.3%**	**100.0%**

[44] Statistical significance tested at the 95 percent confidence intervals.

Table 4-5 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; however, the difference is only statistically significant for the kW and therm factors.

Table 4-5. Attribution Adjustment Factors, Service Buydowns
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

Measure 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	29	58.6%	18.3%	12.8%	29	37.0%	18.0%	25.6%	179	34.6%	11.0%	31.7%
Not Service	560	67.7%	5.7%	87.2%	489	65.7%	5.9%	74.4%	123	71.8%	10.3%	68.3%
Business Programs Overall	**589**	**66.6%**	**5.7%**	**100.0%**	**518**	**59.1%**	**7.3%**	**100.0%**	**302**	**59.5%**	**8.1%**	**100.0%**

Table 4-6 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; however, the difference is only statistically significant for the therm realization rate.

Table 4-6. Realization Rate, Service Buydowns
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

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
Service	29	62.1%	26.0%	12.8%	29	44.4%	22.1%	25.6%	179	34.5%	10.9%	31.7%
Not Service	560	68.9%	7.2%	87.2%	489	64.7%	6.5%	74.4%	123	78.2%	12.7%	68.3%
Business Programs Overall	**589**	**68.1%**	**7.2%**	**100.0%**	**518**	**60.7%**	**7.9%**	**100.0%**	**302**	**62.9%**	**9.1%**	**100.0%**

4.7 NEW CONSTRUCTION

At the request of the PSCW, the evaluation team designed our sample to include enough new construction measures to allow us to analyze the adjustment results specifically for this portion of the population. Table 4-7 shows the gross savings adjustment for new construction and non-new construction measures.

The table shows that new construction measures make up a small portion of program therm savings at 1.8 percent. They make up a slightly larger portion of kWh and kW savings at 5.4 percent and 5.8 percent respectively. For kW and therm energy units, the new construction adjustment factor is lower than the non-new construction value; however, the difference is only statistically significant for the therm factor. For kWh, the new construction adjustment factor is slightly higher than the non-new construction value but the difference is not statistically significant.

Table 4-7. Gross Savings Adjustment Factors, New Construction Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

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
New Construction	63	102.8%	4.7%	5.4%	61	93.8%	16.7%	5.8%	15	95.8%	4.7%	1.8%
Not New Construction	556	102.2%	6.9%	94.6%	488	103.3%	4.4%	94.2%	297	106.0%	5.4%	98.2%
Business Programs Overall	**619**	**102.3%**	**6.5%**	**100.0%**	**549**	**102.8%**	**4.2%**	**100.0%**	**312**	**105.8%**	**5.3%**	**100.0%**

Table 4-8 shows the attribution adjustment for new construction and non-new construction measures. For all three energy units, the new construction adjustment factor is less than the non-new construction value; however, the difference is only statistically significant for the therm factor.

Table 4-8. Attribution Adjustment Factors, New Construction Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

Measure 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
New Construction	61	48.5%	17.9%	5.4%	58	46.2%	15.0%	5.8%	13	16.5%	13.5%	1.8%
Not New Construction	528	67.8%	5.9%	94.6%	460	59.8%	7.6%	94.2%	289	60.2%	8.2%	98.2%
Business Programs Overall	**589**	**66.6%**	**5.7%**	**100.0%**	**518**	**59.1%**	**7.3%**	**100.0%**	**302**	**59.5%**	**8.1%**	**100.0%**

Table 4-9 shows the realization rates for new construction and non-new construction measures. For all three energy units, the new construction realization rate is less than the non-new construction value; however, the difference is only statistically significant for the therm realization rate.

Table 4-9. Realization Rate, New Construction Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

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
New Construction	61	49.8%	18.5%	5.4%	58	43.3%	16.1%	5.8%	13	15.9%	13.0%	1.8%
Not New Construction	528	69.3%	7.6%	94.6%	460	61.8%	8.3%	94.2%	289	63.8%	9.3%	98.2%
Business Programs Overall	**589**	**68.1%**	**7.2%**	**100.0%**	**518**	**60.7%**	**7.9%**	**100.0%**	**302**	**62.9%**	**9.1%**	**100.0%**

4.8 ENGINEERING VERIFICATION FINDINGS

This section addresses gross savings adjustments based on engineering reviews (engineering sample) and information obtained in the CATI survey (CATI sample). In past impact evaluations, CATI sample savings were either not adjusted or were adjusted based on information from the engineering reviews. In this evaluation, savings adjustments are made to the CATI sample based on information obtained in the CATI survey. Adjustments to each sample are discussed below.

4.8.1 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. In past evaluations, if the difference in verified and reported savings was less than ten percent, the reported savings was used as the verified savings regardless of the reason for the change. In this evaluation, all discrepancies are reported regardless of their magnitude. That is not to say that the evaluation engineer calculated an alternative savings estimate for all measures; however, when alternative savings were calculated because of changes to the calculation inputs or the calculation method, the evaluation estimate was always taken for the verified gross estimate, even if the change was less than 10 percent different from the reported savings.

Table 4-10, Table 4-11, and Table 4-12 show the adjustment counts and percent savings for kWh, kW, and therm. 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 percent total savings columns in these tables are not the amount adjusted; rather, they are the percent of total reported savings in the engineering review represented by the measures that were adjusted. For example, a percent 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 4-10 shows that, of the 410 measures in the engineering sample, 102 were adjusted for kWh and 308 were not adjusted. Of the 102 that were adjusted, 48 have verified savings greater than reported and 54 lesser than reported. These adjustments were made on measures that represent 44 percent of the kWh savings in the engineering sample. Adjustments of less than 10 percent were the greatest in number, with 23 adjustments representing 15 percent of the total kWh savings. Note that the 13 adjustments that were greater than 100 percent represent only two percent of total savings, indicating that the measures that were adjusted more than 100 percent were small and do not represent a large portion of the total savings. The percent change is large but the associated effect on the adjustment factor is not.

Table 4-10. kWh Adjustment Count and Percent Savings, Engineering Sample

Percent Change (%)	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	1	1	0%	0%	0%
1 to 10	15	8	23	8%	7%	15%
11 to 20	4	9	13	2%	3%	5%
21 to 30	1	3	4	0%	1%	1%
31 to 40	4	14	18	2%	8%	10%
41 to 50	2	6	8	3%	2%	5%
51 to 100	9	12	21	1%	6%	6%
Greater than 100	12	1	13	2%	0%	2%
Verified is non-zero when rpt is zero	1	0	1	0%	0%	0%
Adjusted	48	54	102	18%	26%	44%
Not adjusted			308			56%
Total			**410**			**100%**

Table 4-11 shows that, of the 410 measures in the engineering sample, 91 were adjusted for kW and 319 were not adjusted. Of the 91 adjusted, 55 had verified savings greater than reported and 36 less than reported. The adjusted measures represent 54 percent of the total kW savings in the sample. As with the kWh adjustments, the greatest number of adjustments and represented savings are those with less than 10 percent change in the reported value. Again, the measures that received the largest adjustments were those with low associated savings. The 11 adjustments greater than 100 percent represent only one percent of total kW savings.

Table 4-11. kW Adjustment Count and Percent Savings, Engineering Sample

Percent Change (%)	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	1	1	0%	0%	0%
1 to 10	15	23	38	9%	16%	25%
11 to 20	6	2	8	8%	1%	9%
21 to 30	5	2	7	3%	0%	3%
31 to 40	5	2	7	5%	1%	7%
41 to 50	3	2	5	0%	1%	1%
51 to 100	7	4	11	1%	6%	8%
Greater than 100	11	0	11	1%	0%	1%
Verified is non-zero when rpt is zero	3	0	3	0%	0%	0%
Adjusted	55	36	91	29%	25%	54%
Not adjusted			319			46%
Total			**410**			**100%**

Table 4-12 shows that, for therms, 47 measures were adjusted and 363 were not adjusted. Of the 47 measures adjusted, 20 had verified savings greater than reported and 27 lesser than reported. The adjusted measures represent 46 percent of the tracked therm savings in the engineering sample. Again, more adjustments were made with less than 10 percent change than any other bin and these represented the greatest percentage of total savings as well.

Table 4-12. Therm Adjustment Count and Percent Savings, Engineering Sample

Percent Change (%)	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	7	6	13	15%	7%	21%
11 to 20	3	7	10	1%	7%	7%
21 to 30	2	2	4	0%	1%	1%
31 to 40	2	5	7	3%	1%	4%
41 to 50	1	1	2	4%	1%	5%
51 to 100	3	6	9	1%	3%	4%
Greater than 100	2	0	2	4%	0%	4%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	20	27	47	28%	19%	46%
Not adjusted			363			54%
Total			**410**			**100%**

KEMA categorized each adjustment according to its primary cause. The categories used and how they are populated are provided in Table 4-13. 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 4-13. Primary Reasons for Adjustment

Primary Reason for Adjustment	Explanation of Population
Rounding adjustment	No difference in calculation method or parameters, but a slight difference in resulting savings.
Customer reported different parameter(s)	Inputs to calculation changed based on customer interview.
Deeming adjustment	Measures were misclassified within deemed measures or as not deemed.
Used site-specific rather than prescriptive	More site-specific information gathered for those measures that use a standard prescriptive method and parameters.
Data entry error	Documentation provides a reasonable savings value, but an unrelated value entered in database.
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.
Other savings in documentation	Reasonable savings exist in documentation, but other savings from documentation entered.
Calculation method unclear	Could not determine program's calculation method.
Not installed	Measure was not installed.

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 also 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 4-14, Table 4-15, and Table 4-16 show the number of engineering sample measures for which KEMA adjusted the savings estimate for each energy unit, along with the percent savings that the changes represent. For kWh, kW, and therms, the primary cause for the largest number of adjustments was “customer provided different parameter(s).” As shown in Table 4-14 and Table 4-16, this category also accounted for the greatest total savings for kWh and therms, representing 22 percent of kWh savings and 32 percent of therm savings. The greatest savings for kW are in the category “Used site specific rather than prescriptive.” This is largely due to several chiller measures for which site-specific information was obtained and used in the calculation, usually resulting in an increase in kW savings. Table 4-15 shows that measures in this category account for 25 percent of kW savings in the sample.

Table 4-14. kWh Adjustment Counts and Percent Savings by Reason, Engineering Sample

Primary Reason for Adjustment	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	23	28	51	10%	11%	22%
Used site-specific rather than prescriptive	5	13	18	1%	8%	9%
Different calculation method or analysis	7	2	9	1%	1%	2%
Rounding adjustment	5	0	5	3%	0%	3%
Deeming adjustment	6	0	6	2%	0%	2%
Different baseline or installation	0	6	6	0%	3%	3%
Calculation method unclear	0	3	3	0%	1%	1%
Data entry error	2	1	3	0%	2%	2%
Not installed	0	1	1	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	48	54	102	18%	26%	44%
Not adjusted			308			56%
Total			**410**			**100%**

Table 4-15. kW Adjustment Counts and Percent Savings by Reason, Engineering Sample

Primary Reason for Adjustment	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	18	11	29	6%	5%	11%
Used site-specific rather than prescriptive	15	3	18	19%	6%	25%
Different calculation method or analysis	6	2	8	1%	0%	1%
Rounding adjustment	5	13	18	1%	8%	8%
Deeming adjustment	6	0	6	1%	0%	1%
Different baseline or installation	4	3	7	1%	2%	4%
Calculation method unclear	0	3	3	0%	4%	4%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	1	1	0%	0%	0%
Other savings in documentation	1	0	1	0%	0%	0%
Adjusted	55	36	91	29%	25%	54%
Not adjusted			319			46%
Total			**410**			**100%**

Table 4-16. Therm Adjustment Counts and Percent Savings by Reason, Engineering Sample

Primary Reason for Adjustment	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	12	17	29	20%	13%	32%
Used site-specific rather than prescriptive	2	0	2	0%	0%	0%
Different calculation method or analysis	2	5	7	1%	4%	5%
Rounding adjustment	1	1	2	6%	0%	7%
Deeming adjustment	1	2	3	0%	0%	0%
Different baseline or installation	1	2	3	1%	1%	2%
Calculation method unclear	1	0	1	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	20	27	47	28%	19%	46%
Not adjusted			363			54%
Total			**410**			**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 significantly more adjustments for “customer reported different parameter(s)” for kWh than for kW and therms, even though it is the most cited reason for all three energy units. Also note that there are more rounding adjustments for kW than for kWh or therms.

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

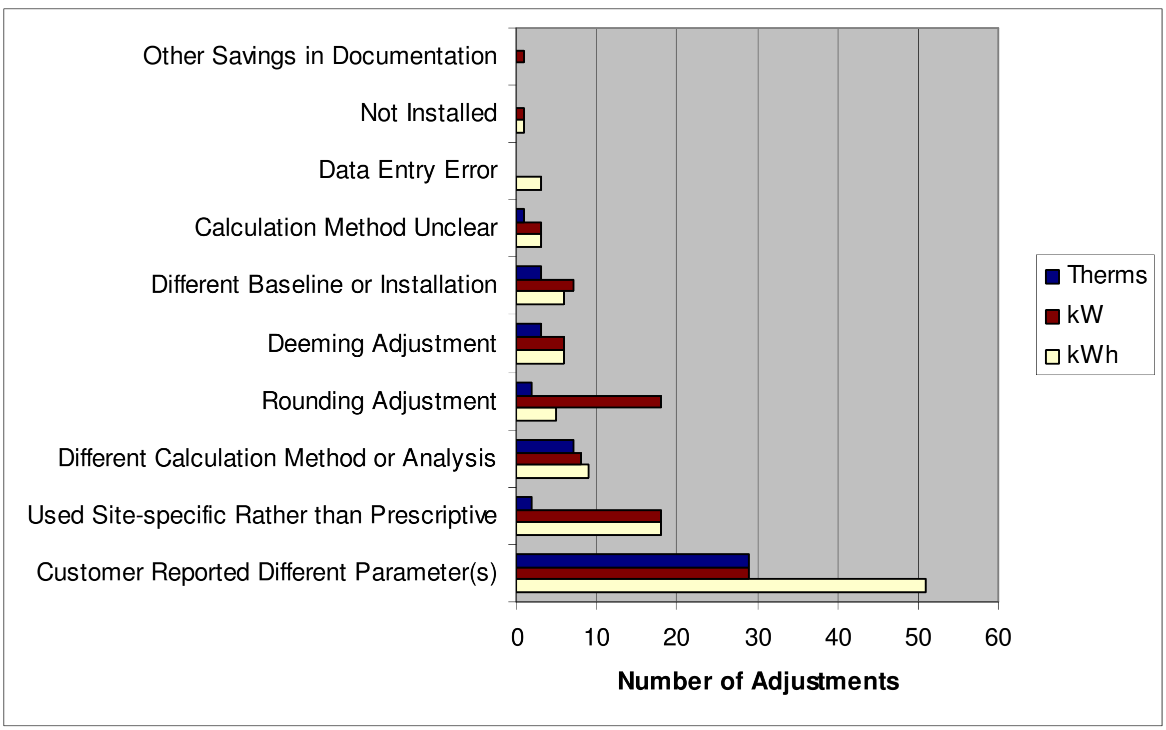
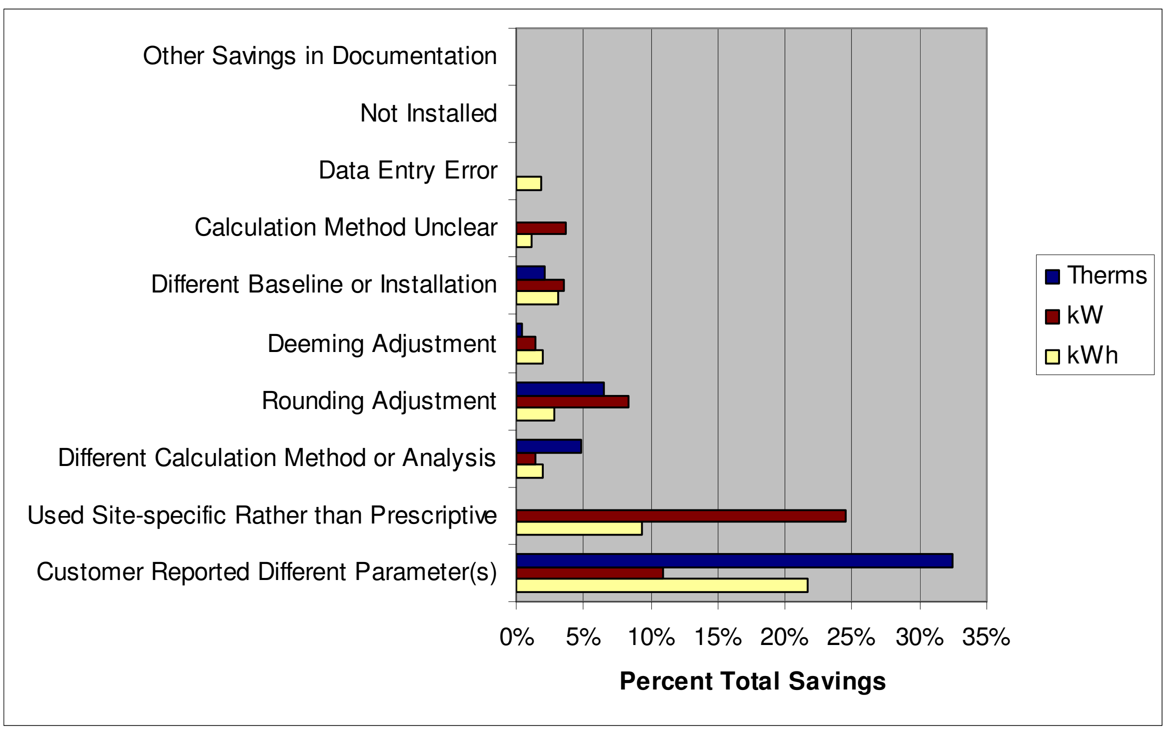


Figure 4-5 shows that a greater percentage of total therm savings received an adjustment due to the customer providing different parameters than did kW and kWh. It also shows that a greater percentage of kWh received an adjustment than did kW for the same reason. This is due in part to the fact that one of the parameters that a customer can provide is annual operating hours, which affects kWh but not kW.

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 approximately the same for therms and kW, but the percent 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 the same number of kWh and kW savings values were adjusted for using site-specific rather than prescriptive values, but that the percent savings represented by the kW measures is considerably greater than that for kWh. This is likely due to the chiller measures referred to above, which account for a greater percentage of kW savings than kWh savings. This is understandable since many chillers do not operate year-round, but they do often run at or near full load during the program's peak savings period.

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



4.8.2 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, 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. Also, for high efficiency motor measures there is an additional multiplier, annual operating hours. The CATI survey included questions to verify these parameters.

Table 4-17, Table 4-18, and Table 4-19 show the count and percent 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 percent of tracking savings in the CATI sample represented by measures that were adjusted. The number of adjustments are fewer and the savings they represent is 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 4-17 shows that for kWh in the CATI sample, 40 measures were adjusted representing five percent of total kWh savings in the sample. Eight of these adjustments were because the measure was not installed, and 22 were less than 10 percent. There were six measures that were adjusted more than 100 percent, but these did not represent a significant percentage of kWh CATI savings. Five of these were motor measures for which greater operating hours were reported by the customer. The other was a lighting measure for which a greater quantity was reported.

Table 4-17. kWh Adjustments and Percent Savings, CATI Sample

Percent Change (%)	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	8	8	0%	2%	2%
1 to 10	19	3	22	3%	0%	3%
11 to 20	2	1	3	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	1	1	0%	0%	0%
51 to 100	0	0	0	0%	0%	0%
Greater than 100	6	0	6	0%	0%	0%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	27	13	40	3%	2%	5%
Not adjusted			441			95%
Total			**481**			**100%**

Table 4-18 shows that for kW savings, 132 measures were adjusted and 349 were not with adjustments representing 27 percent of tracked kW savings in the sample. Of the 132 adjusted, 121 were adjusted less than 10 percent from the reported savings. As discussed below, most of these adjustments were due to rounding differences.

Table 4-18. kW Savings Adjustments and Percent Savings, CATI Sample

Percent Change (%)	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	8	8	0%	2%	2%
1 to 10	45	76	121	8%	17%	25%
11 to 20	1	1	2	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	1	0	1	0%	0%	0%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	47	85	132	8%	19%	27%
Not adjusted			349			73%
Total			**481**			**100%**

Table 4-19 shows that only four measures were adjusted for therms in the CATI sample, representing two percent of total reported therm savings. Two measures were not installed and two were adjusted less than ten percent.

Table 4-19. CATI Sample Discrepancy Count and Percent Savings, Therm Savings

Percent Change (%)	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	2	2	0%	1%	1%
1 to 10	2	0	2	1%	0%	1%
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%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	2	2	4	1%	1%	2%
Not adjusted			477			98%
Total			**481**			**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. The primary reasons are that the customer provided a different quantity or multiplier, the customer provided different motor operating hours, the measure was not installed, and rounding adjustments.

Table 4-20, Table 4-21, and Table 4-22 show the primary reasons for adjustments to savings in the CATI sample for kWh, kW, and therms. The most common adjustments are rounding differences, and most of these adjustments are to kW. These adjustments are largely but not exclusively due to kW rounding errors for lighting measures, especially linear fluorescents. Eight of the 40 adjustments to kWh are for motor operating hours, but these do not represent a significant percentage of total reported savings.

Table 4-20. kWh Adjustments and Percent Savings by Reason, CATI Sample

Primary Reason for Adjustment	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Rounding adjustment	16	3	19	2%	0%	3%
Customer reported different quantity/multiplier	4	1	5	1%	0%	1%
Motor operating hours	7	1	8	0%	0%	0%
Not installed	0	8	8	0%	2%	2%
Adjusted	27	13	40	3%	2%	5%
Not adjusted			441			95%
Total			**481**			**100%**

Table 4-21. kW Adjustments and Percent Savings by Reason, CATI Sample

Primary Reason for Adjustment	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Rounding adjustment	43	76	119	7%	17%	24%
Customer reported different quantity/multiplier	4	1	5	0%	0%	1%
Motor operating hours	0	0	0	0%	0%	0%
Not installed	0	8	8	0%	2%	2%
Adjusted	47	85	132	8%	19%	27%
Not Adjusted			349			73%
Total			**481**			**100%**

Table 4-22. Therm Adjustments and Percent Savings by Reason, CATI Sample

Primary Reason for Adjustment	Count			Percent Total Savings		
	V > R	V < R	Total	V > R	V < R	Total
Rounding adjustment	1	0	1	0%	0%	0%
Customer reported different quantity/multiplier	1	0	1	1%	0%	1%
Motor operating hours	0	0	0	0%	0%	0%
Not installed	0	2	2	0%	1%	1%
Adjusted	2	2	4	1%	1%	2%
Not adjusted			477			98%
Total			**481**			**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 kW savings values adjusted for rounding differences, as compared to all other reasons for all energy units. Figure 4-7 looks very much like Figure 4-6, indicating that the percent overall savings of adjusted measures tracks closely with the number of measures adjusted. Comparing the two figures for “customer reported different quantity/multiplier” does indicate that the measures with therm savings adjusted for this reason are a greater percentage of overall therm savings than those for kWh and kW savings are of their total savings values. This is consistent with the measures adjusted for the same reason in the engineering sample.

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

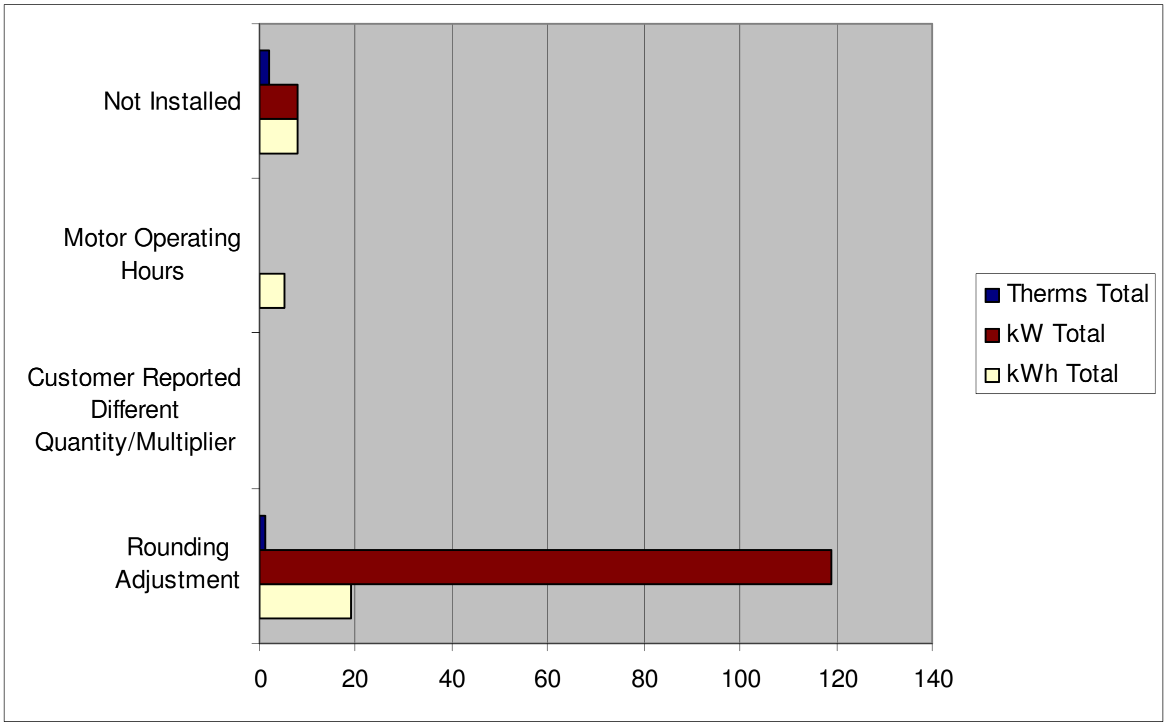
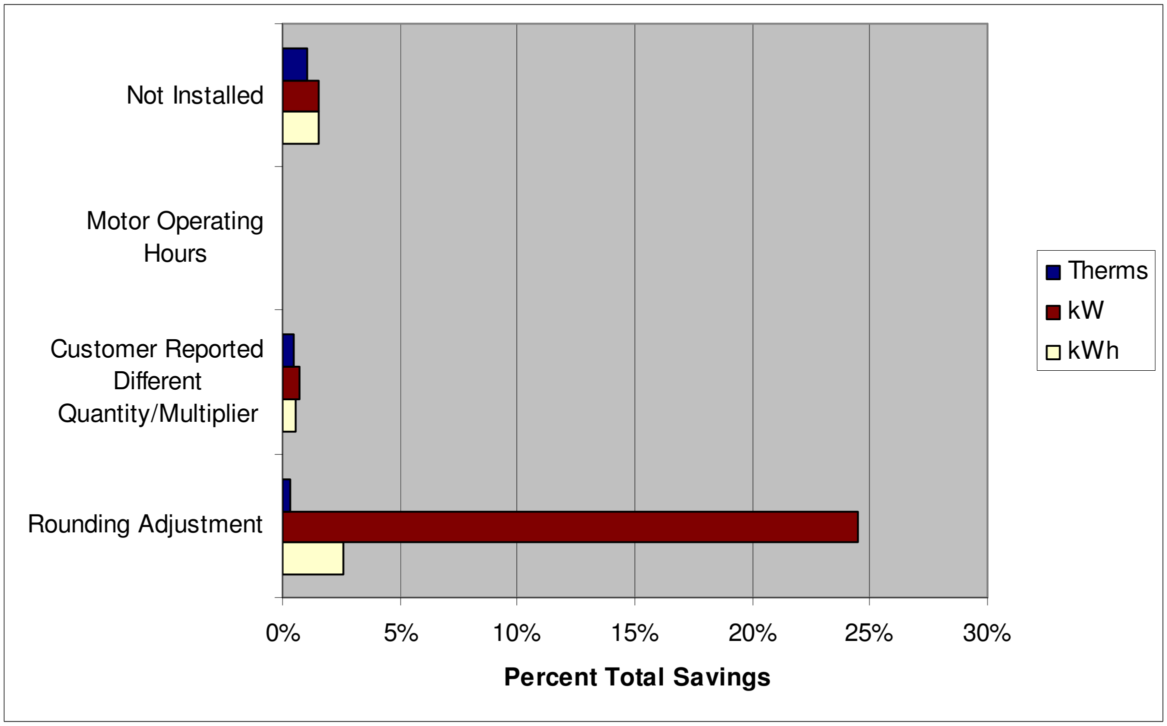


Figure 4-7. Percent Total Savings by Reason, CATI Sample



4.8.3 Comparison with previous evaluations

Table 4-23 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.[45] In CY09, the percentage of adjusted measures is remarkably consistent across energy units. Verified savings are equal to reported savings for 68 percent of kWh and kW measures and for 67 percent of therm measures with applicable savings for those energy units. These values are greater than those for any of the recent evaluations, meaning that a lesser percentage of measures were adjusted in this evaluation than in the recent past.

[45] Discrepancies shown in Table 4-23 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 4-23. Comparison to Previous Evaluations

Adjustments by Energy Unit		FY07 #	FY07 %	18MCP Rounds 1 and 2 #	18MCP Rounds 1 and 2 %	CY09 #	CY09 %
kWh	Not installed	0	0%	4	1%	1	0%
	Verified equal reported	25	51%	319	46%	213	68%
	Verified not equal reported	24	49%	368	53%	102	32%
	Engineering sample		49		691		315
kW	Not installed	0	0%	3	0%	1	0%
	Verified equal reported	25	60%	325	51%	190	68%
	Verified not equal reported	17	40%	368	58%	91	32%
	Engineering sample		42		635		281
Therm	Not installed	0	0%	1	1%	0	0%
	Verified equal reported	9	23%	74	47%	94	67%
	Verified not equal reported	31	78%	81	52%	47	33%
	Engineering sample		40		156		141
Total engineering sample			**50**		**801**		**410**

There were three changes to the verified gross savings analysis for this round that would affect the comparison across evaluation years.

- This evaluation marks the first round that data has been collected from the CATI survey to inform the gross savings adjustment for measures other than CFLs. In this round, 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 previous evaluations, discrepancies were not reported unless they were an adjustment of 10 percent or more. In this evaluation all discrepancies were reported, regardless of the degree of change from the tracking estimate.
- This is the second 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 number of analysis changes between the 18MCP and CY09 limits the ability to compare gross savings adjustment results across years.

4.9 EVALUATED TRACKED ENERGY IMPACTS

For CY09 (October 1, 2008, through September 30, 2009), Table 4-24 gives tracking and verified gross savings and net savings by reporting measure group and for Focus Business Programs overall.

The estimates of the adjustment factors by reporting measure group presented above are used to calculate verified gross savings and net savings for this time 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.*[46] The effects of the *Impact Evaluation of the Education and Training Program*[47] are represented below in the Untracked Attributable row and are included in the total net savings for each energy unit.

Table 4-25 summarizes tracking and verified gross savings and net savings for Business Programs overall for the program through the first three quarters of Calendar Year 2009 (program start through September 30, 2009).

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

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

Table 4-24. All Business Programs: Tracked Energy Impacts CY09 (October 1, 2008–September 30, 2009)[a48]

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	52,511,381	16,318	16,138	14,583	-	-	-
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
Business Programs Overall	**491,833,648**	**504,149,296**	**349,627,610**	**110,833**	**115,108**	**70,764**	**23,288,088**	**24,800,973**	**20,002,027**

[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.

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[48] Additional savings resulting from the Alliant Shared Savings program will be reported in the Semiannual Report consistent with the memorandum titled *Joint Focus on Energy-Shared Savings Attribution Analysis*, prepared for Oscar Bloch, PSCW, and dated September 18, 2009.

Table 4-25. All Business Programs: Tracked Energy Impacts Program to Date (Program start–September 30, 2009)

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)	491,833,648	504,149,296	349,627,610	110,833	115,108	70,764	23,288,088	24,800,973	20,002,027
Total Focus (Program start to September 30, 2009)	**1,522,945,702**	**1,437,029,019**	**906,764,523**	**318,508**	**299,883**	**181,061**	**88,023,524**	**83,778,095**	**58,746,826**

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.

Several key observations emerge from the findings.

- In general, the program has maintained or improved on performance from the 18MCP. The CY09 kW realization rate is consistent with the 18MCP estimate. The kWh realization rate increased from 55.4 percent in the 18MCP to 68.1 percent in CY09. The therm realization rate increased from 47.6 percent in 18MCP to 62.9 percent in CY09. Both changes are statistically significant at the 95 percent confidence interval.
- The program has done an effective job of estimating gross savings resulting from energy efficiency measures. All three CY09 gross savings adjustment factors are greater in CY09 than they were in the 18MCP and all three changes are statistically significant at the 95 percent confidence interval. For kWh, the gross savings adjustment factor increased from 93.0 percent in the 18MCP to 102.3 percent in CY09. For kW, the gross savings adjustment factor increased from 93.3 percent in the 18MCP to 102.8 percent in CY09. For therms, the gross savings adjustment factor increased from 90.8 percent in the 18MCP to 105.8 percent in CY09.
- The attribution factor estimates have maintained or improved over the 18MCP. The kWh attribution factor has increased from 59.5 percent in 18MCP to 66.6 percent in CY09. The kW and therm attribution factors are statistically consistent with the 18MCP results.
- Service buydown measures have a lower attribution than non-service buydown measures for the kW and therms energy units. The kW attribution factor for service buydown measures is 37.0 percent and for non-service buydown measures it is 65.7 percent. The therms attribution factor for service buydown measures is 34.6 percent and for non-service buydown measures it is 71.8 percent. The differences for kW and therms are statistically significant at the 95 percent confidence interval. The kWh attribution factor for service buydowns is statistically consistent with non-service buydown measures.
- New construction measures have a lower attribution than non-new construction measures for the therms energy unit. The therm attribution factor for new construction measures is 16.5 percent and for non-new construction measures it is 60.2 percent. This result is statistically significant at the 95 percent confidence interval. The kWh and kW new construction attribution factors are statistically consistent with the non-new construction factors.

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.
- Review chiller service buydown gross savings estimates and make changes as appropriate. Based on recent meetings between the evaluation team and program

staff, this analysis is already planned by the program. The evaluation team supports the review.

- Review service buydown measures and offerings and determine whether a change in program approach is warranted.
- Review new construction measures and offerings and determine whether a change in program approach is warranted.

APPENDIX A: OTHER ADJUSTMENT FACTORS

This appendix presents the CY09 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 CY09 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.[49] 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, 2008–September 30, 2009) 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 measure installed within the analysis period (October 1, 2008–September 30, 2009) 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

[49] 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 2010.

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 the 18MCP and CY09

	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	7	100%	<0.1%	<0.1%	100.0%	100.0%	1	100%	<0.1%	<0.1%	<0.1%	<0.1%	166	100%	0.4%	0.3%	99.2%	99.9%
Non-Small CFL Lighting	287	99%	0.7%	0.7%	98.6%	100.1%	263	99%	0.8%	0.8%	98.5%	100.1%	-	-	-	-	-	-
Refrigeration	47	100%	<0.1%	<0.1%	100.0%	100.0%	46	100%	<0.1%	<0.1%	100.0%	100.0%	3	100%	<0.1%	<0.1%	100.0%	100.0%
HVAC	92	100%	<0.1%	<0.1%	99.9%	100.0%	72	100%	<0.1%	<0.1%	99.9%	100.0%	76	100%	<0.1%	<0.1%	100.0%	100.0%
Expanded Process	51	100%	<0.1%	<0.1%	100.0%	100.0%	44	100%	<0.1%	<0.1%	100.0%	100.0%	31	100%	<0.1%	<0.1%	100.0%	100.0%
Small CFLs	54	99%	1.5%	1.5%	97.1%	100.1%	54	99%	1.4%	1.3%	97.4%	100.1%	-	-	-	-	-	-
Other	90	100%	<0.1%	<0.1%	99.9%	100.0%	75	100%	0.2%	0.2%	99.7%	100.1%	38	100%	<0.1%	<0.1%	100.0%	100.0%
Business Programs Overall	**628**	**100%**	**0.4%**	**0.4%**	**99.2%**	**99.9%**	**555**	**100%**	**0.4%**	**0.4%**	**99.2%**	**99.9%**	**314**	**100%**	**0.1%**	**0.1%**	**99.7%**	**100.0%**

Table A-2. Engineering Verification Factors by Reporting Measure Group
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	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	7	99%	2.3%	2.3%	96.9%	101.4%	1	100%	<0.1%	<0.1%	<0.1%	<0.1%	164	99%	0.8%	0.8%	98.7%	100.2%
Non-Small CFL Lighting	283	102%	1.4%	1.4%	100.2%	103.0%	259	102%	1.6%	1.7%	100.5%	103.9%	-	-	-	-	-	-
Refrigeration	47	96%	9.3%	9.0%	87.3%	105.3%	46	95%	10.1%	9.6%	85.5%	104.8%	3	94%	26.4%	24.8%	69.3%	118.9%
HVAC	90	102%	38.5%	39.2%	62.5%	141.0%	71	96%	10.4%	9.9%	85.8%	105.6%	76	106%	7.1%	7.5%	98.4%	113.4%
Expanded Process	51	110%	22.9%	25.2%	84.7%	135.1%	45	145%	26.0%	37.8%	107.3%	182.9%	31	118%	14.0%	16.5%	101.3%	134.2%
Small CFLs	52	100%	0.3%	0.3%	99.9%	100.5%	52	100%	0.2%	0.2%	99.9%	100.3%	-	-	-	-	-	-
Other	89	106%	14.5%	15.4%	90.8%	121.7%	75	113%	14.0%	15.8%	96.8%	128.4%	38	91%	9.5%	8.7%	82.6%	100.0%
Business Programs Overall	**619**	**103%**	**6.3%**	**6.5%**	**96.3%**	**109.2%**	**549**	**103%**	**4.1%**	**4.2%**	**99.0%**	**107.5%**	**312**	**106%**	**5.0%**	**5.3%**	**100.6%**	**111.2%**

Table A-3. Gross Savings Adjustment Factors by Reporting Measure Group Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

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	7	99%	2.3%	2.3%	96.9%	101.4%	1	100%	<0.1%	<0.1%	<0.1%	<0.1%	164	99%	0.8%	0.8%	98.2%	99.9%
Non-Small CFL Lighting	283	101%	1.6%	1.6%	99.4%	102.6%	259	102%	1.8%	1.9%	99.7%	103.4%	-	-	-	-	-	-
Refrigeration	47	96%	9.3%	9.0%	87.3%	105.3%	46	95%	10.1%	9.6%	85.5%	104.8%	3	94%	26.4%	24.8%	69.3%	118.9%
HVAC	90	102%	38.5%	39.2%	62.5%	141.0%	71	96%	10.4%	9.9%	85.7%	105.6%	76	106%	7.1%	7.5%	98.4%	113.4%
Expanded Process	51	110%	22.9%	25.2%	84.7%	135.1%	44	145%	26.1%	37.8%	107.3%	182.9%	31	118%	14.0%	16.5%	101.3%	134.2%
Small CFLs	52	99%	1.6%	1.5%	97.3%	100.4%	52	99%	1.4%	1.4%	97.5%	100.3%	-	-	-	-	-	-
Other	89	106%	14.5%	15.4%	90.8%	121.6%	75	113%	14.0%	15.8%	96.7%	128.3%	38	91%	9.5%	8.7%	82.6%	100.0%
Business Programs Overall	**619**	**102%**	**6.3%**	**6.5%**	**95.8%**	**108.7%**	**549**	**103%**	**4.1%**	**4.2%**	**98.5%**	**107.0%**	**312**	**106%**	**5.0%**	**5.3%**	**100.5%**	**111.1%**

Table A-4. Attribution Adjustment Factors by Reporting Measure Group Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

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	7	89%	16.3%	14.6%	74.7%	103.9%	-	-	-	-	-	-	159	33%	39.1%	13.0%	20.3%	46.4%
Non-Small CFL Lighting	267	60%	13.7%	8.2%	51.5%	67.8%	244	61%	14.3%	8.7%	52.1%	69.5%	-	-	-	-	-	-
Refrigeration	44	76%	13.5%	10.2%	65.4%	85.8%	43	72%	17.1%	12.4%	60.0%	84.7%	3	77%	56.2%	43.5%	33.9%	120.9%
HVAC	84	77%	35.0%	27.0%	50.1%	104.1%	64	38%	49.5%	18.8%	19.1%	56.7%	72	44%	44.3%	19.5%	24.5%	63.4%
Expanded Process	50	66%	26.8%	17.8%	48.5%	84.0%	43	58%	34.7%	20.2%	38.1%	78.5%	31	90%	7.5%	6.7%	82.9%	96.3%
Small CFLs	52	90%	1.0%	0.9%	89.2%	91.1%	52	90%	1.0%	0.9%	89.5%	91.3%	-	-	-	-	-	-
Other	85	48%	33.7%	16.3%	32.0%	64.5%	71	54%	37.9%	20.4%	33.5%	74.2%	37	79%	18.3%	14.5%	64.6%	93.6%
Business Programs Overall	**589**	**67%**	**8.6%**	**5.7%**	**60.9%**	**72.3%**	**518**	**59%**	**12.4%**	**7.3%**	**51.8%**	**66.4%**	**302**	**59%**	**13.6%**	**8.1%**	**51.4%**	**67.6%**

Table A-5. Realization Rates by Reporting Measure Group Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

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	7	89%	16.5%	14.6%	73.9%	103.2%	-	-	-	-	-	-	159	33%	39.1%	12.9%	20.1%	45.9%
Non-Small CFL Lighting	267	60%	13.8%	8.3%	51.9%	68.5%	244	62%	14.4%	8.9%	52.9%	70.6%	-	-	-	-	-	-
Refrigeration	44	73%	16.4%	12.0%	60.8%	84.8%	43	69%	19.8%	13.7%	55.2%	82.6%	3	73%	62.0%	45.2%	27.6%	118.0%
HVAC	84	78%	52.1%	40.8%	37.6%	119.3%	64	36%	50.6%	18.3%	17.9%	54.6%	72	47%	44.9%	20.9%	25.7%	67.4%
Expanded Process	50	73%	35.3%	25.7%	47.1%	98.5%	43	85%	43.4%	36.7%	47.9%	121.3%	31	105%	15.9%	16.7%	88.7%	122.2%
Small CFLs	52	89%	1.9%	1.7%	87.5%	90.8%	52	89%	1.7%	1.5%	87.8%	90.9%	-	-	-	-	-	-
Other	85	51%	36.7%	18.8%	32.4%	70.1%	71	61%	40.4%	24.5%	36.1%	85.1%	37	72%	20.6%	14.9%	57.3%	87.2%
Business Programs Overall	**589**	**68%**	**10.6%**	**7.2%**	**60.8%**	**75.3%**	**518**	**61%**	**13.1%**	**7.9%**	**52.8%**	**68.6%**	**302**	**63%**	**14.5%**	**9.1%**	**53.8%**	**72.0%**

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 the 18MCP and CY09

	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	7	100%	<0.1%	<0.1%	100.0%	100.0%	1	100%	<0.1%	<0.1%	<0.1%	<0.1%	166	100%	0.4%	0.3%	99.2%	99.9%
Lighting	287	99%	0.7%	0.8%	98.6%	100.1%	263	99%	0.8%	0.8%	98.5%	100.1%	-	-	-	-	-	-
Refrigeration	47	100%	<0.1%	<0.1%	100.0%	100.0%	46	100%	<0.1%	<0.1%	100.0%	100.0%	3	100%	<0.1%	<0.1%	100.0%	100.0%
HVAC	92	100%	<0.1%	<0.1%	99.9%	100.0%	72	100%	<0.1%	<0.1%	99.9%	100.0%	76	100%	<0.1%	<0.1%	100.0%	100.0%
Process	24	100%	<0.1%	<0.1%	100.0%	100.0%	23	100%	<0.1%	<0.1%	100.0%	100.0%	25	100%	<0.1%	<0.1%	100.0%	100.0%
Compressed Air, Vacuum Pumps	17	100%	<0.1%	<0.1%	100.0%	100.0%	17	100%	<0.1%	<0.1%	100.0%	100.0%	2	100%	<0.1%	<0.1%	100.0%	100.0%
Agriculture	9	100%	<0.1%	<0.1%	100.0%	100.0%	7	100%	<0.1%	<0.1%	100.0%	100.0%	7	100%	<0.1%	<0.1%	100.0%	100.0%
Waste Water Treatment	9	100%	<0.1%	<0.1%	100.0%	100.0%	4	100%	<0.1%	<0.1%	100.0%	100.0%	-	-	-	-	-	-
Industrial Ovens and Furnaces	1	100%	<0.1%	<0.1%	<0.1%	<0.1%	-	-	-	-	-	-	4	100%	<0.1%	<0.1%	100.0%	100.0%
New Construction	9	100%	<0.1%	<0.1%	100.0%	100.0%	9	100%	<0.1%	<0.1%	100.0%	100.0%	7	100%	<0.1%	<0.1%	100.0%	100.0%
Motors & Drives	45	99%	1.2%	1.7%	98.2%	100.5%	42	99%	1.7%	1.7%	97.3%	100.7%	-	-	-	-	-	-
CFL	54	99%	1.5%	1.3%	97.1%	100.1%	54	99%	1.4%	1.3%	97.4%	100.1%	-	-	-	-	-	-
Other	27	100%	<0.1%	<0.1%	100.0%	100.0%	17	100%	<0.1%	<0.1%	100.0%	100.0%	24	100%	<0.1%	<0.1%	100.0%	100.0%
Business Programs Overall	**628**	**100%**	**0.4%**	**0.4%**	**99.2%**	**99.9%**	**555**	**100%**	**0.4%**	**0.4%**	**99.2%**	**99.9%**	**314**	**100%**	**0.1%**	**0.1%**	**99.7%**	**100.0%**

Table A-7. Engineering Verification Factors by Sampling Measure Group
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	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	7	99%	2.3%	2.3%	96.9%	101.4%	1	100%	<0.1%	<0.1%	<0.1%	<0.1%	164	99%	0.8%	0.8%	98.7%	100.2%
Lighting	283	102%	1.4%	1.4%	100.2%	103.0%	259	102%	1.6%	1.7%	100.5%	103.9%	-	-	-	-	-	-
Refrigeration	47	96%	9.3%	9.0%	87.3%	105.3%	46	95%	10.1%	9.6%	85.5%	104.8%	3	94%	26.4%	24.8%	69.3%	118.9%
HVAC	90	102%	38.5%	39.2%	62.5%	141.0%	71	96%	10.4%	9.9%	85.8%	105.6%	76	106%	7.1%	7.5%	98.4%	113.4%
Process	24	82%	31.2%	25.4%	56.1%	107.0%	23	157%	50.9%	79.7%	77.0%	236.4%	25	122%	13.6%	16.5%	105.5%	138.6%
Compressed Air, Vacuum Pumps	17	133%	32.8%	43.5%	89.1%	176.2%	17	139%	30.8%	42.8%	96.3%	181.9%	2	76%	216.0%	164.0%	<0.1%	239.9%
Agriculture	9	120%	32.6%	39.2%	80.9%	159.3%	7	124%	25.5%	31.6%	92.3%	155.6%	7	105%	4.2%	4.4%	100.4%	109.2%
Waste Water Treatment	9	103%	21.7%	22.5%	81.0%	125.9%	4	108%	29.3%	31.7%	76.4%	139.7%	-	-	-	-	-	-
Industrial Ovens and Furnaces	1	31%	<0.1%	<0.1%	<0.1%	<0.1%	1	0%	<0.1%	<0.1%	<0.1%	<0.1%	4	64%	161.8%	104.3%	<0.1%	168.8%
New Construction	9	100%	0.1%	0.1%	100.0%	100.3%	9	100%	<0.1%	<0.1%	100.0%	100.1%	7	100%	<0.1%	<0.1%	100.0%	100.0%
Motors & Drives	44	94%	9.5%	9.0%	85.3%	103.2%	41	77%	16.4%	12.6%	64.4%	89.7%	-	-	-	-	-	-
CFL	52	100%	0.3%	0.3%	99.9%	100.5%	52	100%	0.2%	0.2%	99.9%	100.3%	-	-	-	-	-	-
Other	27	99%	4.2%	4.2%	94.8%	103.2%	18	128%	45.8%	58.7%	69.4%	186.7%	24	88%	13.5%	11.8%	75.9%	99.6%
Business Programs Overall	**619**	**103%**	**6.3%**	**6.5%**	**96.3%**	**109.2%**	**549**	**103%**	**4.1%**	**4.2%**	**99.0%**	**107.5%**	**312**	**106%**	**5.0%**	**5.3%**	**100.6%**	**111.2%**

Table A-8. Gross Savings Adjustment Factors by Sampling Measure Group Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	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	7	99%	2.3%	2.3%	96.9%	101.4%	1	100%	<0.1%	<0.1%	<0.1%	<0.1%	164	99%	0.8%	0.8%	98.2%	99.9%
Lighting	283	101%	1.6%	1.6%	99.4%	102.6%	259	102%	1.8%	1.9%	99.7%	103.4%	-	-	-	-	-	-
Refrigeration	47	96%	9.3%	9.0%	87.3%	105.3%	46	95%	10.1%	9.6%	85.5%	104.8%	3	94%	26.4%	24.8%	69.3%	118.9%
HVAC	90	102%	38.5%	39.2%	62.5%	141.0%	71	96%	10.4%	9.9%	85.7%	105.6%	76	106%	7.1%	7.5%	98.4%	113.4%
Process	24	82%	31.2%	25.4%	56.1%	107.0%	23	157%	50.9%	79.7%	77.0%	236.4%	25	122%	13.6%	16.5%	105.5%	138.6%
Compressed Air, Vacuum Pumps	17	133%	32.8%	43.5%	89.1%	176.2%	17	139%	30.8%	42.8%	96.3%	181.9%	2	76%	216.0%	164.0%	<0.1%	239.9%
Agriculture	9	120%	32.6%	39.2%	80.9%	159.3%	7	124%	25.5%	31.6%	92.3%	155.6%	7	105%	4.2%	4.4%	100.4%	109.2%
Waste Water Treatment	9	103%	21.7%	22.5%	81.0%	125.9%	4	108%	29.3%	31.7%	76.4%	139.7%	-	-	-	-	-	-
Industrial Ovens and Furnaces	1	31%	<0.1%	<0.1%	<0.1%	<0.1%	-	-	-	-	-	-	4	64%	161.8%	104.3%	<0.1%	168.8%
New Construction	9	100%	0.1%	0.1%	100.0%	100.3%	9	100%	<0.1%	<0.1%	100.0%	100.1%	7	100%	<0.1%	<0.1%	100.0%	100.0%
Motors & Drives	44	94%	9.6%	9.0%	84.6%	102.6%	41	76%	16.5%	12.6%	63.7%	88.8%	-	-	-	-	-	-
CFL	52	99%	1.6%	1.5%	97.3%	100.4%	52	99%	1.4%	1.4%	97.5%	100.3%	-	-	-	-	-	-
Other	27	99%	4.2%	4.2%	94.8%	103.2%	17	128%	46.0%	58.9%	69.2%	187.0%	24	88%	13.5%	11.8%	75.9%	99.6%
Business Programs Overall	**619**	**102%**	**6.3%**	**6.5%**	**95.8%**	**108.7%**	**549**	**103%**	**4.1%**	**4.2%**	**98.5%**	**107.0%**	**312**	**106%**	**5.0%**	**5.3%**	**100.5%**	**111.1%**

Table A-9. Attribution Adjustment Factors by Sampling Measure Group Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09[50]

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Measure Group	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	7	89%	16.3%	14.6%	74.7%	103.9%	-	-	-	-	-	-	159	33%	39.1%	13.0%	20.3%	46.4%
Lighting	267	60%	13.7%	8.2%	51.5%	67.8%	244	61%	14.3%	8.7%	52.1%	69.5%	-	-	-	-	-	-
Refrigeration	44	76%	13.5%	10.2%	65.4%	85.8%	43	72%	17.1%	12.4%	60.0%	84.7%	3	77%	56.2%	43.5%	33.9%	120.9%
HVAC	84	77%	35.0%	27.0%	50.1%	104.1%	64	38%	49.5%	18.8%	19.1%	56.7%	72	44%	44.3%	19.5%	24.5%	63.4%
Process	24	68%	42.0%	28.7%	39.7%	97.2%	22	46%	77.7%	35.8%	10.3%	81.9%	25	93%	6.5%	6.1%	86.8%	98.9%
Compressed Air, Vacuum Pumps	17	65%	37.5%	24.3%	40.5%	89.1%	16	66%	33.7%	22.2%	43.7%	88.1%	2	56%	194.0%	108.3%	<0.1%	164.1%
Agriculture	9	60%	28.8%	17.3%	42.8%	77.3%	7	66%	59.4%	39.2%	26.8%	105.3%	7	79%	39.1%	30.9%	48.2%	109.9%
Waste Water Treatment	8	83%	37.6%	31.1%	51.6%	113.7%	4	76%	75.3%	56.9%	18.6%	132.4%	-	-	-	-	-	-
Industrial Ovens and Furnaces	-	-	-	-	-	-	-	-	-	-	-	-	4	11%	224.4%	25.4%	<0.1%	36.8%
New Construction	9	20%	140.1%	28.5%	<0.1%	48.9%	9	22%	115.7%	25.7%	<0.1%	47.8%	7	31%	55.1%	17.2%	14.0%	48.5%
Motors & Drives	40	15%	99.9%	14.6%	<0.1%	29.2%	37	42%	70.9%	30.1%	12.3%	72.4%	-	-	-	-	-	-
CFL	52	90%	1.0%	0.9%	89.2%	91.1%	52	90%	1.0%	0.9%	89.5%	91.3%	-	-	-	-	-	-
Other	27	57%	66.1%	37.8%	19.4%	95.1%	18	74%	48.4%	36.0%	38.3%	110.3%	23	85%	16.3%	13.8%	71.0%	98.6%
Business Programs Overall	**589**	**67%**	**8.6%**	**5.7%**	**60.9%**	**72.3%**	**518**	**59%**	**12.4%**	**7.3%**	**51.8%**	**66.4%**	**302**	**59%**	**13.6%**	**8.1%**	**51.4%**	**67.6%**

[50] The kW results for the Boilers and Burners group were suppressed for confidentiality reasons, as were the kWh and kW results for Industrial Ovens and Furnaces. There is only one participant in these categories.

Table A-10. Realization Rates by Sampling Measure Group Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09[50]

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	7	89%	16.5%	14.6%	73.9%	103.2%	-	-	-	-	-	-	159	33%	39.1%	12.9%	20.1%	45.9%
Lighting	267	60%	13.8%	8.3%	51.9%	68.5%	244	62%	14.4%	8.9%	52.9%	70.6%	-	-	-	-	-	-
Refrigeration	44	73%	16.4%	12.0%	60.8%	84.8%	43	69%	19.8%	13.7%	55.2%	82.6%	3	73%	62.0%	45.2%	27.6%	118.0%
HVAC	84	78%	52.1%	40.8%	37.6%	119.3%	64	36%	50.6%	18.3%	17.9%	54.6%	72	47%	44.9%	20.9%	25.7%	67.4%
Process	24	56%	52.3%	29.2%	26.6%	85.1%	22	72%	92.9%	67.1%	5.1%	139.3%	25	113%	15.0%	17.0%	96.3%	130.3%
Compressed Air, Vacuum Pumps	17	86%	49.8%	42.8%	43.1%	128.8%	16	92%	45.7%	41.9%	49.8%	133.6%	2	42%	290.3%	123.1%	<0.1%	165.4%
Agriculture	9	72%	43.5%	31.4%	40.7%	103.5%	7	82%	64.6%	52.9%	29.0%	134.8%	7	83%	39.3%	32.5%	50.3%	115.4%
Waste Water Treatment	8	86%	43.6%	37.3%	48.2%	122.8%	4	82%	80.8%	66.0%	15.6%	147.5%	-	-	-	-	-	-
Industrial Ovens and Furnaces	-	-	-	-	-	-	-	-	-	-	-	-	4	7%	276.6%	20.2%	<0.1%	27.5%
New Construction	9	20%	140.1%	28.6%	<0.1%	48.9%	9	22%	115.7%	25.7%	<0.1%	47.8%	7	31%	55.1%	17.2%	14.0%	48.5%
Motors & Drives	40	14%	100.3%	13.7%	<0.1%	27.4%	37	32%	72.8%	23.5%	8.8%	55.9%	-	-	-	-	-	-
CFL	52	89%	1.9%	1.7%	87.5%	90.8%	52	89%	1.7%	1.5%	87.8%	90.9%	-	-	-	-	-	-
Other	27	57%	66.2%	37.5%	19.2%	94.2%	17	95%	66.9%	63.6%	31.5%	158.8%	23	74%	21.2%	15.7%	58.7%	90.2%
Business Programs Overall	**589**	**68%**	**10.6%**	**7.2%**	**60.8%**	**75.3%**	**518**	**61%**	**13.1%**	**7.9%**	**52.8%**	**68.6%**	**302**	**63%**	**14.5%**	**9.1%**	**53.8%**	**72.0%**

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 percent savings represented by those adjustments, and the reasons for the adjustments.

Table B-1 shows the number measures, percentage of measures, and the percentage of total savings for each energy unit by sector. For example, in the engineering review there were 84 Commercial measures, accounting for 20 percent of the total measures reviewed. The Commercial measures accounted for 24 percent of the reported kWh savings, 39 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

Sector	Measures		Percentage of Reported Savings		
	Number	Percent	kWh	kW	Therm
Agriculture	49	12%	9%	5%	2%
Commercial	84	20%	24%	39%	22%
Industrial	195	48%	59%	42%	55%
S & G	82	20%	8%	15%	22%
Total	**410**	**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 percent of total adjusted measures represented by each category.

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

	kWh Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
Percent Change (%)	**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	1	1	0	0	0	0	1	1
1 to 10	2	2	4	2	0	2	10	6	16	1	0	1	15	8	23
11 to 20	1	3	4	0	0	0	2	5	7	1	1	2	4	9	13
21 to 30	0	1	1	0	0	0	1	1	2	0	1	1	1	3	4
31 to 40	0	1	1	1	3	4	3	7	10	0	3	3	4	14	18
41 to 50	1	1	2	0	1	1	1	2	3	0	2	2	2	6	8
51 to 100	1	2	3	2	4	6	5	4	9	1	2	3	9	12	21
Greater than 100	1	0	1	6	0	6	5	0	5	0	1	1	12	1	13
Verified is non-zero when rpt is zero	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1
Total adjusted	6	10	16	11	8	19	28	26	54	3	10	13	48	54	102
Percent of adjusted measures	6%	10%	16%	11%	8%	19%	27%	25%	53%	3%	10%	13%	47%	53%	100%

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

	kW Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
Percent Change (%)	**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	1	1	0	0	0	0	1	1
1 to 10	0	6	6	7	7	14	6	9	15	2	1	3	15	23	38
11 to 20	0	1	1	1	1	2	3	0	3	2	0	2	6	2	8
21 to 30	1	1	2	0	0	0	3	1	4	1	0	1	5	2	7
31 to 40	0	0	0	2	0	2	1	2	3	2	0	2	5	2	7
41 to 50	0	1	1	0	0	0	3	1	4	0	0	0	3	2	5
51 to 100	1	0	1	0	2	2	5	1	6	1	1	2	7	4	11
Greater than 100	1	0	1	5	0	5	5	0	5	0	0	0	11	0	11
Verified is non-zero when rpt is zero	1	0	1	0	0	0	2	0	2	0	0	0	3	0	3
Total adjusted	4	9	13	15	10	25	28	15	43	8	2	10	55	36	91
Percent of adjusted measures	4%	10%	14%	16%	11%	27%	31%	16%	47%	9%	2%	11%	60%	40%	100%

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

	Therm Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
Percent Change (%)	**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	2	0	2	1	0	1	4	4	8	0	2	2	7	6	13
11 to 20	1	1	2	0	0	0	2	4	6	0	2	2	3	7	10
21 to 30	1	0	1	1	0	1	0	2	2	0	0	0	2	2	4
31 to 40	0	0	0	0	1	1	2	2	4	0	2	2	2	5	7
41 to 50	0	0	0	0	0	0	1	1	2	0	0	0	1	1	2
51 to 100	0	0	0	0	0	0	3	6	9	0	0	0	3	6	9
Greater than 100	0	0	0	0	0	0	2	0	2	0	0	0	2	0	2
Verified is non-zero when rpt is zero	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total adjusted	4	1	5	2	1	3	14	19	33	0	6	6	20	27	47
Percent of adjusted measures	9%	2%	11%	4%	2%	6%	30%	40%	70%	0%	13%	13%	43%	57%	100%

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

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

	kWh: Percent Reported Savings Represented by Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
Percent Change (%)	**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	17%	15%	32%	1%	0%	1%	11%	9%	20%	2%	0%	2%	8%	7%	15%
11 to 20	4%	2%	6%	0%	0%	0%	3%	4%	7%	1%	1%	2%	2%	3%	5%
21 to 30	0%	5%	5%	0%	0%	0%	0%	0%	0%	0%	4%	4%	0%	1%	1%
31 to 40	0%	8%	8%	3%	11%	14%	3%	6%	9%	0%	8%	8%	2%	8%	10%
41 to 50	30%	0%	30%	0%	2%	2%	0%	1%	1%	0%	11%	11%	3%	2%	5%
51 to 100	0%	2%	2%	0%	9%	9%	1%	4%	4%	2%	13%	15%	1%	6%	6%
Greater than 100	0%	0%	0%	2%	0%	2%	3%	0%	3%	0%	0%	0%	2%	0%	2%
Verified is non-zero when rpt is zero	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent of sector savings	50%	32%	83%	5%	22%	27%	20%	25%	45%	5%	38%	42%	na	na	na
Percent of total savings	5%	3%	8%	1%	5%	7%	12%	14%	26%	0%	3%	3%	18%	26%	44%

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

	kW: Percent Reported Savings Represented by Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
Percent Change (%)	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%	4%	4%	15%	19%	33%	4%	12%	16%	13%	23%	36%	9%	16%	25%
11 to 20	0%	10%	10%	14%	0%	14%	4%	0%	4%	6%	0%	6%	8%	1%	9%
21 to 30	16%	3%	19%	0%	0%	0%	1%	0%	2%	12%	0%	12%	3%	0%	3%
31 to 40	0%	0%	0%	6%	0%	6%	4%	3%	7%	10%	0%	10%	5%	1%	7%
41 to 50	0%	4%	4%	0%	0%	0%	1%	2%	3%	0%	0%	0%	0%	1%	1%
51 to 100	11%	0%	11%	0%	14%	14%	1%	1%	2%	1%	5%	6%	1%	6%	8%
Greater than 100	0%	0%	0%	0%	0%	0%	3%	0%	3%	0%	0%	0%	1%	0%	1%
Verified is non-zero when rpt is zero	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent of sector savings	27%	21%	48%	35%	32%	68%	18%	18%	36%	42%	28%	70%	na	na	na
Percent of adjusted measures	1%	1%	2%	14%	13%	26%	8%	7%	15%	6%	4%	10%	29%	25%	54%

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

	Therms: Percent Reported Savings Represented by Adjusted Measures														
	Agriculture			Commercial			Industrial			S&G			Total		
Percent Change (%)	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	50%	0%	50%	29%	0%	29%	14%	3%	17%	0%	23%	23%	15%	7%	21%
11 to 20	10%	8%	18%	0%	0%	0%	1%	8%	9%	0%	8%	8%	1%	7%	7%
21 to 30	1%	0%	1%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%	1%	1%
31 to 40	0%	0%	0%	0%	0%	0%	6%	1%	7%	0%	1%	1%	3%	1%	4%
41 to 50	0%	0%	0%	0%	0%	0%	7%	1%	8%	0%	0%	0%	4%	1%	5%
51 to 100	0%	0%	0%	0%	0%	0%	2%	5%	7%	0%	0%	0%	1%	3%	4%
Greater than 100	0%	0%	0%	0%	0%	0%	7%	0%	7%	0%	0%	0%	4%	0%	4%
Verified is non-zero when rpt is zero	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent of sector savings	61%	8%	69%	29%	0%	29%	37%	21%	58%	0%	33%	33%	na	na	na
Percent of adjusted measures	1%	0%	1%	6%	0%	6%	20%	12%	32%	0%	7%	7%	28%	19%	46%

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

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

Percent Change (%)	Agriculture kWh					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	2	2	4	17%	15%	32%
11 to 20	1	3	4	4%	2%	6%
21 to 30	0	1	1	0%	5%	5%
31 to 40	0	1	1	0%	8%	8%
41 to 50	1	1	2	30%	0%	30%
51 to 100	1	2	3	0%	2%	2%
Greater than 100	1	0	1	0%	0%	0%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	6	10	16	50%	32%	83%
Not adjusted			33			17%
Total			**49**			**100%**

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

Percent Change (%)	Agriculture kW					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	0	6	6	0%	4%	4%
11 to 20	0	1	1	0%	10%	10%
21 to 30	1	1	2	16%	3%	19%
31 to 40	0	0	0	0%	0%	0%
41 to 50	0	1	1	0%	4%	4%
51 to 100	1	0	1	11%	0%	11%
Greater than 100	1	0	1	0%	0%	0%
Verified is non-zero when rpt is zero	1	0	1	0%	0%	0%
Adjusted	4	9	13	27%	21%	48%
Not adjusted			36			52%
Total			**49**			**100%**

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

	Agriculture Therms					
	Count			Percent Sector Savings		
Percent Change (%)	**V > R**	**V < R**	**Total**	**V > R**	**V < R**	**Total**
Not installed	0	0	0	0%	0%	0%
1 to 10	2	0	2	50%	0%	50%
11 to 20	1	1	2	10%	8%	18%
21 to 30	1	0	1	1%	0%	1%
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%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	4	1	5	61%	8%	69%
Not adjusted			44			31%
Total			**49**			**100%**

Table B-11, Table B-12, and Table B-13 show the number of adjustments and percent 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			Percent Sector Savings		
Percent Change (%)	**V > R**	**V < R**	**Total**	**V > R**	**V < R**	**Total**
Not installed	0	0	0	0%	0%	0%
1 to 10	2	0	2	1%	0%	1%
11 to 20	0	0	0	0%	0%	0%
21 to 30	0	0	0	0%	0%	0%
31 to 40	1	3	4	3%	11%	14%
41 to 50	0	1	1	0%	2%	2%
51 to 100	2	4	6	0%	9%	9%
Greater than 100	6	0	6	2%	0%	2%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	11	8	19	5%	22%	27%
Not adjusted			65			73%
Total			**84**			**100%**

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

Percent Change (%)	Commercial kW					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	7	7	14	15%	19%	33%
11 to 20	1	1	2	14%	0%	14%
21 to 30	0	0	0	0%	0%	0%
31 to 40	2	0	2	6%	0%	6%
41 to 50	0	0	0	0%	0%	0%
51 to 100	0	2	2	0%	14%	14%
Greater than 100	5	0	5	0%	0%	0%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	15	10	25	35%	32%	68%
Not adjusted			59			32%
Total			**84**			**100%**

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

Percent Change (%)	Commercial Therms					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	1	0	1	29%	0%	29%
11 to 20	0	0	0	0%	0%	0%
21 to 30	1	0	1	0%	0%	0%
31 to 40	0	1	1	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%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	2	1	3	29%	0%	29%
Not adjusted			81			71%
Total			**84**			**100%**

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

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

	Industrial kWh					
	Count			Percent Sector Savings		
Percent Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	1	1	0%	0%	0%
1 to 10	10	6	16	11%	9%	20%
11 to 20	2	5	7	3%	4%	7%
21 to 30	1	1	2	0%	0%	0%
31 to 40	3	7	10	3%	6%	9%
41 to 50	1	2	3	0%	1%	1%
51 to 100	5	4	9	1%	4%	4%
Greater than 100	5	0	5	3%	0%	3%
Verified is non-zero when rpt is zero	1	0	1	0%	0%	0%
Adjusted	28	26	54	20%	25%	45%
Not adjusted			141			55%
Total			**195**			**100%**

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

	Industrial kW					
	Count			Percent Sector Savings		
Percent Change (%)	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	1	1	0%	0%	0%
1 to 10	6	9	15	4%	12%	16%
11 to 20	3	0	3	4%	0%	4%
21 to 30	3	1	4	1%	0%	2%
31 to 40	1	2	3	4%	3%	7%
41 to 50	3	1	4	1%	2%	3%
51 to 100	5	1	6	1%	1%	2%
Greater than 100	5	0	5	3%	0%	3%
Verified is non-zero when rpt is zero	2	0	2	0%	0%	0%
Adjusted	28	15	43	18%	18%	36%
Not adjusted			152			64%
Total			**195**			**100%**

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

Percent Change (%)	Industrial Therms					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	4	4	8	14%	3%	17%
11 to 20	2	4	6	1%	8%	9%
21 to 30	0	2	2	0%	2%	2%
31 to 40	2	2	4	6%	1%	7%
41 to 50	1	1	2	7%	1%	8%
51 to 100	3	6	9	2%	5%	7%
Greater than 100	2	0	2	7%	0%	7%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	14	19	33	37%	21%	58%
Not adjusted			161			42%
Total			**194**			**100%**

Table B-17, Table B-18, and Table B-19 show the number of adjustments and the percent 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

Percent Change (%)	Schools and Government kWh					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	1	0	1	2%	0%	2%
11 to 20	1	1	2	1%	1%	2%
21 to 30	0	1	1	0%	4%	4%
31 to 40	0	3	3	0%	8%	8%
41 to 50	0	2	2	0%	11%	11%
51 to 100	1	2	3	2%	13%	15%
Greater than 100	0	1	1	0%	0%	0%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	3	10	13	5%	38%	42%
Not adjusted			69			58%
Total			**82**			**100%**

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

Percent Change (%)	Schools and Government kW					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	2	1	3	13%	23%	36%
11 to 20	2	0	2	6%	0%	6%
21 to 30	1	0	1	12%	0%	12%
31 to 40	2	0	2	10%	0%	10%
41 to 50	0	0	0	0%	0%	0%
51 to 100	1	1	2	1%	5%	6%
Greater than 100	0	0	0	0%	0%	0%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	8	2	10	42%	28%	70%
Not adjusted			72			30%
Total			**82**			**100%**

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

Percent Change (%)	Schools and Government Therms					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Not installed	0	0	0	0%	0%	0%
1 to 10	0	2	2	0%	23%	23%
11 to 20	0	2	2	0%	8%	8%
21 to 30	0	0	0	0%	0%	0%
31 to 40	0	2	2	0%	1%	1%
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%
Verified is non-zero when rpt is zero	0	0	0	0%	0%	0%
Adjusted	0	6	6	0%	33%	33%
Not adjusted			76			67%
Total			**82**			**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

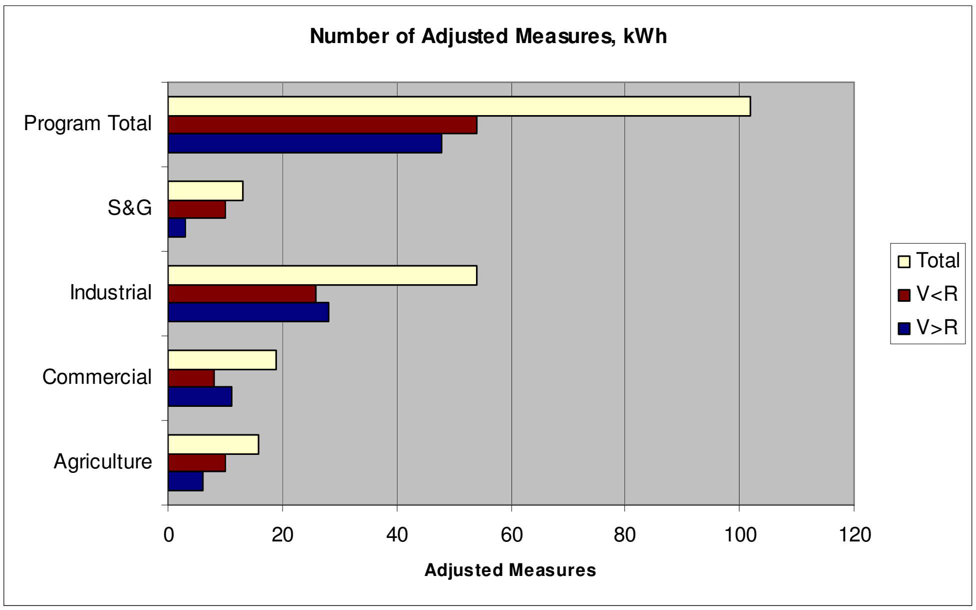


Figure B-2. Count of Measures with Adjustments, kW

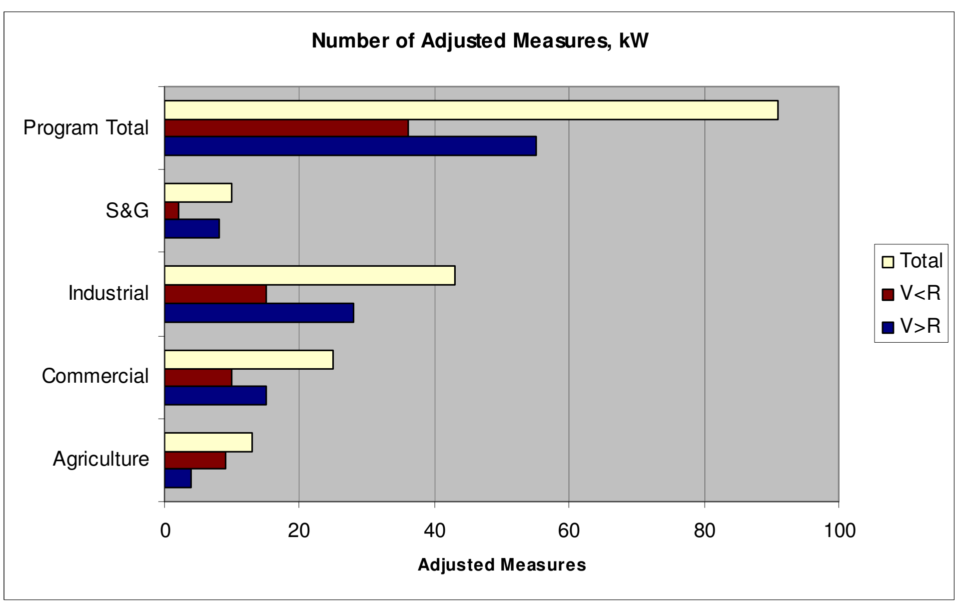


Figure B-3. Count of Measures with Adjustments, Therms

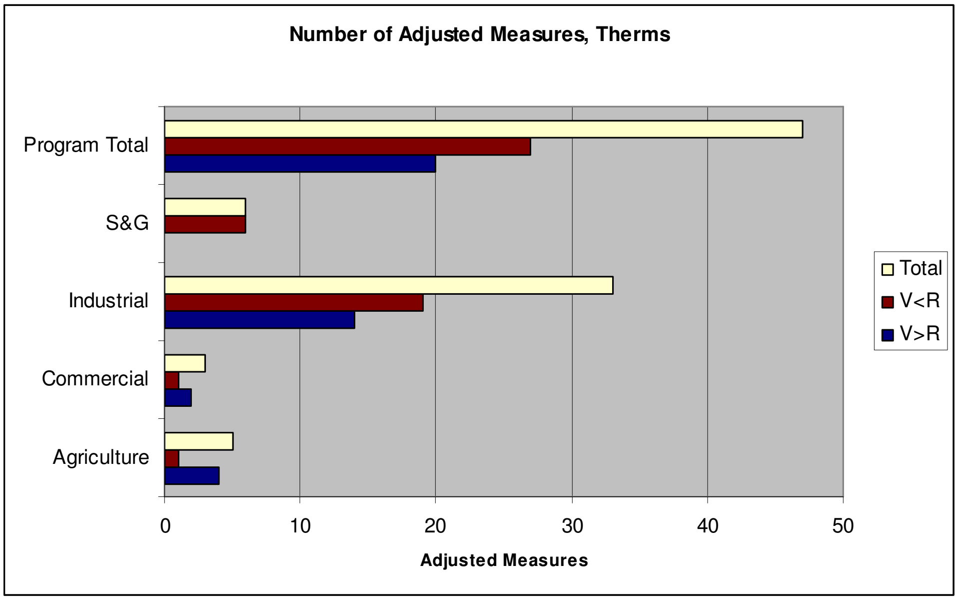


Figure B-4, Figure B-5, and Figure B-6 show the percentage of total engineering sample savings represented by adjustments for each sector and for the engineering sample overall.

Figure B-4. Percentage Savings with Adjustments, kWh

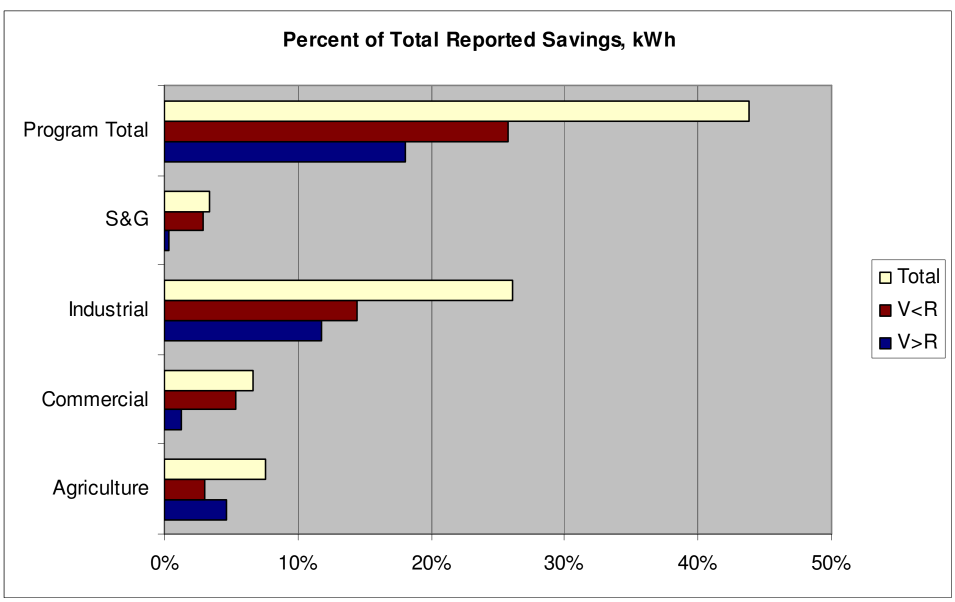


Figure B-5. Percentage Savings with Adjustments, kW

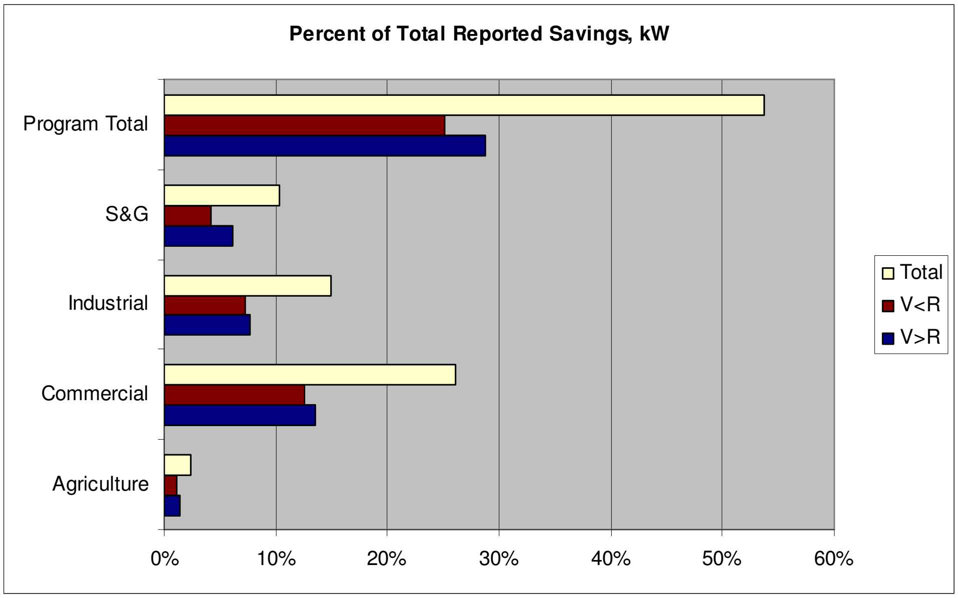
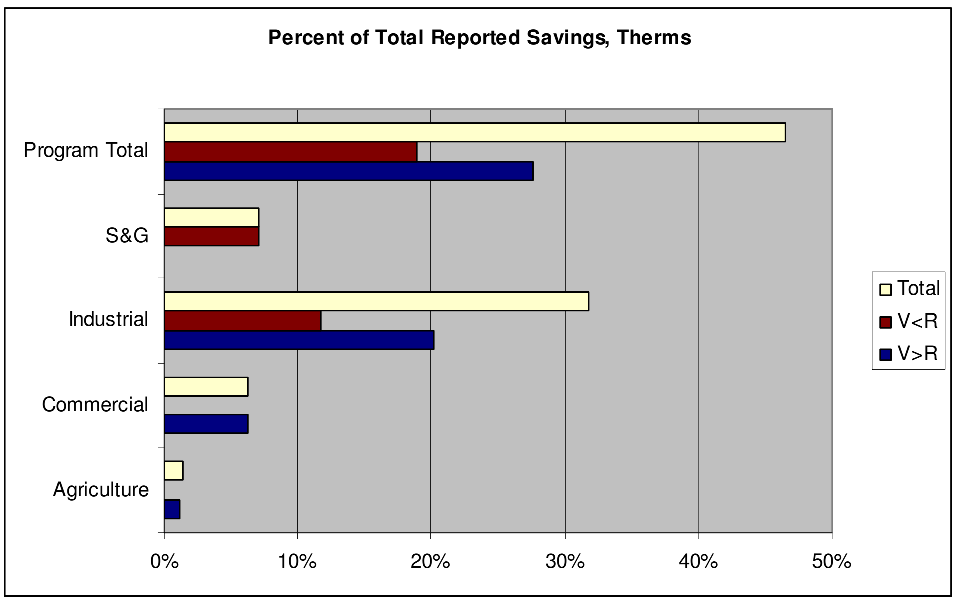


Figure B-6. Percentage Savings with Adjustments, Therms



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 percent 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			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	4	7	11	50%	22%	73%
Used Site-specific rather than prescriptive	0	0	0	0%	0%	0%
Different calculation method or analysis	2	0	2	0%	0%	0%
Rounding adjustment	0	0	0	0%	0%	0%
Deeming adjustment	0	0	0	0%	0%	0%
Different baseline or installation	0	1	1	0%	8%	8%
Calculation method unclear	0	2	2	0%	2%	2%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	6	10	16	50%	32%	83%
Not adjusted			33			17%
Total			**49**			**100%**

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

Primary Reason for Adjustment	Agriculture kW					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	1	2	3	16%	12%	28%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Different calculation method or analysis	1	0	1	0%	0%	0%
Rounding adjustment	0	5	5	0%	2%	2%
Deeming adjustment	0	0	0	0%	0%	0%
Different baseline or installation	1	0	1	11%	0%	11%
Calculation method unclear	0	2	2	0%	7%	7%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	1	0	1	0%	0%	0%
Adjusted	4	9	13	27%	21%	48%
Not adjusted			36			52%
Total			**49**			**100%**

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

Primary Reason for Adjustment	Agriculture Therms					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	2	1	3	61%	8%	68%
Used site-specific rather than prescriptive	1	0	1	1%	0%	1%
Different calculation method or analysis	1	0	1	0%	0%	0%
Rounding adjustment	0	0	0	0%	0%	0%
Deeming adjustment	0	0	0	0%	0%	0%
Different baseline or installation	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	4	1	5	61%	8%	69%
Not adjusted			44			31%
Total			**49**			**100%**

Table B-23, Table B-24, and Table B-25 show the number of adjustments and the percent 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			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	3	1	4	3%	0%	3%
Used site-specific rather than prescriptive	1	7	8	0%	22%	22%
Different calculation method or analysis	2	0	2	1%	0%	1%
Rounding adjustment	0	0	0	0%	0%	0%
Deeming adjustment	4	0	4	1%	0%	1%
Different baseline or installation	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	1	0	1	1%	0%	1%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	11	8	19	5%	22%	27%
Not adjusted			65			73%
Total			**84**			**100%**

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

Primary Reason for Adjustment	Commercial kW					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	3	0	3	7%	0%	7%
Used site-specific rather than prescriptive	5	3	8	28%	16%	43%
Different calculation method or analysis	1	1	2	0%	0%	0%
Rounding adjustment	2	6	8	0%	17%	17%
Deeming adjustment	4	0	4	0%	0%	0%
Different baseline or installation	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	15	10	25	35%	32%	68%
Not adjusted			59			32%
Total			**84**			**100%**

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

Primary Reason for Adjustment	Commercial Therms					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	1	1	0%	0%	0%
Used site-specific rather than prescriptive	1	0	1	0%	0%	0%
Different calculation method or analysis	0	0	0	0%	0%	0%
Rounding adjustment	1	0	1	29%	0%	29%
Deeming adjustment	0	0	0	0%	0%	0%
Different baseline or installation	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	2	1	3	29%	0%	29%
Not adjusted			81			71%
Total			**84**			**100%**

Table B-26, Table B-27, and Table B-28 show the number of adjustments and the percent 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

	Industrial kWh					
	Count			Percent Sector Savings		
Primary Reason for Adjustment	**V > R**	**V < R**	**Total**	**V > R**	**V < R**	**Total**
Customer reported different parameter(s)	15	17	32	8%	15%	24%
Used site-specific rather than prescriptive	3	3	6	2%	2%	4%
Different calculation method or analysis	2	1	3	2%	1%	3%
Rounding adjustment	5	0	5	5%	0%	5%
Deeming adjustment	2	0	2	3%	0%	3%
Different baseline or installation	0	3	3	0%	3%	3%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	1	1	2	0%	3%	3%
Not installed	0	1	1	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	28	26	54	20%	25%	45%
Not adjusted			141			55%
Total			**195**			**100%**

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

	Industrial kW					
	Count			Percent Sector Savings		
Primary Reason for Adjustment	**V > R**	**V < R**	**Total**	**V > R**	**V < R**	**Total**
Customer reported different parameter(s)	13	9	22	5%	10%	16%
Used site-specific rather than prescriptive	6	0	6	7%	0%	7%
Different calculation method or analysis	2	1	3	1%	1%	2%
Rounding adjustment	3	2	5	1%	3%	4%
Deeming adjustment	2	0	2	3%	0%	3%
Different baseline or installation	2	2	4	0%	4%	4%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	1	1	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	28	15	43	18%	18%	36%
Not adjusted			152			64%
Total			**195**			**100%**

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

Primary Reason for Adjustment	Industrial Therms					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	10	10	20	34%	14%	48%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Different calculation method or analysis	1	4	5	1%	4%	5%
Rounding adjustment	0	1	1	0%	1%	1%
Deeming adjustment	1	2	3	0%	1%	1%
Different baseline or installation	1	2	3	2%	2%	4%
Calculation method unclear	1	0	1	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	14	19	33	37%	21%	58%
Not adjusted			162			42%
Total			195			100%

Table B-29, Table B-30, and Table B-31 show the number of adjustments and the percent 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			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	1	3	4	1%	1%	3%
Used site-specific rather than prescriptive	1	3	4	2%	18%	19%
Different calculation method or analysis	1	1	2	2%	1%	3%
Rounding adjustment	0	0	0	0%	0%	0%
Deeming adjustment	0	0	0	0%	0%	0%
Different baseline or installation	0	2	2	0%	5%	5%
Calculation method unclear	0	1	1	0%	13%	13%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	3	10	13	5%	38%	42%
Not adjusted			69			58%
Total			**82**			**100%**

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

Primary Reason for Adjustment	Schools and Government kW					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	1	0	1	1%	0%	1%
Used site-specific rather than prescriptive	4	0	4	33%	0%	33%
Different calculation method or analysis	2	0	2	3%	0%	3%
Rounding adjustment	0	0	0	0%	0%	0%
Deeming adjustment	0	0	0	0%	0%	0%
Different baseline or installation	1	1	2	5%	5%	11%
Calculation method unclear	0	1	1	0%	23%	23%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	8	2	10	42%	28%	70%
Not adjusted			72			30%
Total			**82**			**100%**

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

Primary Reason for Adjustment	Schools and Government Therms					
	Count			Percent Sector Savings		
	V > R	V < R	Total	V > R	V < R	Total
Customer reported different parameter(s)	0	5	5	0%	22%	22%
Used site-specific rather than prescriptive	0	0	0	0%	0%	0%
Different calculation method or analysis	0	1	1	0%	10%	10%
Rounding adjustment	0	0	0	0%	0%	0%
Deeming adjustment	0	0	0	0%	0%	0%
Different baseline or installation	0	0	0	0%	0%	0%
Calculation method unclear	0	0	0	0%	0%	0%
Data entry error	0	0	0	0%	0%	0%
Not installed	0	0	0	0%	0%	0%
Other savings in documentation	0	0	0	0%	0%	0%
Adjusted	0	6	6	0%	33%	33%
Not adjusted			76			67%
Total			**82**			**100%**

APPENDIX C: SECTOR LEVEL RESULTS

This appendix presents the adjustment factors at the sector level.[51] Evaluation results were traditionally reported at this level in the past. However, for this round 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 CY09 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	5,937	41	64	3%	3%	0%	0%	0%	0%
Agriculture	Not deemed	1,539	23	28	3%	3%	2%	0%	0%	1%
Commercial	Deemed	12,414	100	229	17%	18%	5%	3%	2%	2%
Commercial	Not deemed	3,448	45	47	17%	22%	8%	1%	2%	1%
Industrial	Deemed	1,863	73	174	8%	6%	4%	2%	2%	2%
Industrial	Not deemed	2,130	104	121	39%	30%	53%	4%	2%	34%
Schools and Government	Deemed	1,588	85	189	4%	3%	10%	1%	1%	5%
Schools and Government	Not deemed	2,104	41	39	8%	15%	19%	0%	1%	1%
	Deemed	**21,802**	**299**	**656**	**32%**	**31%**	**18%**	**6%**	**5%**	**10%**
	Not deemed	**9,221**	**213**	**235**	**68%**	**69%**	**82%**	**6%**	**5%**	**36%**
Business Programs Overall		**31,023**	**512**	**891**	**100%**	**100%**	**100%**	**12%**	**10%**	**46%**

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.

[51] 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 the 18MCP and CY09

	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	85	99%	1.9%	1.9%	97.0%	100.8%	75	98%	2.9%	2.9%	95.4%	101.2%	13	100%	<0.1%	<0.1%	100.0%	100.0%
Commercial	210	100%	<0.1%	<0.1%	100.0%	100.0%	194	100%	<0.1%	<0.1%	100.0%	100.0%	77	100%	<0.1%	<0.1%	100.0%	100.0%
Industrial	227	100%	<0.1%	<0.1%	100.0%	100.0%	205	100%	<0.1%	<0.1%	100.0%	100.0%	91	100%	<0.1%	<0.1%	100.0%	100.0%
S&G	106	96%	4.4%	4.2%	91.4%	99.8%	81	97%	2.8%	2.7%	94.4%	99.8%	133	99%	0.5%	0.5%	98.9%	99.9%
Business Programs Overall	**628**	**100%**	**0.4%**	**0.4%**	**99.2%**	**99.9%**	**555**	**100%**	**0.4%**	**0.4%**	**99.2%**	**99.9%**	**314**	**100%**	**0.1%**	**0.1%**	**99.7%**	**100.0%**

Table C-3. Engineering Verification Factor by Sector
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	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	84	107%	15.5%	16.6%	90.4%	123.6%	75	110%	11.0%	12.1%	97.9%	122.2%	13	104%	3.5%	3.7%	99.9%	107.3%
Commercial	210	105%	13.7%	14.4%	90.6%	119.4%	194	97%	6.3%	6.1%	91.1%	103.3%	77	100%	<0.1%	<0.1%	99.9%	100.0%
Industrial	226	102%	7.4%	7.6%	94.6%	109.8%	206	111%	7.6%	8.4%	102.4%	119.2%	91	112%	9.3%	10.5%	101.9%	122.9%
S&G	99	90%	6.6%	5.9%	84.4%	96.2%	74	102%	9.4%	9.6%	92.4%	111.6%	131	98%	0.9%	0.9%	97.3%	99.1%
Business Programs Overall	**619**	**103%**	**6.3%**	**6.5%**	**96.3%**	**109.2%**	**549**	**103%**	**4.1%**	**4.2%**	**99.0%**	**107.5%**	**312**	**106%**	**5.0%**	**5.3%**	**100.6%**	**111.2%**

Table C-4. Gross Savings Adjustment Factor by Sector
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	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	84	106%	15.6%	16.5%	89.3%	122.4%	75	108%	11.4%	12.3%	95.9%	120.5%	13	104%	3.5%	3.7%	99.9%	107.3%
Commercial	210	105%	13.7%	14.4%	90.6%	119.4%	194	97%	6.3%	6.1%	91.1%	103.3%	77	100%	<0.1%	<0.1%	99.9%	100.0%
Industrial	226	102%	7.4%	7.6%	94.6%	109.8%	205	111%	7.6%	8.4%	102.4%	119.2%	91	112%	9.3%	10.5%	101.9%	122.9%
S&G	99	86%	7.9%	6.8%	79.5%	93.1%	74	99%	9.8%	9.7%	89.3%	108.8%	131	98%	1.1%	1.0%	96.6%	98.7%
Business Programs Overall	**619**	**102%**	**6.3%**	**6.5%**	**95.8%**	**108.7%**	**549**	**103%**	**4.1%**	**4.2%**	**98.5%**	**107.0%**	**312**	**106%**	**5.0%**	**5.3%**	**100.5%**	**111.1%**

Table C-5. Attribution Adjustment Factor by Sector
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	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	80	55%	27.3%	14.9%	39.7%	69.5%	71	61%	22.5%	13.8%	47.4%	74.9%	13	66%	48.5%	32.1%	34.1%	98.2%
Commercial	194	85%	10.3%	8.7%	76.4%	93.9%	179	71%	19.2%	13.6%	57.1%	84.2%	70	26%	71.4%	18.5%	7.4%	44.3%
Industrial	219	56%	15.5%	8.7%	47.5%	64.9%	198	52%	18.8%	9.8%	42.1%	61.7%	91	78%	9.9%	7.7%	70.0%	85.4%
S&G	96	55%	20.8%	11.4%	43.5%	66.3%	70	37%	52.7%	19.5%	17.6%	56.6%	128	41%	31.8%	12.9%	27.7%	53.6%
Business Programs Overall	**589**	**67%**	**8.6%**	**5.7%**	**60.9%**	**72.3%**	**518**	**59%**	**12.4%**	**7.3%**	**51.8%**	**66.4%**	**302**	**59%**	**13.6%**	**8.1%**	**51.4%**	**67.6%**

Table C-6. Realization Rate by Sector
Based on Samples from Participants Who Installed a Measure during the 18MCP and CY09

	kWh						kW						Therms					
			90% Confidence Interval						90% Confidence Interval						90% Confidence Interval			
Segment	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	80	58%	31.4%	18.2%	39.6%	76.0%	71	66%	25.2%	16.7%	49.5%	82.9%	13	68%	48.6%	33.3%	35.2%	101.8%
Commercial	194	89%	17.1%	15.3%	74.1%	104.7%	179	69%	20.2%	13.9%	54.8%	82.6%	70	26%	71.4%	18.5%	7.4%	44.3%
Industrial	219	57%	17.2%	9.9%	47.6%	67.3%	198	57%	20.3%	11.7%	45.8%	69.2%	91	87%	13.6%	11.9%	75.5%	99.3%
S&G	96	47%	22.2%	10.5%	36.9%	57.9%	70	37%	53.6%	19.7%	17.1%	56.4%	128	40%	31.8%	12.6%	27.1%	52.3%
Business Programs Overall	**589**	**68%**	**10.6%**	**7.2%**	**60.8%**	**75.3%**	**518**	**61%**	**13.1%**	**7.9%**	**52.8%**	**68.6%**	**302**	**63%**	**14.5%**	**9.1%**	**53.8%**	**72.0%**

C.3 COMPARISONS ACROSS YEARS

This section shows the five sector-level adjustment factors from CY09 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 twelve 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 fiscal year'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[52].
- 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.

[52] 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[53] were used for all low wattage (<30 W) CFLs. These attribution rates were 93 percent for the Commercial sector and 67 percent for the Agricultural sector. This is the second evaluation that uses separate adjustment factors for Commercial and Agriculture[54].
- 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.[55] 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[56] with the 18MCP.
- The CY09 evaluation is the first to include data from the CATI survey to determine the engineering verification factor.

[53] Tom Mauldin, Lynn Hoefgen, NMR Group. *2008 Sector-based CFL Net-to-Gross Analysis*. Forthcoming.

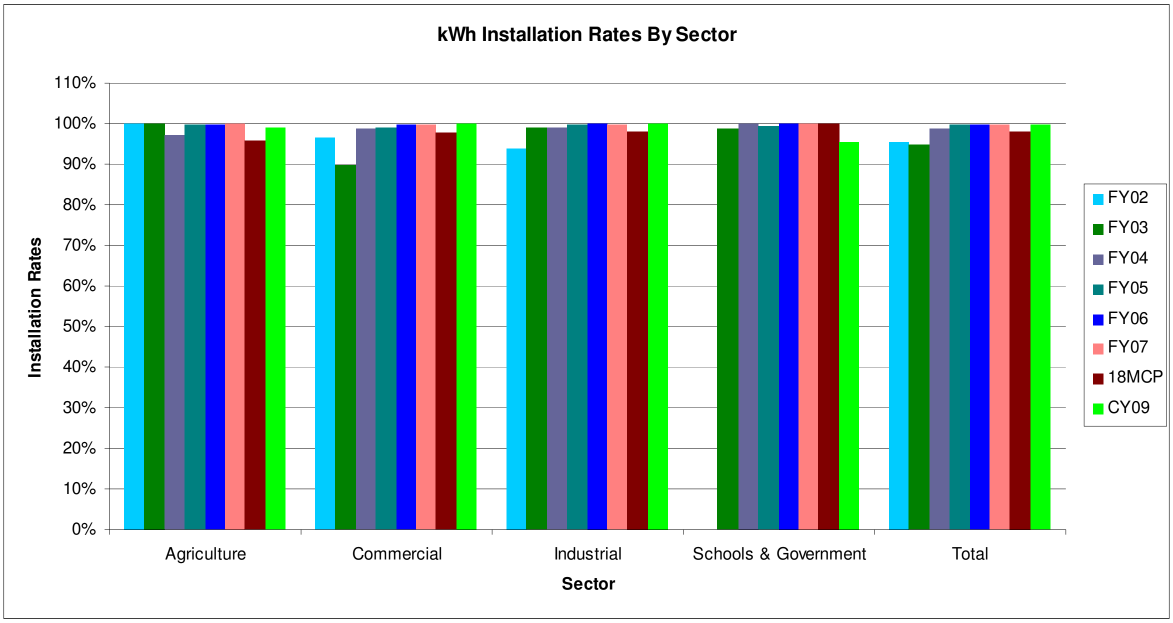
[54] The Commercial value of 93 percent attribution was applied to CFLs in the CATI sample that fell under the Industrial or Schools & Government sectors.

[55] 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.

[56] 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.

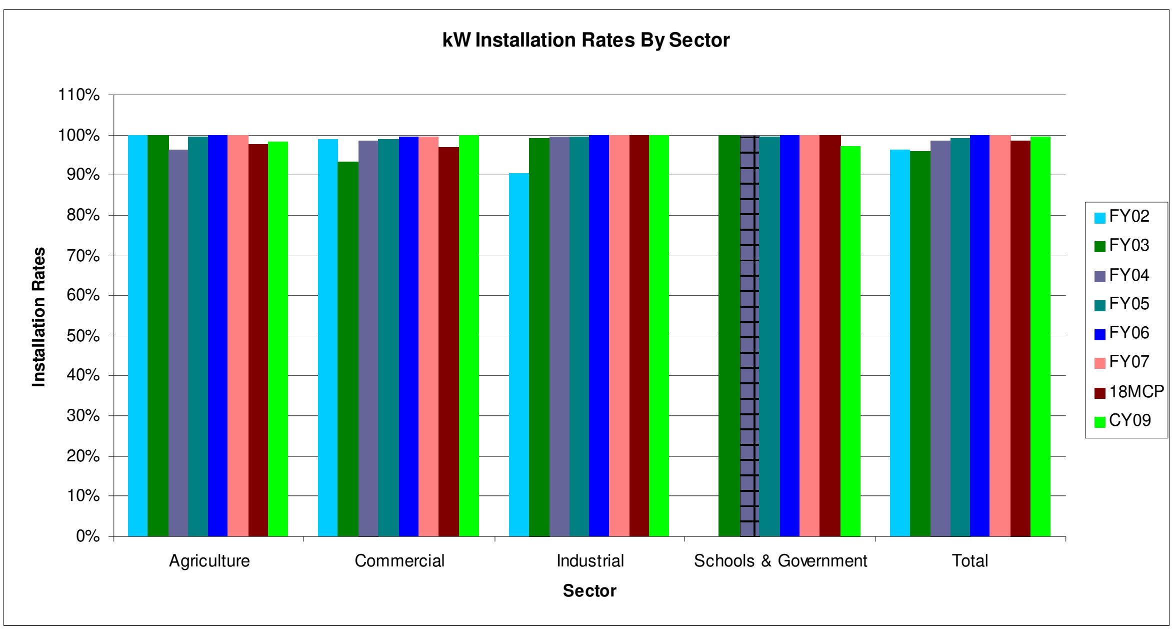
Figure C-1 through Figure C-3 compare the CY09 installation rate to previous years.

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



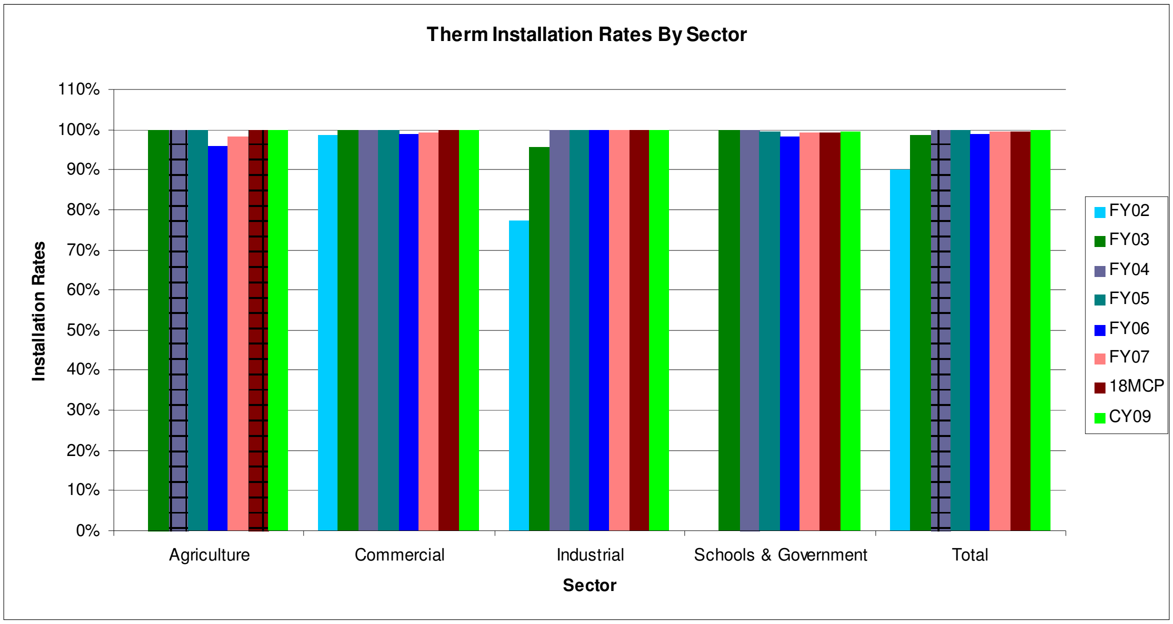
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

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]



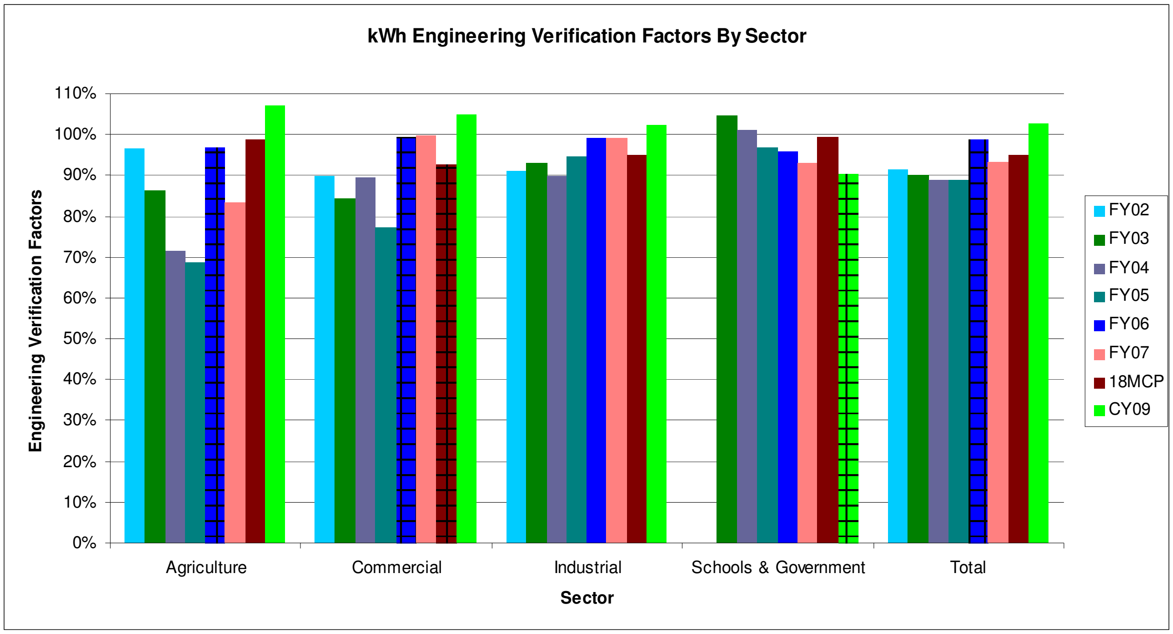
[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy 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.

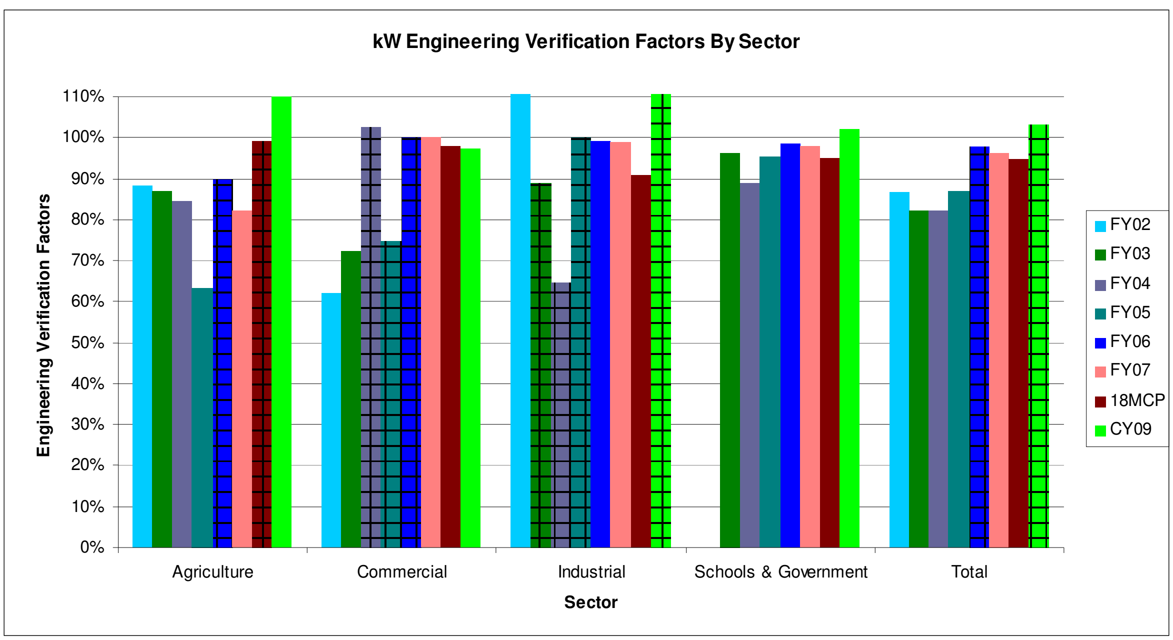
Figure C-4 through Figure C-6 compare the CY09 engineering verification factor to previous years.

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



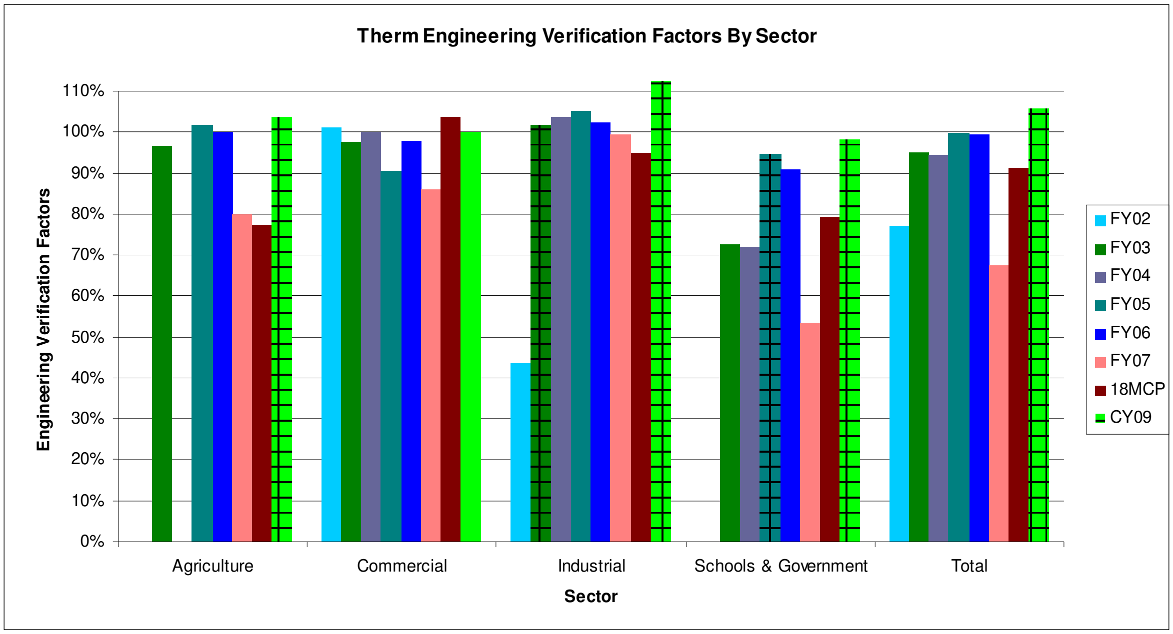
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

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]



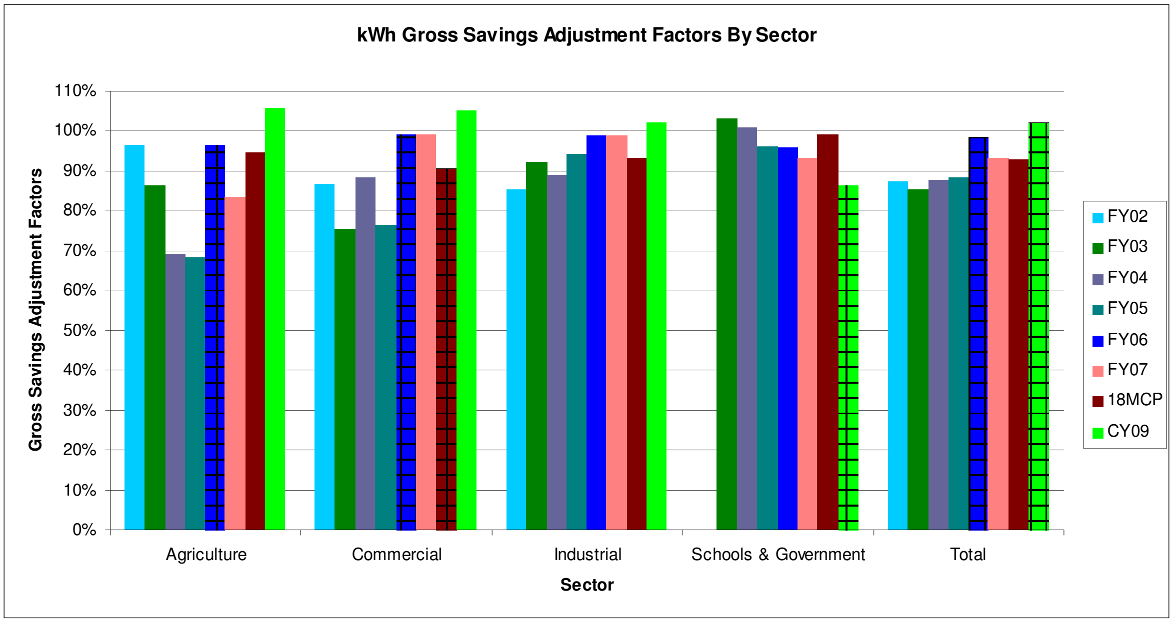
[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy 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.

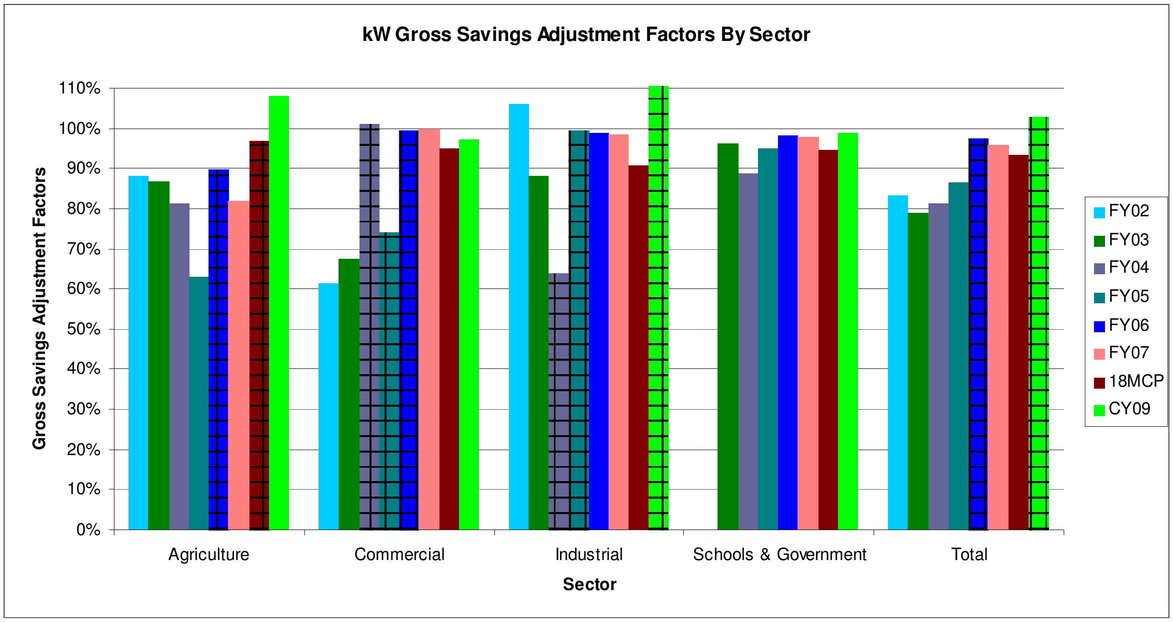
Figure C-7 through Figure C-9 compare the CY09 gross savings adjustment factor to previous years.

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



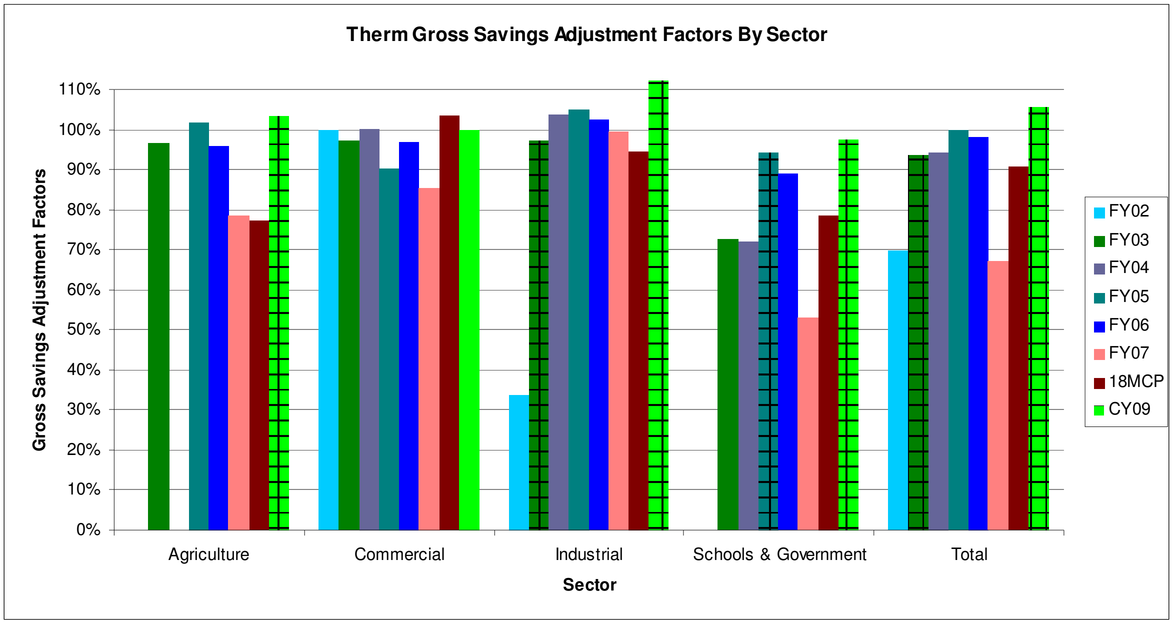
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

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]**



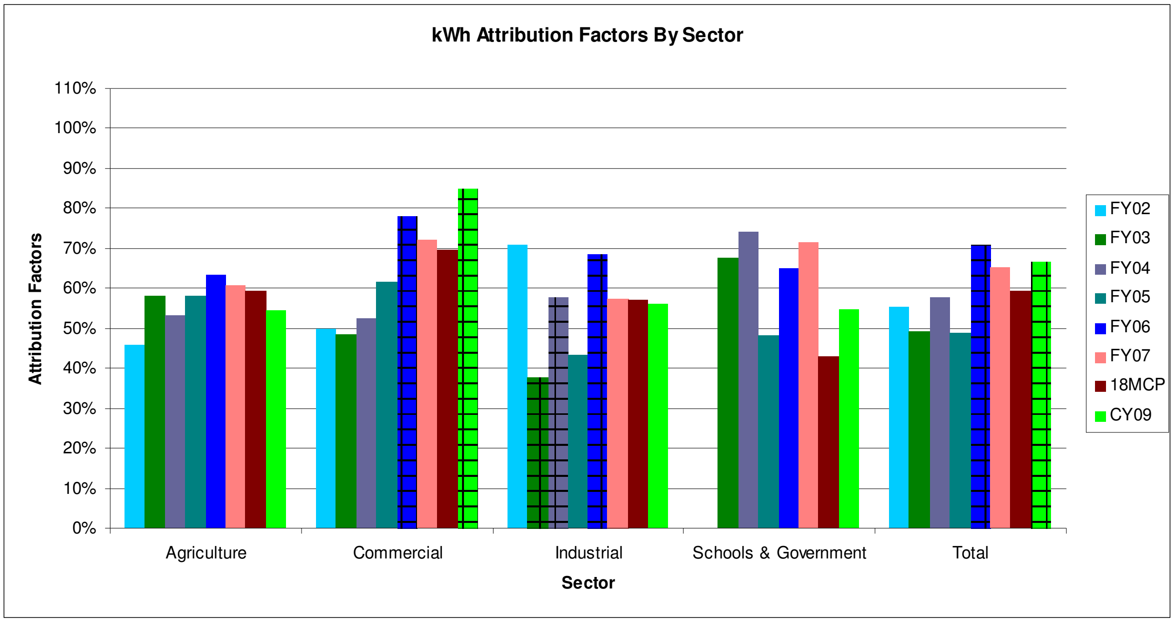
[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy 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.

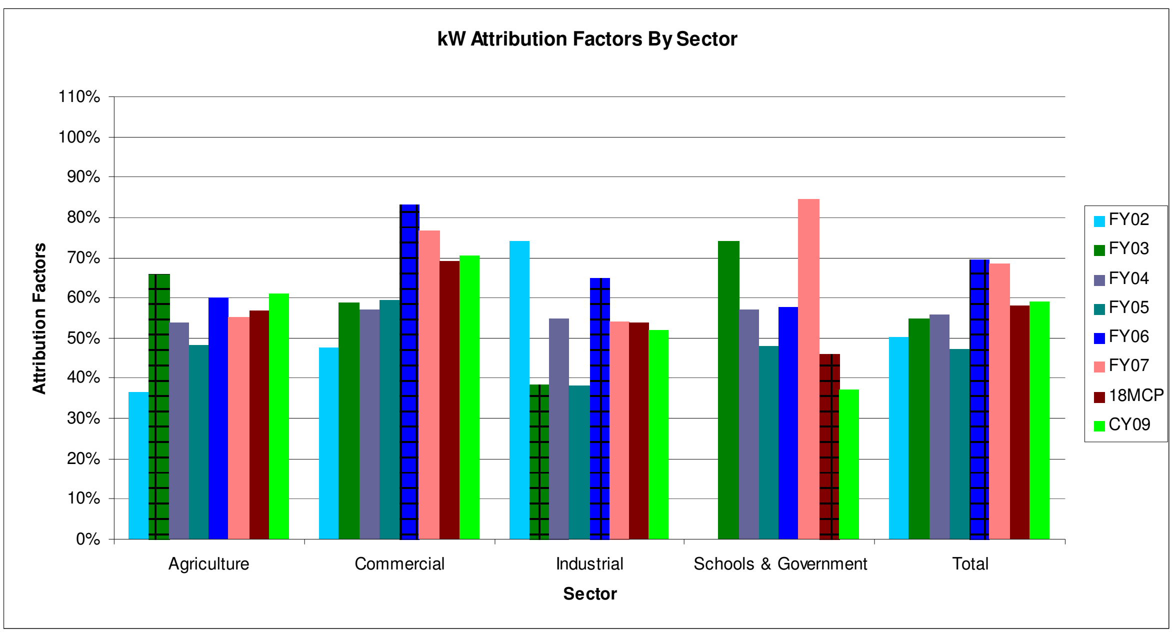
Figure C-10 through Figure C-12 compare the CY09 attribution adjustment factor to previous years.

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



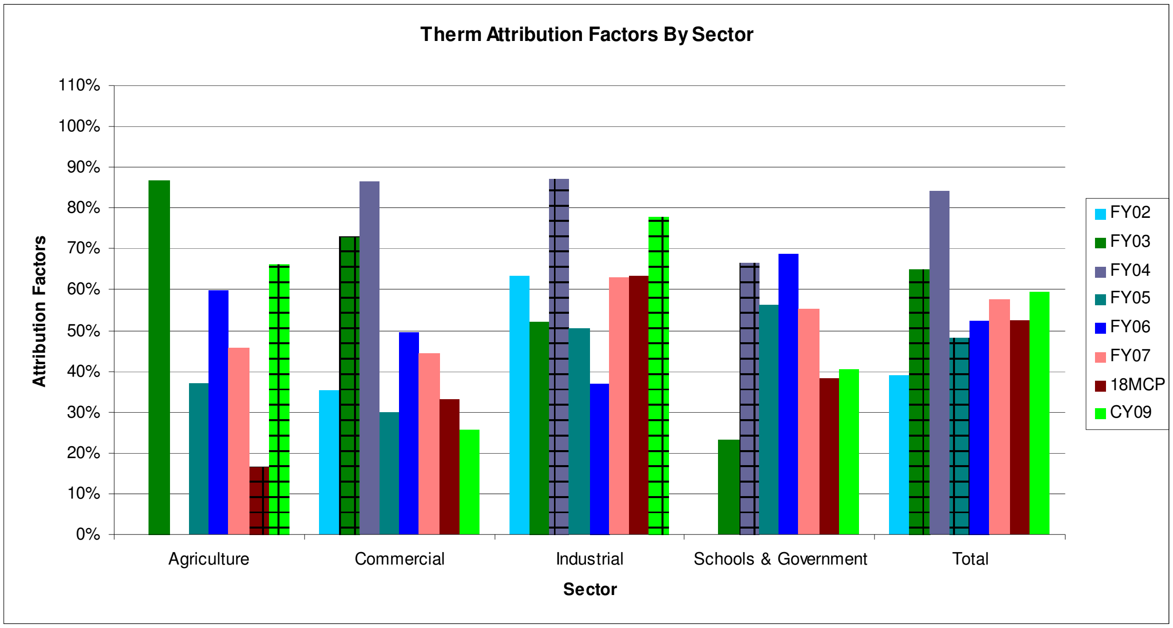
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

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]



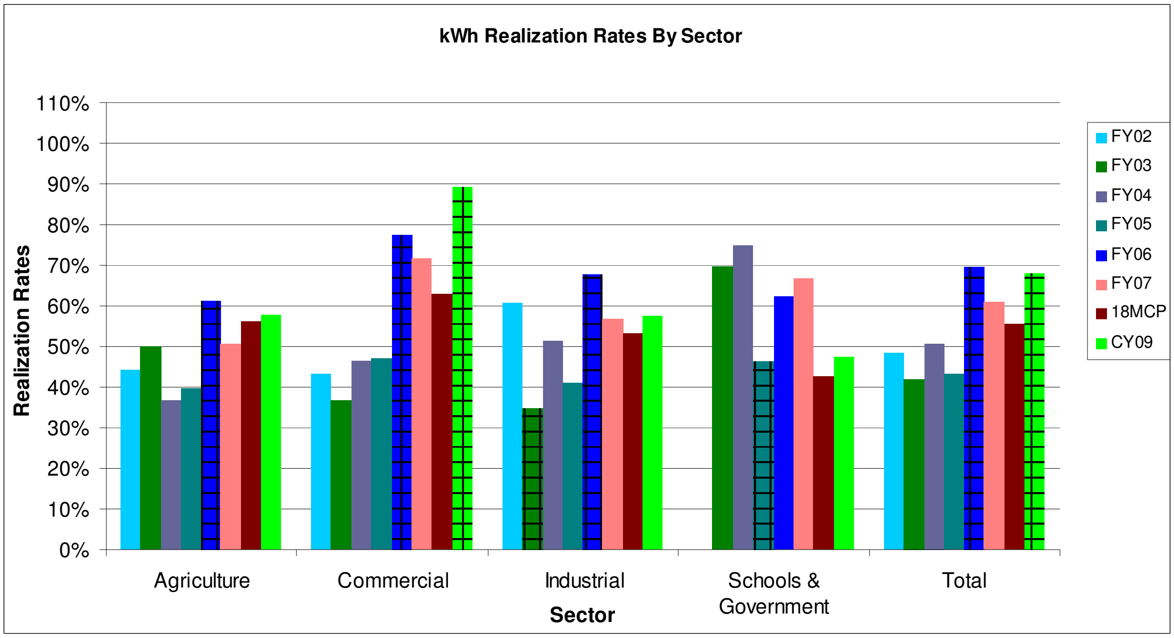
[a] For the agriculture segment, the FY04 adjustment factor for therms was estimated with inadequate accuracy. Hence, the results are essentially uninformative and they are not reported. In part, the agriculture segment savings adjustment factor for therms was difficult to estimate with adequate accuracy 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.

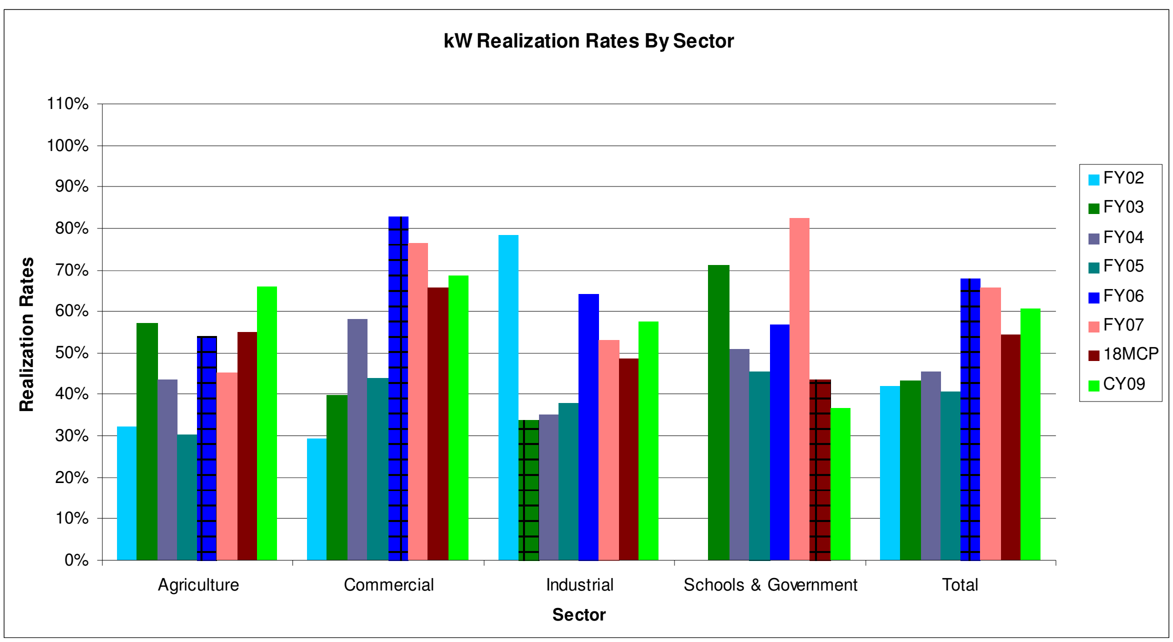
Figure C-13 through Figure C-15 compare the CY09 realization rate to previous years.

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



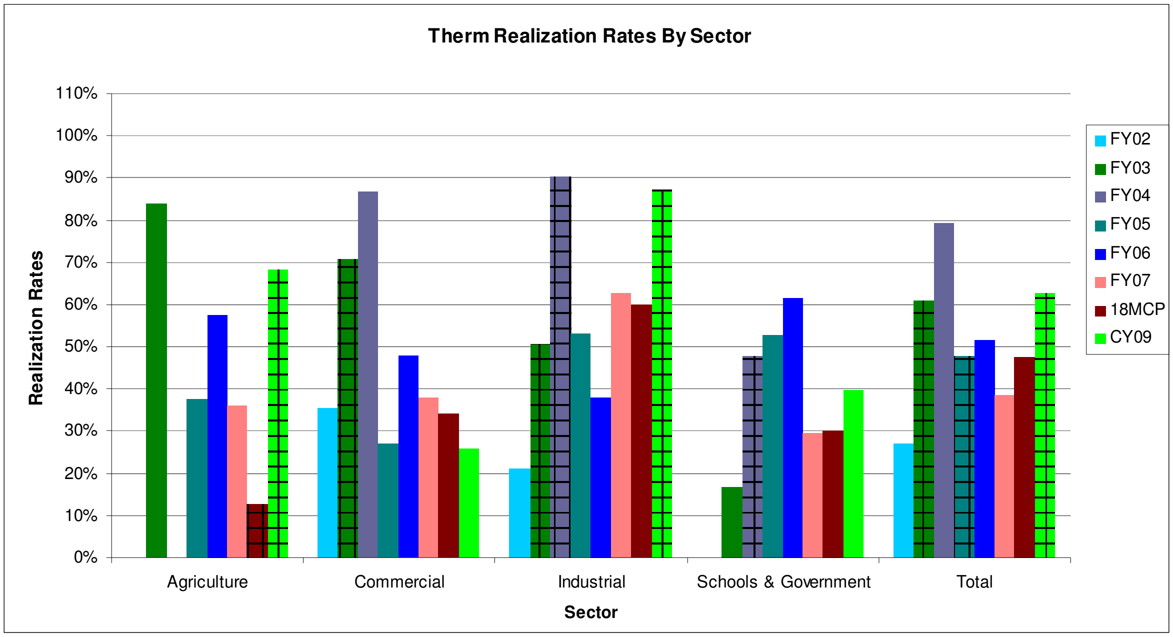
[a] Differences over time reflect some methodological changes. FY06 increases in kWh and kW adjustment factors are primarily due to methodological changes.
[b] FY07 results are an amalgam of FY06 and FY07 measures. See the FY07 impact evaluation memo for more details.

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 sector and for Focus Business Programs overall. Estimating adjustment factors at the 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 CY09 at the 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.[57]

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[57] 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)

		kWh			kW			Therms		
Segment	**Sector/Program**	**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

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net
Channel Motors	Channel Motors & VSDs-Commercial[b]	99,835	97,249	58,392	2	2	1	0	0	0
Channel Motors	Channel Motors & VSDs-Industrialb	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

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net
	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

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net
	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

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net
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

Segment	Sector/Program	kWh			kW			Therms		
		Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net	Tracking Gross[a]	Verified Gross	Net
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

Table C-14. Agriculture Sample Disposition by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
1	Agriculture	Not Deemed	No Therms	209	747	2	2	Exhausted
2	Agriculture	Not Deemed	No Therms	1,242	168	1	2	Exhausted
3	Agriculture	Not Deemed	No Therms	4,269	65	1	2	Exhausted
4	Agriculture	Not Deemed	Has Therms	1,722	48	2	3	Exhausted
5	Agriculture	Not Deemed	Has Therms	8,571	13	2	2	Exhausted
6	Agriculture	Not Deemed	Has Therms	86,321	2	2	1	Exhausted
7	Boilers & Burners	Deemed	Has Therms	1,885	3	1	1	Exhausted
8	Boilers & Burners	Not Deemed	No Therms	1,032	2	1	1	Exhausted
9	Boilers & Burners	Not Deemed	Has Therms	2,432	2	1	2	Exhausted
10	CFL	Deemed	No Therms	33	3,218	3	2	Exhausted
11	CFL	Deemed	No Therms	106	1,246	3	3	Available
12	CFL	Deemed	No Therms	182	803	3	4	Exhausted
13	CFL	Deemed	No Therms	612	327	2	3	Exhausted
14	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	1,217	2	1	2	Exhausted
15	HVAC	Deemed	No Therms	569	73	3	7	Available
16	HVAC	Deemed	No Therms	2,009	26	3	6	Available
17	HVAC	Deemed	No Therms	3,999	14	3	4	Available
18	HVAC	Deemed	No Therms	8,191	8	3	5	Exhausted
19	HVAC	Deemed	No Therms	14,929	6	3	1	Exhausted
20	HVAC	Deemed	No Therms	30,866	1	1	1	Exhausted
21	HVAC	Deemed	Has Therms	287	1	1	1	Exhausted
22	HVAC	Deemed	Has Therms	15,152	1	1	1	Exhausted
23	HVAC	Not Deemed	No Therms	2,092	35	1	2	Exhausted
24	HVAC	Not Deemed	Has Therms	222	2	1	1	Exhausted
25	Lighting	Deemed	No Therms	278	123	3	8	Available
26	Lighting	Deemed	No Therms	979	44	2	5	Available
27	Lighting	Deemed	No Therms	2,021	24	2	6	Available
28	Lighting	Deemed	No Therms	6,575	10	2	4	Exhausted
29	Lighting	Not Deemed	No Therms	389	236	1	1	Exhausted
30	Motors & Drives	Deemed	No Therms	69	8	1	2	Available
31	Motors & Drives	Not Deemed	No Therms	1,159	55	2	2	Exhausted
32	Other	Deemed	No Therms	22	1	1	0	Exhausted
33	Other	Not Deemed	No Therms	1,334	132	2	2	Exhausted
34	Other	Not Deemed	Has Therms	2,377	17	1	1	Exhausted
35	Refrigeration	Not Deemed	No Therms	1,880	1	1	0	Exhausted
36	Waste Water Treatment	Not Deemed	No Therms	258	12	1	2	Exhausted
	All	**All**	**All**		**7,476**	**64**	**92**	

Table C-15. Commercial Sample Disposition by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
37	Boilers & Burners	Deemed	Has Therms	433	231	3	6	Available
38	Boilers & Burners	Deemed	Has Therms	2,010	66	3	14	Available
39	Boilers & Burners	Deemed	Has Therms	4,617	33	3	13	Available
40	Boilers & Burners	Deemed	Has Therms	43,363	6	2	4	Exhausted
41	Boilers & Burners	Not Deemed	No Therms	691	10	1	2	Exhausted
42	Boilers & Burners	Not Deemed	Has Therms	5,391	62	2	1	Exhausted
43	Boilers & Burners	Not Deemed	Has Therms	51,391	10	2	2	Exhausted
44	CFL	Deemed	No Therms	55	6,117	3	3	Available
45	CFL	Deemed	No Therms	246	1,788	3	3	Available
46	CFL	Deemed	No Therms	671	798	3	3	Available
47	CFL	Deemed	No Therms	1,569	405	3	4	Available
48	CFL	Deemed	No Therms	3,876	197	3	6	Available
49	CFL	Deemed	No Therms	14,748	70	2	5	Available
50	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	1,285	12	1	1	Exhausted
51	HVAC	Deemed	No Therms	429	153	3	4	Available
52	HVAC	Deemed	No Therms	4,447	22	3	5	Exhausted
53	HVAC	Deemed	No Therms	9,011	13	2	2	Exhausted
54	HVAC	Deemed	Has Therms	605	84	3	3	Available
55	HVAC	Deemed	Has Therms	6,438	13	3	3	Available
56	HVAC	Deemed	Has Therms	12,884	7	3	4	Exhausted
57	HVAC	Deemed	Has Therms	20,635	5	3	3	Available
58	HVAC	Deemed	Has Therms	29,402	4	3	3	Exhausted
59	HVAC	Not Deemed	No Therms	818	558	2	2	Exhausted
60	HVAC	Not Deemed	No Therms	4,497	135	2	3	Exhausted
61	HVAC	Not Deemed	No Therms	11,738	62	2	1	Exhausted
62	HVAC	Not Deemed	No Therms	40,354	24	2	3	Exhausted
63	HVAC	Not Deemed	Has Therms	4,130	96	2	1	Exhausted
64	HVAC	Not Deemed	Has Therms	40,825	15	2	1	Exhausted
65	Lighting	Deemed	No Therms	187	1,316	7	9	Available
66	Lighting	Deemed	No Therms	966	333	7	19	Available
67	Lighting	Deemed	No Therms	2,324	165	7	13	Available
68	Lighting	Deemed	No Therms	5,868	79	6	20	Available
69	Lighting	Deemed	No Therms	17,390	34	6	20	Available
70	Lighting	Not Deemed	No Therms	505	1,193	3	2	Exhausted
71	Lighting	Not Deemed	No Therms	3,516	234	3	4	Exhausted
72	Lighting	Not Deemed	No Therms	16,747	70	3	3	Exhausted
73	Motors & Drives	Deemed	No Therms	90	40	2	7	Available
74	Motors & Drives	Not Deemed	No Therms	2,192	28	2	2	Exhausted
75	New Construction	Not Deemed	No Therms	5,313	2	1	2	Exhausted
76	New Construction	Not Deemed	Has Therms	22,402	13	2	3	Exhausted
77	Other	Deemed	No Therms	245	238	3	5	Available
78	Other	Deemed	Has Therms	899	74	3	12	Available
79	Other	Not Deemed	No Therms	1,026	183	2	1	Exhausted
80	Other	Not Deemed	Has Therms	1,755	163	2	2	Exhausted
81	Process	Not Deemed	No Therms	10,979	2	1	2	Exhausted
82	Refrigeration	Deemed	No Therms	1,275	94	3	16	Available
83	Refrigeration	Deemed	No Therms	9,363	17	3	11	Exhausted
84	Refrigeration	Deemed	No Therms	15,739	12	2	9	Exhausted
85	Refrigeration	Not Deemed	No Therms	482	496	3	2	Exhausted
86	Refrigeration	Not Deemed	No Therms	8,579	50	2	2	Exhausted

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
87	Refrigeration	Not Deemed	No Therms	184,885	1	1	1	Exhausted
88	Refrigeration	Not Deemed	Has Therms	4,585	16	1	2	Exhausted
89	Waste Water Treatment	Not Deemed	No Therms	768	13	1	2	Exhausted
	All	**All**	**All**		**15,862**	**145**	**276**	

Table C-16. Industrial Sample Disposition by Stratum

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
90	Agriculture	Not Deemed	No Therms	694	1	1	1	Exhausted
91	Boilers & Burners	Deemed	Has Therms	969	53	4	8	Available
92	Boilers & Burners	Deemed	Has Therms	4,446	15	3	8	Available
93	Boilers & Burners	Deemed	Has Therms	9,111	9	3	4	Exhausted
94	Boilers & Burners	Deemed	Has Therms	16,456	5	3	3	Exhausted
95	Boilers & Burners	Deemed	Has Therms	26,896	4	3	3	Exhausted
96	Boilers & Burners	Deemed	Has Therms	73,688	4	4	2	Exhausted
97	Boilers & Burners	Not Deemed	No Therms	8,607	9	1	0	Exhausted
98	Boilers & Burners	Not Deemed	Has Therms	10,152	33	3	5	Exhausted
99	Boilers & Burners	Not Deemed	Has Therms	43,210	11	3	5	Exhausted
100	Boilers & Burners	Not Deemed	Has Therms	111,911	5	2	2	Exhausted
101	Boilers & Burners	Not Deemed	Has Therms	556,145	1	1	1	Exhausted
102	CFL	Deemed	No Therms	579	37	1	8	Exhausted
103	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	2,533	231	3	5	Exhausted
104	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	8,076	89	3	4	Exhausted
105	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	26,439	35	3	2	Exhausted
106	Compressed Air, Vacuum Pumps	Not Deemed	Has Therms	17,940	11	2	2	Exhausted
107	HVAC	Deemed	No Therms	822	31	2	6	Available
108	HVAC	Deemed	Has Therms	1,005	11	2	2	Exhausted
109	HVAC	Deemed	Has Therms	5,318	4	1	3	Exhausted
110	HVAC	Deemed	Has Therms	50,673	1	1	0	Exhausted
111	HVAC	Not Deemed	No Therms	3,221	169	3	4	Exhausted
112	HVAC	Not Deemed	No Therms	23,203	34	2	1	Exhausted
113	HVAC	Not Deemed	Has Therms	14,425	40	3	5	Exhausted
114	HVAC	Not Deemed	Has Therms	140,606	6	2	3	Exhausted
115	Industrial Ovens and Furnaces	Not Deemed	No Therms	27,597	1	1	1	Exhausted
116	Industrial Ovens and Furnaces	Not Deemed	Has Therms	25,793	7	2	2	Exhausted
117	Industrial Ovens and Furnaces	Not Deemed	Has Therms	127,079	2	1	2	Exhausted
118	Industrial Ovens and Furnaces	Not Deemed	Has Therms	240,780	1	1	0	Exhausted
119	Lighting	Deemed	No Therms	415	640	7	27	Available
120	Lighting	Deemed	No Therms	2,312	152	7	15	Available
121	Lighting	Deemed	No Therms	4,899	83	7	20	Available
122	Lighting	Deemed	No Therms	9,136	50	7	19	Available
123	Lighting	Deemed	No Therms	16,401	31	6	15	Exhausted
124	Lighting	Deemed	No Therms	32,322	19	6	7	Exhausted

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
125	Lighting	Not Deemed	No Therms	879	680	3	4	Exhausted
126	Lighting	Not Deemed	No Therms	3,688	204	3	4	Exhausted
127	Lighting	Not Deemed	No Therms	7,333	118	3	2	Exhausted
128	Lighting	Not Deemed	No Therms	12,691	76	3	3	Exhausted
129	Lighting	Not Deemed	No Therms	20,582	52	3	4	Exhausted
130	Lighting	Not Deemed	No Therms	41,347	30	3	5	Exhausted
131	Motors & Drives	Deemed	No Therms	41	556	3	12	Available
132	Motors & Drives	Deemed	No Therms	213	149	2	10	Exhausted
133	Motors & Drives	Not Deemed	No Therms	8,033	27	3	3	Exhausted
134	New Construction	Not Deemed	Has Therms	22,393	4	1	2	Exhausted
135	New Construction	Not Deemed	Has Therms	193,920	2	2	1	Exhausted
136	Other	Deemed	No Therms	134	9	1	2	Available
137	Other	Not Deemed	No Therms	21,349	6	1	1	Exhausted
138	Other	Not Deemed	Has Therms	5,760	19	1	2	Exhausted
139	Process	Not Deemed	No Therms	3,195	105	3	5	Exhausted
140	Process	Not Deemed	No Therms	26,102	19	3	3	Exhausted
141	Process	Not Deemed	No Therms	91,697	7	2	2	Exhausted
142	Process	Not Deemed	No Therms	287,291	1	1	1	Exhausted
143	Process	Not Deemed	Has Therms	22,979	18	4	6	Exhausted
144	Process	Not Deemed	Has Therms	78,184	6	4	4	Exhausted
145	Process	Not Deemed	Has Therms	128,621	5	4	5	Exhausted
146	Process	Not Deemed	Has Therms	157,333	4	3	3	Exhausted
147	Process	Not Deemed	Has Therms	219,695	3	3	1	Exhausted
148	Process	Not Deemed	Has Therms	545,844	7	7	6	Exhausted
149	Refrigeration	Not Deemed	No Therms	18,018	22	3	4	Exhausted
150	Refrigeration	Not Deemed	Has Therms	5,887	1	1	1	Exhausted
151	Waste Water Treatment	Not Deemed	No Therms	19,442	28	3	4	Exhausted
	All	**All**	**All**		**3,993**	**177**	**295**	

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

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
152	Agriculture	Not Deemed	Has Therms	341	1	1	1	Exhausted
153	Boilers & Burners	Deemed	Has Therms	773	164	6	14	Available
154	Boilers & Burners	Deemed	Has Therms	2,131	71	6	19	Available
155	Boilers & Burners	Deemed	Has Therms	4,257	41	6	15	Available
156	Boilers & Burners	Deemed	Has Therms	7,976	24	6	13	Exhausted
157	Boilers & Burners	Deemed	Has Therms	17,341	14	6	11	Exhausted
158	Boilers & Burners	Not Deemed	No Therms	723	33	1	2	Exhausted
159	Boilers & Burners	Not Deemed	Has Therms	2,264	166	2	2	Exhausted
160	Boilers & Burners	Not Deemed	Has Therms	4,760	91	2	3	Exhausted
161	Boilers & Burners	Not Deemed	Has Therms	7,901	60	2	1	Exhausted

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
162	Boilers & Burners	Not Deemed	Has Therms	11,622	45	2	1	Exhausted
163	Boilers & Burners	Not Deemed	Has Therms	19,167	29	2	2	Exhausted
164	Boilers & Burners	Not Deemed	Has Therms	47,722	15	1	1	Exhausted
165	CFL	Deemed	No Therms	1,160	87	2	6	Available
166	CFL	Deemed	No Therms	28,523	7	2	3	Exhausted
167	CFL	Deemed	No Therms	123,769	1	1	1	Exhausted
168	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	3,417	10	1	2	Exhausted
169	HVAC	Deemed	No Therms	420	31	1	3	Available
170	HVAC	Deemed	Has Therms	3,679	35	5	15	Exhausted
171	HVAC	Deemed	Has Therms	12,272	13	5	9	Exhausted
172	HVAC	Deemed	Has Therms	18,667	10	4	5	Exhausted
173	HVAC	Deemed	Has Therms	25,283	7	4	4	Exhausted
174	HVAC	Deemed	Has Therms	34,556	6	4	4	Exhausted
175	HVAC	Deemed	Has Therms	67,336	4	4	3	Exhausted
176	HVAC	Not Deemed	No Therms	1,403	400	3	4	Exhausted
177	HVAC	Not Deemed	No Therms	6,481	112	2	3	Exhausted
178	HVAC	Not Deemed	No Therms	21,217	44	2	1	Exhausted
179	HVAC	Not Deemed	No Therms	137,880	1	1	1	Exhausted
180	HVAC	Not Deemed	Has Therms	4,066	140	3	2	Exhausted
181	Lighting	Deemed	No Therms	180	543	4	5	Available
182	Lighting	Deemed	No Therms	824	152	3	9	Available
183	Lighting	Deemed	No Therms	1,602	89	3	9	Available
184	Lighting	Deemed	No Therms	3,149	52	3	15	Exhausted
185	Lighting	Deemed	No Therms	14,140	17	3	5	Available
186	Lighting	Not Deemed	No Therms	742	552	3	4	Exhausted
187	Lighting	Not Deemed	No Therms	6,023	103	2	1	Exhausted
188	Motors & Drives	Deemed	No Therms	73	100	2	7	Available
189	Motors & Drives	Not Deemed	No Therms	2,359	28	2	0	Exhausted
190	New Construction	Not Deemed	Has Therms	19,351	6	1	1	Exhausted
191	Other	Deemed	No Therms	265	100	2	10	Available
192	Other	Deemed	Has Therms	583	20	3	4	Available
193	Other	Not Deemed	No Therms	3,714	58	2	1	Exhausted
194	Other	Not Deemed	Has Therms	2,465	156	2	3	Exhausted
195	Process	Not Deemed	No Therms	879	1	1	1	Exhausted
196	Refrigeration	Not Deemed	No Therms	548	23	1	1	Exhausted
197	Waste Water Treatment	Not Deemed	No Therms	3,030	30	2	1	Exhausted
	All	**All**	**All**		**3,692**	**126**	**228**	

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	Agriculture	Not Deemed	No Therms	209	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%
2	Agriculture	Not Deemed	No Therms	1,242	0.6%	0.6%	0.0%	0.0%	0.0%	0.0%
3	Agriculture	Not Deemed	No Therms	4,269	0.7%	0.8%	0.0%	0.1%	0.0%	0.0%
4	Agriculture	Not Deemed	Has Therms	1,722	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
5	Agriculture	Not Deemed	Has Therms	8,571	0.0%	0.0%	0.5%	0.0%	0.0%	0.1%
6	Agriculture	Not Deemed	Has Therms	86,321	0.0%	0.0%	0.7%	0.0%	0.0%	0.5%
7	Boilers & Burners	Deemed	Has Therms	1,885	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	Boilers & Burners	Not Deemed	No Therms	1,032	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
9	Boilers & Burners	Not Deemed	Has Therms	2,432	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	CFL	Deemed	No Therms	33	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%
11	CFL	Deemed	No Therms	106	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%
12	CFL	Deemed	No Therms	182	0.4%	0.5%	0.0%	0.0%	0.0%	0.0%
13	CFL	Deemed	No Therms	612	0.5%	0.6%	0.0%	0.0%	0.0%	0.0%
14	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	1,217	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
15	HVAC	Deemed	No Therms	569	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
16	HVAC	Deemed	No Therms	2,009	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
17	HVAC	Deemed	No Therms	3,999	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
18	HVAC	Deemed	No Therms	8,191	0.2%	0.2%	0.0%	0.1%	0.1%	0.0%
19	HVAC	Deemed	No Therms	14,929	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%
20	HVAC	Deemed	No Therms	30,866	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
21	HVAC	Deemed	Has Therms	287	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
22	HVAC	Deemed	Has Therms	15,152	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
23	HVAC	Not Deemed	No Therms	2,092	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
24	HVAC	Not Deemed	Has Therms	222	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25	Lighting	Deemed	No Therms	278	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
26	Lighting	Deemed	No Therms	979	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
27	Lighting	Deemed	No Therms	2,021	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
28	Lighting	Deemed	No Therms	6,575	0.2%	0.2%	0.0%	0.1%	0.1%	0.0%
29	Lighting	Not Deemed	No Therms	389	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%
30	Motors & Drives	Deemed	No Therms	69	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
31	Motors & Drives	Not Deemed	No Therms	1,159	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
32	Other	Deemed	No Therms	22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
33	Other	Not Deemed	No Therms	1,334	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%
34	Other	Not Deemed	Has Therms	2,377	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
35	Refrigeration	Not Deemed	No Therms	1,880	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	Waste Water Treatment	Not Deemed	No Therms	258	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	All	**All**	**All**		**6.2%**	**6.3%**	**1.6%**	**0.6%**	**0.6%**	**0.7%**

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
37	Boilers & Burners	Deemed	Has Therms	433	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
38	Boilers & Burners	Deemed	Has Therms	2,010	0.0%	0.0%	0.6%	0.0%	0.0%	0.1%
39	Boilers & Burners	Deemed	Has Therms	4,617	0.0%	0.0%	0.7%	0.0%	0.0%	0.3%
40	Boilers & Burners	Deemed	Has Therms	43,363	0.0%	0.0%	1.1%	0.0%	0.0%	0.8%
41	Boilers & Burners	Not Deemed	No Therms	691	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
42	Boilers & Burners	Not Deemed	Has Therms	5,391	0.0%	0.0%	1.4%	0.0%	0.0%	0.1%
43	Boilers & Burners	Not Deemed	Has Therms	51,391	0.0%	0.0%	2.2%	0.0%	0.0%	0.4%
44	CFL	Deemed	No Therms	55	0.8%	1.1%	0.0%	0.0%	0.0%	0.0%
45	CFL	Deemed	No Therms	246	1.1%	1.4%	0.0%	0.0%	0.0%	0.0%
46	CFL	Deemed	No Therms	671	1.3%	1.7%	0.0%	0.0%	0.0%	0.0%
47	CFL	Deemed	No Therms	1,569	1.6%	2.0%	0.0%	0.0%	0.0%	0.0%
48	CFL	Deemed	No Therms	3,876	1.9%	2.4%	0.0%	0.1%	0.1%	0.0%
49	CFL	Deemed	No Therms	14,748	2.5%	3.2%	0.0%	0.3%	0.4%	0.0%
50	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	1,285	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
51	HVAC	Deemed	No Therms	429	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%
52	HVAC	Deemed	No Therms	4,447	0.3%	0.2%	0.0%	0.0%	0.1%	0.0%
53	HVAC	Deemed	No Therms	9,011	0.4%	0.2%	0.0%	0.0%	0.1%	0.0%
54	HVAC	Deemed	Has Therms	605	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
55	HVAC	Deemed	Has Therms	6,438	0.0%	0.0%	0.4%	0.0%	0.0%	0.1%
56	HVAC	Deemed	Has Therms	12,884	0.0%	0.0%	0.4%	0.0%	0.0%	0.2%
57	HVAC	Deemed	Has Therms	20,635	0.0%	0.0%	0.4%	0.0%	0.0%	0.3%
58	HVAC	Deemed	Has Therms	29,402	0.0%	0.0%	0.5%	0.0%	0.0%	0.4%
59	HVAC	Not Deemed	No Therms	818	0.9%	1.7%	0.0%	0.0%	0.0%	0.0%
60	HVAC	Not Deemed	No Therms	4,497	1.3%	2.1%	0.0%	0.0%	0.1%	0.0%
61	HVAC	Not Deemed	No Therms	11,738	1.3%	2.9%	0.0%	0.0%	0.1%	0.0%
62	HVAC	Not Deemed	No Therms	40,354	1.6%	4.1%	0.0%	0.2%	0.6%	0.0%
63	HVAC	Not Deemed	Has Therms	4,130	0.5%	0.5%	0.9%	0.0%	0.0%	0.0%
64	HVAC	Not Deemed	Has Therms	40,825	0.5%	0.3%	1.9%	0.0%	0.1%	0.1%
65	Lighting	Deemed	No Therms	187	0.7%	0.6%	0.0%	0.0%	0.0%	0.0%
66	Lighting	Deemed	No Therms	966	0.9%	0.9%	0.0%	0.1%	0.1%	0.0%
67	Lighting	Deemed	No Therms	2,324	1.1%	1.0%	0.0%	0.1%	0.1%	0.0%
68	Lighting	Deemed	No Therms	5,868	1.3%	1.2%	0.0%	0.3%	0.3%	0.0%
69	Lighting	Deemed	No Therms	17,390	1.6%	1.6%	0.0%	0.9%	0.8%	0.0%
70	Lighting	Not Deemed	No Therms	505	1.7%	1.6%	0.0%	0.0%	0.0%	0.0%
71	Lighting	Not Deemed	No Therms	3,516	2.2%	2.3%	0.0%	0.0%	0.0%	0.0%
72	Lighting	Not Deemed	No Therms	16,747	3.2%	3.1%	0.0%	0.1%	0.1%	0.0%
73	Motors & Drives	Deemed	No Therms	90	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
74	Motors & Drives	Not Deemed	No Therms	2,192	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
75	New Construction	Not Deemed	No Therms	5,313	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
76	New Construction	Not Deemed	Has Therms	22,402	0.5%	0.6%	0.5%	0.2%	0.1%	0.0%
77	Other	Deemed	No Therms	245	0.2%	0.1%	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
78	Other	Deemed	Has Therms	899	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
79	Other	Not Deemed	No Therms	1,026	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%
80	Other	Not Deemed	Has Therms	1,755	0.1%	0.1%	1.1%	0.0%	0.0%	0.0%
81	Process	Not Deemed	No Therms	10,979	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
82	Refrigeration	Deemed	No Therms	1,275	0.5%	0.1%	0.0%	0.1%	0.0%	0.0%
83	Refrigeration	Deemed	No Therms	9,363	0.6%	0.2%	0.0%	0.3%	0.2%	0.0%
84	Refrigeration	Deemed	No Therms	15,739	0.6%	0.3%	0.0%	0.5%	0.2%	0.0%
85	Refrigeration	Not Deemed	No Therms	482	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%
86	Refrigeration	Not Deemed	No Therms	8,579	1.3%	0.9%	0.0%	0.0%	0.0%	0.0%
87	Refrigeration	Not Deemed	No Therms	184,885	0.6%	0.4%	0.0%	0.6%	0.4%	0.0%
88	Refrigeration	Not Deemed	Has Therms	4,585	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
89	Waste Water Treatment	Not Deemed	No Therms	768	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	All	**All**	**All**		**34.8%**	**39.9%**	**13.2%**	**4.0%**	**4.0%**	**2.9%**

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
90	Agriculture	Not Deemed	No Therms	694	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
91	Boilers & Burners	Deemed	Has Therms	969	0.0%	0.0%	0.3%	0.0%	0.0%	0.1%
92	Boilers & Burners	Deemed	Has Therms	4,446	0.0%	0.0%	0.3%	0.0%	0.0%	0.2%
93	Boilers & Burners	Deemed	Has Therms	9,111	0.0%	0.0%	0.4%	0.0%	0.0%	0.2%
94	Boilers & Burners	Deemed	Has Therms	16,456	0.0%	0.0%	0.4%	0.0%	0.0%	0.3%
95	Boilers & Burners	Deemed	Has Therms	26,896	0.0%	0.0%	0.5%	0.0%	0.0%	0.4%
96	Boilers & Burners	Deemed	Has Therms	73,688	0.0%	0.0%	1.5%	0.0%	0.0%	0.9%
97	Boilers & Burners	Not Deemed	No Therms	8,607	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%
98	Boilers & Burners	Not Deemed	Has Therms	10,152	0.0%	0.0%	1.7%	0.0%	0.0%	0.2%
99	Boilers & Burners	Not Deemed	Has Therms	43,210	0.0%	0.0%	2.3%	0.0%	0.0%	1.0%
100	Boilers & Burners	Not Deemed	Has Therms	111,911	0.1%	0.0%	2.6%	0.1%	0.1%	0.8%
101	Boilers & Burners	Not Deemed	Has Therms	556,145	0.0%	0.0%	2.7%	0.0%	0.0%	2.7%
102	CFL	Deemed	No Therms	579	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
103	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	2,533	1.7%	1.5%	0.0%	0.0%	0.0%	0.0%
104	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	8,076	2.3%	1.5%	0.0%	0.1%	0.1%	0.0%
105	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	26,439	3.2%	1.6%	0.0%	0.1%	0.1%	0.0%
106	Compressed Air, Vacuum Pumps	Not Deemed	Has Therms	17,940	0.3%	0.1%	0.6%	0.0%	0.0%	0.1%
107	HVAC	Deemed	No Therms	822	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
108	HVAC	Deemed	Has Therms	1,005	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
109	HVAC	Deemed	Has Therms	5,318	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
110	HVAC	Deemed	Has Therms	50,673	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
111	HVAC	Not Deemed	No Therms	3,221	1.1%	2.1%	0.0%	0.0%	0.0%	0.0%
112	HVAC	Not Deemed	No Therms	23,203	1.7%	2.6%	0.0%	0.1%	0.1%	0.0%
113	HVAC	Not Deemed	Has Therms	14,425	0.2%	0.2%	2.5%	0.0%	0.1%	0.5%
114	HVAC	Not Deemed	Has Therms	140,606	0.3%	0.1%	3.8%	0.2%	0.0%	2.0%
115	Industrial Ovens and Furnaces	Not Deemed	No Therms	27,597	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
116	Industrial Ovens and Furnaces	Not Deemed	Has Therms	25,793	-0.1%	0.0%	1.0%	0.0%	0.0%	0.1%

Stratum	Measure Group	Deemed	Therms	Average Avoided Cost	Fraction of Frame Total Reported Gross Savings					
					Frame			Sample		
					kWh	kW	Therms	kWh	kW	Therms
117	Industrial Ovens and Furnaces	Not Deemed	Has Therms	127,079	0.0%	0.0%	1.3%	0.0%	0.0%	1.3%
118	Industrial Ovens and Furnaces	Not Deemed	Has Therms	240,780	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%
119	Lighting	Deemed	No Therms	415	0.8%	0.5%	0.0%	0.0%	0.0%	0.0%
120	Lighting	Deemed	No Therms	2,312	1.0%	0.8%	0.0%	0.1%	0.1%	0.0%
121	Lighting	Deemed	No Therms	4,899	1.2%	1.0%	0.0%	0.3%	0.2%	0.0%
122	Lighting	Deemed	No Therms	9,136	1.4%	1.0%	0.0%	0.5%	0.3%	0.0%
123	Lighting	Deemed	No Therms	16,401	1.5%	1.2%	0.0%	0.7%	0.5%	0.0%
124	Lighting	Deemed	No Therms	32,322	1.8%	1.5%	0.0%	0.6%	0.6%	0.0%
125	Lighting	Not Deemed	No Therms	879	1.8%	1.4%	0.0%	0.0%	0.0%	0.0%
126	Lighting	Not Deemed	No Therms	3,688	2.2%	1.8%	0.0%	0.1%	0.0%	0.0%
127	Lighting	Not Deemed	No Therms	7,333	2.5%	2.1%	0.0%	0.0%	0.0%	0.0%
128	Lighting	Not Deemed	No Therms	12,691	2.8%	2.4%	0.0%	0.1%	0.1%	0.0%
129	Lighting	Not Deemed	No Therms	20,582	3.2%	2.5%	0.0%	0.3%	0.2%	0.0%
130	Lighting	Not Deemed	No Therms	41,347	3.7%	2.9%	0.0%	0.6%	0.4%	0.0%
131	Motors & Drives	Deemed	No Therms	41	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
132	Motors & Drives	Deemed	No Therms	213	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
133	Motors & Drives	Not Deemed	No Therms	8,033	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%
134	New Construction	Not Deemed	Has Therms	22,393	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
135	New Construction	Not Deemed	Has Therms	193,920	0.6%	0.8%	0.8%	0.5%	0.4%	0.1%
136	Other	Deemed	No Therms	134	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
137	Other	Not Deemed	No Therms	21,349	0.6%	0.0%	0.0%	0.1%	0.0%	0.0%
138	Other	Not Deemed	Has Therms	5,760	0.0%	0.0%	0.5%	0.0%	0.0%	0.1%
139	Process	Not Deemed	No Therms	3,195	1.1%	0.7%	0.0%	0.1%	0.0%	0.0%
140	Process	Not Deemed	No Therms	26,102	1.7%	0.9%	0.0%	0.3%	0.2%	0.0%
141	Process	Not Deemed	No Therms	91,697	2.2%	1.1%	0.0%	0.5%	0.1%	0.0%
142	Process	Not Deemed	No Therms	287,291	1.0%	0.5%	0.0%	1.0%	0.5%	0.0%
143	Process	Not Deemed	Has Therms	22,979	0.4%	0.1%	1.5%	0.1%	0.1%	0.4%
144	Process	Not Deemed	Has Therms	78,184	0.0%	0.0%	2.3%	0.0%	0.0%	1.5%
145	Process	Not Deemed	Has Therms	128,621	0.0%	0.0%	3.2%	0.0%	0.0%	3.2%
146	Process	Not Deemed	Has Therms	157,333	-0.3%	-0.2%	3.5%	-0.3%	-0.2%	2.7%
147	Process	Not Deemed	Has Therms	219,695	0.9%	0.5%	1.9%	0.0%	0.0%	1.0%
148	Process	Not Deemed	Has Therms	545,844	-0.2%	-0.2%	19.2%	-0.2%	-0.2%	16.2%
149	Refrigeration	Not Deemed	No Therms	18,018	1.1%	1.1%	0.0%	0.3%	0.2%	0.0%
150	Refrigeration	Not Deemed	Has Therms	5,887	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
151	Waste Water Treatment	Not Deemed	No Therms	19,442	2.0%	0.7%	0.0%	0.0%	0.0%	0.0%
	All	**All**	**All**		**47.3%**	**36.2%**	**56.6%**	**6.7%**	**4.3%**	**36.1%**

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
152	Agriculture	Not Deemed	Has Therms	341	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
153	Boilers & Burners	Deemed	Has Therms	773	0.0%	0.0%	0.6%	0.0%	0.0%	0.1%
154	Boilers & Burners	Deemed	Has Therms	2,131	0.0%	0.0%	0.7%	0.0%	0.0%	0.2%
155	Boilers & Burners	Deemed	Has Therms	4,257	0.0%	0.0%	0.8%	0.0%	0.0%	0.3%
156	Boilers & Burners	Deemed	Has Therms	7,976	0.0%	0.0%	0.9%	0.0%	0.0%	0.5%
157	Boilers & Burners	Deemed	Has Therms	17,341	0.0%	0.0%	1.2%	0.0%	0.0%	0.9%
158	Boilers & Burners	Not Deemed	No Therms	723	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
159	Boilers & Burners	Not Deemed	Has Therms	2,264	0.0%	0.0%	1.8%	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
160	Boilers & Burners	Not Deemed	Has Therms	4,760	0.0%	0.0%	2.1%	0.0%	0.0%	0.1%
161	Boilers & Burners	Not Deemed	Has Therms	7,901	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%
162	Boilers & Burners	Not Deemed	Has Therms	11,622	0.0%	0.0%	2.5%	0.0%	0.0%	0.1%
163	Boilers & Burners	Not Deemed	Has Therms	19,167	0.0%	0.0%	2.7%	0.0%	0.0%	0.2%
164	Boilers & Burners	Not Deemed	Has Therms	47,722	0.0%	0.0%	3.4%	0.0%	0.0%	0.2%
165	CFL	Deemed	No Therms	1,160	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%
166	CFL	Deemed	No Therms	28,523	0.5%	0.6%	0.0%	0.1%	0.1%	0.0%
167	CFL	Deemed	No Therms	123,769	0.3%	0.3%	0.0%	0.3%	0.3%	0.0%
168	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	3,417	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
169	HVAC	Deemed	No Therms	420	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
170	HVAC	Deemed	Has Therms	3,679	0.0%	0.0%	0.6%	0.0%	0.0%	0.3%
171	HVAC	Deemed	Has Therms	12,272	0.0%	0.0%	0.8%	0.0%	0.0%	0.5%
172	HVAC	Deemed	Has Therms	18,667	0.0%	0.0%	0.9%	0.0%	0.0%	0.4%
173	HVAC	Deemed	Has Therms	25,283	0.0%	0.0%	0.8%	0.0%	0.0%	0.5%
174	HVAC	Deemed	Has Therms	34,556	0.0%	0.0%	1.0%	0.0%	0.0%	0.7%
175	HVAC	Deemed	Has Therms	67,336	0.0%	0.0%	1.3%	0.0%	0.0%	1.0%
176	HVAC	Not Deemed	No Therms	1,403	1.0%	2.2%	0.0%	0.0%	0.0%	0.0%
177	HVAC	Not Deemed	No Therms	6,481	1.0%	3.4%	0.0%	0.0%	0.1%	0.0%
178	HVAC	Not Deemed	No Therms	21,217	1.1%	4.6%	0.0%	0.0%	0.1%	0.0%
179	HVAC	Not Deemed	No Therms	137,880	0.2%	0.5%	0.0%	0.2%	0.5%	0.0%
180	HVAC	Not Deemed	Has Therms	4,066	0.1%	0.5%	2.3%	0.0%	0.0%	0.0%
181	Lighting	Deemed	No Therms	180	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%
182	Lighting	Deemed	No Therms	824	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
183	Lighting	Deemed	No Therms	1,602	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
184	Lighting	Deemed	No Therms	3,149	0.5%	0.4%	0.0%	0.1%	0.1%	0.0%
185	Lighting	Deemed	No Therms	14,140	0.7%	0.6%	0.0%	0.1%	0.1%	0.0%
186	Lighting	Not Deemed	No Therms	742	1.2%	1.0%	0.0%	0.0%	0.0%	0.0%
187	Lighting	Not Deemed	No Therms	6,023	1.7%	1.6%	0.0%	0.0%	0.0%	0.0%
188	Motors & Drives	Deemed	No Therms	73	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
189	Motors & Drives	Not Deemed	No Therms	2,359	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
190	New Construction	Not Deemed	Has Therms	19,351	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%
191	Other	Deemed	No Therms	265	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
192	Other	Deemed	Has Therms	583	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
193	Other	Not Deemed	No Therms	3,714	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%
194	Other	Not Deemed	Has Therms	2,465	0.1%	0.1%	1.7%	0.0%	0.0%	0.1%
195	Process	Not Deemed	No Therms	879	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
196	Refrigeration	Not Deemed	No Therms	548	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
197	Waste Water Treatment	Not Deemed	No Therms	3,030	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
	All	**All**	**All**		**11.7%**	**17.7%**	**28.6%**	**1.1%**	**1.5%**	**6.1%**

APPENDIX D: SURVEY RESPONSES

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*[58] 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 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.[59] In this round, Engineering sample participants[60] 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 had an effect on timing, efficiency, or quantity of the measure. The follow-up questions are used

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[58] 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.

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

[60] For this round, the CATI sample was exclusively deemed measures, while the engineering sample had custom and some deemed measures. See Section 3 for more details.

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 percent of overall program energy savings represented by those responses. The number of responses does not reflect any survey weight or relative savings but the percent 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	94	24%	34%	30%	244	7%	7%	7%	338	31%	41%	37%
Earlier	3	2%	1%	0%	8	0%	0%	1%	11	2%	1%	1%
Later	89	34%	32%	23%	190	10%	8%	7%	279	44%	40%	30%
Never	42	16%	12%	24%	108	7%	5%	2%	150	23%	17%	26%
Don't Know/Refused	3	0%	0%	6%	8	1%	0%	0%	11	1%	0%	7%

The table shows that 131 of the Not Deemed respondents and 298 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 represent 50 percent of population kWh savings, 44 percent of population kW savings, and 47 percent of the population therm savings. For the Deemed responses, the kWh, kW, and therm savings represented are 17 percent, 13 percent, and 9 percent respectively. In total, 67 percent of program kWh savings, 57 percent of program kW savings, and 56 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, boiler tune-ups, 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	76	28%	28%	17%	236	13%	13%	1%	312	41%	41%	18%
Lower	30	18%	20%	6%	86	5%	5%	0%	116	23%	25%	6%
Higher	0	0%	0%	0%	5	1%	1%	0%	5	1%	1%	0%
Not Applicable	121	29%	32%	59%	216	5%	1%	16%	337	33%	32%	75%
Don't Know/Refused	4	1%	0%	0%	15	1%	1%	0%	19	2%	2%	0%

The table shows that 76 Not Deemed and 236 Deemed respondents would have installed equipment of the same efficiency without the Focus incentives and services. These respondents represent 41 percent of total kWh savings, 41 percent of kW savings, and 18 percent of therm savings. There were a number of measures where efficiency was not applicable, representing 33 percent of kWh savings, 32 percent of kW savings, and 75 percent of therm savings.

The table also shows that 30 Not Deemed and 86 Deemed respondents said that they would have installed Lower efficiency in the absence of the program. These responses represent 23 percent of total kWh savings, 25 percent of kW savings, and six 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	149	44%	49%	42%	349	13%	12%	10%	498	57%	61%	52%
Less	29	13%	11%	5%	129	6%	5%	4%	158	19%	15%	9%
More	1	0%	0%	0%	3	0%	0%	0%	4	0%	0%	0%
None	43	19%	16%	24%	71	5%	4%	3%	114	24%	20%	27%
Not Applicable	9	0%	4%	11%	0	0%	0%	0%	9	0%	4%	11%
Don't Know/Refused	0	0%	0%	0%	6	0%	0%	0%	6	0%	0%	0%

The table shows that 149 of the Not Deemed and 349 of the Deemed respondents would have installed the same quantity without Focus incentives or services, representing 57 percent of total kWh savings, 61 percent of kW savings, and 52 percent of therm savings.

The table also shows that 73 Not Deemed and 203 Deemed respondents would have installed less, more, or no equipment in the absence of Focus. These responses represent 43 percent of program kWh savings, 35 percent of program kW savings, and 36 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 Percent 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, Percent 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	17	0%	0%	16%	74	0%	0%	5%	91	0%	0%	20%
	Expanded Process	14	3%	2%	1%	0	0%	0%	0%	14	3%	2%	1%
	HVAC	21	5%	21%	6%	50	1%	2%	2%	71	6%	23%	8%
	Non-Small CFL Lighting	9	8%	7%	0%	69	5%	4%	0%	78	13%	11%	0%
	Other	29	7%	4%	7%	47	0%	0%	0%	76	7%	4%	7%
	Refrigeration	4	2%	1%	0%	4	0%	0%	0%	8	2%	1%	0%
Earlier	Boilers & Burners	0	0%	0%	0%	2	0%	0%	1%	2	0%	0%	1%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	1	0%	0%	0%	1	0%	0%	0%
	Non-Small CFL Lighting	1	1%	1%	0%	5	0%	0%	0%	6	1%	1%	0%
	Other	1	0%	0%	0%	0	0%	0%	0%	1	0%	0%	0%
	Refrigeration	1	0%	0%	0%	0	0%	0%	0%	1	0%	0%	0%
Later	Boilers & Burners	12	0%	0%	8%	52	0%	0%	4%	64	0%	0%	12%
	Expanded Process	29	8%	4%	10%	0	0%	0%	0%	29	8%	4%	10%
	HVAC	12	6%	12%	3%	31	0%	1%	3%	43	6%	12%	7%
	Non-Small CFL Lighting	19	14%	13%	0%	89	8%	7%	0%	108	22%	20%	0%
	Other	11	4%	1%	2%	7	0%	0%	0%	18	4%	1%	2%
	Refrigeration	6	2%	1%	0%	11	1%	0%	0%	17	3%	1%	0%
Never	Boilers & Burners	4	0%	0%	5%	2	0%	0%	0%	6	0%	0%	5%
	Expanded Process	24	6%	3%	16%	0	0%	0%	0%	24	6%	3%	16%
	HVAC	4	0%	0%	3%	13	0%	0%	2%	17	0%	0%	4%
	Non-Small CFL Lighting	7	9%	9%	0%	64	5%	4%	0%	71	14%	12%	0%
	Other	2	1%	0%	0%	11	0%	0%	0%	13	1%	0%	0%
	Refrigeration	1	0%	0%	0%	18	2%	1%	0%	19	2%	1%	0%
Don't Know/ Refused	Boilers & Burners	0	0%	0%	0%	1	0%	0%	0%	1	0%	0%	0%
	Expanded Process	3	0%	0%	6%	0	0%	0%	0%	3	0%	0%	6%
	HVAC	0	0%	0%	0%	2	0%	0%	0%	2	0%	0%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	4	0%	0%	0%	4	0%	0%	0%
	Other	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Refrigeration	0	0%	0%	0%	1	1%	0%	0%	1	1%	0%	0%
Total	Boilers & Burners	33	0%	0%	28%	131	0%	0%	10%	164	0%	0%	38%
	Expanded Process	70	17%	9%	33%	0	0%	0%	0%	70	17%	9%	33%
	HVAC	37	11%	33%	12%	97	2%	3%	7%	134	13%	36%	20%
	Non-Small CFL Lighting	36	32%	30%	0%	231	19%	16%	0%	267	51%	46%	0%
	Other	43	11%	6%	9%	65	1%	0%	0%	108	12%	6%	9%
	Refrigeration	12	4%	2%	0%	34	4%	1%	0%	46	7%	3%	0%

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 91 responses representing 20 percent of the total therm savings. The majority of the responses were for deemed measures but those only represent five percent of the total savings. The 17 non-deemed responses represent the remaining savings, or 16 percent. For measures with kWh savings, the Non-Small CFL Lighting group was most likely to respond that they would have installed the measure at the same time with 78 responses representing 13 percent of the total kWh savings. For kW, the largest group was HVAC with 71 responses representing 23 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 (179) representing 36 percent of the total kWh savings and 32 percent of the total kW savings. The greatest number of those responses were for deemed measures but they only represented 13 percent of the total kWh savings and 11 percent of the total kW savings. The non-deemed responses had a greater effect, representing 23 percent and 22 percent of total kWh and kW savings respectively. For therm measures, the Expanded Process group had the greatest effect, with 53 responses representing 26 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, Percent 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	17	9%	0%	41%	74	0%	0%	12%	91	9%	0%	53%
	Expanded Process	14	16%	18%	2%	0	0%	0%	0%	14	16%	18%	2%
	HVAC	21	38%	58%	33%	50	9%	7%	11%	71	47%	65%	43%
	Non-Small CFL Lighting	9	15%	16%	0%	69	10%	9%	0%	78	25%	25%	0%
	Other	29	58%	67%	79%	47	2%	3%	1%	76	60%	69%	80%
	Refrigeration	4	21%	24%	16%	4	3%	2%	0%	8	24%	26%	16%
Earlier	Boilers & Burners	0	0%	0%	0%	2	0%	0%	3%	2	0%	0%	3%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	1	0%	0%	0%	1	0%	0%	0%
	Non-Small CFL Lighting	1	2%	1%	0%	5	1%	1%	0%	6	3%	2%	0%
	Other	1	0%	0%	0%	0	0%	0%	0%	1	0%	0%	0%
	Refrigeration	1	5%	8%	0%	0	0%	0%	0%	1	5%	8%	0%
Later	Boilers & Burners	12	10%	0%	21%	52	0%	0%	9%	64	10%	0%	31%
	Expanded Process	29	48%	48%	29%	0	0%	0%	0%	29	48%	48%	29%
	HVAC	12	48%	33%	16%	31	4%	2%	17%	43	51%	34%	33%
	Non-Small CFL Lighting	19	28%	29%	0%	89	16%	16%	0%	108	44%	45%	0%
	Other	11	32%	21%	16%	7	2%	2%	0%	18	34%	23%	16%
	Refrigeration	6	22%	36%	68%	11	14%	3%	0%	17	36%	39%	68%
Never	Boilers & Burners	4	81%	100%	12%	2	0%	0%	1%	6	81%	100%	12%
	Expanded Process	24	36%	34%	50%	0	0%	0%	0%	24	36%	34%	50%
	HVAC	4	2%	0%	15%	13	0%	0%	8%	17	2%	0%	23%
	Non-Small CFL Lighting	7	18%	19%	0%	64	9%	8%	0%	71	27%	27%	0%
	Other	2	5%	7%	2%	11	1%	0%	2%	13	6%	7%	4%
	Refrigeration	1	0%	0%	15%	18	24%	26%	0%	19	24%	26%	15%
Don't Know/ Refused	Boilers & Burners	0	0%	0%	0%	1	0%	0%	1%	1	0%	0%	1%
	Expanded Process	3	0%	0%	19%	0	0%	0%	0%	3	0%	0%	19%
	HVAC	0	0%	0%	0%	2	0%	0%	0%	2	0%	0%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	4	1%	1%	0%	4	1%	1%	0%
	Other	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Refrigeration	0	0%	0%	0%	1	10%	1%	0%	1	10%	1%	0%
Total	Boilers & Burners	33	100%	100%	74%	131	0%	0%	26%	164	100%	100%	100%
	Expanded Process	70	100%	100%	100%	0	0%	0%	0%	70	100%	100%	100%
	HVAC	37	88%	91%	63%	97	12%	9%	37%	134	100%	100%	100%
	Non-Small CFL Lighting	36	63%	65%	0%	231	37%	35%	0%	267	100%	100%	100%
	Other	43	95%	96%	97%	65	5%	4%	3%	108	100%	100%	100%
	Refrigeration	12	49%	67%	100%	34	51%	33%	0%	46	100%	100%	100%

The table shows that the Other measure group has the highest proportion of savings represented by "Same Time" responses, at 60 percent kWh, 69 percent kW, and 80 percent of measure group therm savings. The Expanded Process measure group has the lowest proportion of savings represented by "Same Time" responses, at 16 percent of kWh, 18 percent of kW, and 2 percent of therms.

Table D-7 shows the distribution of responses to the DAT2a efficiency question by reporting measure group. In the table, the Percent 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, Percent 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
	Boilers & Burners	5	0%	0%	2%	7	0%	0%	1%	12	0%	0%	3%
	Expanded Process	14	2%	1%	4%	0	0%	0%	0%	14	2%	1%	4%
	HVAC	10	-1%	5%	8%	28	1%	2%	0%	38	0%	7%	8%
	Non-Small CFL Lighting	26	22%	19%	0%	149	12%	11%	0%	175	33%	30%	0%
	Other	19	4%	2%	3%	43	0%	0%	0%	62	5%	3%	3%
Same	Refrigeration	2	1%	0%	0%	9	0%	0%	0%	11	1%	0%	0%
	Boilers & Burners	1	0%	0%	0%	4	0%	0%	0%	5	0%	0%	0%
	Expanded Process	3	0%	0%	0%	0	0%	0%	0%	3	0%	0%	0%
	HVAC	5	4%	9%	0%	15	1%	1%	0%	20	5%	10%	0%
	Non-Small CFL Lighting	6	7%	8%	0%	41	3%	3%	0%	47	11%	11%	0%
	Other	12	5%	2%	6%	10	0%	0%	0%	22	5%	2%	6%
Lower	Refrigeration	3	1%	1%	0%	16	2%	1%	0%	19	3%	1%	0%
	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%	5	1%	1%	0%	5	1%	1%	0%
	Other	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Higher	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Boilers & Burners	26	0%	0%	26%	119	0%	0%	9%	145	0%	0%	35%
	Expanded Process	52	13%	7%	28%	0	0%	0%	0%	52	13%	7%	28%
	HVAC	22	7%	19%	4%	51	0%	0%	7%	73	8%	19%	11%
	Non-Small CFL Lighting	4	3%	3%	0%	27	2%	0%	0%	31	6%	3%	0%
	Other	10	2%	1%	0%	10	0%	0%	0%	20	2%	1%	1%
Not Applicable	Refrigeration	7	2%	1%	0%	9	2%	0%	0%	16	4%	2%	0%
	Boilers & Burners	1	0%	0%	0%	1	0%	0%	0%	2	0%	0%	0%
	Expanded Process	1	1%	0%	0%	0	0%	0%	0%	1	1%	0%	0%
	HVAC	0	0%	0%	0%	3	0%	0%	0%	3	0%	0%	0%
	Non-Small CFL Lighting	0	0%	0%	0%	9	1%	1%	0%	9	1%	1%	0%
	Other	2	0%	0%	0%	2	0%	0%	0%	4	0%	0%	0%
Don't Know/ Refused	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Boilers & Burners	33	0%	0%	28%	131	0%	0%	10%	164	0%	0%	38%
	Expanded Process	70	17%	9%	33%	0	0%	0%	0%	70	17%	9%	33%
	HVAC	37	11%	33%	12%	97	2%	3%	7%	134	13%	36%	20%
	Non-Small CFL Lighting	36	32%	30%	0%	231	19%	16%	0%	267	51%	46%	0%
	Other	43	11%	6%	9%	65	1%	0%	0%	108	12%	6%	9%
Total	Refrigeration	12	4%	2%	0%	34	4%	1%	0%	46	7%	3%	0%

The table shows that the Non-Small CFL Lighting group was the most likely to have installed the same efficiency, with 175 responses representing 33 percent of total kWh savings and 30 percent of total kW savings. The greatest number of responses were for deemed measures (149) but the greatest effect came from the non-deemed measures, representing 22 percent of total kWh savings and 19 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 (47) representing 11 percent of the kWh savings and 11 percent of the kW savings. Only one measure group had both measurable therm savings (six percent) and “Lower” responses (22) and that was the “Other” measure group.

Table D-8 shows the distribution of responses to the DAT2a efficiency 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-8. Responses to the DAT2a Efficiency Question by Reporting Measure Group, Percent 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
	Boilers & Burners	5	0%	0%	5%	7	0%	0%	2%	12	0%	0%	7%
	Expanded Process	14	12%	14%	13%	0	0%	0%	0%	14	12%	14%	13%
	HVAC	10	-6%	13%	42%	28	6%	5%	0%	38	0%	19%	42%
	Non-Small CFL Lighting	26	42%	41%	0%	149	23%	25%	0%	175	65%	66%	0%
	Other	19	37%	40%	31%	43	2%	2%	1%	62	39%	42%	32%
Same	Refrigeration	2	8%	10%	0%	9	4%	3%	0%	11	12%	13%	0%
	Boilers & Burners	1	1%	0%	0%	4	0%	0%	1%	5	1%	0%	1%
	Expanded Process	3	2%	4%	0%	0	0%	0%	0%	3	2%	4%	0%
	HVAC	5	34%	24%	1%	15	4%	3%	0%	20	38%	27%	1%
	Non-Small CFL Lighting	6	15%	17%	0%	41	6%	7%	0%	47	21%	24%	0%
	Other	12	39%	34%	62%	10	0%	0%	1%	22	39%	34%	62%
Lower	Refrigeration	3	15%	16%	84%	16	21%	23%	0%	19	36%	40%	84%
	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%	5	1%	1%	0%	5	1%	1%	0%
	Other	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Higher	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Boilers & Burners	26	95%	100%	69%	119	0%	0%	24%	145	95%	100%	92%
	Expanded Process	52	81%	77%	87%	0	0%	0%	0%	52	81%	77%	87%
	HVAC	22	60%	53%	20%	51	1%	0%	36%	73	61%	54%	56%
	Non-Small CFL Lighting	4	6%	6%	0%	27	4%	0%	0%	31	11%	7%	0%
Not	Other	10	19%	22%	4%	10	2%	0%	2%	20	21%	22%	6%
Applicable	Refrigeration	7	26%	41%	16%	9	26%	7%	0%	16	52%	48%	16%
	Boilers & Burners	1	3%	0%	0%	1	0%	0%	0%	2	3%	0%	0%
	Expanded Process	1	5%	5%	0%	0	0%	0%	0%	1	5%	5%	0%
	HVAC	0	0%	0%	0%	3	1%	0%	0%	3	1%	0%	0%
Don't	Non-Small CFL Lighting	0	0%	0%	0%	9	2%	2%	0%	9	2%	2%	0%
Know/	Other	2	0%	0%	0%	2	1%	2%	0%	4	1%	2%	0%
Refused	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Boilers & Burners	33	100%	100%	74%	131	0%	0%	26%	164	100%	100%	100%
	Expanded Process	70	100%	100%	100%	0	0%	0%	0%	70	100%	100%	100%
	HVAC	37	88%	91%	63%	97	12%	9%	37%	134	100%	100%	100%
	Non-Small CFL Lighting	36	63%	65%	0%	231	37%	35%	0%	267	100%	100%	100%
	Other	43	95%	96%	97%	65	5%	4%	3%	108	100%	100%	100%
Total	Refrigeration	12	49%	67%	100%	34	51%	33%	0%	46	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 65 percent kWh and 66 percent kW. The HVAC measure group has the highest proportion of therm savings represented by “Same” responses at 42 percent.

In the table, the Refrigeration measure group has the greatest proportion of savings represented by “Lower” responses at 36 percent kWh, 40 percent kW, and 84 percent therms. The Other measure group is also well represented by the “Lower” response at 36 percent kWh, 40 percent kW, and 84 percent therms.

Table D-9 shows the distribution of responses to the DAT3 quantity question by reporting measure group. In the table, the Percent 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, Percent 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	24	0%	0%	21%	101	0%	0%	7%	125	0%	0%	28%
	Expanded Process	41	9%	5%	11%	0	0%	0%	0%	41	9%	5%	11%
	HVAC	23	7%	23%	5%	63	1%	3%	3%	86	9%	25%	8%
	Non-Small CFL Lighting	21	17%	16%	0%	122	11%	9%	0%	143	28%	25%	0%
	Other	34	9%	4%	4%	49	0%	0%	0%	83	9%	4%	4%
	Refrigeration	6	1%	1%	0%	14	1%	0%	0%	20	2%	1%	0%
Less	Boilers & Burners	4	0%	0%	2%	23	0%	0%	1%	27	0%	0%	4%
	Expanded Process	6	3%	1%	1%	0	0%	0%	0%	6	3%	1%	1%
	HVAC	6	2%	2%	1%	27	0%	0%	3%	33	2%	3%	4%
	Non-Small CFL Lighting	7	6%	5%	0%	57	4%	3%	0%	64	9%	8%	0%
	Other	2	0%	0%	1%	4	0%	0%	0%	6	0%	0%	1%
	Refrigeration	4	2%	1%	0%	18	2%	1%	0%	22	5%	2%	0%
More	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%	3	0%	0%	0%	3	0%	0%	0%
	Other	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Refrigeration	1	0%	0%	0%	0	0%	0%	0%	1	0%	0%	0%
None	Boilers & Burners	4	0%	0%	4%	5	0%	0%	2%	9	0%	0%	6%
	Expanded Process	22	5%	3%	19%	0	0%	0%	0%	22	5%	3%	19%
	HVAC	4	3%	4%	0%	6	0%	0%	1%	10	3%	4%	1%
	Non-Small CFL Lighting	8	9%	8%	0%	47	4%	3%	0%	55	14%	12%	0%
	Other	4	2%	1%	0%	11	0%	0%	0%	15	2%	1%	0%
	Refrigeration	1	0%	0%	0%	2	1%	0%	0%	3	1%	0%	0%
Not Applicable	Boilers & Burners	1	0%	0%	0%	0	0%	0%	0%	1	0%	0%	0%
	Expanded Process	1	0%	0%	2%	0	0%	0%	0%	1	0%	0%	2%
	HVAC	4	-1%	4%	5%	0	0%	0%	0%	4	-1%	4%	5%
	Non-Small CFL Lighting	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Other	3	0%	0%	3%	0	0%	0%	0%	3	0%	0%	3%
	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
Don't Know/ Refused	Boilers & Burners	0	0%	0%	0%	2	0%	0%	0%	2	0%	0%	0%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	1	0%	0%	0%	1	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%
Total	Boilers & Burners	33	0%	0%	28%	131	0%	0%	10%	164	0%	0%	38%
	Expanded Process	70	17%	9%	33%	0	0%	0%	0%	70	17%	9%	33%
	HVAC	37	11%	33%	12%	97	2%	3%	7%	134	13%	36%	20%
	Non-Small CFL Lighting	36	32%	30%	0%	231	19%	16%	0%	267	51%	46%	0%
	Other	43	11%	6%	9%	65	1%	0%	0%	108	12%	6%	9%
	Refrigeration	12	4%	2%	0%	34	4%	1%	0%	46	7%	3%	0%

The table shows that the Non-Small CFL Lighting group was the most likely to have installed the same quantity, with 143 responses representing 28 percent of total kWh savings and 25 percent of total kW savings. Again, the greatest number of responses were for deemed measures (122) but the greatest effect came from the non-deemed measures, representing 15 percent of total kWh savings and 13 percent of total kW savings. For therms, the Boilers and Burners group had the greatest number of "Same" responses (125) representing 28 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 (122) representing 23 percent of the total kWh savings and 20 percent of the kW savings. For therms, the measure group with the greatest portion of savings in this category was the Expanded Process group, representing 20 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 Percent 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, Percent 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
	Boilers & Burners	24	9%	0%	56%	101	0%	0%	18%	125	9%	0%	74%
	Expanded Process	41	55%	54%	33%	0	0%	0%	0%	41	55%	54%	33%
	HVAC	23	58%	63%	28%	63	10%	8%	15%	86	69%	71%	43%
	Non-Small CFL Lighting	21	34%	35%	0%	122	21%	20%	0%	143	55%	55%	0%
	Other	34	73%	70%	47%	49	3%	3%	1%	83	76%	73%	48%
Same Amount	Refrigeration	6	18%	24%	16%	14	7%	5%	0%	20	26%	29%	16%
	Boilers & Burners	4	10%	0%	6%	23	0%	0%	3%	27	10%	0%	9%
	Expanded Process	6	16%	16%	2%	0	0%	0%	0%	6	16%	16%	2%
	HVAC	6	12%	7%	5%	27	2%	1%	16%	33	14%	7%	21%
	Non-Small CFL Lighting	7	11%	11%	0%	57	7%	7%	0%	64	18%	19%	0%
	Other	2	3%	4%	11%	4	1%	2%	0%	6	4%	5%	11%
Less	Refrigeration	4	31%	43%	0%	18	31%	25%	0%	22	62%	68%	0%
	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%	3	0%	0%	0%	3	0%	0%	0%
	Other	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
More	Refrigeration	1	0%	0%	68%	0	0%	0%	0%	1	0%	0%	68%
	Boilers & Burners	4	81%	100%	11%	5	0%	0%	4%	9	81%	100%	15%
	Expanded Process	22	28%	29%	59%	0	0%	0%	0%	22	28%	29%	59%
	HVAC	4	23%	11%	2%	6	0%	0%	5%	10	23%	11%	7%
	Non-Small CFL Lighting	8	18%	18%	0%	47	8%	7%	0%	55	26%	26%	0%
	Other	4	17%	22%	2%	11	1%	0%	2%	15	18%	22%	4%
None	Refrigeration	1	0%	0%	15%	2	13%	3%	0%	3	13%	3%	15%
	Boilers & Burners	1	0%	0%	1%	0	0%	0%	0%	1	0%	0%	1%
	Expanded Process	1	1%	1%	5%	0	0%	0%	0%	1	1%	1%	5%
	HVAC	4	-6%	10%	28%	0	0%	0%	0%	4	-6%	10%	28%
	Non-Small CFL Lighting	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Other	3	1%	0%	37%	0	0%	0%	0%	3	1%	0%	37%
Not Applicable	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Boilers & Burners	0	0%	0%	0%	2	0%	0%	1%	2	0%	0%	1%
	Expanded Process	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	HVAC	0	0%	0%	0%	1	0%	0%	1%	1	0%	0%	1%
	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%
Don't Know/ Refused	Refrigeration	0	0%	0%	0%	0	0%	0%	0%	0	0%	0%	0%
	Boilers & Burners	33	100%	100%	74%	131	0%	0%	26%	164	100%	100%	100%
	Expanded Process	70	100%	100%	100%	0	0%	0%	0%	70	100%	100%	100%
	HVAC	37	88%	91%	63%	97	12%	9%	37%	134	100%	100%	100%
	Non-Small CFL Lighting	36	63%	65%	0%	231	37%	35%	0%	267	100%	100%	100%
	Other	43	95%	96%	97%	65	5%	4%	3%	108	100%	100%	100%
Total	Refrigeration	12	49%	67%	100%	34	51%	33%	0%	46	100%	100%	100%

The table shows that the “Other” measure group has the highest proportion of savings represented by “Same” responses, at 76 percent kWh, 73 percent kW, and 48 percent therms. The Boilers and Burners measure group has the highest proportion of therm savings represented by “Same” responses at 74 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 previous survey had two formal confirmation questions, one for timing and one for efficiency. 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	145	18%	30%	31%
Somewhat likely	110	34%	29%	16%
Not very likely	78	21%	12%	26%
Very unlikely	56	22%	21%	23%
Don't know/refused	7	5%	7%	4%

The table shows that the savings are fairly evenly distributed across the 4 answer options, though the number of responses favors the "Very Likely" end of the scale. This suggests that the respondents who installed smaller measures were more likely to do so without the influence of Focus, while those that installed larger measures were influenced by the program.

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	338	31%	41%	37%	0
Earlier	N/A	11	2%	1%	1%	0
Later	Months < 48	201	33%	30%	22%	Months / 48
	Months >= 48	27	7%	5%	6%	100%
	Don't know/refused	51	3%	5%	2%	Average of DAT1b
Never	N/A	150	23%	17%	26%	100%
Don't know/refused	N/A	11	1%	0%	7%	Average of DAT1a

The table shows that 349 of the respondents would have not received any timing attribution, representing 33 percent of kWh savings, 42 percent of kW savings, and 38 percent of therm savings. A smaller number of respondents indicated 100 percent attribution (177) but they represent a comparable portion of the savings with 30 percent of kWh savings, 22 percent of kW savings, and 32 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	312	41%	41%	18%	0%
Lower	Standard Efficiency	52	11%	13%	5%	100%
	Slightly > Standard	15	4%	5%	0%	70%
	Between Standard and High	34	6%	4%	1%	50%
	Slightly < High	11	0%	0%	0%	30%
	Don't know/refused	4	1%	3%	0%	Average of DAT2b
Higher	N/A	5	1%	1%	0%	0%
Not applicable	N/A	337	33%	32%	75%	-
Don't know/refused	N/A	19	2%	2%	0%	Average of DAT2a

Efficiency was not applicable for 337 measures representing 33 percent of the kWh savings, 32 percent of the kW savings, and 75 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 42 percent of kWh savings, 41 percent of kW savings, and 18 percent of therm savings. Only 52 responses indicate 100 percent efficiency attribution, representing 11 percent of kWh savings, 13 percent of kW savings, and five 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	498	57%	61%	52%	0%
Less	Value < 100%	78	8%	7%	5%	Value < 50%
	Value >= 100%	68	10%	6%	5%	Value > 50%
	Don't know/refused	12	1%	2%	0%	Average of DAT3a
More	Value < 100%	2	0%	0%	0%	Value < 100%
	Value >= 100%	1	0%	0%	0%	Value = 100%
	Don't know/refused	1	0%	0%	0%	Average of DAT3a
None	N/A	114	24%	20%	27%	100%
Not applicable	N/A	9	0%	4%	11%	-
Don't know/refused	N/A	6	0%	0%	0%	Average of DAT3

Quantity was not applicable for nine responses representing four percent of kW savings and 11 percent of therm savings. As mentioned in the previous section, quantity attribution does not apply to all measures. The majority of respondents (498) indicated that they would have installed a measure of the same quantity without Focus, representing 57 percent of kWh, 61 percent of kW, and 52 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	5	0%	2%	0%	11	1%	1%	0%
Yes	No	Yes	18	6%	6%	10%	73	4%	2%	4%
Yes	No	No	46	18%	20%	18%	96	5%	4%	3%
Yes	Yes	No	7	6%	5%	0%	13	1%	1%	0%
No	Yes	Yes	7	9%	9%	0%	47	3%	2%	0%
No	Yes	No	15	3%	4%	6%	30	1%	1%	0%
No	No	Yes	43	16%	10%	19%	78	4%	3%	3%
No	No	No	90	17%	23%	30%	210	6%	5%	6%

The table shows that 90 non-deemed measures did not receive any attribution representing 17 percent of kWh savings, 23 percent of kW savings, and 30 percent of therm savings. Of the deemed measures, 210 did not receive any attribution representing six percent of kWh savings, five percent of kW savings, and six percent of therm savings. Only 16 measures received all three forms of attribution, representing one percent of kWh savings, three 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 percent 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	91	9%	0%	53%	0
Earlier	N/A	2	0%	0%	3%	0
Later	Months < 48	51	10%	0%	22%	Months / 48
	Months >= 48	4	0%	0%	6%	100%
	Don't know/refused	9	0%	0%	3%	Average of DAT1b
Never	N/A	6	81%	100%	12%	100%
Don't know/refused	N/A	1	0%	0%	1%	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	14	16%	18%	2%	0
Earlier	N/A	0	0%	0%	0%	0
Later	Months < 48	23	33%	36%	21%	Months / 48
	Months >= 48	6	15%	12%	8%	100%
	Don't Know/Refused	0	0%	0%	0%	Average of DAT1b
Never	N/A	24	36%	34%	50%	100%
Don't Know/Refused	N/A	3	0%	0%	19%	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	71	47%	65%	43%	0
Earlier	N/A	1	0%	0%	0%	0
Later	Months < 48	32	24%	20%	29%	Months / 48
	Months >= 48	3	21%	7%	2%	100%
	Don't know/refused	8	6%	7%	2%	Average of DAT1b
Never	N/A	17	2%	0%	23%	100%
Don't know/refused	N/A	2	0%	0%	0%	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	78	25%	25%	0%	0
Earlier	N/A	6	3%	2%	0%	0
Later	Months < 48	74	36%	38%	0%	Months / 48
	Months >= 48	12	3%	2%	0%	100%
	Don't know/refused	22	4%	5%	0%	Average of DAT1b
Never	N/A	71	27%	27%	0%	100%
Don't know/refused	N/A	4	1%	1%	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	8	24%	26%	16%	0
Earlier	N/A	1	5%	8%	0%	0
Later	Months < 48	9	35%	38%	0%	Months / 48
	Months >= 48	0	0%	0%	0%	100%
	Don't know/refused	8	2%	1%	68%	Average of DAT1b
Never	N/A	19	24%	26%	15%	100%
Don't know/refused	N/A	1	10%	1%	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	76	60%	69%	80%	0
Earlier	N/A	1	0%	0%	0%	0
Later	Months < 48	12	33%	22%	5%	Months / 48
	Months >= 48	2	0%	0%	10%	100%
	Don't know/refused	4	1%	1%	2%	Average of DAT1b
Never	N/A	13	6%	7%	4%	100%
Don't know/refused	N/A	0	0%	0%	0%	Average of DAT1a

The HVAC and Other measure groups have the highest portion of savings represented by the “Same Time” response. In the HVAC group, the “Same Time” respondents represent 47 percent of kWh savings, 65 percent of kW savings, and 43 percent of therm savings. In the Other group, the “Same Time” respondents represent 60 percent of kWh savings, 69 percent of kW savings, and 80 percent of therm savings. The Expanded Process measure group has the highest proportion of savings that receive 100 percent timing attribution, at 51 percent of kWh, 46 percent of kW, and 58 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 percent 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%	7%	0%
Lower	Standard Efficiency	0	0%	0%	0%	100%
	Slightly > Standard	2	0%	0%	0%	70%
	Between Standard and High	2	1%	0%	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	145	95%	100%	92%	-
Don't know/refused	N/A	2	3%	0%	0%	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	14	12%	14%	13%	0%
Lower	Standard Efficiency	1	2%	3%	0%	100%
	Slightly > Standard	0	0%	0%	0%	70%
	Between Standard and High	2	0%	1%	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	52	81%	77%	87%	-
Don't know/refused	N/A	1	5%	5%	0%	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	38	0%	19%	42%	0%
Lower	Standard Efficiency	9	21%	13%	0%	100%
	Slightly > Standard	2	8%	6%	0%	70%
	Between Standard and High	4	3%	1%	1%	50%
	Slightly < High	3	0%	0%	0%	30%
	Don't know/refused	2	6%	7%	0%	Average of DAT2b
Higher	N/A	0	0%	0%	0%	0%
Not applicable	N/A	73	61%	54%	56%	-
Don't know/refused	N/A	3	1%	0%	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	175	65%	66%	0%	0%
Lower	Standard Efficiency	29	13%	15%	0%	100%
	Slightly > Standard	8	5%	6%	0%	70%
	Between Standard and High	7	3%	3%	0%	50%
	Slightly < High	2	0%	0%	0%	30%
	Don't know/refused	1	0%	0%	0%	Average of DAT2b
Higher	N/A	5	1%	1%	0%	0%
Not applicable	N/A	31	11%	7%	0%	-
Don't know/refused	N/A	9	2%	2%	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	11	12%	13%	0%	0%
Lower	Standard Efficiency	1	0%	0%	15%	100%
	Slightly > Standard	1	15%	16%	0%	70%
	Between Standard and High	16	21%	23%	0%	50%
	Slightly < High	0	0%	0%	0%	30%
	Don't know/refused	1	0%	0%	68%	Average of DAT2b
Higher	N/A	0	0%	0%	0%	0%
Not applicable	N/A	16	52%	48%	16%	-
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	62	39%	42%	32%	0%
Lower	Standard Efficiency	12	15%	16%	58%	100%
	Slightly > Standard	2	0%	0%	0%	70%
	Between Standard and High	3	23%	16%	2%	50%
	Slightly < High	5	1%	3%	2%	30%
	Don't know/refused	0	0%	0%	0%	Average of DAT2b
Higher	N/A	0	0%	0%	0%	0%
Not applicable	N/A	20	21%	22%	6%	-
Don't know/refused	N/A	4	1%	2%	0%	Average of DAT2a

The Non-Small CFL Lighting measure group has the highest proportion of electric savings represented by the “Same” response, with 65 percent of kWh savings and 66 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 58 percent of therm savings that will receive 100 percent attribution.

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	125	9%	0%	74%	0%
Less	Value < 100%	10	0%	0%	1%	Value < 50%
	Value >= 100%	17	10%	0%	8%	Value > 50%
	Don't know/refused	0	0%	0%	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	81%	100%	15%	100%
Not applicable	N/A	1	0%	0%	1%	-
Don't know/refused	N/A	2	0%	0%	1%	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	41	55%	54%	33%	0%
Less	Value < 100%	2	1%	1%	0%	Value < 50%
	Value >= 100%	3	15%	15%	2%	Value > 50%
	Don't know/refused	1	0%	0%	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	22	28%	29%	59%	100%
Not applicable	N/A	1	1%	1%	5%	-
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	86	69%	71%	43%	0%
Less	Value < 100%	23	4%	2%	17%	Value < 50%
	Value >= 100%	7	9%	0%	4%	Value > 50%
	Don't know/refused	3	1%	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	10	23%	11%	7%	100%
Not applicable	N/A	4	-6%	10%	28%	-
Don't know/refused	N/A	1	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	143	55%	55%	0%	0%
Less	Value < 100%	37	11%	11%	0%	Value < 50%
	Value >= 100%	21	7%	7%	0%	Value > 50%
	Don't know/refused	6	0%	0%	0%	Average of DAT3a
More	Value < 100%	2	0%	0%	0%	Value < 100%
	Value >= 100%	1	0%	0%	0%	Value = 100%
	Don't know/refused	0	0%	0%	0%	Average of DAT3a
None	N/A	55	26%	26%	0%	100%
Not applicable	N/A	0	0%	0%	0%	-
Don't know/refused	N/A	2	0%	0%	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	20	26%	29%	16%	0%
Less	Value < 100%	2	25%	18%	0%	Value < 50%
	Value >= 100%	19	35%	48%	0%	Value > 50%
	Don't know/refused	1	2%	2%	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	1	0%	0%	68%	Average of DAT3a
None	N/A	3	13%	3%	15%	100%
Not applicable	N/A	0	0%	0%	0%	-
Don't know/refused	N/A	0	0%	0%	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	83	76%	73%	48%	0%
Less	Value < 100%	4	0%	0%	10%	Value < 50%
	Value >= 100%	1	3%	4%	1%	Value > 50%
	Don't know/refused	1	0%	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	15	18%	22%	4%	100%
Not applicable	N/A	3	1%	0%	37%	-
Don't know/refused	N/A	1	0%	0%	0%	Average of DAT3

The “Other” measure group has the highest proportion of electric savings in the “Same Amount” response at 76 percent kWh and 73 percent kW. The Boilers and Burners has the highest proportion of therms savings in the “Same Amount” response at 74 percent. The Expanded Process group has the highest proportion of savings in the “None” response at 28 percent of kWh savings, 29 percent of kW savings, and 59 percent of kWh 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. 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 measure in our CATI and engineering samples. We ask them to identify the appropriate category for each measure. If a certain category is chosen 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 also complete a survey with the supplier.

There were 114 supplier surveys completed in this round of evaluation, significantly more than the 21 completed for the last evaluation. 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 114 surveys completed, approximately two-thirds of the supplier surveys had attribution greater than that provided by the customer for an individual measure, representing eight percent of kWh savings, eight percent of kW savings, and four percent of therm savings. However, those that did not have a higher attribution had a greater portion of savings, representing eight percent kWh, 12 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		675	84%	80%	90%
Yes	No	42	8%	12%	6%
	Yes	72	8%	8%	4%

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. However, the greatest portion of savings is represented by the "Later" response, with 46 percent of kWh savings, 54 percent of kW savings, and 57 percent of therms savings.

Table D-35. Timing Attribution, Supplier Surveys

DAT1a	Responses	Percent kWh	Percent kW	Percent Therms
Same time	67	42%	37%	26%
Earlier	3	0%	0%	13%
Later	23	46%	54%	57%
Never	14	10%	7%	3%
Don't know/refused	7	1%	1%	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 61 percent of kWh savings, 56 percent of kW savings, and 93 percent of therms savings.

Table D-36. Efficiency Attribution, Supplier Surveys

DAT2a	Responses	Percent kWh	Percent kW	Percent Therms
Same	81	61%	56%	93%
Lower	19	27%	34%	0%
Higher	3	2%	1%	0%
Not applicable	10	10%	8%	7%
Don't know/refused	1	1%	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 101 "Same Amount" responses represent 94 percent of kWh savings, 95 percent of kW savings, and 97 percent of therms savings.

Table D-37. Quantity Attribution, Supplier Surveys

DAT3	Responses	Percent kWh	Percent kW	Percent Therms
Same amount	101	94%	95%	97%
Less	4	0%	0%	2%
More	3	1%	1%	0%
None	4	4%	3%	0%
Don't know/refused	2	1%	1%	0%

D.5 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-38 shows the DAT4 responses for measures in the engineering survey that received attribution, and Table D-39 shows the DAT4 responses for measures in the engineering survey that did not receive attribution. Table D-40 and Table D-41 provide the same information for the CATI survey respondents.

Table D-38. Open-ended Responses to DAT4, Engineering Measures with Attribution

Open Responses, DAT4, ENGI Survey , With Attribution
I wish I'd known about them before but we didn't hear about the incentives till the work was already done.
Influence on efficiency, incentives helped them purchase the best equipment
We wouldn't have been able to do the work without them.
The original contractor didn't include it in his bid, but FOE suggested it and then he came back later with them in, because of FOE.
Without financial incentives, project would never have happened at any efficiency or quantity because of insufficient payback.
FOE incentive increased efficiency
FOE incentives made the project happen
Project would have been installed at the same time with or without Focus, though Focus increased installed capacity by 22%. No efficiency level associated with measure.
Project would have most likely happened at same time and efficiency level regardless of rebate. However, rebate allowed expansion of project by 25%
It is hard to know. It was necessary. Focus was a major driver to get things going.
Wouldn't have done them this year without the incentives
They gave us money and it let us get it done.
Without incentive, timing may have been later
Regarding timing, the customer would have waited to invest additional funds. Would have went with the same amount of equipment.
Wouldn't have done it this year. Would have had to evaluate it next year.
Focus was a great help. They helped present all the data to show the service needed to be done. From all records available, it had never been done.
Attractiveness of a rebate pushed the project, because would have waited until economy recovered (predicted mid 2010)
I would have put off the service for a long time
We probably wouldn't have done the project if we didn't have the incentive. We needed it to meet the payback we'd need to do the project. We'd tried a few retrofits before, with failing equipment, but weren't ready to replace the equipment otherwise.
Focus gave recommendations and calculations, which gave them much motivation and info.
Would have done it later and to a lesser extent
Project would have happened at same time with the same system in the same quantity
The program helped get the project approved. Been looking at the project for years. Helped it pass through management.

Open Responses, DAT4, ENGI Survey , With Attribution
improved efficiency, would have waited longer
Energy efficiency would have still been a goal, but FOE helped motivation.
FOE pushed up timing for retrofit project - no effect on quantity or efficiency
Might have pushed the timing up.
Focus had their requirements which they wanted to meet. Without Focus, he's not sure whether they would have met them.
Project would never have happened with any amount of efficiency
Helped push project up (timing)
FOE suggested project, increased number
Would have eventually gone with the new equipment, but FOE helped us do it sooner.
Would not have done it.
With Focus we do service every 6 months. Without it, we would do it every 12 months
FOE pushed timing up by improving ROI. No effect on size or efficiency
The timing was good. Overall, I think it's a fantastic program. The ability to get help to pay for project like this is great. Literally, I would not have done it without them.
Focus incentives made this measure get installed about 18 months earlier, at the same efficiency, and with 20% more.
FOE incentive made the project possible during tight economic times.
Without FOE would have probably installed fewer and done it later
Without FOE, projects would not have happened
No. FOE is great. I wish they gave bigger rebates. Some of the stuff you have to install is a little more expensive. With the rebate from FOE and the energy savings calculations (which the rep went over with me), it helps with how long it takes to pay the equipment
We would have done the service, we do it every year. We would have done the same number. WE used an incentive on another service too. Even if we do it anyway, it's good to get money out of it.
Process did not hold up capital approvement. Guidelines (FOE) made bidding process easier. Incentive deadline pushed project up.
Focus assistance made this project happen about 6 months earlier. However, it had no influence on efficiency or amount, which is not applicable to this measure.
Probably would have done the equipment anyway at the same time.
FOE opened eyes to the possibility of energy savings and provided the incentive to make in happen
Focus helped us get the work done sooner because the additional money brought down the ROI
FOE affected efficiency of lighting installed.
I don't really know, I don't know what product we would have ended up with. I was steered in the direction by FOE that this equipment qualified for rebates and that they were good. My concern was how good they were and how they performed.
Without the rebate, this project might have still happened at the same efficiency level and scope, though it would have had happened approximately 18 months later.
FOE played a big role with the cost. They did not help with equipment selection. I installed the same number as I replaced and I got better performance.
Program was great. Would have waited a few years to upgrade equipment.
Incentive pushed up timing of project by making ROI acceptable in a time of reduced expenditure.
Probably would have done it eventually.
Without Focus, they almost certainly have not installed the equipment to any extent at anytime. If they had, they would have installed the same amount and efficiency.
The incentive helped

Open Responses, DAT4, ENGI Survey , With Attribution
We probably would have done the same efficiency, and the same amount. FOE helped us do it earlier because of the payback. Also, we got it all done before last December. They never know if they're going to continue the incentive next year. We weren't sure they would
We generally do the service every couple years, Focus got us going on it.
Impacted timing. Made decision quicker. Incentive is "carrot"
For both of the measures we only would have done the minimum amount of work without the extra cash
Because of an incentive to go the route we did we got savings. We did it right after the new construction. FOE's incentive pushed us to do the equipment for the new construction. We wanted to upgrade the existing stuff as well to match.
Not much influence. Were planning on it, but FOE gave a little nudge
Service encouraged and improved done than if done internally.
FOE had an influence in that we wouldn't have done it to the extent we did. You need the money to do it and the incentive helped.
Program accelerated project by verifying savings and providing incentive.
Without incentive, no project would have been done to any extent or efficiency
Project could have happened two years later to same efficiency and amount. Without incentive it definitely would not have happened now.
Well Focus recommended it, we wouldn't have known about it without them.
Without Focus rebate, payback would be too low and measure would not have been installed.
Focus information drove the project and incentives made it possible to justify whole project right away.
Focus had a huge influence at all levels especially with regard to efficiency
It was somewhat likely this project would have happened at the same amount as was done. The incentive made the project happen 2-3 months earlier than otherwise.
Focus rebate was necessary to make project happen. Otherwise, project would never have happened. Only one was ever under consideration.
Without FOE, probably would not have installed it.
Focus really helps with projects if they are right on the threshold, otherwise could be stalled. Would have taken longer to get it through
Without the Focus incentive, this project would never have happened to any extent or efficiency level.
With regard to the timing, the incentive made us do it faster. The deadline especially made us do it faster. We also bought more than I would have otherwise. Also, the efficiency was slightly higher.
No influence
Made it easier decision
Influence timing, made them choose the best equipment
Focus helped do the project sooner. I didn't really work with them though
Project might have been done at a later date, but would have been done in steps. Efficiency is n/a.
Focus had no impact on timing, efficiency, or quantity.
Were able to evaluate scope and look closely at each component, which would have happened nearly as well without Focus or at that time.
Focus made recommendations which made their building more efficient
Brought to the forefront these types of projects
Eh, we wanted to do it. The incentive allows us to do it more often
Focus rebate was necessary to make project financially viable to company. Otherwise, project would go undone. All or nothing measure.
Because of Focus, we do the service more frequently
Decided to do project based on incentive available
FOE incentive and justification helped get a decision now, and incentive helped get more efficient unit

Open Responses, DAT4, ENGI Survey , With Attribution
Caused them to consider various options and may have improved efficiency some.
Very important-they made them do a bigger more efficient plant
Efficiency and amount unchanged by incentive. Incentive accelerated project by 6 months
Very little
Wouldn't have been able to do it without Focus
Pushed up timing significantly and wouldn't have installed any controls any time soon
Definitely helped with timing. Scope of work would have been the same. Efficiency would have been the same if project was done, because energy savings were the reason for it.
Without Focus, there is no way we would have done these installations
Would not have installed some of the equipment without FOE involvement and incentive
Focus rebate accelerated this project by about 1 year because the rebate helped the payback. However, the efficiency and amount were unaffected as there was not much flexibility in that.
Would not have done project without FOE incentive
Incentive accelerated project by ~9 months. Without incentive, similarly sized system of same efficiency would have been installed later.
We would have put this off at least a year.
I needed to replace the old equipment supplier told us which one to go with. Needed replacement.
It is not very likely we would have completed this without Focus. They helped validate the energy savings and improved payback.
Pushed up timing significantly
Without Focus study, opportunity would likely never been identified
Focus was great. They told us what to expect and let us know all the details we needed to get the work done, and convince us it needed to be done.
increased number
It didn't really help affect decision making, but obviously any rebate money was beneficial in helping pay back the fan
We typically do this, but Focus got us to do it all at once.
May not have done it at all, but if we did it, would have done it at the same time and the same number.
Good incentive to do it all at once rather than over time
added bonus - no influence
I would have done the same, regardless.
With incentive, allowed to show good return on investment on project
Only did that one this last year. And really one time through is all we would do it annually. Might have not got done if it weren't for FOE
Incentive-wise it made the difference between putting it in and not putting it in. We wouldn't have put it in without them
We would have waited a year or so.
Helped get it approved faster - pushed up timing. Might have installed a little less without FOE
Helped speed up timing
We needed to do this but would have put it off some time.
We probably would have put in the same equipment, but a little less if the energy advisor hadn't been there.
Without FOE would have done half of them
No efficiency improved.
I probably would have rescheduled the equipment eventually, but not for a while
FOE didn't have any effect

Open Responses, DAT4, ENGI Survey , With Attribution
Incentive was primary driver of project.
Would have replaced maybe 1 per year without FOE
FOE had more of an impact on timing and efficiency levels than number of pieces of equipment
Allowed us to complete project in full as soon as possible
The program strongly influenced our purchases because it made it more practical.
Having FOE backing/rebate made us go forward more quickly
I was never informed that I would need a bigger unit. FOE helped me be able to put it in sooner.
FOE pushed up timing and increased number of fixtures
Focus helped push them to do it earlier
Without incentives, we would have delayed upgrade to 2-3 years.
Helped do all of it now.
We had no idea how much we were wasting without Focus. I never would have gotten the project passed.
Provided guidance for what products were used.
Would not have been able to do it, the ROI was not there.
Would "never" have installed measure at payback without incentive. Existing equipment would have been retained.
High influence - pointed out things that we weren't aware of and justified spending more for high efficiency
Focus helped us get the whole thing done, but maybe we wouldn't have done quite as much.
They allow us to do this every year
Probably would have done anyway
Made them go with energy efficient motor
Focus made them all happen at once and more thorough. Otherwise less efficient service would happen as needed. Many wouldn't have happened without Focus
Incentive was primary driver of project.
Incentive pushed up timing
We probably would not have done it
Timing - would have done it then. Efficiency - less, Amount - less
Would have taken a lot longer to get approval without FOE rebate.
The incentive was crucial for getting any of this measure installed, of any quantity or efficiency.
We probably would have done lower efficiency without Focus, but the work still needed to be done.
Incentive was necessary to make this project happen at this time. Project might have happened 12 months later, though. If it did, it would have been same quantity.
The ROI needed to be brought down.
Focus let us do this work earlier and let us do it on more units.
We probably would have done something eventually. We needed to do something. FOE helped us look at savings, and the incentive pushed us to do it. We'd been considering it for a while.
Helped push project through
The process was long but they helped
The Focus incentive was strongly responsible for this project happening at this time. Without it, a similar project might have occurred in 18 months, though not sure about efficiency level. Only one system was under consideration.
Without Focus, would not have happened
Knowing that Focus funding was out there made us more committed, and having the numbers helped carry the energy efficiency components through the project
The Focus incentive accelerated the project by 18 months. Respondent was not privy to efficiency discussions and only one of them was under consideration.

Open Responses, DAT4, ENGI Survey , With Attribution
Focus incentives were responsible for both early replacement and installation of a high efficiency equipment. Only one piece of equipment was applicable for replacement.
I don't think Focus had a particularly large role in any of those things
Would not have installed equipment any time soon without FOE
Not much. Made sure got high efficiency. Wouldn't have got higher efficiency
Without Focus, these would have been basic replacements
We would have done it anyway. The equipment might not have been as efficient.
I think they played an important role in suggesting the work and financially making it happen
Would have done nothing without FOE.
We had needed to replace it. We probably would have done less efficient.
Pushed timing up. Got it done before recession hit.
Not have happened at all without rebate. Only one project was possible and efficiency level is n/a.
Pushed up timing with incentive. Not many options re: efficiency, amount driven by process
Focus recommended this work and we're appreciative of it. We wouldn't have done this without them.
Made them go through maintenance yearly rather than as needed
The incentive helped, especially this year.
Without the incentive, this project would not have occurred then or at anytime in the future to any extent or efficiency.
Without program, would have installed an lesser efficiency

Table D-39. Open-ended Responses to DAT4, Engineering Measures without Attribution

Open Responses, DAT4, ENGI Survey , No Attribution
Project timing was occurring with Orion, without Focus. Efficiency could possibly been changed (though not likely), quantity unaffected.
We would have put in fewer, because it was based on a fixed budget.
Focus did not affect our process other than pointing us towards what we were looking for. We have a commitment to installing the highest efficiency possible. We needed to install these units because they were old and breaking.
They had a huge impact. They're the ones that pointed out the most efficient way to go here. But I probably would have got it anyway.
It didn't really make a difference.
Overall, the impact of the grand was minimal. We were doing the project anyway.
None, on this one
Focus had no impact on project timing, efficiency or amount.
None
Didn't change overall efficiency
They do not effect our purchases
No effect
It wouldn't have mattered, we would have done it anyway
No effect, for process reasons
No influence on the project. Rebate was "added bonus." We were getting rid of inefficient equipment.
Some, they were proactive.
The incentive helped, probably still would have did it anyway

Open Responses, DAT4, ENGI Survey , No Attribution
Getting the loan really helped.
Would have gotten same equipment at same time without FOE
This would have been done with or without Focus
Focus recommended these 4 years ago, savings outweigh the costs
No effect on this project.
If project had been done, it would have been the same timing and amount. Most likely, the same amount of efficiency would have been installed.
Again, it would not have made any difference if it was there or not. We needed to make those changes anyway. We had loans all secured to do what we needed to do.
We do this every year because of Focus. They have shown me that it is really worth the cost.
No real influence
We would have done them anyhow.
The incentive had no effect on project timing, efficiency, or size.
Hoped that we could be eligible - it was after bids that they came in as an option
It didn't
The incentive was good, but didn't change timing.
FOE didn't have too much of an impact.
Focus didn't affect our decision too much
Focus on energy helped organize the justification of the project.
Always include the incentive in money request, but would have done the same thing with or without FOE in this case
Helps a lot of projects get approved, but not so much this one.
FOE had no impact on it. We would have done the same thing regardless
Focus did not affect our process other than pointing us towards what we were looking for. We have a commitment to installing the highest efficiency possible. We needed to install these units because they were old and breaking.
helped
gave them a sense of urgency to get them done
FOE didn't affect it
Very little on this particular project
They gave us the incentive, but we had to get it done anyway.
The impact is, we received what we were looking for it's working great, did what we wanted it to do.
I'm not really sure but I don't think they played too much of a roll. We had a referendum to pay for the work and the architect speculated everything out.
Incentive had no influence on timing, efficiency, or quantity.
Although they appreciated the rebate, they would have completed the project at the same efficiency, extent, and time regardless of the incentive
Incentive may have made approval a little easier
Focus allows us to go deeper with the service, but would do them anyway.
Did not affect timing, efficiency or number
The programs didn't have any impact
No influence - may do more in the future
Part of other project as ad-on. No effect on timing or number.
Program encourages you to do more but this was cost effective anyhow
The incentive likely had little or no impact on project timing, scope. It had a mild impact on the probability of the project occurring.

Open Responses, DAT4, ENGI Survey , No Attribution
They chose what projects to do without considering rebates
They didn't really effect those things
Good addition to helping pay for it. Focus is in the right spot.
We basically needed the size, it couldn't have varied. With the efficiency of what we were putting in and the quality of the product, FOE allowed us to put in what we really wanted to put in, by helping with the cost. We could have done the same efficiency and time
I probably would have done the same thing then that I ended up doing, even without FOE. Today, FOE would have larger impact

Table D-40. Open-ended Responses to DAT4, CATI Measures with Attribution

Open Responses, DAT4, CATI Survey , With Attribution
It was a big part of the decision
When we chose our equipment we were told by the company that we'd get a rebate. we needed the equipment anyway, and the added bonus was the rebate
At the time, it lowered the overall cost and made us look at the efficacy instead of the cost
It was important gave us advice confidence and cost
Like I said, because of Focus we replaced all of them instead of some
Would not have installed at all without program
Focus did an audit and gave them a big list of improvements. They organized by low, medium, high impact and have been going down the list implementing the improvements starting with the highest impact improvements. I have a team working with me now.
Think it is a great program, the timing was good and it worked out fine, and I go on their web site now and see what else we can do to improve our energy use and use the programs offered
Accelerated the timing.
The process had to take place the incentive was great that it was there
Without the program we might not have done it at the time we did it, or the volume we did
A positive effect financially--they helped us to complete it
FOE showed us the energy savings we would have
Without the program we probably wouldn't have done it at all
It accelerated the timing definitely. For quantity nothing. It makes us more aware of the energy saving options that we wouldn't have known about otherwise
We found we need to do the service
We were losing energy, realizing this we found out we could get money back and still improve the energy ratings
Increased the frequency and number of service.
A very positive effect, i wouldn't have been thinking about it if they hadn't come here first
It was a nice incentive to get it going and finish it. we made sure it fell under the rebate program
Due to financial reasons i would not have done it with out Focus on Energy
Without program wouldn't have done it at all or thought to do it
The effect was more effective use of the equipment and the cost effectiveness
The information was very good and with the rebates. it increased our productivity by 5%
I enjoyed saving 30 percent on my energy savings
It allowed us to complete it in a more timely manner due to budgetary issues.
Without the program we would not have been able to complete this project

Open Responses, DAT4, CATI Survey , With Attribution
We would have installed the same number and style but at a later date
If it wouldn't have been for focus we would have kept our present system
Decision was based on the rebates and recommendation of Focus on Energy
They helped me verify the savings amount; and the payback is there after 18 months, it is what they said
Rebate was added bonus
Cost savings
I felt it was good service
It was a great amount and we also found new ways of saving on natural gas
The rebates and the evaluation was needed
The big carrot was the rebate incentive that was huge and the better efficiency so those things combined made it an easier decision
Added weeks to process because of lead time ordering equipment helped "sell" putting in efficient equipment. With rebates, brought down payback. With energy committee - another selling point to keep operational costs down and reduce need to retrofit. no effect on amount.
Would have installed the same number efficiency, but project would have taken one more year to implement.
It's a 50% reduction in energy consumption
It because the time the equipment operates
It allowed us to complete it earlier that we could complete it due to incentives
Program pulled the trigger on the projects - wouldn't have done it without programs.
It was a huge influence. rebate influenced me it did everything it needed to do
The financial incentive
It would have generated and then accelerated the project, with the program it made us understand the necessary help we needed
Focus was the only reason we did it because they explained the cost savings and benefit to environment.
Because of program, we researched and looked at doing efficiency measures to make them better. helped us decide what and how much to do. because they were available at time of construction - made it easy to do it in one package.
with the incentive and the numbers it made a high impact
It is a great idea and service for sure! it helped us make it more timely instead of stretching it over 2 years it took 4-6 months so we were able to make the changes we needed on an earlier time line
We appreciate that they have programs out there for this and it was a good thing to be able to get the incentives. I would have continued to advise changing the equipment even without the incentive but it was still nice to have. it would have taken an extra year or two
Timing was effected, because of the help it was effective now, and the rest just needed to be done
Project just needed to be done
The program both accelerated the time to complete and our ability to get a quicker return on our investment quicker
We used Focus to maximize the incentives and high energy efficiency that we could apply to our organization
Just minor, would have done it, just not as soon.
They didn't have any impact on the amount of equipment we installed, just whether or not we did it.
A very positive program that let us upgrade our obsolete equipment
A big effect with the incentives and the awareness of the program, long term energy savings, the equipment lasts longer and i don't have to change them as often so that cuts down on the maintenance
Helped expedite

Open Responses, DAT4, CATI Survey , With Attribution
Without Focus on Energy we wouldn't have done anything and with their help, getting dollar amounts on rebates and looking at options, we thought this made sense
They had somewhat of an influence. providing me with enough information to know what the savings would be
Immense it made a lot of difference we would have not have done or thought about it
We wouldn't have done the equipment at all without focus on energy
Able to install more
A good project for us to undertake. It was valuable a service we'll use down the road
I would like to note that I sent the paperwork in to Focus on Energy and they lost everything and I had to re-submit the paperwork 2 times.
They provided incentives to help pay for project that was the main thing
I was satisfied with all the help from foe it was quite helpful with everything they helped us with
They had somewhat of an influence
Cost driven and lead driven
The incentive made it worthwhile to spend the additional money to install the product
Accelerated timing, increased amount
We wouldn't have looked at it without the rebate
Because of the financial help from focus the project went forward
The retro fit it had a big impact
I didn't know nothing about you guys until afterwards but I was still thinking about it because I wanted to lower my energy bill
It helped by making us pick the high efficiency ones we chose
Because of the need, they needed to be repaired regardless, the program helped with the amount we were able to do
We upgraded all the equipment to reduce the maintenance and our energy cost for in the future
They helped make the decision, it was a good decision and I’m glad we made the decision that we did
That it was a bonus
It was a bonus
It was a bonus basically
Incentive pushed the project up and allowed us to do it sooner. same amount, but wouldn't have done it for a couple years.
Because of the program we installed the higher efficiency ot receive the dollars
We are saving energy but it is hard to see if what i bought is saving money
Amount was a set amount, the timing was affected by the expiration dates, the efficiency cost savings was also a bonus.
Focus initiated a bunch of projects a couple years ago and work closely with us to manage the focus programs. rebates helped defer costs because they don't have an energy budget - they only have a maintenance budget
It gave us the opportunity it takes some of the cost. we were able to do it sooner
A tremendous positive effect
Caused me to do a project I would have otherwise not have done.
Without it I may have not done as much
They had influence for me choosing the higher efficiency and to do the job properly and having the financial incentive was helpful
When you put it in you use 30 percent less, I was assuming that was going to be the effect
They showed us we could save energy and cut our cost

Open Responses, DAT4, CATI Survey , With Attribution
We needed the rebates to do it
We would have still installed a unit but not one as efficient if we hadn't gotten money from focus
If it wasn't for foe contacting us and providing information on potential savings we would never had investigated the project
Same as other project - financial hurdles, incentive helps reduce payback period, to meet corporation standards.
It would have not gotten done without focus on energy help
None, it would have been done anyways.
Focus helped us do them quicker: helped us save energy
We did it because of the money involved and the timing because of the first of the year thing
Without rebate we couldn't have done them all at once
We did the whole building at one time
As far as the amount it's simply the amount we needed, the timing was probably we do a certain amount every year and we just budget for that, i think their involvement in the efficiency level was very important.
Program provided the opportunity to install, without money, we would not be able to do it due to long payback
The program enabled us to do the installation, otherwise i wouldn't have been able to get it approved
It helped get it done in a timely manner
It allowed us to do it quicker and do more of it which in turn decreases our energy
Because of rebates being available at the time they did upgrades there it made it easy to make it cost effective.
A huge difference, we wouldn't have put them in without it, because of the cost
We may not have installed any of them without it
Somewhat they had influence helping the way we ordered and put pro together, prioritize
Just speeded it up
Timing was the same, the efficiency was the best thing, we went with the higher because of the program
Has contributed in decrease in electric consumption. Influenced our decision for future projects.
Basically speaking, with the grant we can do the service more often which makes more efficiency, save us money, and saves on fuel
If the incentive is offered again we will do it again
Cover the cost of the work we proceeded with it
We purchased it at least a year sooner and a better efficiency
Without, it would have been spread out over a 12 month period, instead we were able to do project as a whole in 2 months.
We needed to have a certain performance and this allowed us to have the most energy efficient and still get it
It didn't change the size of the fan but did allow us to install a more energy efficient unit
It had a effect on the efficiency every thing else would have been the same
The list was invaluable
We would have had to go ahead with the original standard efficiency
They came around with the rebates and it made it a smart idea to replace. the money we saved helped us to put in new instead of repaired
The timing was the biggest concern with cost and without foe we would have had to wait
That was one of the reasons we did it was it was done at a different location before and it was there when we needed it, so without the money we wouldn't have done it as soon
They had a tremendous effect, a very positive effect

Open Responses, DAT4, CATI Survey , With Attribution
The jump started the project that we'd have never started, because to the incentives.
We had a reconstruction the contractor suggested we replace the equipment, but with the rebates in place it made it feasible
That the program sold the job for me
When I talked to a Focus advisor and we compared, and we decided he was right and we went with his suggestion
The overall program effectiveness gave us savings to get the job done. they provided us with what we needed
The timing was impeccable, they came right when we were discussing doing the project, and helped with the speed and timing of the project. because of the help we were able to move forward more quickly than would have been possible if we had been able to do it at all
Because of the expiration date of the rebate, it made it expedite the replacement, it helped improve our efficiency because we had so much bad equipment we were wasting energy and money
We could use less, saved money, and more energy efficient on bill
We were able to put in extra equipment for better performance and save energy
timing was the same; helped them increase efficiency. No effect on size and let them split it in two.
having the rebate option
Little effect. Incentive to do the regular thing that are already done.
It was a positive cooperation between us and them
For the same reason, it is the same reason, we wouldn't have done it as fast or as broadly without them.
They helped us meet our time line and the energy efficient equipment
They sped it up quite a bit
Helped us, promoted us to do it earlier, based on what we needed, and the check at the end is good
We would've gotten to the same answer, i believe, but it would have been farther down the road. we would have gotten to the same point but they helped us focus so our payback was quicker
They had the dollars figured out.
They were recommended by focus, they work well and are efficient
The program gave me and incentive to do it at this point in time, and when the repairs were found it was in my benefit to have them done now
Very high degree. energy savings
Everything was positive.
Same as before - financial hurdles, incentive help reduce payback period, to meet corporation standards.
Program moved the timing ahead
It's a deal maker, it provides the additional reasons to spend the money
Without that we would have only done the one phase
Would have done less than entire building and over multiple years.
Heard the rebate might be going away so that pushed the project up. That's why we decided to do what we did when we did.
Because of the incentive we worked with the contractor to find the best efficiency for the plant
We need about 20 more to get the shop done
Without a rebate we might have went with something else
Focus on energy assisted in the planning during the remodeling to meet the demands of that job and without focus on energy we probably wouldn't have gone to that extent in part of it.
Cost.
It was cost driven and lead driven, they helped save money

Table D-41. Open-ended Responses to DAT4, CATI Measures without Attribution

Open Responses, DAT4, CATI Survey , No Attribution
Focus gave us a benefit to doing what we already needed to do
It is recommended procedures, Focus reinforced
It's new construction needed the equipment and rebates was a help
Focus on energy offered rebates, they came and looked. recommended equipment they approve it sent a check
Same as before a little to no impact, annual maintenance
Very little effect, did provide financial support
Makes it more economical
For budget and to have it done
Good program and it helps with budgets and crunches that we have
We would do the service anyway the money helped
It helped out a lot
It saved us money by doing that and it is a good program
They helped us a lot, we appreciate that, we got the job done, running real good.
None
Saving money on fuel dollars
No influence
No effect
Incentives encouraged us to move forward sooner than later
I would say that we were going to put it in any way and it was mostly an opportunity to learn about Focus on Energy. Doing the project with them gave me the opportunity to save money and learn about them and now we are using them for another project.
It was a bonus we would have still done the project.
It is good preventative maintenance and also to save energy
They are excellent and i have nothing negative to say.
It gives us something to do within a time frame and that is always good to have that time frame
It saved me energy and by giving me money for getting it done. and by having it done within a specific time helps also
No bearing on timing. made equipment suggestions and they took some and left some
We do it because it's needed and it's better do the service than replace the whole thing
It did not have an effect on my choice, or the selection and installation, it just a nice perk at the end
No effect - it's a measure we've always done.
The only thing was the fact that the money was there when we needed the repairs, it was in the budget already the extra help was appreciated
It's always a good effect if you can get rebates, especially on something you're already going to do.
Same as other equipment
No impact
Preventative maintenance
A little to no impact, annual maintenance
I would have done it mo matter what
They told us it was a good deal so we did it
They were very informative on the timing and the forms and getting things like that done in an orderly fashion to get my application turned in on time
No impact. it had to be done

Open Responses, DAT4, CATI Survey , No Attribution
Program gave them the info they needed to move forward but it did not influence decision from a monetary standpoint
Because it was available we used it at the time
We had no problems, everything went well, the paperwork was easy to do, we ended up with more $ money than we thought. We had changed electrical, and had gotten rebates.
Very positive
We were going to service the units anyway - we service units every year. but we checked with Focus to see if we could get help and they required we do some more thorough maintenance than we would have done. so they helped us do a better
It was a good perk for us, it helped us to have confidence of the decision we made. the check made a big difference at the end, it made us feel appreciated by focus on energy and by the government
Extremely important
A great effect
The contractor was very honest, made recommendations.
Bonus
It's new construction , needed equipment and energy efficiency, so FOE didn't really have any influence this time
Very little effect
It was, just had very little effect on anything
We would have done it at the same time with or without them, we would have done the same amount with or without them
It had a big impact on the decision
They offered a double incentive but earlier in the year.
It didn't really influence me at all, that's something i contracted with the vendor for but this year i submitted to have financial assistance.
We do the service, with or without them, they just help financially because it's a program that you have
We would have done all that without them, we had a study done on it so we would have gone ahead and done it anyways
We renovated. We had to do it.
It was after thing
Good effect it helped in the decision making
We put in what we wanted
Relatively little
It was very helpful economically. it was definitely preventative maintenance and it prolongs the life of the equipment. we are very open to accepting those types of incentives
Had quite a bit of an effect
It was what we needed
No effect on timing. would have been same amount. The fact that they could get a discount on high efficiency equipment helped make the decision.
It influenced the equipment i got
Honestly not a huge effect on my decision, I was a little disappointed on one part of the project. On the other part we were going to do it with or without the grant.
Fairly little, it really didn't influence us
Because of the faulty equipment we had, they updated me with the energy efficiency ones available. since we had to bid they helped a lot
We were relieved that it would help us
We would have done it with or without them but it was nice that they existed

Open Responses, DAT4, CATI Survey , No Attribution
The program information provided simplified the process of simplifying and getting the project justified through the board.
Needed equipment. Focus on Energy said they what would be good saved money we were pleased
Again it had little effect on anything.
It was , just had very little effect on anything
We thought we could upgrade a little cheaper than before the program, so it had some influence
The Focus on Energy is a good program for anything that uses gas/electric, a good guider
Positive effect financial
No effect. it would have been done anyways
No ef
It was nice to get a rebate.
A positive effect, financially made sense
They had considerable influence
We were blessed that they could help us. they had direct bearing for our project, we have reached our goal of better efficiency
Somewhat of a nominal amount (of) 4 so didn't have an affect, but we would have done it anyway

APPENDIX E: ATTRIBUTION ANALYSIS METHODOLOGY

This appendix provides a detailed explanation of the program attribution methodology used in this impact evaluation.[61]

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,[62] 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

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[61] 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.

[62] For purposes of this discussion, "CFLs" includes small CFLs only; for example, measures described in the program tracking databases as "CFL <= 30W". The standard evaluation attribution battery is used for larger CFL installations (> 30W).

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

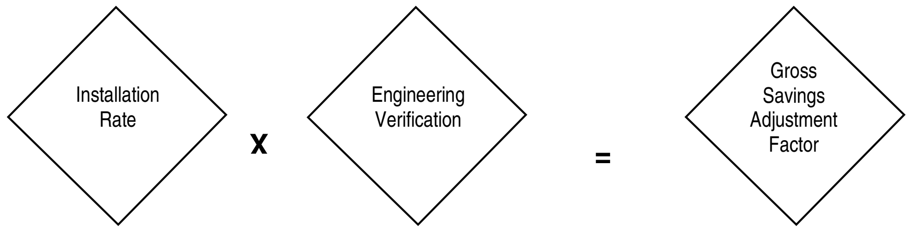
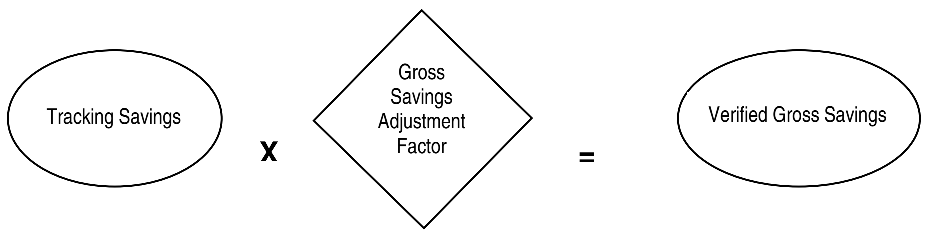
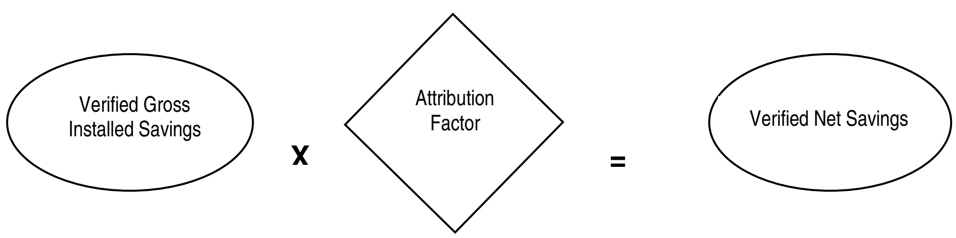


Figure E-2. Verified Gross Savings Calculation



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

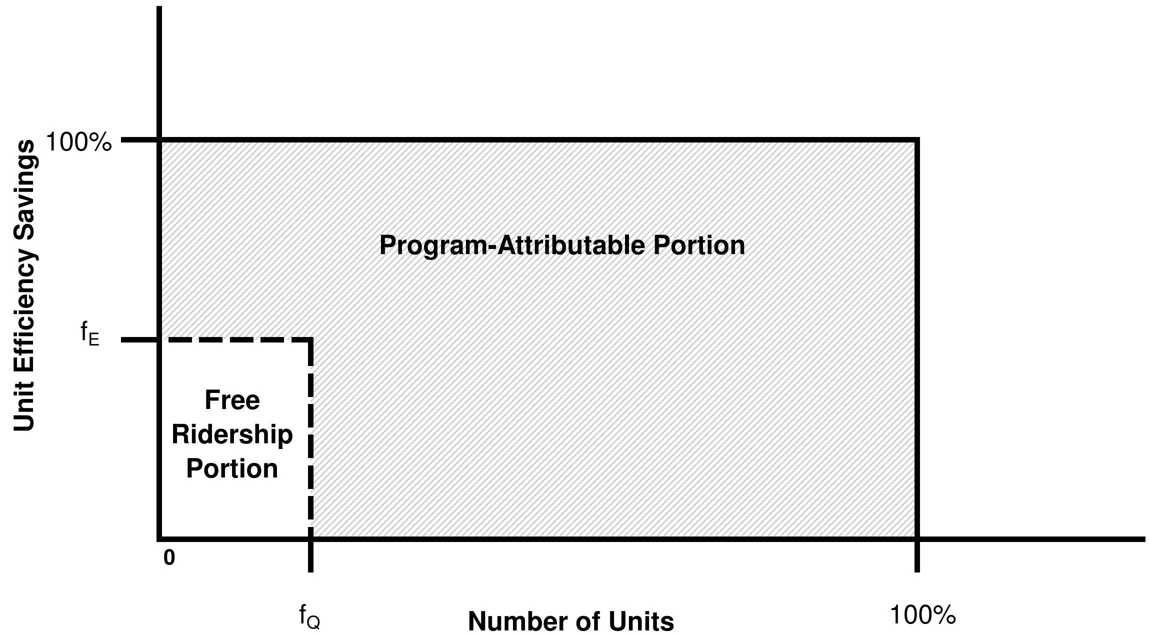
$$f_{QE} = (2/3) \times (1/2) = 1/3.$$

The SPA is the complement of this free rider portion.

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

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 percent 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?"

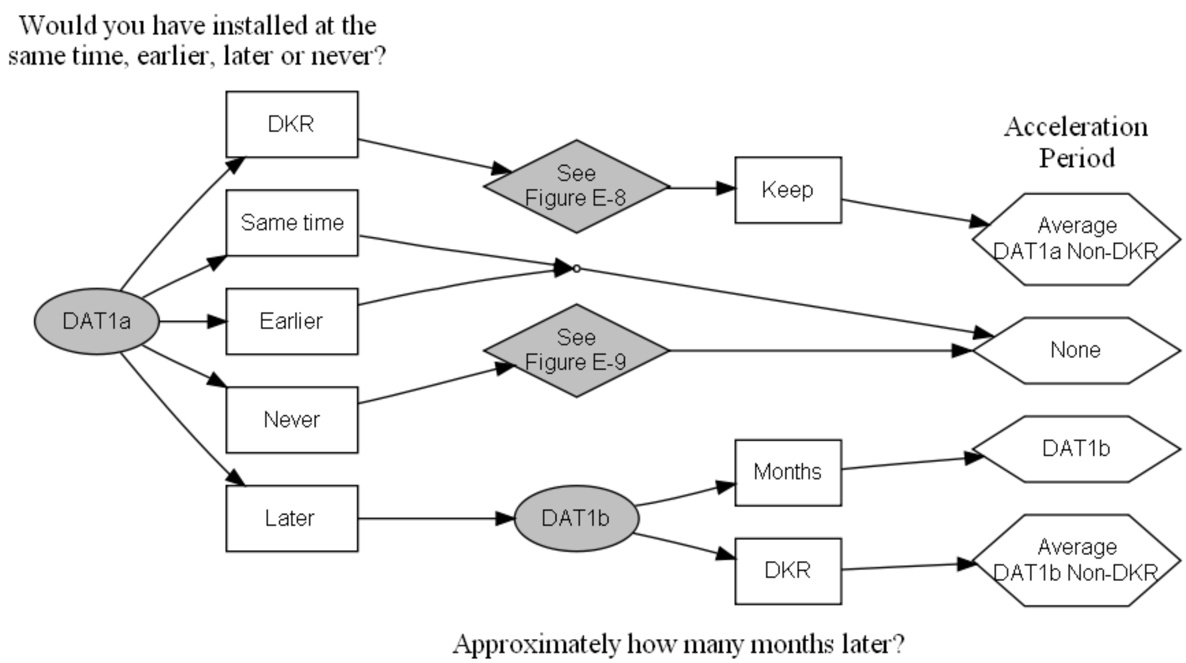
> DAT1b: "Approximately how many months later?" (DAT1b is only asked if DAT1a is "Later.")

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.")

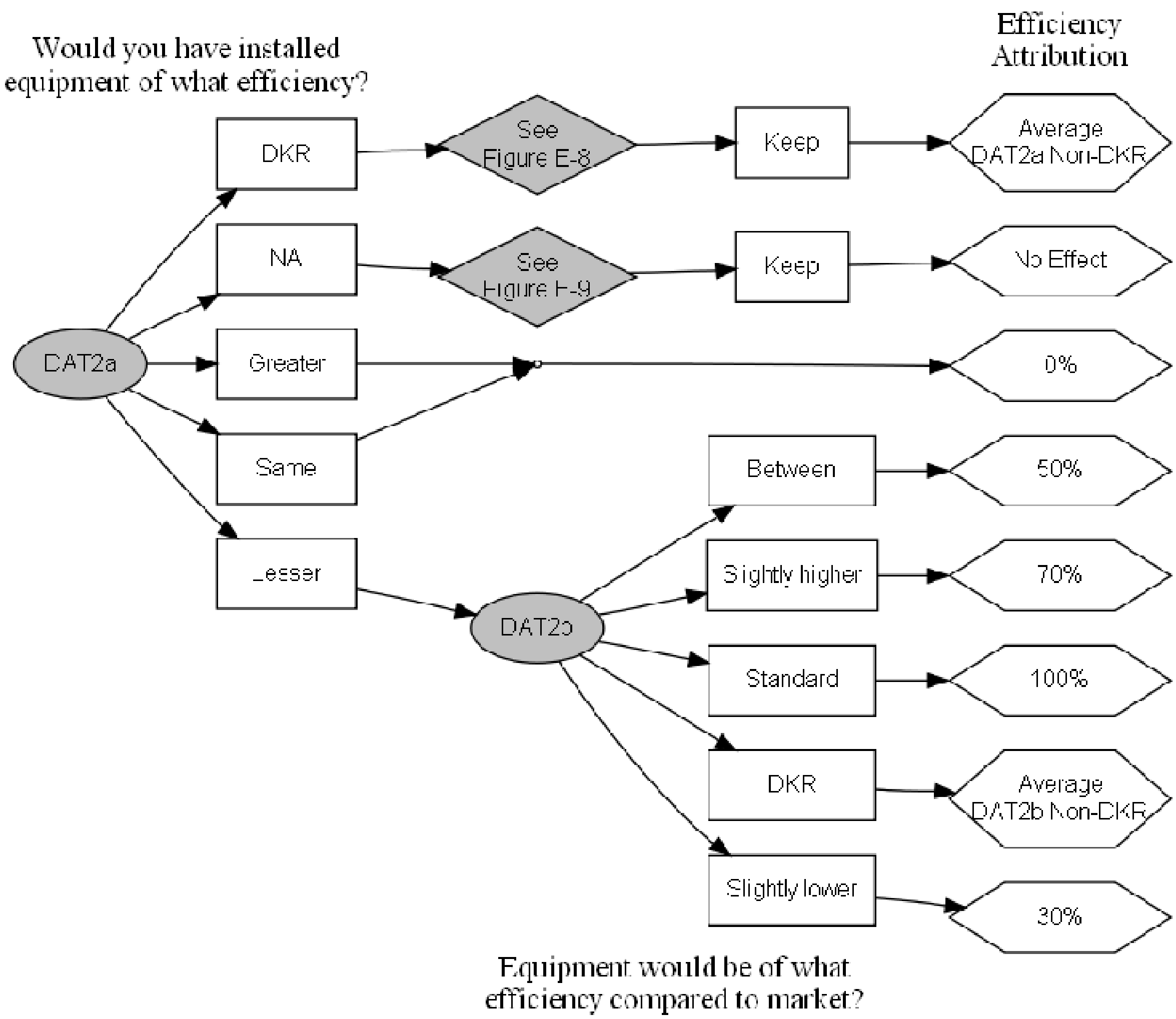
The program receives nonzero Efficiency Attribution if the respondent indicates that they would have installed a less efficient measure without the influence of Focus. The magnitude of the Efficiency Attribution is determined based on the answer to DAT2b, as shown in Table E-2. Figure E-6 shows the corresponding 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

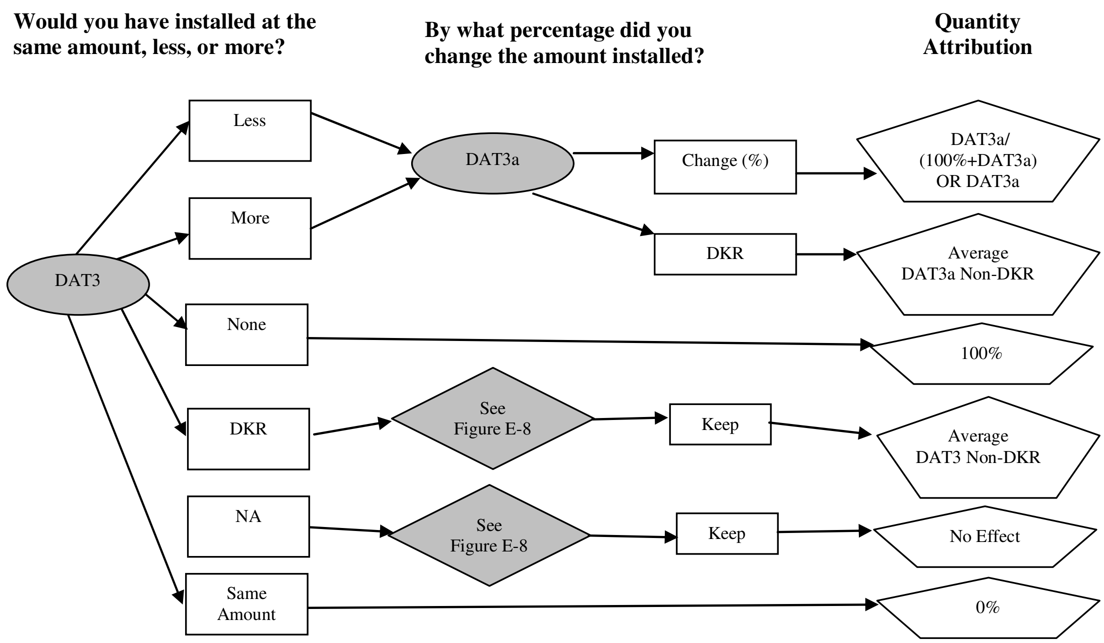
Quantity Attribution, A_Q, gives the program credit for increasing the quantity of a measure above what would have been installed in the absence of the program. The two relevant questions are DAT3 and DAT3a.

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 = percent change in quantity because of Focus.

If the respondent would have installed a larger measure without Focus, then the Quantity Attribution is

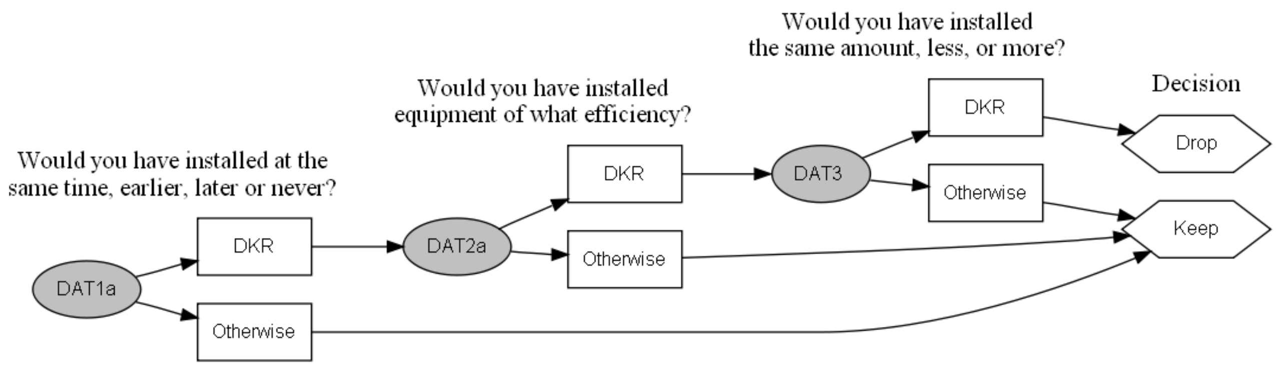
$$A_Q = Inc.$$

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

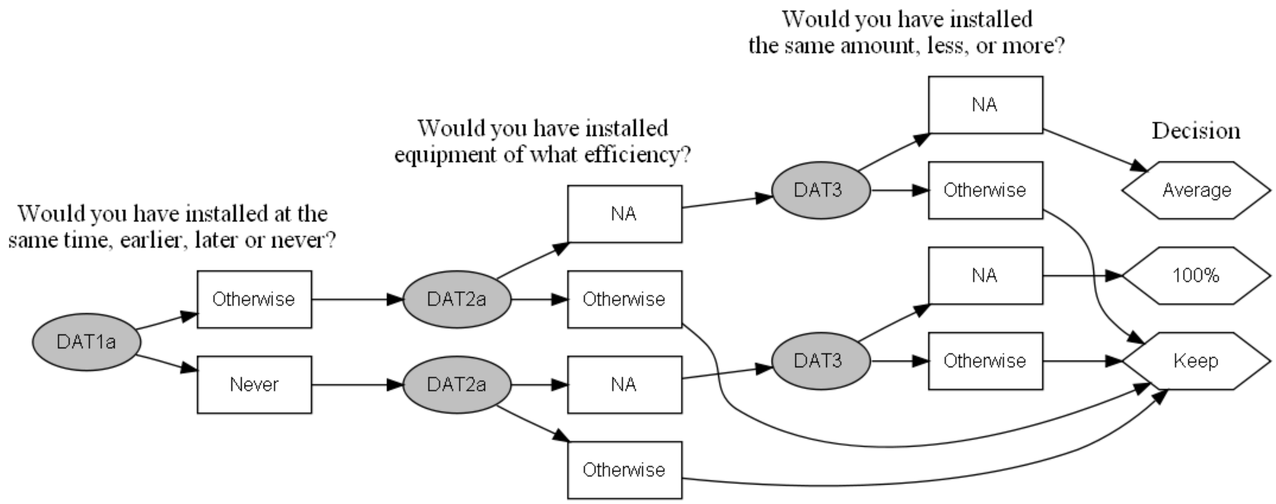


f. WHEN EFFICIENCY AND QUANTITY DON'T APPLY

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.

APPENDIX F: RATIO EXPANSION—SAMPLE TO POPULATION RESULTS

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[63]. 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

[63] 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 are then added to the population net savings. Unlike the added spillover savings, the untracked attributable savings resulting from the impact evaluation of the Education and Training program 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:

$$R_G = R_I R_V = \left[\frac{\sum_{j \varepsilon A} G_{Ij} w_{Aj}}{\sum_{j \varepsilon A} G_{Tj} w_{Aj}}\right]\left[\frac{\sum_{j \varepsilon A} N_{Vj} w_{Aj}}{\sum_{j \varepsilon A} G_{Vj} w_{Aj}}\right].$$

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.

G.1 SAMPLE DISPOSITIONS

Table G-1. Boilers and Burners Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
7	Agriculture	Boilers & Burners	Deemed	Has Therms	1,885	3	1	1	Exhausted
8	Agriculture	Boilers & Burners	Not Deemed	No Therms	1,032	2	1	1	Exhausted
9	Agriculture	Boilers & Burners	Not Deemed	Has Therms	2,432	2	1	2	Exhausted
37	Commercial	Boilers & Burners	Deemed	Has Therms	433	231	3	6	Available
38	Commercial	Boilers & Burners	Deemed	Has Therms	2,010	66	3	14	Available
39	Commercial	Boilers & Burners	Deemed	Has Therms	4,617	33	3	13	Available
40	Commercial	Boilers & Burners	Deemed	Has Therms	43,363	6	2	4	Exhausted
41	Commercial	Boilers & Burners	Not Deemed	No Therms	691	10	1	2	Exhausted
42	Commercial	Boilers & Burners	Not Deemed	Has Therms	5,391	62	2	1	Exhausted
43	Commercial	Boilers & Burners	Not Deemed	Has Therms	51,391	10	2	2	Exhausted
91	Industrial	Boilers & Burners	Deemed	Has Therms	969	53	4	8	Available
92	Industrial	Boilers & Burners	Deemed	Has Therms	4,446	15	3	8	Available
93	Industrial	Boilers & Burners	Deemed	Has Therms	9,111	9	3	4	Exhausted
94	Industrial	Boilers & Burners	Deemed	Has Therms	16,456	5	3	3	Exhausted
95	Industrial	Boilers & Burners	Deemed	Has Therms	26,896	4	3	3	Exhausted
96	Industrial	Boilers & Burners	Deemed	Has Therms	73,688	4	4	2	Exhausted
97	Industrial	Boilers & Burners	Not Deemed	No Therms	8,607	9	1	-	Exhausted
98	Industrial	Boilers & Burners	Not Deemed	Has Therms	10,152	33	3	5	Exhausted
99	Industrial	Boilers & Burners	Not Deemed	Has Therms	43,210	11	3	5	Exhausted
100	Industrial	Boilers & Burners	Not Deemed	Has Therms	111,911	5	2	2	Exhausted
101	Industrial	Boilers & Burners	Not Deemed	Has Therms	556,145	1	1	1	Exhausted
153	Schools and Government	Boilers & Burners	Deemed	Has Therms	773	164	6	14	Available
154	Schools and Government	Boilers & Burners	Deemed	Has Therms	2,131	71	6	19	Available
155	Schools and Government	Boilers & Burners	Deemed	Has Therms	4,257	41	6	15	Available
156	Schools and Government	Boilers & Burners	Deemed	Has Therms	7,976	24	6	13	Exhausted
157	Schools and Government	Boilers & Burners	Deemed	Has Therms	17,341	14	6	11	Exhausted
158	Schools and Government	Boilers & Burners	Not Deemed	No Therms	723	33	1	2	Exhausted
159	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	2,264	166	2	2	Exhausted
160	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	4,760	91	2	3	Exhausted
161	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	7,901	60	2	1	Exhausted
162	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	11,622	45	2	1	Exhausted
163	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	19,167	29	2	2	Exhausted
164	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	47,722	15	1	1	Exhausted
	Boilers & Burners Overall					**1,327**	**91**	**171**	

Table G-2. Small CFL Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
10	Agriculture	CFL	Deemed	No Therms	33	3,218	3	2	Exhausted
11	Agriculture	CFL	Deemed	No Therms	106	1,246	3	3	Available
12	Agriculture	CFL	Deemed	No Therms	182	803	3	4	Exhausted
13	Agriculture	CFL	Deemed	No Therms	612	327	2	3	Exhausted
44	Commercial	CFL	Deemed	No Therms	55	6,117	3	3	Available
45	Commercial	CFL	Deemed	No Therms	246	1,788	3	3	Available
46	Commercial	CFL	Deemed	No Therms	671	798	3	3	Available
47	Commercial	CFL	Deemed	No Therms	1,569	405	3	4	Available
48	Commercial	CFL	Deemed	No Therms	3,876	197	3	6	Available
49	Commercial	CFL	Deemed	No Therms	14,748	70	2	5	Available
102	Industrial	CFL	Deemed	No Therms	579	37	1	8	Exhausted
165	Schools and Government	CFL	Deemed	No Therms	1,160	87	2	6	Available
166	Schools and Government	CFL	Deemed	No Therms	28,523	7	2	3	Exhausted
167	Schools and Government	CFL	Deemed	No Therms	123,769	1	1	1	Exhausted
	Small CFL Overall					**15,101**	**34**	**54**	

Table G-3. HVAC Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
15	Agriculture	HVAC	Deemed	No Therms	569	73	3	7	Available
16	Agriculture	HVAC	Deemed	No Therms	2,009	26	3	6	Available
17	Agriculture	HVAC	Deemed	No Therms	3,999	14	3	4	Available
18	Agriculture	HVAC	Deemed	No Therms	8,191	8	3	5	Exhausted
19	Agriculture	HVAC	Deemed	No Therms	14,929	6	3	1	Exhausted
20	Agriculture	HVAC	Deemed	No Therms	30,866	1	1	1	Exhausted
21	Agriculture	HVAC	Deemed	Has Therms	287	1	1	1	Exhausted
22	Agriculture	HVAC	Deemed	Has Therms	15,152	1	1	1	Exhausted
23	Agriculture	HVAC	Not Deemed	No Therms	2,092	35	1	2	Exhausted
24	Agriculture	HVAC	Not Deemed	Has Therms	222	2	1	1	Exhausted
51	Commercial	HVAC	Deemed	No Therms	429	153	3	4	Available
52	Commercial	HVAC	Deemed	No Therms	4,447	22	3	5	Exhausted
53	Commercial	HVAC	Deemed	No Therms	9,011	13	2	2	Exhausted
54	Commercial	HVAC	Deemed	Has Therms	605	84	3	3	Available
55	Commercial	HVAC	Deemed	Has Therms	6,438	13	3	3	Available
56	Commercial	HVAC	Deemed	Has Therms	12,884	7	3	4	Exhausted
57	Commercial	HVAC	Deemed	Has Therms	20,635	5	3	3	Available
58	Commercial	HVAC	Deemed	Has Therms	29,402	4	3	3	Exhausted
59	Commercial	HVAC	Not Deemed	No Therms	818	558	2	2	Exhausted
60	Commercial	HVAC	Not Deemed	No Therms	4,497	135	2	3	Exhausted
61	Commercial	HVAC	Not Deemed	No Therms	11,738	62	2	1	Exhausted
62	Commercial	HVAC	Not Deemed	No Therms	40,354	24	2	3	Exhausted
63	Commercial	HVAC	Not Deemed	Has Therms	4,130	96	2	1	Exhausted
64	Commercial	HVAC	Not Deemed	Has Therms	40,825	15	2	1	Exhausted
107	Industrial	HVAC	Deemed	No Therms	822	31	2	6	Available
108	Industrial	HVAC	Deemed	Has Therms	1,005	11	2	2	Exhausted
109	Industrial	HVAC	Deemed	Has Therms	5,318	4	1	3	Exhausted
110	Industrial	HVAC	Deemed	Has Therms	50,673	1	1	-	Exhausted
111	Industrial	HVAC	Not Deemed	No Therms	3,221	169	3	4	Exhausted
112	Industrial	HVAC	Not Deemed	No Therms	23,203	34	2	1	Exhausted
113	Industrial	HVAC	Not Deemed	Has Therms	14,425	40	3	5	Exhausted
114	Industrial	HVAC	Not Deemed	Has Therms	140,606	6	2	3	Exhausted
169	Schools and Government	HVAC	Deemed	No Therms	420	31	1	3	Available
170	Schools and Government	HVAC	Deemed	Has Therms	3,679	35	5	15	Exhausted
171	Schools and Government	HVAC	Deemed	Has Therms	12,272	13	5	9	Exhausted
172	Schools and Government	HVAC	Deemed	Has Therms	18,667	10	4	5	Exhausted
173	Schools and Government	HVAC	Deemed	Has Therms	25,283	7	4	4	Exhausted
174	Schools and Government	HVAC	Deemed	Has Therms	34,556	6	4	4	Exhausted
175	Schools and Government	HVAC	Deemed	Has Therms	67,336	4	4	3	Exhausted
176	Schools and Government	HVAC	Not Deemed	No Therms	1,403	400	3	4	Exhausted
177	Schools and Government	HVAC	Not Deemed	No Therms	6,481	112	2	3	Exhausted
178	Schools and Government	HVAC	Not Deemed	No Therms	21,217	44	2	1	Exhausted
179	Schools and Government	HVAC	Not Deemed	No Therms	137,880	1	1	1	Exhausted
180	Schools and Government	HVAC	Not Deemed	Has Therms	4,066	140	3	2	Exhausted
	HVAC Overall					**2,457**	**109**	**145**	

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
25	Agriculture	Lighting	Deemed	No Therms	278	123	3	8	Available
26	Agriculture	Lighting	Deemed	No Therms	979	44	2	5	Available
27	Agriculture	Lighting	Deemed	No Therms	2,021	24	2	6	Available
28	Agriculture	Lighting	Deemed	No Therms	6,575	10	2	4	Exhausted
29	Agriculture	Lighting	Not Deemed	No Therms	389	236	1	1	Exhausted
65	Commercial	Lighting	Deemed	No Therms	187	1,316	7	9	Available
66	Commercial	Lighting	Deemed	No Therms	966	333	7	19	Available
67	Commercial	Lighting	Deemed	No Therms	2,324	165	7	13	Available
68	Commercial	Lighting	Deemed	No Therms	5,868	79	6	20	Available
69	Commercial	Lighting	Deemed	No Therms	17,390	34	6	20	Available
70	Commercial	Lighting	Not Deemed	No Therms	505	1,193	3	2	Exhausted
71	Commercial	Lighting	Not Deemed	No Therms	3,516	234	3	4	Exhausted
72	Commercial	Lighting	Not Deemed	No Therms	16,747	70	3	3	Exhausted
119	Industrial	Lighting	Deemed	No Therms	415	640	7	27	Available
120	Industrial	Lighting	Deemed	No Therms	2,312	152	7	15	Available
121	Industrial	Lighting	Deemed	No Therms	4,899	83	7	20	Available
122	Industrial	Lighting	Deemed	No Therms	9,136	50	7	19	Available
123	Industrial	Lighting	Deemed	No Therms	16,401	31	6	15	Exhausted
124	Industrial	Lighting	Deemed	No Therms	32,322	19	6	7	Exhausted
125	Industrial	Lighting	Not Deemed	No Therms	879	680	3	4	Exhausted
126	Industrial	Lighting	Not Deemed	No Therms	3,688	204	3	4	Exhausted
127	Industrial	Lighting	Not Deemed	No Therms	7,333	118	3	2	Exhausted
128	Industrial	Lighting	Not Deemed	No Therms	12,691	76	3	3	Exhausted
129	Industrial	Lighting	Not Deemed	No Therms	20,582	52	3	4	Exhausted
130	Industrial	Lighting	Not Deemed	No Therms	41,347	30	3	5	Exhausted
181	Schools and Government	Lighting	Deemed	No Therms	180	543	4	5	Available
182	Schools and Government	Lighting	Deemed	No Therms	824	152	3	9	Available
183	Schools and Government	Lighting	Deemed	No Therms	1,602	89	3	9	Available
184	Schools and Government	Lighting	Deemed	No Therms	3,149	52	3	15	Exhausted
185	Schools and Government	Lighting	Deemed	No Therms	14,140	17	3	5	Available
186	Schools and Government	Lighting	Not Deemed	No Therms	742	552	3	4	Exhausted
187	Schools and Government	Lighting	Not Deemed	No Therms	6,023	103	2	1	Exhausted
	Non-Small CFL Lighting Overall					**7,504**	**131**	**287**	

Table G-5. Expanded Process Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
14	Agriculture	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	1,217	2	1	2	Exhausted
50	Commercial	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	1,285	12	1	1	Exhausted
103	Industrial	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	2,533	231	3	5	Exhausted
104	Industrial	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	8,076	89	3	4	Exhausted
105	Industrial	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	26,439	35	3	2	Exhausted
106	Industrial	Compressed Air, Vacuum Pumps	Not Deemed	Has Therms	17,940	11	2	2	Exhausted
168	Schools and Government	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	3,417	10	1	2	Exhausted
115	Industrial	Industrial Ovens and Furnaces	Not Deemed	No Therms	27,597	1	1	1	Exhausted
116	Industrial	Industrial Ovens and Furnaces	Not Deemed	Has Therms	25,793	7	2	2	Exhausted
117	Industrial	Industrial Ovens and Furnaces	Not Deemed	Has Therms	127,079	2	1	2	Exhausted
118	Industrial	Industrial Ovens and Furnaces	Not Deemed	Has Therms	240,780	1	1	-	Exhausted
81	Commercial	Process	Not Deemed	No Therms	10,979	2	1	2	Exhausted
139	Industrial	Process	Not Deemed	No Therms	3,195	105	3	5	Exhausted
140	Industrial	Process	Not Deemed	No Therms	26,102	19	3	3	Exhausted
141	Industrial	Process	Not Deemed	No Therms	91,697	7	2	2	Exhausted
142	Industrial	Process	Not Deemed	No Therms	287,291	1	1	1	Exhausted
143	Industrial	Process	Not Deemed	Has Therms	22,979	18	4	6	Exhausted
144	Industrial	Process	Not Deemed	Has Therms	78,184	6	4	4	Exhausted
145	Industrial	Process	Not Deemed	Has Therms	128,621	5	4	5	Exhausted
146	Industrial	Process	Not Deemed	Has Therms	157,333	4	3	3	Exhausted
147	Industrial	Process	Not Deemed	Has Therms	219,695	3	3	1	Exhausted
148	Industrial	Process	Not Deemed	Has Therms	545,844	7	7	6	Exhausted
195	Schools and Government	Process	Not Deemed	No Therms	879	1	1	1	Exhausted
36	Agriculture	Waste Water Treatment	Not Deemed	No Therms	258	12	1	2	Exhausted
89	Commercial	Waste Water Treatment	Not Deemed	No Therms	768	13	1	2	Exhausted
151	Industrial	Waste Water Treatment	Not Deemed	No Therms	19,442	28	3	4	Exhausted
197	Schools and Government	Waste Water Treatment	Not Deemed	No Therms	3,030	30	2	1	Exhausted
	Expanded Process Overall					**662**	**62**	**71**	

Table G-6. Refrigeration Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
35	Agriculture	Refrigeration	Not Deemed	No Therms	1,880	1	1	-	Exhausted
82	Commercial	Refrigeration	Deemed	No Therms	1,275	94	3	16	Available
83	Commercial	Refrigeration	Deemed	No Therms	9,363	17	3	11	Exhausted
84	Commercial	Refrigeration	Deemed	No Therms	15,739	12	2	9	Exhausted
85	Commercial	Refrigeration	Not Deemed	No Therms	482	496	3	2	Exhausted
86	Commercial	Refrigeration	Not Deemed	No Therms	8,579	50	2	2	Exhausted
87	Commercial	Refrigeration	Not Deemed	No Therms	184,885	1	1	1	Exhausted
88	Commercial	Refrigeration	Not Deemed	Has Therms	4,585	16	1	2	Exhausted
149	Industrial	Refrigeration	Not Deemed	No Therms	18,018	22	3	4	Exhausted
150	Industrial	Refrigeration	Not Deemed	Has Therms	5,887	1	1	1	Exhausted
196	Schools and Government	Refrigeration	Not Deemed	No Therms	548	23	1	1	Exhausted
	Refrigeration Overall					**733**	**21**	**49**	

Table G-7. Other Sample Disposition by Stratum

Stratum	Sector	Measure Group	Deemed	Therms	Average Avoided Cost	Frame	Target	Sample Completes	Status
1	Agriculture	Agriculture	Not Deemed	No Therms	209	747	2	2	Exhausted
2	Agriculture	Agriculture	Not Deemed	No Therms	1,242	168	1	2	Exhausted
3	Agriculture	Agriculture	Not Deemed	No Therms	4,269	65	1	2	Exhausted
4	Agriculture	Agriculture	Not Deemed	Has Therms	1,722	48	2	3	Exhausted
5	Agriculture	Agriculture	Not Deemed	Has Therms	8,571	13	2	2	Exhausted
6	Agriculture	Agriculture	Not Deemed	Has Therms	86,321	2	2	1	Exhausted
90	Industrial	Agriculture	Not Deemed	No Therms	694	1	1	1	Exhausted
152	Schools and Government	Agriculture	Not Deemed	Has Therms	341	1	1	1	Exhausted
75	Commercial	New Construction	Not Deemed	No Therms	5,313	2	1	2	Exhausted
76	Commercial	New Construction	Not Deemed	Has Therms	22,402	13	2	3	Exhausted
134	Industrial	New Construction	Not Deemed	Has Therms	22,393	4	1	2	Exhausted
135	Industrial	New Construction	Not Deemed	Has Therms	193,920	2	2	1	Exhausted
190	Schools and Government	New Construction	Not Deemed	Has Therms	19,351	6	1	1	Exhausted
30	Agriculture	Motors & Drives	Deemed	No Therms	69	8	1	2	Available
31	Agriculture	Motors & Drives	Not Deemed	No Therms	1,159	55	2	2	Exhausted
73	Commercial	Motors & Drives	Deemed	No Therms	90	40	2	7	Available
74	Commercial	Motors & Drives	Not Deemed	No Therms	2,192	28	2	2	Exhausted
131	Industrial	Motors & Drives	Deemed	No Therms	41	556	3	12	Available
132	Industrial	Motors & Drives	Deemed	No Therms	213	149	2	10	Exhausted
133	Industrial	Motors & Drives	Not Deemed	No Therms	8,033	27	3	3	Exhausted
188	Schools and Government	Motors & Drives	Deemed	No Therms	73	100	2	7	Available
189	Schools and Government	Motors & Drives	Not Deemed	No Therms	2,359	28	2	-	Exhausted
32	Agriculture	Other	Deemed	No Therms	22	1	1	-	Exhausted
33	Agriculture	Other	Not Deemed	No Therms	1,334	132	2	2	Exhausted
34	Agriculture	Other	Not Deemed	Has Therms	2,377	17	1	1	Exhausted
77	Commercial	Other	Deemed	No Therms	245	238	3	5	Available
78	Commercial	Other	Deemed	Has Therms	899	74	3	12	Available
79	Commercial	Other	Not Deemed	No Therms	1,026	183	2	1	Exhausted
80	Commercial	Other	Not Deemed	Has Therms	1,755	163	2	2	Exhausted
136	Industrial	Other	Deemed	No Therms	134	9	1	2	Available
137	Industrial	Other	Not Deemed	No Therms	21,349	6	1	1	Exhausted
138	Industrial	Other	Not Deemed	Has Therms	5,760	19	1	2	Exhausted
191	Schools and Government	Other	Deemed	No Therms	265	100	2	10	Available
192	Schools and Government	Other	Deemed	Has Therms	583	20	3	4	Available
193	Schools and Government	Other	Not Deemed	No Therms	3,714	58	2	1	Exhausted
194	Schools and Government	Other	Not Deemed	Has Therms	2,465	156	2	3	Exhausted
	Other Overall					**3,239**	**64**	**114**	

G.2 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
7	Agriculture	Boilers & Burners	Deemed	Has Therms	1,885	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	Agriculture	Boilers & Burners	Not Deemed	No Therms	1,032	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
9	Agriculture	Boilers & Burners	Not Deemed	Has Therms	2,432	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
37	Commercial	Boilers & Burners	Deemed	Has Therms	433	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
38	Commercial	Boilers & Burners	Deemed	Has Therms	2,010	0.0%	0.0%	0.6%	0.0%	0.0%	0.1%
39	Commercial	Boilers & Burners	Deemed	Has Therms	4,617	0.0%	0.0%	0.7%	0.0%	0.0%	0.3%
40	Commercial	Boilers & Burners	Deemed	Has Therms	43,363	0.0%	0.0%	1.1%	0.0%	0.0%	0.8%
41	Commercial	Boilers & Burners	Not Deemed	No Therms	691	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
42	Commercial	Boilers & Burners	Not Deemed	Has Therms	5,391	0.0%	0.0%	1.4%	0.0%	0.0%	0.1%
43	Commercial	Boilers & Burners	Not Deemed	Has Therms	51,391	0.0%	0.0%	2.2%	0.0%	0.0%	0.4%
91	Industrial	Boilers & Burners	Deemed	Has Therms	969	0.0%	0.0%	0.3%	0.0%	0.0%	0.1%
92	Industrial	Boilers & Burners	Deemed	Has Therms	4,446	0.0%	0.0%	0.3%	0.0%	0.0%	0.2%
93	Industrial	Boilers & Burners	Deemed	Has Therms	9,111	0.0%	0.0%	0.4%	0.0%	0.0%	0.2%
94	Industrial	Boilers & Burners	Deemed	Has Therms	16,456	0.0%	0.0%	0.4%	0.0%	0.0%	0.3%
95	Industrial	Boilers & Burners	Deemed	Has Therms	26,896	0.0%	0.0%	0.5%	0.0%	0.0%	0.4%
96	Industrial	Boilers & Burners	Deemed	Has Therms	73,688	0.0%	0.0%	1.5%	0.0%	0.0%	0.9%
97	Industrial	Boilers & Burners	Not Deemed	No Therms	8,607	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%
98	Industrial	Boilers & Burners	Not Deemed	Has Therms	10,152	0.0%	0.0%	1.7%	0.0%	0.0%	0.2%
99	Industrial	Boilers & Burners	Not Deemed	Has Therms	43,210	0.0%	0.0%	2.3%	0.0%	0.0%	1.0%
100	Industrial	Boilers & Burners	Not Deemed	Has Therms	111,911	0.1%	0.0%	2.6%	0.1%	0.1%	0.8%
101	Industrial	Boilers & Burners	Not Deemed	Has Therms	556,145	0.0%	0.0%	2.7%	0.0%	0.0%	2.7%
153	Schools and Government	Boilers & Burners	Deemed	Has Therms	773	0.0%	0.0%	0.6%	0.0%	0.0%	0.1%
154	Schools and Government	Boilers & Burners	Deemed	Has Therms	2,131	0.0%	0.0%	0.7%	0.0%	0.0%	0.2%
155	Schools and Government	Boilers & Burners	Deemed	Has Therms	4,257	0.0%	0.0%	0.8%	0.0%	0.0%	0.3%
156	Schools and Government	Boilers & Burners	Deemed	Has Therms	7,976	0.0%	0.0%	0.9%	0.0%	0.0%	0.5%
157	Schools and Government	Boilers & Burners	Deemed	Has Therms	17,341	0.0%	0.0%	1.2%	0.0%	0.0%	0.9%
158	Schools and Government	Boilers & Burners	Not Deemed	No Therms	723	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
159	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	2,264	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%
160	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	4,760	0.0%	0.0%	2.1%	0.0%	0.0%	0.1%
161	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	7,901	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%
162	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	11,622	0.0%	0.0%	2.5%	0.0%	0.0%	0.1%
163	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	19,167	0.0%	0.0%	2.7%	0.0%	0.0%	0.2%
164	Schools and Government	Boilers & Burners	Not Deemed	Has Therms	47,722	0.0%	0.0%	3.4%	0.0%	0.0%	0.2%
	Boilers & Burners Overall					**0.5%**	**0.2%**	**38.1%**	**0.1%**	**0.1%**	**10.9%**

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
10	Agriculture	CFL	Deemed	No Therms	33	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%
11	Agriculture	CFL	Deemed	No Therms	106	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%
12	Agriculture	CFL	Deemed	No Therms	182	0.4%	0.5%	0.0%	0.0%	0.0%	0.0%
13	Agriculture	CFL	Deemed	No Therms	612	0.5%	0.6%	0.0%	0.0%	0.0%	0.0%
44	Commercial	CFL	Deemed	No Therms	55	0.8%	1.1%	0.0%	0.0%	0.0%	0.0%
45	Commercial	CFL	Deemed	No Therms	246	1.1%	1.4%	0.0%	0.0%	0.0%	0.0%
46	Commercial	CFL	Deemed	No Therms	671	1.3%	1.7%	0.0%	0.0%	0.0%	0.0%
47	Commercial	CFL	Deemed	No Therms	1,569	1.6%	2.0%	0.0%	0.0%	0.0%	0.0%
48	Commercial	CFL	Deemed	No Therms	3,876	1.9%	2.4%	0.0%	0.1%	0.1%	0.0%
49	Commercial	CFL	Deemed	No Therms	14,748	2.5%	3.2%	0.0%	0.3%	0.4%	0.0%
102	Industrial	CFL	Deemed	No Therms	579	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
165	Schools and Government	CFL	Deemed	No Therms	1,160	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%
166	Schools and Government	CFL	Deemed	No Therms	28,523	0.5%	0.6%	0.0%	0.1%	0.1%	0.0%
167	Schools and Government	CFL	Deemed	No Therms	123,769	0.3%	0.3%	0.0%	0.3%	0.3%	0.0%
	Small CFL Overall					**12.0%**	**14.7%**	**0.0%**	**0.8%**	**1.0%**	**0.0%**

Table G-10. HVAC Fraction of Frame Savings in Sample by Stratum

					Average Avoided	Fraction of Frame Total Reported Gross Savings					
						Frame			Sample		
Stratum	Sector	Measure Group	Deemed	Therms	Cost	kWh	kW	Therms	kWh	kW	Therms
15	Agriculture	HVAC	Deemed	No Therms	569	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
16	Agriculture	HVAC	Deemed	No Therms	2,009	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
17	Agriculture	HVAC	Deemed	No Therms	3,999	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
18	Agriculture	HVAC	Deemed	No Therms	8,191	0.2%	0.2%	0.0%	0.1%	0.1%	0.0%
19	Agriculture	HVAC	Deemed	No Therms	14,929	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%
20	Agriculture	HVAC	Deemed	No Therms	30,866	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
21	Agriculture	HVAC	Deemed	Has Therms	287	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
22	Agriculture	HVAC	Deemed	Has Therms	15,152	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
23	Agriculture	HVAC	Not Deemed	No Therms	2,092	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
24	Agriculture	HVAC	Not Deemed	Has Therms	222	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
51	Commercial	HVAC	Deemed	No Therms	429	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%
52	Commercial	HVAC	Deemed	No Therms	4,447	0.3%	0.2%	0.0%	0.0%	0.1%	0.0%
53	Commercial	HVAC	Deemed	No Therms	9,011	0.4%	0.2%	0.0%	0.0%	0.1%	0.0%
54	Commercial	HVAC	Deemed	Has Therms	605	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
55	Commercial	HVAC	Deemed	Has Therms	6,438	0.0%	0.0%	0.4%	0.0%	0.0%	0.1%
56	Commercial	HVAC	Deemed	Has Therms	12,884	0.0%	0.0%	0.4%	0.0%	0.0%	0.2%
57	Commercial	HVAC	Deemed	Has Therms	20,635	0.0%	0.0%	0.4%	0.0%	0.0%	0.3%
58	Commercial	HVAC	Deemed	Has Therms	29,402	0.0%	0.0%	0.5%	0.0%	0.0%	0.4%
59	Commercial	HVAC	Not Deemed	No Therms	818	0.9%	1.7%	0.0%	0.0%	0.0%	0.0%
60	Commercial	HVAC	Not Deemed	No Therms	4,497	1.3%	2.1%	0.0%	0.0%	0.1%	0.0%
61	Commercial	HVAC	Not Deemed	No Therms	11,738	1.3%	2.9%	0.0%	0.0%	0.1%	0.0%
62	Commercial	HVAC	Not Deemed	No Therms	40,354	1.6%	4.1%	0.0%	0.2%	0.6%	0.0%
63	Commercial	HVAC	Not Deemed	Has Therms	4,130	0.5%	0.5%	0.9%	0.0%	0.0%	0.0%
64	Commercial	HVAC	Not Deemed	Has Therms	40,825	0.5%	0.3%	1.9%	0.0%	0.1%	0.1%
107	Industrial	HVAC	Deemed	No Therms	822	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
108	Industrial	HVAC	Deemed	Has Therms	1,005	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
109	Industrial	HVAC	Deemed	Has Therms	5,318	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
110	Industrial	HVAC	Deemed	Has Therms	50,673	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
111	Industrial	HVAC	Not Deemed	No Therms	3,221	1.1%	2.1%	0.0%	0.0%	0.0%	0.0%
112	Industrial	HVAC	Not Deemed	No Therms	23,203	1.7%	2.6%	0.0%	0.1%	0.1%	0.0%
113	Industrial	HVAC	Not Deemed	Has Therms	14,425	0.2%	0.2%	2.5%	0.0%	0.1%	0.5%
114	Industrial	HVAC	Not Deemed	Has Therms	140,606	0.3%	0.1%	3.8%	0.2%	0.0%	2.0%
169	Schools and Government	HVAC	Deemed	No Therms	420	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
170	Schools and Government	HVAC	Deemed	Has Therms	3,679	0.0%	0.0%	0.6%	0.0%	0.0%	0.3%
171	Schools and Government	HVAC	Deemed	Has Therms	12,272	0.0%	0.0%	0.8%	0.0%	0.0%	0.5%
172	Schools and Government	HVAC	Deemed	Has Therms	18,667	0.0%	0.0%	0.9%	0.0%	0.0%	0.4%
173	Schools and Government	HVAC	Deemed	Has Therms	25,283	0.0%	0.0%	0.8%	0.0%	0.0%	0.5%
174	Schools and Government	HVAC	Deemed	Has Therms	34,556	0.0%	0.0%	1.0%	0.0%	0.0%	0.7%
175	Schools and Government	HVAC	Deemed	Has Therms	67,336	0.0%	0.0%	1.3%	0.0%	0.0%	1.0%
176	Schools and Government	HVAC	Not Deemed	No Therms	1,403	1.0%	2.2%	0.0%	0.0%	0.0%	0.0%
177	Schools and Government	HVAC	Not Deemed	No Therms	6,481	1.0%	3.4%	0.0%	0.0%	0.1%	0.0%
178	Schools and Government	HVAC	Not Deemed	No Therms	21,217	1.1%	4.6%	0.0%	0.0%	0.1%	0.0%
179	Schools and Government	HVAC	Not Deemed	No Therms	137,880	0.2%	0.5%	0.0%	0.2%	0.5%	0.0%
180	Schools and Government	HVAC	Not Deemed	Has Therms	4,066	0.1%	0.5%	2.3%	0.0%	0.0%	0.0%
	HVAC Overall					**14.5%**	**30.0%**	**19.1%**	**1.3%**	**2.3%**	**7.2%**

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
25	Agriculture	Lighting	Deemed	No Therms	278	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
26	Agriculture	Lighting	Deemed	No Therms	979	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
27	Agriculture	Lighting	Deemed	No Therms	2,021	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
28	Agriculture	Lighting	Deemed	No Therms	6,575	0.2%	0.2%	0.0%	0.1%	0.1%	0.0%
29	Agriculture	Lighting	Not Deemed	No Therms	389	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%
65	Commercial	Lighting	Deemed	No Therms	187	0.7%	0.6%	0.0%	0.0%	0.0%	0.0%
66	Commercial	Lighting	Deemed	No Therms	966	0.9%	0.9%	0.0%	0.1%	0.1%	0.0%
67	Commercial	Lighting	Deemed	No Therms	2,324	1.1%	1.0%	0.0%	0.1%	0.1%	0.0%
68	Commercial	Lighting	Deemed	No Therms	5,868	1.3%	1.2%	0.0%	0.3%	0.3%	0.0%
69	Commercial	Lighting	Deemed	No Therms	17,390	1.6%	1.6%	0.0%	0.9%	0.8%	0.0%
70	Commercial	Lighting	Not Deemed	No Therms	505	1.7%	1.6%	0.0%	0.0%	0.0%	0.0%
71	Commercial	Lighting	Not Deemed	No Therms	3,516	2.2%	2.3%	0.0%	0.0%	0.0%	0.0%
72	Commercial	Lighting	Not Deemed	No Therms	16,747	3.2%	3.1%	0.0%	0.1%	0.1%	0.0%
119	Industrial	Lighting	Deemed	No Therms	415	0.8%	0.5%	0.0%	0.0%	0.0%	0.0%
120	Industrial	Lighting	Deemed	No Therms	2,312	1.0%	0.8%	0.0%	0.1%	0.1%	0.0%
121	Industrial	Lighting	Deemed	No Therms	4,899	1.2%	1.0%	0.0%	0.3%	0.2%	0.0%
122	Industrial	Lighting	Deemed	No Therms	9,136	1.4%	1.0%	0.0%	0.5%	0.3%	0.0%
123	Industrial	Lighting	Deemed	No Therms	16,401	1.5%	1.2%	0.0%	0.7%	0.5%	0.0%
124	Industrial	Lighting	Deemed	No Therms	32,322	1.8%	1.5%	0.0%	0.6%	0.6%	0.0%
125	Industrial	Lighting	Not Deemed	No Therms	879	1.8%	1.4%	0.0%	0.0%	0.0%	0.0%
126	Industrial	Lighting	Not Deemed	No Therms	3,688	2.2%	1.8%	0.0%	0.1%	0.0%	0.0%
127	Industrial	Lighting	Not Deemed	No Therms	7,333	2.5%	2.1%	0.0%	0.0%	0.0%	0.0%
128	Industrial	Lighting	Not Deemed	No Therms	12,691	2.8%	2.4%	0.0%	0.1%	0.1%	0.0%
129	Industrial	Lighting	Not Deemed	No Therms	20,582	3.2%	2.5%	0.0%	0.3%	0.2%	0.0%
130	Industrial	Lighting	Not Deemed	No Therms	41,347	3.7%	2.9%	0.0%	0.6%	0.4%	0.0%
181	Schools and Government	Lighting	Deemed	No Therms	180	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%
182	Schools and Government	Lighting	Deemed	No Therms	824	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
183	Schools and Government	Lighting	Deemed	No Therms	1,602	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
184	Schools and Government	Lighting	Deemed	No Therms	3,149	0.5%	0.4%	0.0%	0.1%	0.1%	0.0%
185	Schools and Government	Lighting	Deemed	No Therms	14,140	0.7%	0.6%	0.0%	0.1%	0.1%	0.0%
186	Schools and Government	Lighting	Not Deemed	No Therms	742	1.2%	1.0%	0.0%	0.0%	0.0%	0.0%
187	Schools and Government	Lighting	Not Deemed	No Therms	6,023	1.7%	1.6%	0.0%	0.0%	0.0%	0.0%
	Non-Small CFL Lighting Overall					**42.5%**	**36.5%**	**0.0%**	**5.3%**	**4.5%**	**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
14	Agriculture	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	1,217	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
50	Commercial	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	1,285	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
103	Industrial	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	2,533	1.7%	1.5%	0.0%	0.0%	0.0%	0.0%
104	Industrial	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	8,076	2.3%	1.5%	0.0%	0.1%	0.1%	0.0%
105	Industrial	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	26,439	3.2%	1.6%	0.0%	0.1%	0.1%	0.0%
106	Industrial	Compressed Air, Vacuum Pumps	Not Deemed	Has Therms	17,940	0.3%	0.1%	0.6%	0.0%	0.0%	0.1%
168	Schools and Government	Compressed Air, Vacuum Pumps	Not Deemed	No Therms	3,417	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
115	Industrial	Industrial Ovens and Furnaces	Not Deemed	No Therms	27,597	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
116	Industrial	Industrial Ovens and Furnaces	Not Deemed	Has Therms	25,793	-0.1%	0.0%	1.0%	0.0%	0.0%	0.1%
117	Industrial	Industrial Ovens and Furnaces	Not Deemed	Has Therms	127,079	0.0%	0.0%	1.3%	0.0%	0.0%	1.3%
118	Industrial	Industrial Ovens and Furnaces	Not Deemed	Has Therms	240,780	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%
81	Commercial	Process	Not Deemed	No Therms	10,979	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
139	Industrial	Process	Not Deemed	No Therms	3,195	1.1%	0.7%	0.0%	0.1%	0.0%	0.0%
140	Industrial	Process	Not Deemed	No Therms	26,102	1.7%	0.9%	0.0%	0.3%	0.2%	0.0%
141	Industrial	Process	Not Deemed	No Therms	91,697	2.2%	1.1%	0.0%	0.5%	0.1%	0.0%
142	Industrial	Process	Not Deemed	No Therms	287,291	1.0%	0.5%	0.0%	1.0%	0.5%	0.0%
143	Industrial	Process	Not Deemed	Has Therms	22,979	0.4%	0.1%	1.5%	0.1%	0.1%	0.4%
144	Industrial	Process	Not Deemed	Has Therms	78,184	0.0%	0.0%	2.3%	0.0%	0.0%	1.5%
145	Industrial	Process	Not Deemed	Has Therms	128,621	0.0%	0.0%	3.2%	0.0%	0.0%	3.2%
146	Industrial	Process	Not Deemed	Has Therms	157,333	-0.3%	-0.2%	3.5%	-0.3%	-0.2%	2.7%
147	Industrial	Process	Not Deemed	Has Therms	219,695	0.9%	0.5%	1.9%	0.0%	0.0%	1.0%
148	Industrial	Process	Not Deemed	Has Therms	545,844	-0.2%	-0.2%	19.2%	-0.2%	-0.2%	16.2%
195	Schools and Government	Process	Not Deemed	No Therms	879	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	Agriculture	Waste Water Treatment	Not Deemed	No Therms	258	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
89	Commercial	Waste Water Treatment	Not Deemed	No Therms	768	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
151	Industrial	Waste Water Treatment	Not Deemed	No Therms	19,442	2.0%	0.7%	0.0%	0.0%	0.0%	0.0%
197	Schools and Government	Waste Water Treatment	Not Deemed	No Therms	3,030	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
	Expanded Process Overall					**17.0%**	**9.4%**	**35.7%**	**2.0%**	**0.8%**	**26.5%**

Table G-13. Refrigeration Fraction of Frame Savings in Sample by Stratum

					Average	Fraction of Frame Total Reported Gross Savings					
					Avoided	Frame			Sample		
Stratum	Sector	Measure Group	Deemed	Therms	Cost	kWh	kW	Therms	kWh	kW	Therms
35	Agriculture	Refrigeration	Not Deemed	No Therms	1,880	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
82	Commercial	Refrigeration	Deemed	No Therms	1,275	0.5%	0.1%	0.0%	0.1%	0.0%	0.0%
83	Commercial	Refrigeration	Deemed	No Therms	9,363	0.6%	0.2%	0.0%	0.3%	0.2%	0.0%
84	Commercial	Refrigeration	Deemed	No Therms	15,739	0.6%	0.3%	0.0%	0.5%	0.2%	0.0%
85	Commercial	Refrigeration	Not Deemed	No Therms	482	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%
86	Commercial	Refrigeration	Not Deemed	No Therms	8,579	1.3%	0.9%	0.0%	0.0%	0.0%	0.0%
87	Commercial	Refrigeration	Not Deemed	No Therms	184,885	0.6%	0.4%	0.0%	0.6%	0.4%	0.0%
88	Commercial	Refrigeration	Not Deemed	Has Therms	4,585	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
149	Industrial	Refrigeration	Not Deemed	No Therms	18,018	1.1%	1.1%	0.0%	0.3%	0.2%	0.0%
150	Industrial	Refrigeration	Not Deemed	Has Therms	5,887	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
196	Schools and Government	Refrigeration	Not Deemed	No Therms	548	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Refrigeration Overall					**5.5%**	**3.6%**	**0.3%**	**1.8%**	**1.1%**	**0.0%**

Table G-14. Other Fraction of Frame Savings in Sample by Stratum

					Average	Fraction of Frame Total Reported Gross Savings					
					Avoided	Frame			Sample		
Stratum	Sector	Measure Group	Deemed	Therms	Cost	kWh	kW	Therms	kWh	kW	Therms
1	Agriculture	Agriculture	Not Deemed	No Therms	209	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%
2	Agriculture	Agriculture	Not Deemed	No Therms	1,242	0.6%	0.6%	0.0%	0.0%	0.0%	0.0%
3	Agriculture	Agriculture	Not Deemed	No Therms	4,269	0.7%	0.8%	0.0%	0.1%	0.0%	0.0%
4	Agriculture	Agriculture	Not Deemed	Has Therms	1,722	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
5	Agriculture	Agriculture	Not Deemed	Has Therms	8,571	0.0%	0.0%	0.5%	0.0%	0.0%	0.1%
6	Agriculture	Agriculture	Not Deemed	Has Therms	86,321	0.0%	0.0%	0.7%	0.0%	0.0%	0.5%
90	Industrial	Agriculture	Not Deemed	No Therms	694	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
152	Schools and Government	Agriculture	Not Deemed	Has Therms	341	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
75	Commercial	New Construction	Not Deemed	No Therms	5,313	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
76	Commercial	New Construction	Not Deemed	Has Therms	22,402	0.5%	0.6%	0.5%	0.2%	0.1%	0.0%
134	Industrial	New Construction	Not Deemed	Has Therms	22,393	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
135	Industrial	New Construction	Not Deemed	Has Therms	193,920	0.6%	0.8%	0.8%	0.5%	0.4%	0.1%
190	Schools and Government	New Construction	Not Deemed	Has Therms	19,351	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%
30	Agriculture	Motors & Drives	Deemed	No Therms	69	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
31	Agriculture	Motors & Drives	Not Deemed	No Therms	1,159	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
73	Commercial	Motors & Drives	Deemed	No Therms	90	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
74	Commercial	Motors & Drives	Not Deemed	No Therms	2,192	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
131	Industrial	Motors & Drives	Deemed	No Therms	41	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
132	Industrial	Motors & Drives	Deemed	No Therms	213	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
133	Industrial	Motors & Drives	Not Deemed	No Therms	8,033	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%
188	Schools and Government	Motors & Drives	Deemed	No Therms	73	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
189	Schools and Government	Motors & Drives	Not Deemed	No Therms	2,359	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
32	Agriculture	Other	Deemed	No Therms	22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
33	Agriculture	Other	Not Deemed	No Therms	1,334	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%
34	Agriculture	Other	Not Deemed	Has Therms	2,377	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
77	Commercial	Other	Deemed	No Therms	245	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
78	Commercial	Other	Deemed	Has Therms	899	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
79	Commercial	Other	Not Deemed	No Therms	1,026	0.7%	0.2%	0.0%	0.0%	0.0%	0.0%
80	Commercial	Other	Not Deemed	Has Therms	1,755	0.1%	0.1%	1.1%	0.0%	0.0%	0.0%
136	Industrial	Other	Deemed	No Therms	134	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
137	Industrial	Other	Not Deemed	No Therms	21,349	0.6%	0.0%	0.0%	0.1%	0.0%	0.0%
138	Industrial	Other	Not Deemed	Has Therms	5,760	0.0%	0.0%	0.5%	0.0%	0.0%	0.1%
191	Schools and Government	Other	Deemed	No Therms	265	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
192	Schools and Government	Other	Deemed	Has Therms	583	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
193	Schools and Government	Other	Not Deemed	No Therms	3,714	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%
194	Schools and Government	Other	Not Deemed	Has Therms	2,465	0.1%	0.1%	1.7%	0.0%	0.0%	0.1%
	Other Overall					**8.1%**	**5.7%**	**6.8%**	**1.0%**	**0.7%**	**1.1%**

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 CY09 to the life-cycle results from the 18 MCP.

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*.[64] 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 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

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[64] 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,[65] 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.[66]
- **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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[65] For purposes of this discussion, "CFLs" includes small CFLs only; for example, measures with the description "CFL <= 30W". Larger CFL installations follow the standard FOE evaluation attribution approach.

[66] 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

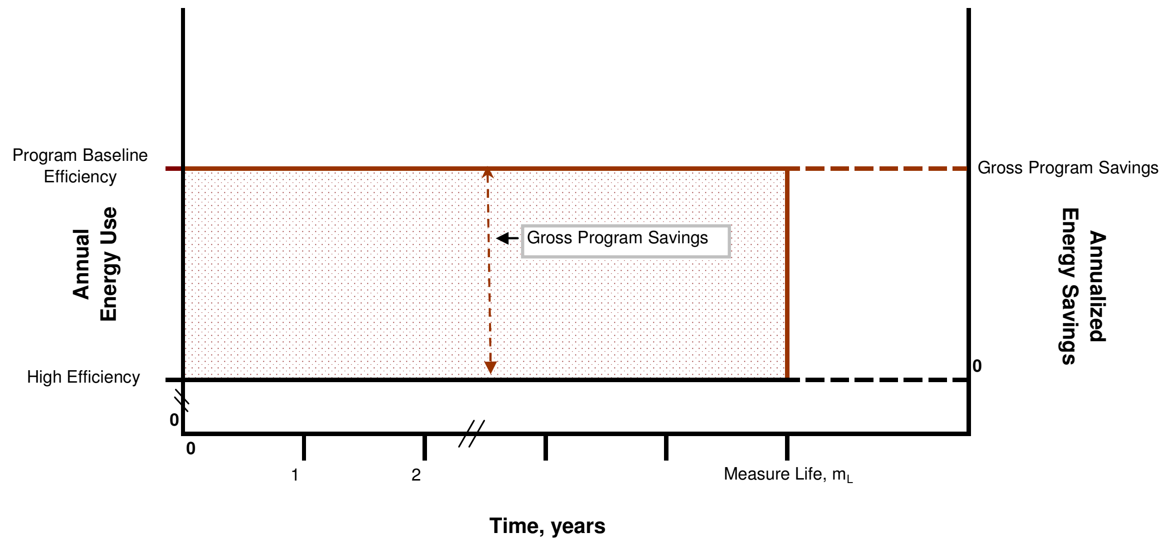
A detailed description of the first year net savings (Y1NS) Focus evaluation attribution methodology is available in Appendix E.

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.

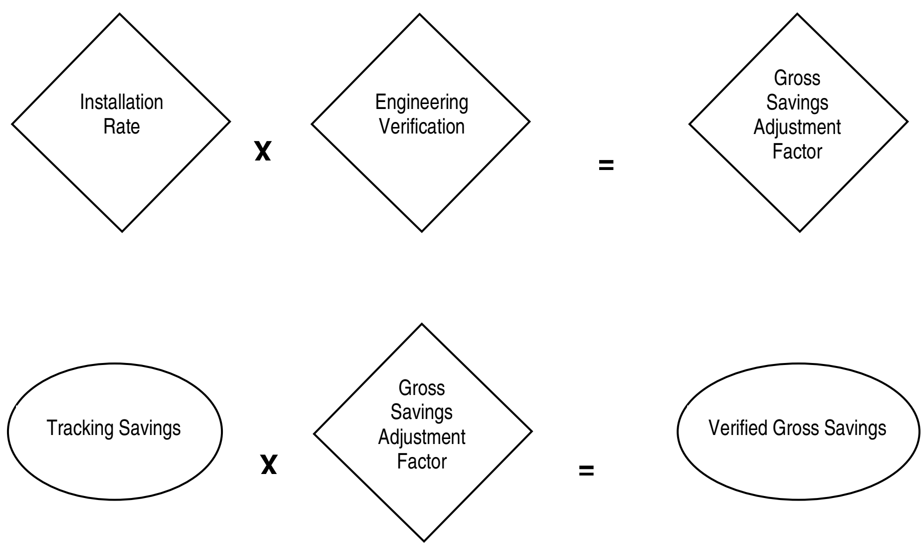
The impact evaluation starts with the program-reported gross savings for a measure. The goal of the new methodology is to produce lifetime net savings as opposed to the first-year net savings produced with the current Focus evaluation methodology. If the program-reported annual gross savings are combined 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

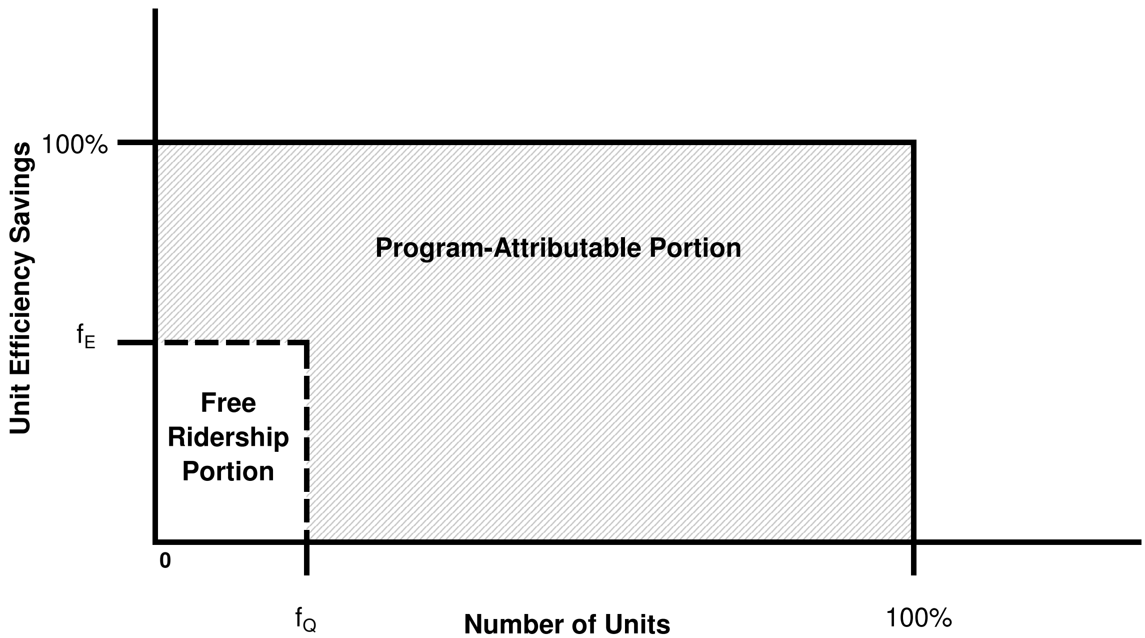
$$f_{QE} = (2/3) \times (1/2) = 1/3.$$

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



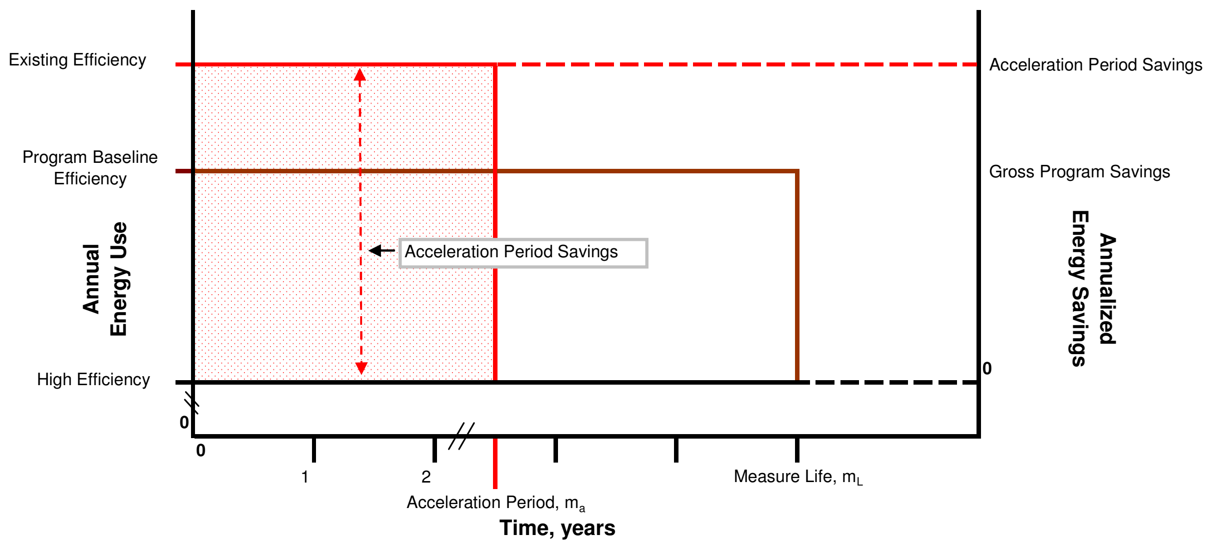
For a replacement measure with acceleration, the program caused the participant to install an energy efficiency measure before they originally intended to install it. During the acceleration period, the energy savings caused by the program are the difference between the energy use of the high efficiency 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.

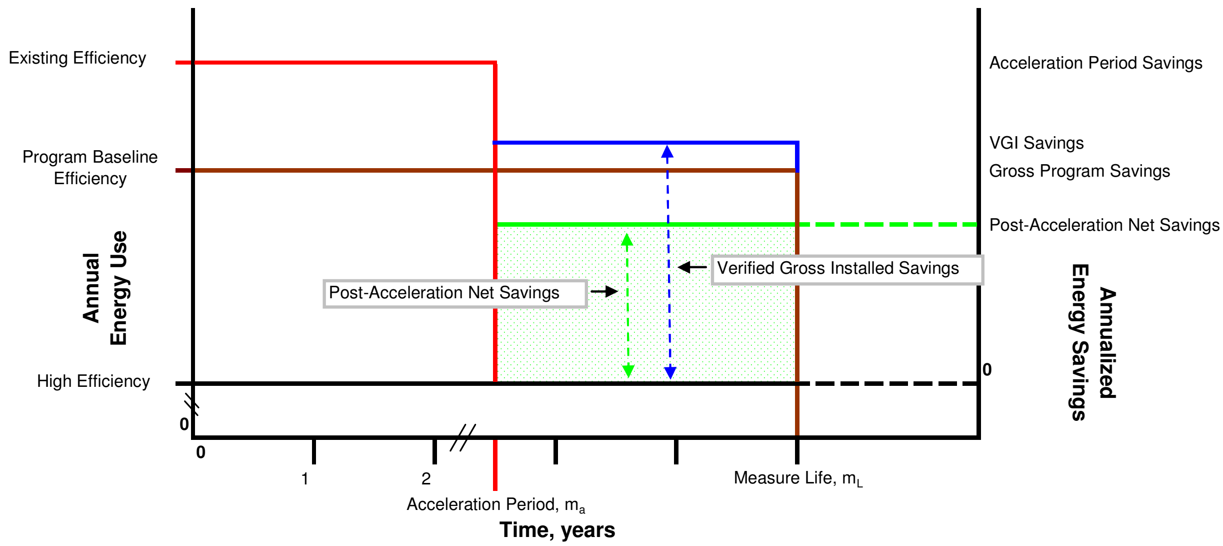
Figure H-3. Acceleration Period Savings



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

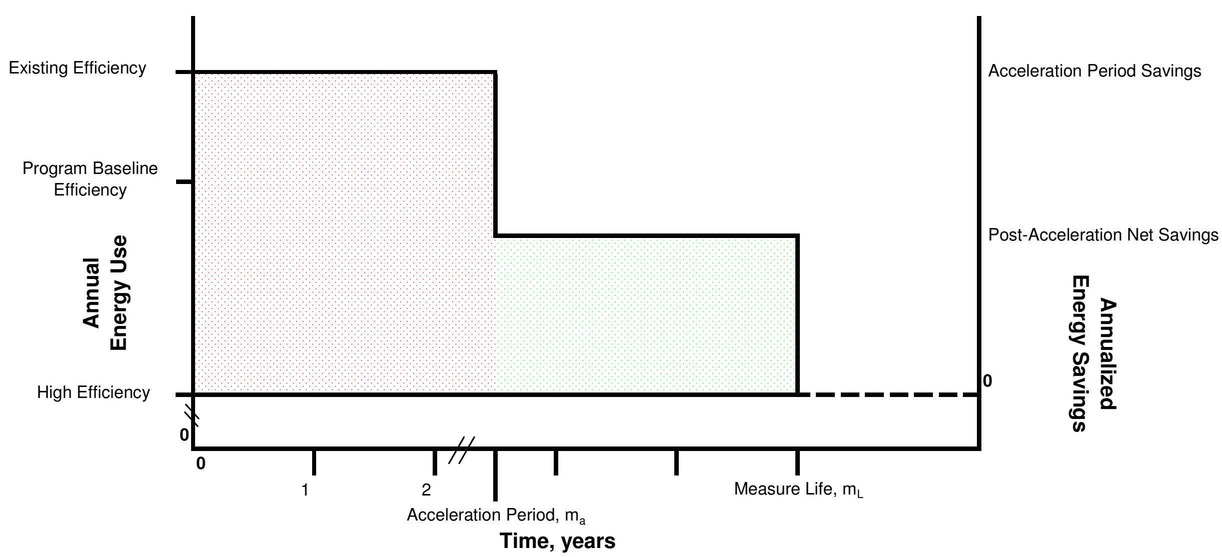


The lifetime net savings for an accelerated measure are the sum of the acceleration period savings and the post-acceleration net savings. This can also be written as

$$\text{Lifetime net savings (accelerated)} = \text{Acceleration Period Savings} + VGI_{post\text{-}accel} * SPA$$

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.

For the life-cycle method, the annual gross savings in the acceleration period had to be estimated for some measures because the input data needed to calculate annual gross savings for these measures is not currently available. The 18MCP impact evaluation used two surveys, one conducted by KEMA engineers, referred to as “the engineering survey” and one CATI survey. The CATI survey did not result in verified gross savings estimations, so additional assumptions were required. In the CY09 impact evaluation the CATI survey did collect data for verified gross savings estimations, so additional assumptions were not required.

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)]

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.

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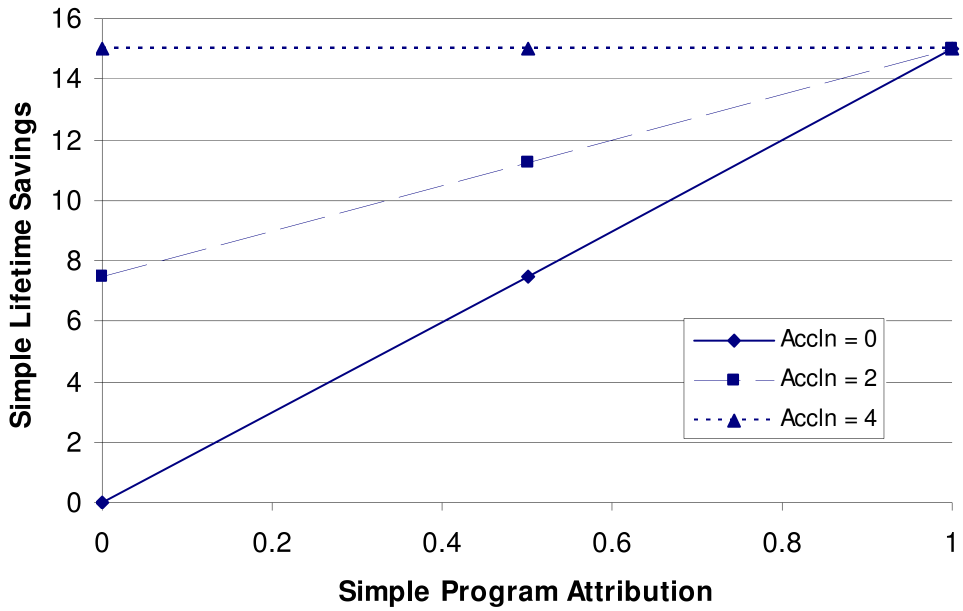
[67] The A/P Ratio is the ratio of the Acceleration Period to the Post-Acceleration Period savings (VGI).

Figure H-6. Simple Lifetime Savings, Y1NS Method; A/P Ratio = 1

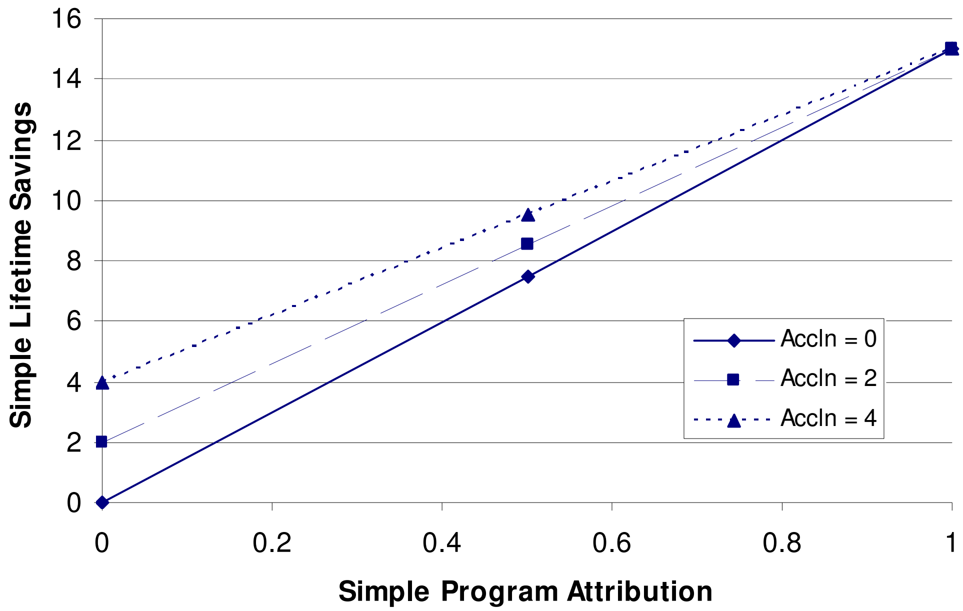


The plot shows that the first-year method produces full savings for all SPA when the acceleration period is four years. Mathematically, an acceleration period of four years produces a timing free ridership of zero ($f_T = 1 – 48/48 = 0$). A timing free ridership of zero produces an overall attribution 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 enduse measure type combinations and assigned a measure life based on the sector and enduse 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

Enduse 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 A/P ratio

In the 18 MCP LCNS analysis it was necessary to assume a value for the A/P ratio for custom measures that we evaluated using the CATI survey. The 18 MCP LCNS analysis also found that the varying the A/P ratio for these measures did not significantly affect the results. In CY09, this assumption was unnecessary as the CATI included only deemed measures. An A/P ratio of one was used for deemed measures in both the 18 MCP and CY09 LCNS analysis.[69]

H.3.3 Results by measure group

The LCNS method results in overall attributions of 60, 53, and 61 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 87 percent. The highest attribution among non-Small CFL measure groups with significant kWh savings is HVAC with 86 percent. Expanded Process has the highest attribution for therms with 88 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	7	87%	17%	1%	1	*%	0%	0%	159	36%	18%	32%
Non-CFL Lighting	267	51%	9%	48%	244	52%	10%	46%	0	0%	0%	0%
Refrigeration	44	70%	12%	6%	43	67%	14%	5%	3	75%	41%	0%
HVAC	84	86%	29%	14%	64	46%	20%	25%	72	36%	23%	20%
Expanded Process	50	59%	22%	15%	43	44%	26%	9%	31	88%	7%	38%
Small CFLs	52	89%	1%	6%	52	90%	1%	8%	0	0%	0%	0%
Other	85	44%	17%	10%	71	46%	22%	7%	37	80%	14%	10%
Business Programs Overall	**589**	**60%**	**7%**	**100%**	**518**	**53%**	**7%**	**100%**	**302**	**61%**	**10%**	**100%**

*Ratio not reported to protect respondent confidentialliy

[69] 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.

Table H-4 shows overall LCNS realization rates of 60, 53, and 65 percent for kWh, kW, and therms respectively. Other than Small CFLs, the highest realization rate for kWh is HVAC with 97 percent. This is much higher than the attribution for HVAC due to gross savings adjustments greater than 100 percent. Expanded Process has the highest realization rate for therms with 104 percent, which is also much greater than its attribution rate.

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	7	86%	17%	1%	1	*%	0%	0%	159	35%	18%	32%
Non-CFL Lighting	267	52%	9%	48%	244	52%	10%	46%	0	0%	0%	0%
Refrigeration	44	68%	13%	6%	43	64%	15%	5%	3	70%	43%	0%
HVAC	84	97%	53%	14%	64	40%	18%	25%	72	39%	25%	20%
Expanded Process	50	51%	22%	15%	43	66%	45%	9%	31	104%	17%	38%
Small CFLs	52	88%	2%	6%	52	88%	2%	8%	0	0%	0%	0%
Other	85	47%	19%	10%	71	48%	23%	7%	37	72%	15%	10%
Business Programs Overall	**589**	**60%**	**8%**	**100%**	**518**	**53%**	**8%**	**100%**	**302**	**65%**	**11%**	**100%**

*Ratio not reported to protect respondent confidentialliy

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 CY09 most reporting measure groups have lower attributions using LCNS than using the Y1NS method as shown in Table H-5 with two exceptions. Electric HVAC savings have a much higher LCNS attribution ratio than their Y1NS method attribution. This is due to HVAC having 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 HVAC annual savings (44 percent) than they do the lifetime savings (nine percent) and thus influence the Y1NS ratio more than the LCNS ratio. The same is true for Boilers and Burners therm savings but the difference in attribution between the service and equipment measures in that measure group is not as great as in HVAC.

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	87%	89%	-2%	*%	*%	*%	36%	33%	2%
Non-CFL Lighting	51%	60%	-9%	52%	61%	-9%	0%	0%	0%
Refrigeration	70%	76%	-5%	67%	72%	-6%	75%	77%	-3%
HVAC	86%	77%	9%	46%	38%	8%	36%	44%	-8%
Expanded Process	59%	66%	-7%	44%	58%	-14%	88%	90%	-2%
Small CFLs	89%	90%	-1%	90%	90%	-1%	0%	0%	0%
Other	44%	48%	-4%	46%	54%	-8%	80%	79%	1%
Business Programs Overall	**60%**	**67%**	**-7%**	**53%**	**59%**	**-6%**	**61%**	**59%**	**2%**

*Ratio not reported to protect respondent confidentialliy

The realization rates have a similar pattern to the attribution ratios: only electric HVAC savings and Boilers and Burners therm savings have higher LCNS realization rates than Y1NS. The other measure groups 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	86%	89%	-2%	*%	*%	*%	35%	33%	2%
Non-CFL Lighting	52%	60%	-9%	52%	62%	-9%	0%	0%	0%
Refrigeration	68%	73%	-5%	64%	69%	-5%	70%	73%	-3%
HVAC	97%	78%	19%	40%	36%	3%	39%	47%	-8%
Expanded Process	51%	73%	-22%	66%	85%	-19%	104%	105%	-2%
Small CFLs	88%	89%	-1%	88%	89%	-1%	0%	0%	0%
Other	47%	51%	-4%	48%	61%	-13%	72%	72%	0%
Business Programs Overall	**60%**	**68%**	**-8%**	**53%**	**61%**	**-8%**	**65%**	**63%**	**2%**

*Ratio not reported to protect respondent confidentialliy

H.3.4 Results by sector

Table H-7 shows that the Commercial sector has the highest LCNS attribution ratio for kWh and kW with 81 and 68 percent respectively, while both Industrial and Agriculture exceed 70 percent attribution for therms.

Table H-7. 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	80	50%	17%	7%	71	53%	17%	7%	13	70%	35%	3%
Commercial	194	81%	12%	33%	179	68%	12%	37%	70	23%	23%	13%
Industrial	219	48%	9%	49%	198	45%	11%	40%	91	75%	10%	63%
Schools and Gov.	96	47%	14%	11%	70	29%	17%	16%	128	47%	20%	21%
Business Programs Overall	**589**	**60%**	**7%**	**100%**	**518**	**53%**	**7%**	**100%**	**302**	**61%**	**10%**	**100%**

Table H-8 shows that the Commercial sector has the highest LCNS realization rate for kWh and kW with 89 and 63 percent respectively, while the realization rate for Industrial therms is 84 percent. Agriculture has a 73 percent realization rate for therms.

Table H-8. 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	80	53%	20%	7%	71	55%	18%	7%	13	73%	36%	3%
Commercial	194	89%	22%	33%	179	63%	12%	37%	70	23%	23%	13%
Industrial	219	46%	9%	49%	198	48%	13%	40%	91	84%	13%	63%
Schools and Gov.	96	42%	13%	11%	70	27%	16%	16%	128	45%	19%	21%
Business Programs Overall	**589**	**60%**	**8%**	**100%**	**518**	**53%**	**8%**	**100%**	**302**	**65%**	**11%**	**100%**

a. *COMPARISON TO Y1NS*

At the sector level, none of the electric attributions are higher using LCNS than using Y1NS. Both Agriculture and Schools and Government show higher attributions for therms when using LCNS as Table H-9 shows.

Table H-9. LCNS vs. Y1NS Attribution by Sector

Sector	kWh			kW			Therms		
	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.
Agriculture	50%	55%	-5%	53%	61%	-8%	70%	66%	4%
Commercial	81%	85%	-4%	68%	71%	-2%	23%	26%	-3%
Industrial	48%	56%	-8%	45%	52%	-7%	75%	78%	-3%
Schools and Gov.	47%	55%	-8%	29%	37%	-8%	47%	41%	6%
Business Programs Overall	**60%**	**67%**	**-7%**	**53%**	**59%**	**-6%**	**61%**	**59%**	**2%**

Like attribution, none of the sector-level electric realization rates are higher using LCNS than using Y1NS. Both Agriculture and Schools and Government show higher realization rates for therms with LCNS as shown in Table H-10.

Table H-10. LCNS vs. Y1NS Realization Rates by Sector

Sector	kWh			kW			Therms		
	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.	LCNS	Y1NS	Diff.
Agriculture	53%	58%	-5%	55%	66%	-12%	73%	68%	5%
Commercial	89%	89%	0%	63%	69%	-6%	23%	26%	-3%
Industrial	46%	57%	-11%	48%	57%	-9%	84%	87%	-4%
Schools and Gov.	42%	47%	-5%	27%	37%	-9%	45%	40%	5%
Business Programs Overall	**60%**	**68%**	**-8%**	**53%**	**61%**	**-8%**	**65%**	**63%**	**2%**

b. *COMPARISON TO THE 18MCP*

LCNS attributions are generally higher in CY09 than they were in the 18MCP. The biggest improvement was Agriculture therms, which increased 57 percent over its 18MCP LCNS attribution as shown in Table H-11.

Table H-11. LCNS: CY09 vs. 18 MCP Attribution by Sector

Sector	kWh			kW			Therms		
	CY09	18 MCP	Diff.	CY09	18 MCP	Diff.	CY09	18 MCP	Diff.
Agriculture	50%	51%	-1%	53%	48%	5%	70%	13%	57%
Commercial	81%	57%	24%	68%	55%	13%	23%	24%	-1%
Industrial	48%	51%	-3%	45%	47%	-2%	75%	50%	25%
Schools and Gov.	47%	39%	8%	29%	47%	-18%	47%	30%	17%
Business Programs Overall	**60%**	**52%**	**8%**	**53%**	**50%**	**3%**	**61%**	**40%**	**21%**

LCNS realization rates are generally higher in CY09 than they were in the 18MCP. The biggest improvements were Agriculture and Industrial therms which increased 60 and 34 percent respectively over their 18MCP LCNS realization rates as shown in Table H-12.

Table H-12. LCNS: CY09 vs. 18 MCP Realization Rates by Sector

Sector	kWh			kW			Therms		
	CY09	18 MCP	Diff.	CY09	18 MCP	Diff.	CY09	18 MCP	Diff.
Agriculture	53%	47%	6%	55%	47%	8%	73%	13%	60%
Commercial	89%	54%	35%	63%	55%	8%	23%	24%	-1%
Industrial	46%	47%	-1%	48%	42%	6%	84%	50%	34%
Schools and Gov.	42%	35%	7%	27%	43%	-16%	45%	30%	15%
Business Programs Overall	**60%**	**48%**	**12%**	**53%**	**46%**	**7%**	**65%**	**34%**	**31%**

H.3.5 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

Since FY06, the impact results have included participant spillover effects for non-CFLs in the attribution estimates. The *Participant Spillover Savings Study*[70] 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.

Starting in the 18MCP, the impact results include Untracked Attributable Savings (UAS) in the total net savings for the program. UAS are defined as savings motivated by the program but not included in program tracking data. The *Impact Evaluation of the Education and Training Program*[71] provides the basis for calculating the untracked attributable savings.

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.

We assumed that the operation and maintenance (O&M) measures were implemented first in the year after the training because we did not know what year they were first implemented[72]. The E&T impact evaluation made no assumptions about measure life for either the one-time or the O&M measures because we were only measuring first-year savings.

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 2008 due to E&T program training was the sum of 2004 training influence on adoption four years out, 2005 training influence on adoption three years, 2006 training influence on adoption two years out, and 2007 training influence on adoption one year. This savings estimation approach is analogous to counting tracked energy savings

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

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

[72] An alternative approach would have been to assume that the O&M projects were initiated at lags varying from one to four years after training. Using this approach, we would have the same total (first-year) O&M savings as the adopted approach, but it would simply be spread out over four years.

implemented in the current year that were the result of multiple years of the program working with the customer on a measure.

The evaluators were asked to use this methodology and the E&T program trainee counts from 2008 to estimate Untracked Attributable Savings for calendar year 2009. Table I-1 shows Untracked Attributable Savings (UAS) estimates for year 2009 by measure type (one-time vs. O&M measures) and savings type.

Table I-1. Untracked Attributable Savings (UAS) Estimates for 2009 by Measure Type and Savings Type

Measure Type	Savings Type		
	kWh	kW	Therms
One-time	8,069,926	982	4,178,533
O&M	4,372,090	2,648	858,104
All	**12,442,016**	**3,630**	**5,036,638**

Table I-2 shows that the E&T program UAS estimates for 2009 were 32—48 percent higher than those for 2008. Most of this increase was due to an increase in the number of trainees from 436 in 2007 to 681 in 2008—a 56 percent increase. Since UAS estimates are calculated on a per-trainee basis, an increase in the number of trainees will increase the level of savings. The increase in the UAS estimates from 2008 to 2009 was smaller for the one-time measures because this estimation method relies on a four-year average of trainee counts and savings estimates. Therefore, in this case the effect of the sharp rise in trainees from 2007 to 2008 was blended in with results from previous years.

Table I-2. Untracked Attributable Savings (UAS) Estimates 2008 vs. 2009 by Measure Type and Savings Type

Measure Type	Savings Type	2008	2009	% Increase
One-time	kWh	6,149,181	8,069,926	31%
	kW	751	982	31%
	Therms	3,268,883	4,178,533	28%
O&M	kWh	2,799,165	4,372,090	56%
	kW	1,695	2,648	56%
	Therms	549,388	858,104	56%
All	**kWh**	**8,948,346**	**12,442,016**	**39%**
	kW	**2,447**	**3,630**	**48%**
	Therms	**3,818,271**	**5,036,638**	**32%**

To calculate these 2009 UAS estimates we first obtained the E&T program database of 2008 trainees. A total of 44 individual course sessions were listed in this database, comprising all of the in-person sessions of courses that were held in the 2008 calendar year. We did not incorporate registration information for web courses into the counts since course name and date were missing.

To insure that the 2008 E&T program trainees were counted in the same manner as we had counted the 2004–2007 trainees for our 2008 evaluation, we took the following steps:

- We excluded from our trainee counts all registrants from participating utilities that were flagged in the database as staff;

- We excluded all registrants who had cancelled or were no-shows;
- We also removed attendees from one course that WECC had indicated should be removed because the course had been offered as a courtesy for WPS; and
- We assigned individuals who had taken multiple courses, which accounted for 10 percent of the 2008 trainees, to a single course stratum. We used the same rules as we had used in the 2008 evaluation to assign them to a stratum.

This filtering process reduced the number of trainees from the 824 that the E&T program originally sent us to 681. These 681 trainees were used to calculate the 2009 UAS estimates that appear in Table I-1. For the savings from the one-time measures, we multiplied these trainee counts by the "stream" of measured energy savings (kWh, kW, therms) from the 2005, 2006, 2007, and 2008 trainee groups.

Because the 2009 UAS estimates for one-time measures are based on a model that utilizes survey results from four different trainee classes, these estimates are much more robust (e.g., drawn from a bigger pool of trainees) and are less subject to the effects of year-to-year course variability. However, this is not the case for the 2009 UAS estimates for O&M measures. As noted above, in the 2008 *Impact Evaluation of Education and Training Program* report we assumed that O&M measures were implemented the year after training was received. Therefore the 2008 UAS estimates for O&M measures were based only on what the 2007 E&T program trainees had reported. Since we did not survey the 2008 E&T Program trainees, we had no comparable way to calculate the 2009 UAS estimates for O&M measures. Therefore, we had to make the simplifying assumption that the per-trainee savings from O&M measures for the 2008 trainees were very similar to the per-trainee savings from O&M measures for the 2007 trainees.

To the test the validity of this assumption, we compared the course distribution of the 2007 E&T program trainees with the course distribution of the 2008 E&T Program trainees.[73] If the course distribution was fairly similar then we would have more confidence in assuming that the per-trainee savings from O&M measures for the 2008 trainees were very similar to the per-trainee savings from O&M measures for the 2007 trainees. Table I-3 presents this comparison.

The table shows that the biggest differences in trainee distributions were:

- In 2008 the following courses were added that had not been offered in 2007:
  - Preventative Operations and Maintenance - Schools and Government courses (142 trainees);
  - Preventative Operations and Maintenance - Schools courses (117 trainees); and
  - Energy Efficient Swimming Pool Operation and Maintenance courses (55 trainees).

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[73] For both 2007 and 2008 we used the same filtering process (described above) to come up with the trainee counts. For both years we also used the same criteria for assigning multiple-course-takers to a single course stratum (these criteria are described in the 2008 *Impact Evaluation of Education and Training Program* report).

- In 2008 the following courses experienced significant drops in attendance from their 2007 levels:
  - The number of trainees in the Practical Energy Management- Commercial courses dropped from 91 in 2007 to 35 in 2008; and
  - The number of trainees in the Ventilation Systems dropped from 76 in 2007 to 23 in 2008.

Besides these bigger differences, there were other course additions and changes in course attendance from 2007 to 2008.

Table I-3.Comparing the Course Distribution of 2007 E&T Program Trainees with 2008 E&T Program Trainees

Strata Category	2007 Trainees		2008 Trainees	
	Number	Percent	Number	Percent
Building Operator Certification	60	14%	54	8%
Compressed Air Energy Management	70	16%	61	9%
Energy Efficient Swimming Pool Operation and Maintenance	-	-	55	8%
Ventilation Systems	76	17%	23	3%
Hotel Energy Management	16	4%	16	2%
Practical Energy Management - Commercial	91	21%	35	5%
Practical Energy Management - Industrial	51	12%	62	9%
Practical Energy Management - Implementaion	7	2%	-	-
Practical Energy Management - Schools			117	17%
Pumping System Energy Management	33	8%	28	4%
Steam System Energy Management	32	7%	45	7%
Preventative Operations and Maintenance - Schools and Government	-	-	142	21%
Retrocommissioning for Large Commercial Buildings	-	-	17	2%
Smart Strategies for Grocery	-	-	7	1%
Smart Strategies for Healthcare	-	-	19	3%
Total	**436**	**100%**	**681**	**100%**

Because the three largest courses that were added in 2008 all focused on O&M, it is likely that the 2008 trainees will have a higher proportion of O&M UAS (vs. one-time measure UAS) than their 2007 counterparts. Therefore, using per-trainee O&M savings from the 2007 trainees for the 2008 trainees may be understating the actual level of per-trainee O&M savings for the 2008 trainees. However, this likely underestimation of O&M savings on the per-trainee level may be offset by the fact that the UAS estimation methodology for O&M measures depends on trainee counts for a single year—rather than trainee counts from multiple years, as is the case for the one-time measures. Relying on a single year means that when trainee counts jump significantly from one year to the next—such as the 56 percent jump from 2007 to 2008—then this jump is directly reflected in the UAS estimates for the O&M measures (see Table I-2). In summary, the components of our methodology for estimating O&M UAS for 2009 likely introduce biases that work in opposite directions—one likely understating the actual O&M UAS and the other likely overstating it. However, it is impossible to tell relative magnitude of these biases.

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).

Measures installed before February 13, 2009 were given deemed savings according to the list approved in June of 2008, shown in Table J-1 and Table J-2. Measures installed after February 13, 2009 were given deemed savings according to the list approved in February of 2009, shown in Table J-3 and Table J-4.

Table J-1. Focus on Energy Demand Savings by Business Program Sector
Approved June 2008 (Non-Lighting)

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors Deemed kW	All Sectors Deemed kWh	All Sectors Deemed Therms
1.1300.430	Boilers & Burners	Boiler	Boiler Tune-up - service buy down	0.0000	0	= 0.679 * MBh
1.1412.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, <50 psig steam (Industrial Only)	0.0000	0	196
1.1414.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, 50-125 psig steam (Industrial Only)	0.0000	0	756
1.1416.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, 126-225 psig steam (Industrial Only)	0.0000	0	1084
1.1418.390	Boilers & Burners	Steam Trap	Repair leaking steam trap, >225 psig steam (Industrial Only)	0.0000	0	2075
1.2790.040	Boilers & Burners	Boiler	Boiler, hot water, high efficiency modulating, for space heating (AFUE >= 90%)(<175 MBh)	0.0000	0	= 3.108 * MBh
1.2791.040	Boilers & Burners	Boiler	Boiler, hot water, high efficiency modulating, for space heating (AFUE >= 90%)(175 - 300 MBh)	0.0000	0	= 3.108 * MBh
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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
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
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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors Deemed kW	Deemed kWh	Deemed Therms
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
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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
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
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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
4.5113.365	HVAC	Rooftop Unit / Split System AC	Rooftop A/C, <65 MBh, EER = 11.9	= 0.0423 * Ton	= 31 * Ton	0
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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
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
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
4.5142.365	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
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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
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
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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors Deemed kW	All Sectors Deemed kWh	All Sectors Deemed Therms
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
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	0.0000	0	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
14.1100.180	Food Service	Fryer	Fryer, Electric, ENERGY STAR	0.2000	983	0
14.1200.180	Food Service	Fryer	Fryer, Gas, ENERGY STAR	0.0000	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	0.0000	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	0.0000	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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
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
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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors Deemed kW	Deemed kWh	Deemed Therms
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	0.0000	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

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
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	0.0000	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
17.0510.085	Plug Loads	Controls	Vending Machine Controls, on cold beverage machine	0.0000	1525	0
17.0520.085	Plug Loads	Controls	Vending Machine Controls, on snack machine	0.0000	343	0
61.0111.270	Motors	Motor	Motor NEMA premium efficiency 1.0 hp	0.0200	= kw * hr/yr	0
61.0112.270	Motors	Motor	Motor NEMA premium efficiency 1.5 hp	0.0200	= kw * hr/yr	0
61.0113.270	Motors	Motor	Motor NEMA premium efficiency 2.0 hp	0.0300	= kw * hr/yr	0
61.0114.270	Motors	Motor	Motor NEMA premium efficiency 3.0 hp	0.0400	= kw * hr/yr	0
61.0115.270	Motors	Motor	Motor NEMA premium efficiency 5.0 hp	0.0600	= kw * hr/yr	0
61.0116.270	Motors	Motor	Motor NEMA premium efficiency 7.5 hp	0.0900	= kw * hr/yr	0
61.0117.270	Motors	Motor	Motor NEMA premium efficiency 10 hp	0.1100	= kw * hr/yr	0

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors		
				Deemed kW	Deemed kWh	Deemed Therms
61.0118.270	Motors	Motor	Motor NEMA premium efficiency 15 hp	0.1200	= kw * hr/yr	0
61.0119.270	Motors	Motor	Motor NEMA premium efficiency 20 hp	0.1900	= kw * hr/yr	0
61.0120.270	Motors	Motor	Motor NEMA premium efficiency 25 hp	0.1800	= kw * hr/yr	0
61.0121.270	Motors	Motor	Motor NEMA premium efficiency 30 hp	0.2000	= kw * hr/yr	0
61.0122.270	Motors	Motor	Motor NEMA premium efficiency 40 hp	0.2200	= kw * hr/yr	0
61.0123.270	Motors	Motor	Motor NEMA premium efficiency 50 hp	0.3500	= kw * hr/yr	0
61.0124.270	Motors	Motor	Motor NEMA premium efficiency 60 hp	0.3800	= kw * hr/yr	0
61.0125.270	Motors	Motor	Motor NEMA premium efficiency 75 hp	0.4100	= kw * hr/yr	0
61.0126.270	Motors	Motor	Motor NEMA premium efficiency 100 hp	0.4900	= kw * hr/yr	0
61.0127.270	Motors	Motor	Motor NEMA premium efficiency 125 hp	0.5400	= kw * hr/yr	0
61.0128.270	Motors	Motor	Motor NEMA premium efficiency 150 hp	0.5800	= kw * hr/yr	0
61.0129.270	Motors	Motor	Motor NEMA premium efficiency 200 hp	0.9500	= kw * hr/yr	0

Table J-2. Focus on Energy Demand Savings by Business Program Sector Approved June 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	0.0500	175	0.0480	323	0.0380	161	0.0510	199
2.0301.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 31-115 Watts, replacing incandescent	0.1215	497	0.1215	618	0.0959	432	0.1215	590
2.0302.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 116-149 Watts, replacing metal halide	0.0900	368	0.0900	458	0.0710	320	0.0900	437
2.0303.165	Lighting	Fluorescent, Compact (CFL)	CFL High Wattage 150-199 Watts, replacing metal halide	0.1305	534	0.1305	664	0.1030	464	0.1305	633
2.0305.060	Lighting	Cold Cathode	CFL Cold Cathode Screw-In, replacing incandescent	0.0189	77	0.0189	96	0.0149	67	0.0189	92
2.0307.165	Lighting	Fluorescent, Compact (CFL)	CFL reflector flood lamps replacing incandescent reflector flood lamps	0.0495	172	0.0495	336	0.0391	178	0.0495	192

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
2.0310.165	Lighting	Fluorescent, Compact (CFL)	CFL Direct Install, replacing incandescent, WPS Hometown Checkup	0.0500	175	0.0480	323	0.0380	161	0.0510	199
2.0400.165	Lighting	Fluorescent, Compact (CFL)	CFL Fixture, replacing incandescent fixture	0.0500	175	0.0720	488	0.0380	161	0.0510	199
2.0505.085	Lighting	Controls	Occupancy Sensors - Wall Mount <= 200 Watts	0.0000	226	0.0000	281	0.0000	197	0.0000	269
2.0506.085	Lighting	Controls	Occupancy Sensors - Wall Mount >= 201 Watts	0.0000	528	0.0000	657	0.0000	459	0.0000	627
2.0507.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount <= 500 Watts	0.0000	528	0.0000	657	0.0000	459	0.0000	627
2.0508.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount 501-1000 Watts	0.0000	1132	0.0000	1407	0.0000	984	0.0000	1343
2.0509.085	Lighting	Controls	Occupancy Sensors - Ceiling Mount >= 1001 Watts	0.0000	1811	0.0000	2251	0.0000	1574	0.0000	2149
2.0515.085	Lighting	Controls	High / low control for 320W PSMH	0.0000	406	0.0000	505	0.0000	253	0.0000	482

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
2.0810.170	Lighting	Fluorescent, Linear	T8 4L-4-4ft High Performance Replacing T12 2L-8 ft	0.0234	96	0.0234	119	0.0185	83	0.0234	114
2.0811.170	Lighting	Fluorescent, Linear	T8 4L-4ft High Performance Replacing T12HO/VHO 2L-8 ft	0.1008	412	0.1008	513	0.0795	358	0.1008	489
2.0821.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0126	52	0.0126	64	0.0099	45	0.0126	61
2.0822.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0214	88	0.0214	109	0.0169	76	0.0214	104
2.0823.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0365	149	0.0365	186	0.0288	130	0.0365	177
2.0824.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 25 Watts	0.0442	181	0.0442	225	0.0349	157	0.0442	214
2.0831.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0114	47	0.0114	58	0.0090	41	0.0114	55
2.0832.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0161	66	0.0161	82	0.0127	57	0.0161	78
2.0833.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0287	117	0.0287	146	0.0227	102	0.0287	139

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
2.0834.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 28 Watts	0.0333	136	0.0333	169	0.0263	118	0.0333	162
2.0841.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0089	36	0.0089	45	0.0070	32	0.0089	43
2.0842.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0150	61	0.0150	76	0.0118	53	0.0150	73
2.0843.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0268	110	0.0268	136	0.0212	95	0.0268	130
2.0844.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Low Watt with CEE Ballast - 30 Watts	0.0314	129	0.0314	160	0.0248	112	0.0314	153
2.0851.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 25 Watts	0.0079	32	0.0079	40	0.0062	28	0.0079	38
2.0852.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 28 Watts	0.0059	24	0.0059	30	0.0047	21	0.0059	29
2.0853.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp - 30 Watts	0.0042	17	0.0042	22	0.0033	15	0.0042	21
2.0856.170	Lighting	Fluorescent, Linear	T8 Low Watt Relamp 8 ft - 54 Watts	0.0045	18	0.0045	23	0.0036	16	0.0045	22
2.0860.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Hi Lumen Lamp with Low BF	0.0072	29	0.0072	37	0.0057	26	0.0072	35

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
2.0870.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Hi Lumen Lamp with Low BF	0.0124	51	0.0124	63	0.0098	44	0.0124	60
2.0880.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Hi Lumen Lamp with Low BF	0.0232	95	0.0232	118	0.0183	83	0.0232	113
2.0890.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Hi Lumen Lamp with Low BF	0.0284	116	0.0284	145	0.0224	101	0.0284	138
2.0895.170	Lighting	Fluorescent, Linear	T8 1L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0036	15	0.0036	18	0.0028	13	0.0036	17
2.0896.170	Lighting	Fluorescent, Linear	T8 2L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0081	33	0.0081	41	0.0064	29	0.0081	39
2.0897.170	Lighting	Fluorescent, Linear	T8 3L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0153	63	0.0153	78	0.0121	54	0.0153	74
2.0898.170	Lighting	Fluorescent, Linear	T8 4L-4 ft Hi Lumen Lamp with Low BF (New Construction)	0.0198	81	0.0198	101	0.0156	70	0.0198	96
2.0900.170	Lighting	Fluorescent, Linear	T5 2L - F28T5 Fixture, Recessed Indirect 2x4, replacing 3LT8 or 4LT12	0.0270	110	0.0270	137	0.0213	96	0.0270	131

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
2.2110.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH) Ceramic 20-100 Watts - Replaces Incandescent	0.1175	480	0.1175	597	0.0927	418	0.1175	570
2.2115.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH) Ceramic 25 Watts - Replaces 75-90 Watts Incandescent	0.0518	212	0.0518	263	0.0408	184	0.0518	251
2.2150.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Pulse Start, 320W replacing 400W HID	0.0846	346	0.0846	430	0.0667	301	0.0846	411
2.2155.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Pulse Start - 750W replacing 1000W MH	0.2565	1049	0.2565	1304	0.2024	912	0.2565	1245
2.2170.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Electronic Ballast Pulse Start - 250W replacing 400W HID	0.1629	666	0.1629	828	0.1285	579	0.1629	791
2.2171.220	Lighting	High Intensity Discharge (HID)	Metal Halide (MH), Electronic Ballast Pulse Start - 320W replacing 400W HID	0.1026	420	0.1026	522	0.0809	365	0.1026	498
2.3100.260	Lighting	Light Emitting Diode (LED)	LED Reach-In Refrigerated Case Lighting replaces T12 or T8	0.0380	337	0.0380	337	0.0380	337	0.0380	337

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
2.5170.170	Lighting	Fluorescent, Linear	T8 4 lamp or T5HO 2 lamp Replacing 250-399 W HID	0.1345	550	0.1345	684	0.1061	478	0.1345	653
2.5180.170	Lighting	Fluorescent, Linear	T8 6 lamp or T5HO 4 lamp Replacing 400-999 W HID	0.2120	867	0.2120	1078	0.1672	754	0.2120	1029
2.5182.170	Lighting	Fluorescent, Linear	T8 8 lamp or T5HO 6 lamp Replacing 400-999 W HID	0.1437	587	0.1437	731	0.1133	511	0.1437	697
2.5185.170	Lighting	Fluorescent, Linear	T8/T5HO <= 500 Watts Replacing >=1000 W HID	0.5589	2285	0.5590	2842	0.4409	1987	0.5589	2713
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 14 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0500	175	0.0480	323	0.0380	161	0.0510	199
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 20 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0500	175	0.0480	323	0.0380	161	0.0510	199

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 14 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0500	175	0.0480	323	0.0380	161	0.0510	199
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 20 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0500	175	0.0480	323	0.0380	161	0.0510	199
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent lamps with 23 Watt compact fluorescent lamps, WPS Hometown Checkup	0.0500	175	0.0480	323	0.0380	161	0.0510	199
n/a	Lighting	Fluorescent, Compact (CFL)	Replace incandescent spotlight lamps with 16 Watt spotlight compact fluorescent lamps, WPS Hometown Checkup	0.0500	175	0.0480	323	0.0380	161	0.0510	199

Table J-3. Focus on Energy Demand Savings by Business Program Sector Approved February 2009 (Non-Lighting)

WISeerts Tech Code	Group Description	Category Description	Measure Description	All Sectors Deemed kW	All Sectors Deemed kWh	All Sectors 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	All Sectors Deemed kWh	All Sectors 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	All Sectors Deemed kWh	All Sectors 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	All Sectors Deemed kWh	All Sectors 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	All Sectors Deemed kWh	All Sectors 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	All Sectors Deemed kWh	All Sectors 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 February 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	0.0510	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 Deemed kW	Agriculture Deemed kWh	Commercial Deemed kW	Commercial Deemed kWh	Industrial Deemed kW	Industrial Deemed kWh	Schools / Gov't Deemed kW	Schools / Gov't 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 Deemed kW	Agriculture Deemed kWh	Commercial Deemed kW	Commercial Deemed kWh	Industrial Deemed kW	Industrial Deemed kWh	Schools / Gov't Deemed kW	Schools / Gov't 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 – 3/29/2010

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

<table>
<tr><td>m1_address,
m2_address, ...,
m*n*_address</td><td>Address where measure was installed.</td></tr>
<tr><td>m1_city, m2_city, ...,
m*n*_city</td><td>City where measure was installed.</td></tr>
<tr><td>m1_qty, m2_qty, ...,
m*n*_qty</td><td>The number of this measure that were installed.</td></tr>
<tr><td>m1_binary,
m2_binary, ...,
m*n*_binary</td><td>0 if measure has various levels of efficiency
1 if measure does not have any levels of efficiency</td></tr>
<tr><td>m1_rebate,
m2_rebate, ...,
m*n*_rebate</td><td>The rebate received for the measure.</td></tr>
<tr><td>mgroup1,
mgroup2,
...,
mgroup*y*</td><td>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:
<table>
<tr><th>Value for Survey</th></tr>
<tr><td>Boiler</td></tr>
<tr><td>CFL</td></tr>
<tr><td>Water Heater</td></tr>
<tr><td>Food Service Equipment</td></tr>
<tr><td>HVAC</td></tr>
<tr><td>Lighting</td></tr>
<tr><td>Motor</td></tr>
<tr><td>Refrigeration</td></tr>
<tr><td>Vending machine</td></tr>
</table></td></tr>
<tr><td>mgroup1_equip,
mgroup2_equip,
..., mgroup*y*_equip</td><td>0 if mgroup does NOT include any equipment
1 if mgroup does include equipment
Database has one per mgroup</td></tr>
<tr><td>Totalreb</td><td>Total amount of rebate customer received for all measures installed (one per respondent)</td></tr>
<tr><td>Joint</td><td>Boolean variable that specifies whether participant is part of the joint program</td></tr>
<tr><td>st_facility</td><td>Boolean variable that specifies whether respondent is a state facility</td></tr>
</table>

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 – Wisonsin 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 1, 2008 and September 30, 2009, 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 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 shows 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 project?

[RECORD VERBATIM]_____dollars
[Don't know].................... -97
[Refused]........................ -98

<<V1e_txt>>

IF <m1> =	**THEN <<V1e_txt>> =**
Daylighting controls	**installed daylighting sensors that control** <m1_qty> **lighting kilowatts. Is** <m1_qty> **kilowatts correct?**
Recessed LED downlight	**installed LED recessed downlights in refrigerator or freezer cases with** <m1_qty> **doors. Is** <m1_qty> **doors correct?**
Lighting controls	**installed occupancy sensors that control** <m1_qty> **of fixtures. Is** <m1_qty> **fixtures correct?**
Boiler controls	**installed controls on a boiler with** <m1_qty> **horsepower output capacity. Is** <m1_qty> **horsepower correct?**
Boiler tune-up	**paid to service a boiler with** <m1_qty> **thousand BTU per hour input capacity. Is** <m1_qty> **thousand BTU correct?**
Boiler	**installed a boiler of** <m1_qty> **thousand BTU per hour input capacity. Is** <m1_qty> **thousand BTU correct?**
Energy star Fryer	**installed a fryer with** <m1_qty> **frypots. Is** <m1_qty> **frypots correct?**
Fryer	
Night curtains	**installed** <m1_qty> **linear feet of night curtains. Is that length correct?**
Rooftop AC unit	**installed a rooftop air conditioner with** <m1_qty> **tons of cooling capacity. Is** <m1_qty> **tons correct?**
Steam trap repair	**replaced** <m1_qty> **leaking steam traps. Is that number correct?**
Faucet aerator	**had** <m1_qty> <m1>**s installed. Is that quantity correct?**
NEMA Motor	**Installed motors with a total of <m1_qty> horsepower. Is that quantity correct?**
Any other	**installed** <m1_qty> <m1>**s. Is that quantity correct?**

V1e_1. Our records show that your organization <<V1e_txt>>

[Yes] ....1 [SKIP TO V1g_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 doors did you install LED recessed downlights on?**
Lighting controls	**How many fixtures do the occupancy sensors control?**
Boiler controls	**How much horsepower output capacity does the boiler have?**
Boiler tune-up Boiler	**How many thousand BTU per hour input capacity does the boiler have?**
Energy star Fryer	**How many frypots does the fryer have?**
Fryer	
Night curtains	**How many linear feet did you install?**
Rooftop AC unit	**How many tons capacity does the rooftop unit have?**
Steam trap repair	**How many leaking steam traps did you replace?**
NEMA motor	**What was the total amount of horsepower that you installed?**
Any other	**How many were installed?**

V1f_1. <<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]

<<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 the downlights on a different number of doors?**
Lighting controls	**did you install controls on a different number of fixtures?**
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	
Night curtains	**was the amount of linear feet different?**
Rooftop AC unit	**was the capacity different?**
Steam trap repair	**was the number of steam traps different?**
NEMA motor	**was the horsepower different?**
Any other	**was the amount of** <m1> **different?**

V1h_1. Why <<V1h_txt>>**?**

[RECORD RESPONSE VERBATIM]_______
[Don't know].................... -97
[Refused]......................... -98

<<V2b_txt>>
IF <m1> = steam trap repair, boiler tune-up
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
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 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] .... 5 [SPECIFY__]
[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] .... 5 [SPECIFY__]
[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] .... 5 [SPECIFY__]
[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>, ..., <mgroupy>). 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 project 8
Part of a retro-commissioning project 9
[Other: Specify_____________] 10
[Don't know] .... -97
[Refused] .... -98

IF <mgroup1_equip> = 0 THEN SKIP TO M56_1
IF <mgroup1_binary> = 1 THEN SKIP TO M56_1

M54_mg1. Did you consider options for this <mgroup1> **equipment that were lower efficiency than what you installed?**

[Yes].. 1
[No] 2
[Don't know] .... -97
[Refused] .... -98

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

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_**mg**1 DOES NOT INCLUDE 1 (PEOPLE INTERNAL TO ORGANIZATION), SKIP TO M56c_timing_**mg**1

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_equip> = 0 or <mgroup1_binary> = 1 THEN SKIP TO M56b_focus_**mg**1
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

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_**mg**1 DOES NOT INCLUDE 2 (FOCUS ON ENERGY ADVISOR), SKIP TO M56d_timing_**mg**1

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_equip> = 0 or <mgroup1_binary> = 1 THEN SKIP TO M56c_focus_**mg**1
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

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_**mg**1 DOES NOT INCLUDE 3 (UTILITY REPRESENTATIVE/ACCOUNT MANAGER), SKIP TO M56e_timing_**mg**1

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_equip> = 0 or <mgroup1_binary> = 1 THEN SKIP TO M56d_focus_**mg**1
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

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_equip> = 0 or <mgroup1_binary> = 1 THEN SKIP TO M56e_focus_**mg**1
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

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_**mg**1 DOES NOT INCLUDE 5 (supplier, contractor, or vendor), SKIP TO M58_**mg**1

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_equip> = 0 or <mgroup1_binary> = 1 THEN SKIP TO M57_focus_**mg**1
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

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_**mg**1]
[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_**mg**1]
[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_**mg**1]
[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_**mg**1]
[Don't know] .... -97 [SKIP TO P5b_**mg**1]
[Refused] .... -98 [SKIP TO P5b_**mg**1]

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_**mg**1]
[No] 2
[Don't know] .... -97 [SKIP TO P4be_**mg**1]
[Refused] .... -98 [SKIP TO P4be_**mg**1]

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_**mg**1]
[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_**mg**1]
[Don't know] .... -97 [SKIP TO P6b_**mg**1]
[Refused] .... -98 [SKIP TO P6b_**mg**1]

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_**mg**1]
[No] 2
[Don't know] .... -97 [SKIP TO P5be_**mg**1]
[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
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
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 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 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> = 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
[slightly higher than standard efficiency] 2
[between standard efficiency and what installed] 3
[slightly lower than the high efficiency installed].........4
[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

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
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 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 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
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 – 3/29/2010

For pre-survey prep and general instructions, see:
Q:\PROJECT\MPAC.0035 CY09 Bus Progs 20910100\impact eval\CY09\Survey Design\BP Standard (Focus) Survey Instructions (v1).doc

Before the interview, the following **must be prepared**:

1. Interviewer name: «**Surveyor**»
2. From the final engineering spreadsheet
   - Strata: «**strata**»
   - Program/s [list all programs the company is associated with]: «**Program**»
   - Company id: «**Company_Identifier**»
   - Company name: «**Company**»
   - State Facility (marked if yes): «**State_Facility**»
   - Predetermined supplier interview needed? (marked if yes): «**Supplier_Survey**»
3. See the start of each section of the survey for additional pre-survey prep instructions.

This should be a: **Focus-only surveyJoint program survey.Focus_Only_Survey** or **Supplier Survey**

CALL LOG

Contact Name: **«Contact_Name»**
phone: **«Contact_Phone» «Second_Contact_Phone_Number» «Third_Contact_Phone_Number»**
alternate phone: **«Alternate_Phone» «Second_Contact_Alt_phone_Number» «Third_Contact_Alt_phone_Number»**
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_Name»?

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 October 1, 2008 and September 30, 2009, your organization made the following energy efficiency improvements:

At «Address_1»in «City_1», Wisconsin: «Measure_Kind_1»
At «Address_2» in «City_2», Wisconsin: «Measure_Kind_2»
At «Address_3» in «City_3», Wisconsin: «Measure_Kind_3»
At «Address_3» in «City_4», Wisconsin: «Measure_Kind_4»

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 3] 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

2 Verify Measure Installation (V)

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?

[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.]

<M_ID> from DB	"At" <ADDRESS>	<CITY>, Wisconsin	Description based on <equipment type>,	<reward amt> from DB	Measure installed V1a_#	Correct Reward amt V1c_#	Total Cost V1d_#	M_ID#
«Measure_ID_1»	**«Address_1»**	**«City_1»**	**(«Quantity_1») «Measure_Kind_1»**	**«Reward_Amount_1»**	Yes……………1 No……………..2 Don't know…-97 Refused……..-98			1
«Measure_ID_2»	**«Address_2»**	**«City_2»**	**(«Quantity_2») «Measure_Kind_2»**	**«Reward_Amount_2»**	Yes……………1 No……………..2 Don't know…-97 Refused……..-98			2
«Measure_ID_3»	**«Address_3»**	**«City_3»**	**(«Quantity_3») «Measure_Kind_3»**	**«Reward_Amount_3»**	Yes……………1 No……………..2 Don't know…-97 Refused……..-98			3
«Measure_ID_4»	**«Address_4»**	**«City_4»**	**(«Quantity_4») «Measure_Kind_4»**	**«Reward_Amount_4»**	Yes……………1 No……………..2 Don't know…-97 Refused……..-98			4

V2. (# refers to M_ID#)

V2a_#	**V2b_#**	**V2c_#**	**V2d_#**	**V2e_#**
M_ID#	**Why wasn't this equipment installed?** [record response]	**Do you plan to install this equipment?**	**When?** [month/year]	**Why not?** [record response]
		Yes…………….1 No……………..2 Don't know…-97 Refused……..-98		
		Yes…………….1 No……………..2 Don't know…-97 Refused……..-98		
		Yes…………….1 No……………..2 Don't know…-97 Refused……..-98		
		Yes…………….1 No……………..2 Don't know…-97 Refused……..-98		

3 Engineering Review Questions

For engineering review questions see:

[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.

Contact information for additional engineering review respondents.]

Name ____
Title ____
Telephone ____
Other ____

«Measure_ID_1»: «Measure_Kind_1» **- «Deemed_Measure_1»**
«Measure_ID_2»: «Measure_Kind_2» - **«Deemed_Measure_2»**
«Measure_ID_3»: «Measure_Kind_3» - **«Deemed_Measure_3»**
«Measure_ID_4»: «Measure_Kind_4» - **«Deemed_Measure_4»**

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]

[If respondent received monetary incentives only:]
Based on Focus on Energy records, your organization received [«Total_Reward»] 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 [**«Total_Reward»**] **of incentives and** [summarize non-monetary assistance] **from Focus on Energy during the period we are discussing.**

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.]

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?

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	Category ID
Boilers & Burners	1
Lighting	2
Refrigeration	3
HVAC	4
Process	5
Domestic Hot Water	6
Building Shell	7
Laundry	8
Compressed Air, Vacuum Pumps	9
Agriculture	10
Waste Water Treatment	11
Industrial Ovens & Furnaces	12
Pools	13
Food Service	14
Information Technology	16
Vending, Plug Loads	17
Motors & Drives	61
CFL	77
New construction	15
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	«Measure_GroupNum_1»	«Measure_Group_Desc_1»	«Measure_Group_1»
MG2	«Measure_GroupNum_2»	«Measure_Group_Desc_2»	«Measure_Group_2»
MG3	«Measure_GroupNum_3»	«Measure_Group_Desc_3»	«Measure_Group_3»
MG4	«Measure_GroupNum_4»	«Measure_Group_Desc_4»	«Measure_Group_4»

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?
[record response and probe: any other reasons]

	Reasons why decided to install
M52_MG1	
M52_MG2	
M52_MG3	
M52_MG4	

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

M54. Did you consider equipment with different efficiency levels than what you eventually installed?

[Yes] 1
[No].................................[Skip to M55b] 2
[Don't Know].................[Skip to M55b] -97
[Refused]......................[Skip to M55b] -98

M54a. What options did you consider? [Probe: Did you consider equip. not eligible for incentive?]

M54a_MG1:____

M54a_MG2:____

M54a_MG3:____

M54a_MG4:____

[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:____

M56. With whom did you discuss different equipment options? [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) **-** Put in energy advisor name(s) from IS or other paperwork]
«Energy_Advisor»

[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: Did they influence the project timing? How did they influence it?

Equipment: What equipment did they recommend? Did they identify equipment eligible for incentive? Equipment NOT eligible? Were they the first time you heard of the option? Did they just provide technical or feasibility details?

Focus: Did they inform you about Focus or provide info about Focus? What info did they provide?

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. Which MGs? (circle) MG1 MG2 MG3 MG4

____
____
____
____
____

M56c_type. Who? (circle type) 1 2 3 4 5 6

M56c_MG. Which MGs? (circle) MG1 MG2 MG3 MG4

____
____
____
____
____

M56d_type.	Who? (circle type)	1	2	3	4	5	6
M56d_MG.	Which MGs? (circle)	MG1	MG2	MG3	MG4		

____

[Ask M57 if not the role of their contractor is not clearly answered by M56.]

M57. What role, if any, did your contractor play in helping you select <measure group**> equipment?** [The goal of this question is to assess how much the contractor influenced the decision to select the equipment that was selected.]

Probes:

Timing:	Did they influence the project timing? How did they influence it?
Equipment:	What equipment did they recommend? Did they identify equipment eligible for incentive? Equipment NOT eligible? Were they the first time you heard of the option? Did they just provide technical or feasibility details?
Focus:	Did they inform you about Focus or provide info about Focus? What info did they provide?
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 (Specify:_______)	1	1	1	1
No	2	2	2	2
[Don't know]	-97	-97	-97	-97
[Refused]	-98	-98	-98	-98

M510. How did you first hear about Focus on Energy? [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

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.

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 helping your organization select and install the 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: ____

____

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: ____

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.

The Focus on Energy Program provided you with [summarize assistance discussed in Section 5]

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>.

[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 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

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	3	3	3
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

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, but installing a VFD will result in energy savings. Heat recovery, lighting controls, and steam trap replacement also fall into this category. Circle “5” 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?

Response	DAT2a_MID1	DAT2a_MID2	DAT2a_MID3	DAT2a_MID4
Same	1	1	1	1
Lower	2	2	2	2
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: ____________________

[IF DAT2a ≠ LOWER, SKIP TO DAT3]

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?"

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
the same <amount/size>,
less,
more,
or not have installed anything?

Response	DAT3_MID1	DAT3_MID2	DAT3_MID3	DAT3_MID4
Same amount	1	1	1	1
Less	2	2	2	2
More	3	3	3	3
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]

DAT3a. By what percentage did you *change* the amount of <measure> installed because of the Focus on Energy Program?

[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.]

8 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: e.g., production crops, livestock, agricultural services [SKIP TO F3] 1
Water or wastewater treatment facility .... [SKIP TO F3] 2
Industrial: manufacturing/industrial process 3
Warehouse nonrefrigerated .... [SKIP TO F3] 4
Warehouse refrigerated .... [SKIP TO F3] 5
Education: including preschool, daycare .... [SKIP TO F3] 6
Food service: e.g., restaurant, bar, fast food, cafeteria .... [SKIP TO F3] 7
Food sales: e.g., grocery store .... [SKIP TO F3] 8
Enclosed mall .... [SKIP TO F3] 9
Strip mall .... [SKIP TO F3] 10
Retail excluding enclosed or strip mall: e.g., auto dealership, showroom, store .... [SKIP TO F3] 11
Public order and safety: including courthouse, probation office, jail [SKIP TO F3] 12
Nursing home/Assisted living (Skilled nursing) .... [SKIP TO F3] 13
Lodging: e.g., hotel/motel/inn/resort, dormitory/fraternity/sorority .... [SKIP TO F3] 14
Lodging: residential .... [SKIP TO F3] 15
Health care inpatient: e.g., hospital .... [SKIP TO F3] 16
Health care outpatient: e.g., doctor/dentist office, clinic .... [SKIP TO F3] 17
Laboratory .... [SKIP TO F3] 18
Religious worship .... [SKIP TO F3] 19
Public assembly: incl. theater, nightclub, library, museum, gym, bowling alley .... [SKIP TO F3] 20
Service: e.g., auto service/repair, dry cleaner/laundromat, repair shop, post office... .... [SKIP TO F3] 21
Office/Professional: including bank, government .... [SKIP TO F3] 22
Other [SPECIFY F3_o]

____

______________________________________ .... [SKIP TO F3] 23
[Don't know] .... [SKIP TO F3] -97
[Refused] .... [SKIP TO F3] -98

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

Focus on Energy
Business Programs
Supplier Survey
Updated – 12/21/2009

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 (Company) Name: ____

Contact Name: ____

Contact Phone Number: ____

Contact Log:

Call #	Date	Time	Disposition (i.e.: Complete, Left Message)
1			
2			
3			
4			
5			
6			

Customer-Project Info:

COMBID	Customer (Company) Name	Type of Project

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?**	
S4d.	**Have you received technical assistance from Focus?**	
S4e.	**Have you received training or education from Focus?**	
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. **Excluding information about financial incentives, has the Focus on Energy program provided you information about energy-efficient products and services that you pass on to your customers?**

[Yes]... 1
[No] .... 2 [SKIP TO S7]
[Don't know] .... -97 [SKIP TO S7]
[Refused]... -98 [SKIP TO S7]

S6b. **What kind of information did Focus provide?**
[Don't know] .... -97
[Refused] .... -98

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] 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
[Don't know] ....[SKIP TO DAT4] -97
[Refused]...[SKIP TO DAT4] -98

DAT3a. **What percent of the quantity installed would you have recommended**?

______________________[RECORD PERCENT]
IF DAT3=2 THEN DAT3a SHOULD BE BETWEEN 0 AND 99.
IF DAT3=3 THEN DAT3a SHOULD BE GREATER THAN 100.]
[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.]