

State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

*Apartment and Condominium Efficiency
Services Program: Whole Building
Supply-side Impacts*

March 19, 2010

Evaluation Contractor: PA Consulting Group Inc.

Prepared by: Jeremy Kraft, Kimberly Bakalars, and Bryan Ward
PA Consulting Group



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Program: Whole Building Supply-side Impacts*

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1. EXECUTIVE SUMMARY

1.1 OVERVIEW

The Apartment and Condominium Efficiency Services (ACES) program offers a full range of energy efficiency services and measures to owners and managers of apartments and condominiums. These services are offered through three distinct program initiatives: (1) New Construction, (2) Whole Building Existing, and (3) In-unit Direct Install.

This report is focused on the Whole Building initiative, which utilizes contracted energy advisors located throughout the state to provide no cost building assessments to determine a building's energy usage, potential energy savings, and potential prescriptive and custom cash incentives for installed eligible measures in residential buildings of four units or more.

Research was conducted in July and August of 2009 to assess the level of program impacts for each of these program initiatives that can be attributed to program activities using a participant self-report approach. In addition to understanding program influence from the participant perspective, there was also interest in understanding influence from the supply-side as well. Because contractors for new construction were typically not involved until after all equipment was specified and the CFLs, low-flow showerheads, and faucet aerators do not require contractor installation, it was determined that it was most appropriate to research supply-side influence for the whole building initiative, since much of the equipment incentivized is typically installed by a contractor.

This research effort was therefore targeted to contractors providing services to customers participating in the ACES Whole Building initiative. The objective was to capture information regarding the program's influence on contractors, and to find out whether, and if so how, Focus on Energy has impacted their business practices. We also quantified any energy impacts resulting from changes in business practices that are not being captured in the program tracking system. This research was also designed to uncover program influence that specific customers might not have considered during the 2009 impact research.

1.1.1 ACES Whole Building supply-side evaluation approach

The analysis for this report drew upon two primary research activities—exploratory in-depth interviews and telephone surveys with contractors involved with projects who received incentives through the Whole Building program (the survey instrument is provided in Appendix C). PA conducted 11 in-depth interviews and 108 structured interviews with program contractors. The interviews were conducted between January 14 and January 26, 2010.

Consistent with the protocols for Focus on Energy, PA provided WECC and the PSCW the opportunity to review the survey and sampling plan prior to conducting the research. Sampling was conducted at the contractor level and included detail about specific projects in which the contractors were involved. The sample was stratified by the number of projects the contractor was associated with in the ACES database since March 2008.

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To assess project-specific program attribution, the survey used methods similar to the Business Program model¹. To assess any contractor-specific nonparticipant spillover, PA used tested methodology from other contractor evaluations conducted for similar energy efficiency programs nationwide, specifically a protocol for quantification of nonparticipant spillover that has been utilized in the Northeast.

1.2 KEY FINDINGS

This section summarizes the key findings. These findings, and supporting evidence, are detailed in the remainder of the report.

1.2.1 Program impacts

Project attribution. Contractors reported higher attribution rates for 14 projects that were involved in the 2009 Whole Building customer research. This suggests program influence that was not accounted for during the customer analysis, and these new rates increase the Whole Building component kWh attribution to 54 percent and the therm attribution rate to 38 percent (from 48 percent and 36 percent respectively).

The rationale for this substitution is that when the contractor reports a strong influence on the customer, and reports a higher level of program influence than the customer reports, we assume that the contractor is aware of some program influence that was not apparent to the customer. In the reverse situation, if a customer reports a higher level of attribution than the contractor reports, we assume that the customer is aware of some program influence that was not apparent to the contractor. This methodology insures that we only replace the customer's responses when there is significant evidence of program influence not accounted for by the customer.

Further details and findings can be found in "Section 3.5 Contractor-reported Attribution Rates."

Nonparticipant spillover². Contractors reported implementing additional program-eligible measures outside of the program that we have estimated result in nonparticipant spillover savings of approximately 232,776 kWh and 378,342 therms. These spillover savings represent 3.6 percent of the gross Whole Building kWh savings and 39 percent of the gross Whole Building therms savings. Most contractors (81 percent) did not report any nonparticipant spillover as all the program-eligible equipment they implemented received program incentives. Those few contractors that did report implementation of program-eligible equipment to nonparticipating customers felt that their involvement with the ACES program was influential in increasing their sales and installation of energy efficiency equipment. Therefore, these sales outside of the program are considered nonparticipant spillover as the contractor would have been less likely to make these sales in absence of the program.

¹ Miriam L. Goldberg, J. Ryan Barry, Ben Jones, Paulo Tanimoto, Jeremiah Robinson, and Tammy Kuiken, KEMA, Inc. *Business Programs Impact Evaluation Report: First Five Quarters of the 18-month Contract Period*. April 2, 2009.

² Nonparticipant spillover refers to program-eligible energy efficient measures installed by customers without receiving an incentive but that were influenced by the program.

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Though we have quantified nonparticipant spillover savings, at this time we do not recommend that the ACES program is credited with it. Given that a small sample of contractors is driving large savings values (one contractor out of 108 represents 70 percent of the spillover savings), we feel the casual link between the program and these savings values requires more investigation. Our methodology for quantifying program-attributable nonparticipant spillover is discussed in “Section 3.7 Contractor-reported Nonparticipant Spillover.”

1.2.2 Contractor characterization

The contractors associated with Whole Building component projects vary widely in their size and focus. They range from large commercial contractors to small residential contractors. Likewise, their involvement with the multifamily market also varies widely with some contractors only completing a single multifamily project in a year while others complete up to 100 projects.

1.2.3 Involvement with ACES

Half of the contractors learned about the ACES program through Focus on Energy sources, either personal contact or print materials. This is encouraging, as messages directly from the source promote a more consistent and controllable message. However, just over half of the contractors reported they have not received any training or assistance through the ACES program. Although this is not a surprising finding, since training is not part of the program model for ACES, 56 percent of the contractors are reporting that they received no assistance through the program.

Contractors appear to be leveraging multiple programs. When asked about other Focus on Energy programs they are involved with, only 23 percent said that ACES was their only involvement with Focus on Energy programs. Forty-three percent of contractors said they are also active with the ENERGY STAR products program and another 23 percent participate in Business programs.

Eighty percent of contractors reported they are registered as a Market Provider or Residential Partner with Focus on Energy. Most of the contractors registered as Market Providers get assistance with general program information and rebates. They also realize benefits from working with the Energy Advisors, representatives from Focus on Energy who are available to assist owners and property managers with energy efficiency questions and decisions. Some of the benefits contractors believe the Energy Advisors provide are suggesting the most appropriate equipment and incentives, connecting them with other consultants, assisting with forms, and recommending how to sell high efficiency equipment.

1.2.4 Role in sales process

After discussions with contractors, it is clear that customers come to them in varying stages of the decision-making process and with varying degrees of knowledge about energy efficiency. Contractors believe that about 60 percent of customers who come to them understand the efficiency options available to them when they first talk with a contractor. Just under half (48 percent) of the customers know they want to install high efficiency equipment when they first talk with the contractor. When making decisions about whether or not to purchase high efficiency equipment or services, contractors feel that the initial cost of equipment (34 percent), payback (29 percent), and energy savings (12 percent) are the primary

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considerations for customers. On average, 39 percent of the contractors' multifamily customers already know about ACES incentives before they speak with a contractor and 67 percent of the contractors' multifamily customers receive an incentive through the ACES program. Seventy-eight percent of contractors report that they "always" offer customers who have not already selected their equipment the high efficiency option. Contractors feel that 57 percent of customers who were not initially planning on purchasing high efficiency equipment end up doing so based on a conversation with the contractor.

Despite the lagging economy, almost half (46 percent) of the contractors anticipate their level of participation in the program will increase in the next 12 months, due to increased program awareness and greater customer interest in energy efficient equipment. Another 37 percent expect that their level of involvement will remain the same. Only ten percent expect a decrease in activity.

1.2.5 Contractor change in practices

Changes in contractor recommendation, installation, and inventory practices, which they attribute to the program, provide evidence of supply side-effects. Changes in recommendation and installation practices are especially important in affecting lasting change in a market. Stocking practices are important in overcoming barriers related to availability of efficient measures, but are much more easily changed. Contractors providing services related to heating equipment were the most influenced by the program. Over 40 percent of contractors providing services related to heating equipment indicated that they had changed their practices and just under 40 percent indicated that these changes were influenced by ACES.

The percent of contractors reporting that ACES had influenced changes in their practices was between 10 and 20 percent for all of the measure categories for which a minimal number of contractors responded. Contractors providing building shell services were the least likely to report changing their practices due to ACES, with only one of eight contractors (13 percent) indicating a change.

1.3 RECOMMENDATIONS

Gain a better understanding of customer knowledge of efficiency levels and contractors sales role. There were many research objectives within this supply-side survey effort. After interviews with property managers and owners, we believe one of the major challenges in the multi-family market is that not all customers care as much about energy efficiency as they do about their profit. Contractors believe that about 60 percent of customers who come to them understand the efficiency options available to them when they first talk with a contractor. Just under half (48 percent) of the customers know they want to install high efficiency equipment when they first talk with the contractor. Contractors were asked these questions to investigate at a high level the customers' knowledge of, and interest in, efficiency from the contractor's point of view, given the contractor's understanding of efficiency levels and their interaction with their customers. This is an area we would suggest researching further with in-depth interviews and case studies of contractors to develop a deeper understanding of the role contractors play in selling high efficiency equipment to customers depending on the customer's knowledge of energy efficient equipment.

Develop a more defined contractor support strategy. Although there are Energy Advisors available to assist contractors with program needs, just over half of them reported receiving

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no training or assistance through ACES. Since the program changes in 2008, all contractors involved with ACES projects are now tracked in the database. We believe a well-defined strategy for providing assistance and support for contractors providing services to the ACES program is important and would recommend that the implementers and evaluators work to define that strategy as a basis for further research efforts.

Increase Whole Building component attribution. Based on contractor-reported program influence, we recommend increasing the Whole Building component kWh attribution to 54 percent and the therm attribution rate to 38 percent. It is our assertion that the contractors involved with customer projects are aware of program influence that customers did not take into account during the 2009 customer survey.

The rationale for this assertion, as stated previously, is that when the contractor reports a strong influence on the customer, and reports a higher level of program influence than the customer reports, we assume that the contractor is aware of some program influence that was not apparent to the customer. This adjustment reflects that program influence.

Further develop spillover methodology. We also recommend continuing to develop spillover methodology to account for and verify outliers that strongly sway overall program attribution. While the methodology employed during the contractor survey results in spillover savings, we feel that a small number of contractors are creating an unbalanced effect. One possible alternative would be to remove exceptional records from analysis and credit the program with the remaining savings. An additional alternative would be to credit the savings to the program with the understanding that results of this size are unlikely to be repeated in future evaluations.

Further investigate contractor influence and program influence on contractors. Finally, we suggest developing future Whole Building customer surveys with contractor and vendor influence batteries. Including more detailed questions about the contractor's involvement would allow for better understanding of the effect that contractors are having on the customers' decision-making process. In addition, we propose adding a quasi-experimental design component by conducting interviews with non-participating contractors in Wisconsin, as well as contractors in a non-program comparison state who provide services to multi-family buildings. One objective of these interviews will be to explore nonparticipant spillover in more depth,

2. INTRODUCTION

2.1 OVERVIEW

The Apartment and Condominium Efficiency Services (ACES) program offers a full range of energy efficiency services and measures to owners and managers of apartments and condominiums. These services are offered through three distinct program initiatives: (1) New Construction, (2) Whole Building Existing, and (3) In-unit Direct Install.

The In-Unit Direct Install component installs CFLs, low-flow showerheads, and aerators at no cost in buildings of four units or more. In planning for calendar year 2009 (CY09), WECC expected participation to provide service to 14,000 units through this initiative. According to their December 2009 monthly report, they provided service to over 17,000 units.

The New Construction component provides a full range of energy efficiency services to owners and developers of new multifamily buildings with four or more units. The program is designed to influence the project team early in the design process to include energy efficient measures in the buildings. Energy modeling is provided at no cost to the owner to encourage a more holistic approach. The program offers both prescriptive and custom cash incentives. In CY09, WECC set a target of 3,000 units for this initiative and achieved 2,855 units, just under the target, in a difficult market for new construction projects.

This report is focused on the Whole Building initiative, which utilizes contracted energy advisors located throughout the state to provide no cost building assessments to determine a building's energy usage, potential energy savings, and potential prescriptive and custom cash incentives for installed eligible measures in residential buildings of four units or more.

Research was conducted in July and August of 2009 to assess the level of program impacts for each of these program initiatives that can be attributed to program activities using a participant self-report approach. In addition to understanding program influence from the participant perspective, there was also interest in understanding influence from the supply-side as well. Because contractors for new construction were typically not involved until after all equipment was specified and the CFLs, low-flow showerheads and faucet aerators do not require contractor installation, it was determined that it was most appropriate to research supply-side influence for the whole building initiative, since much of the equipment incentivized is typically installed by a contractor.

This research effort was therefore targeted to contractors providing services to customers participating in the ACES Whole Building initiative. The objective was to capture information regarding the program's influence on contractors, and to find out whether, and if so how, Focus on Energy has impacted their business practices. We also quantified any energy impacts resulting from changes in business practices due to ACES program influence that are not being captured in the program tracking system. This research was also designed to uncover program influence that specific customers might not have considered during the 2009 impact research.

A key aspect of this task was to combine the customer interview results with the market actor interviews in a fashion often referred to as "preponderance of evidence" (as suggested in the California Public Utility Commission Evaluation Protocols). Although there is no standard or established evaluation procedure for quantitatively integrating the self-report data with

contractor data, we sought an outcome that was an informed judgment regarding the most likely range of net program impacts.

2.2 ORGANIZATION OF THIS REPORT

The remainder of this report summarizes the study methodology (Section 2) and our findings (Section 3). The original research plan and sampling plan can be found in Appendix A and Appendix B, respectively. The final contractor survey instrument is included as Appendix C.

2.3 DATABASE ANALYSIS TO INFORM SAMPLING

As the first step of our supply-side evaluation research, we conducted in-depth analysis of the Whole Building data available in the ACES database combined with data collected during the impact analysis. We examined the number and type of contractors involved, their duration and level of program involvement, and average self-reported participant attribution by contractor group. The results of this analysis were used to inform sampling and content of both in-depth interviews and quantitative survey research. The detailed results were presented in the *ACES Market Actor Database Analysis*³ and are included in Appendix D.

This database analysis resulted in a meeting with WECC and the PSCW to discuss the most appropriate timeframe from which to pull participating contractors for inclusion in the sample. It was agreed that the most appropriate timeframe was March of 2008 to December of 2009 to correspond with the beginning of the timeframe used for the customer research and minimize issues related to early database design.

2.4 SURVEY OBJECTIVES

The ACES database contains data for 431 contractors who have participated in the Whole Building program component since January 1, 2007. From this population, as discussed in the *ACES Supply-side Research Plan*⁴, we conducted 11 semi-structured, in-depth interviews. We conducted several of these interviews with contractors who participated in the program both before and after January 1, 2007, in order to explore what effect any changes in program implementation might have had and to understand long-term program effects on their energy efficiency services offered to the multifamily market.

Information gathered from the in-depth interviews and comments by the respondents were used to refine the set of questions for quantitative CATI interviews with the full sample from the March 2008 to December 2009 contractor population. The key objectives of the supply-side research are listed below.

- Explore the contractor's role in the customer sales process.
- Determine the contractor's perception of attribution—including influence of the rebate and program existence. This will be determined on a measure-by-measure basis.

³ Jeremy Kraft, Kimberly Bakalars, and Bryan Ward, PA Consulting Group. *ACES Market Actor Database Analysis*. December 10, 2009.

⁴ Kimberly Bakalars, Jeremy Kraft, Bryan Ward, and David Sumi, PA Consulting Group. *ACES Supply-side Research Plan (Draft)*. November 13, 2009.

- Investigate other projects done outside the ACES program and any associated spillover.
- Identify changes to contractor practices as a result of doing work through the program, including how it has affected their sales and inventory practices before their experience with the program.
- Determine the effect skills, knowledge, and/or tools acquired through ACES projects has had on work with nonparticipating customers and customers in other markets.

2.5 METHODOLOGY

2.5.1 Sampling

As outlined in the sampling plan submitted in the *Apartment and Condominium Efficiency Services Supply-side Sampling Plan and Survey*⁵ memo, PA completed interviews with 108 contractors who provided equipment and services through the ACES Whole Building program component. These contractors were selected from a sample of the 338 contractors who were recorded in the WECC tracking database as having been involved with a project that received program incentives after March 1, 2008. Contractors identified as retail outlets (e.g., Home Depot, Ace Hardware) were removed from the sample, as customer involvement with these outlets is substantially different from interactions with a traditional installation contractor.

Based on findings from the preliminary in-depth interviews with contractors and the analysis of the WECC tracking database, we stratified the contractor sample by the number of projects that each contractor had completed with the Whole Building component. This stratification was designed to ensure that we contacted a sufficient number of low, medium, and high activity contractors in order to identify any possible differences in program influence by contractor involvement. Also, it ensures that overall results remain focused on contractors who were most likely to have been affected by the program and who could provide detailed responses to specific projects for which we have conducted previous attribution research. Low-activity contractors were defined as firms that had completed only one participating project since March 2008. Medium-activity contractors were defined as firms that had completed more than one but less than five participating projects since March 2008. High-activity contractors were defined as firms that had completed five or more projects since March 2008.

Low- and medium-activity contractors were randomly selected from the population for interviews. In order to complete enough interviews for statistical analysis, a census of all high-activity contractors was conducted. Additionally, any contractors who were involved with a project for a customer who was interviewed as part of the 2009 customer research, but were not included in the high-activity contractor census or randomly selected for the low- or medium-activity sample, were included in the last sampling group. These records were included in order to make comparison of program attribution on a project-by-project basis possible. Table 2-1 details these four different sampling categories and their population.

⁵ Kimberly Bakalars, Jeremy Kraft, Bryan Ward, and David Sumi, PA Consulting Group. *Apartment and Condominium Efficiency Services Supply-side Sampling Plan and Survey (Draft)*. December 23, 2009.

Table 2-1. ACES Contractor Population

Type	Count	Matched Projects from 2009 Customer Research	Description
Low-activity	224	24	Contractors with one project in the database
Medium-activity	83	61	Contractors with two to four projects in the database
High-activity	31	62	Contractors with five or more projects in the database
Customer-matched	18	18	Remaining contractors not randomly sampled but matching a customer complete for Whole Building. Only asked project attribution questions.
Total	356	165	

Table 2-2 details the number of completed interviews by sampling category. The table lists the number of contractors in the population, the number of contractors sampled, our target for the number of completed interviews, and the number of interviews actually completed by each sampling category.

Table 2-2. ACES Supply-side Survey Sample Details

Type	Population	Included in Sample	Target	Completed	Completed Matched Projects
Low-activity	224	79	36	40	12
Medium-activity	83	68	29	39	27
High-activity	31	31	19	18	42
Customer-matched	18	18	9	11	11
Total	356	196	93	108	92

The contractors represented in this study cover 30 percent of *all* Whole Building kWh savings and 69 percent of the Whole Building kWh savings since March 2008 (the missing 31 percent are measures associated with retail outlets, labeled as self-install, or missing contractor data). Therm savings coverage is even higher; 40 percent of all Whole Building therm savings and over 100 percent⁶ of all therm savings since March 2008.

Due to the sampling stratification, the interviews covered a high percentage of the Whole Building component savings after March 2008; 87 percent of the contractor-associated kWh savings and 93 percent of the contractor-associated therm savings. Table 2-3 details the savings coverage.

⁶ There are 23,849 therms listed as penalties for measures that did not have a contractor ID associated with them.

Table 2-3. Whole Building Contractor Savings Coverage

Category	kWh Savings	Therm Savings
All Whole Building savings	23,917,323	2,836,114
All Whole Building savings after March 2008	10,407,625	1,126,586
All Whole Building savings after March 2008 where a contractor was involved	7,131,180	1,134,232
Total savings associated with interviewed contractors	6,205,550	1,049,518

The sample records from the database varied in the completeness of contact information. There were three basic scenarios—no contact information, one contact available, or multiple contacts available. For records with no contact information, interviewers used online telephone directories, company web sites, and other sources to look up contact information. For records with multiple contacts, interviewers called the company prior to the interview to determine the most appropriate contact person for the survey. In all cases, it was verified in the first few questions of the survey that we had the appropriate person on the phone who could respond to the survey questions.

In order to minimize respondent burden, contractors were asked only the questions that applied to them. Contractors who were randomly sampled for the high-, medium-, and low-activity categories were asked the general contractor questions. If any of those contractors matched a completed 2009 customer survey, they were also asked the attribution section for any customer projects they matched. The contractors who fell into the customer-matched category were asked only the attribution section for any 2009 customer research projects they matched along with company characterization questions.

2.5.2 Response rate

Calling occurred from January 13, 2010, to January 27, 2010. Hours of calling were typically between 9 am to 5 pm, although we did call back contractors before 9 am when an earlier time was requested. PA conducted 108 surveys with the contractors. As part of these interviews, we asked contractors about 74 specific projects that were included in the 2009 customer research. Table 2-4 details the final response rate by sampling category.

Table 2-4. ACES Supply-side Final Response Rate

	Low-activity	Medium-activity	High-activity	Customer-matched	Total
Starting sample	79	68	30	18	195
No contact information	7	4	5	2	18
Does not recall program	6	2	2	0	10
Adjusted sample	66	62	23	16	167
Refusal	6	4	3	2	15
Active sample	20	19	2	3	44
Completed interviews	40	39	18	11	108
Response rate	61%	63%	78%	69%	65%

2. Introduction

Contractors with more than two matching customer completes were called outside the normal interviewing process to obtain information on as many matches as possible while minimizing respondent burden. This interview followed the structured interview used for other contractors so the results would still be quantifiable.

3. FINDINGS

This section summarizes the study findings regarding the make-up of the contractors associated with the program, contractor-reported program attribution, any changes in the contractor market due to the program, and estimated nonparticipant spillover.

3.1 CONTRACTOR CHARACTERIZATION

To give context to later findings, our research first speaks to the type of contractors who typically work within the program.

Over half the contractors contacted for the supply-side survey offered high efficiency heating equipment, followed by AC equipment, lighting, water heating equipment, and boiler clean and tune-up services. Those answering other specified controls or sensors.

Table 3-1. ACES Supply-side Survey Sample Details

Equipment Type	Percent Offering
Heating equipment (e.g., boilers, furnaces)	57%
Air conditioning equipment	32%
Lighting equipment	29%
Water heating equipment	23%
HVAC/domestic hot water heater clean and tune	23%
Other	17%
Building shell (e.g., insulation, windows)	7%
Appliances (e.g., clothes washers, dishwashers)	5%

Forty-five percent of contractors interviewed both specify and provide high efficiency equipment to multifamily customer. Twenty-three percent only specify equipment to their customers, while another 23 percent only provide equipment that someone else has specified.

When asked about the proportion of their business that is commercial and the proportion that is multifamily, we see a wide variety of responses that contribute to the challenges for this program. Eight percent of the contractors we spoke with only serve commercial customers. For six percent of contractors, all of their commercial work is done for multifamily customers. On average, contractors report that 47 percent of their business is commercial. Of that 47 percent, 26 percent is multifamily (or 12 percent of total business). This variation across contractors is a challenge for the program as it is difficult for the program to target a specific contractor market working with multifamily properties.

Likewise, there are large differences in the number of multifamily projects on which the contractors work in a given year. Contractors reported annual involvement with anywhere from a single multifamily project up to 100 projects.

3.2 PARTICIPATION IN ACES

Although contractors were sampled from the population of Whole Building contractors associated with projects between March of 2008 and December of 2009, only 32 percent of respondents said their first year of involvement with ACES was 2008 or 2009. Another 46 percent said they became involved between 2001 and 2007.

There are a variety of sources from which contractors might learn about the ACES program, but the most common source is directly from Focus on Energy. Half of the contractors learned about the ACES program through Focus sources, either personal contact or print materials. This is encouraging, as messages directly from the source promote a more consistent and controllable message. However, 17 percent do not remember how they heard about the program.

Table 3-2. How Contractors First Heard of ACES

Source	Percent Selecting
Focus on Energy contact or Energy Advisor	31%
Focus on Energy mail or newsletter	19%
Don't remember	17%
Business colleague	10%
Apartment association	9%
Customer	8%
Other (mostly through utilities)	6%
Supply house/distributor	6%
Focus website	6%
Workshop/seminar	5%
Trade show	2%
Advertising	1%

Contractors appear to be leveraging multiple programs. When asked about other Focus on Energy programs they are involved with, only 23 percent said that ACES was their only involvement with Focus on Energy programs. Forty-three percent of contractors said they are also active with ENERGY STAR products/Efficient Heating and Cooling Initiative (Table 3-3). However, contractors rarely refer to these programs by these names. They are more likely to refer to them in terms such as the "residential furnace program."

Another 23 percent participate in Business programs. For those contractors participating in Business programs, 88 percent are working with the commercial sector, 48 percent are working with industrial clients, and 48 percent are working with schools or governments. One quarter of the contractors participating in Business Programs deal with new business construction and one fifth each work with agriculture as well as equipment and systems.

Table 3-3. Other Focus on Energy Programs

Program	Percent Selecting
ENERGY STAR Products/EHCI	43%
Business Programs	23%
None	23%
Home Performance with ENERGY STAR	19%
Wisconsin ENERGY STAR Homes	16%
Targeted Home Performance with ENERGY STAR	14%
Other	14%
Don't know	4%

Eighty percent of contractors reported they are registered as a Market Provider or Residential Partner with Focus on Energy. Most of the contractors registered as Market Providers get assistance with general program information and rebates. They also benefit from working with the Energy Advisors. Below are some of the specific benefits that contractors reported.

- "Looking over my breakdown for energy savings and connecting me with outside consultants."
- "They make sure that we get the customer the biggest rebate they could get."
- "He explains what program or equipment is available for the program and provides ideas about improvements for the owner."
- "It's nice because it allows the advisor to be in touch with the building owners. Creates a good sense of continuity."
- "He can give us the fast track on how to fill things out."
- "We don't work with an EA regularly - just for help on particular jobs. Sometimes the price is high and the rebate is not enough so we get assistance on how to sell."

Just over half (56 percent) of the contractors spoken with reported they have not received training or assistance from Focus on Energy. Twenty percent have attended Focus on Energy seminars and meetings and another 11 percent have received only written information from Focus on Energy. Five percent of contractors said they skip trainings since they have personal contact with Focus on Energy representatives.

3.3 CONTRACTOR ROLE IN THE SALES PROCESS

Contractors are likely to work with building owners (67 percent) and property managers (46 percent) of multifamily projects when specifying and installing equipment. It is less common, but possible, that they would work with maintenance staff (18 percent) or the architect or designer (16 percent). When making decisions about whether or not to purchase high efficiency equipment or services, contractors feel that the initial cost of equipment (34 percent), payback (29 percent), and energy savings (12 percent) are the primary considerations for customers.

After discussions with contractors, it is clear that customers come to them in varying stages of the decision-making process and with varying degrees of knowledge about energy efficiency. Contractors believe that about 60 percent of customers who come to them understand the efficiency options available to them when they first talk with a contractor. Just under half (48 percent) of customers come to a contractor knowing they want to install high efficiency equipment. On average, 39 percent of the contractors' multifamily customers already know about Focus ACES incentives before they speak with a contractor and 67 percent of the contractors' multifamily customers receive an incentive through the Focus ACES program.

Seventy-eight percent of contractors report that they "always" offer customers who have not already selected their equipment the high efficiency equipment option. Contractors feel that 57 percent of customers who were not initially planning on purchasing high efficiency equipment end up doing so based on a conversation with the contractor.

Despite the lagging economy, almost half (46 percent) of the contractors anticipate their level of participation in the program will increase in the next 12 months, due to increased program awareness and greater customer interest in energy efficient equipment. Another 37 percent expect that their level of involvement will remain the same. Only 10 percent expect a decrease in activity.

3.4 CONTRACTOR PERCEPTION OF ATTRIBUTION

Overall, contractors felt that the rebates were effective in convincing customers to upgrade to higher efficiency equipment. Only 13 percent of contractors disagree that the incentive offered by Focus ACES is effective. Below are several of the reasons that contractors gave as to why the rebates were not effective.

- "Some of the customers were not real happy with the stringent requirements [when they] come to find out that the rebate was nominal."
- "A recent customer was not able to get a rebate on a high-efficiency washer because the program only takes into account electrical efficiency and not water savings, which are the important part of the efficiency for washers."
- "[The] incentives are not enough to purchase the higher efficiency. Customers are looking for the least expensive equipment."

Contractors were asked for their level of agreement to a series of three questions using a scale from one to five where one indicates "strongly agree" and five indicates "strongly disagree." Over 80 percent of contractors agreed (rating of one or two) that the program encourages customers to purchase a higher efficiency of equipment than they would have otherwise purchased. Seventy-two percent of contractors agreed (rating of one or two) that the program encourages customers to purchase high efficiency equipment sooner than they had planned. And two-thirds agree (rating of one or two) that the program encourages customers to purchase a higher quantity of equipment than they had planned.

However, although large contractors are most likely to agree (94 percent) that the program encourages customers to purchase a higher efficiency than they might otherwise, large contractors are less likely to agree that the program encourages customers to purchase sooner (61 percent) or a higher quantity (38 percent) than they had planned.

Table 3-4 details the contractors' perception of attribution as compared to results from the 2009 customer survey. When compared, contractors report that the program overall is having a larger effect than self-reported program influence by customers. This finding supports our later analysis of measure-specific contractor attribution rates (Section 3.5) in which, when asked about specific projects, a percentage of contractors reported greater program influence than the customers reported for that same project.

Table 3-4. Contractor and Customer Perception of Program Attribution

Program's Effect on Customer	Percentage of Contractors that Agree with Statement	Percentage of Customers Indicated Program Influence
Program encourages customers to purchase higher efficiency equipment that otherwise would have purchased	80%	42% ⁷
Program encourages customers to purchase higher efficiency equipment sooner than planned	72%	29% ⁸
Program encourages customers to purchase higher efficiency equipment in a greater quantity	66%	30% ⁹

Please note the customer percentages reported in Table 3-4 are not in response to the same "agree/disagree" statements. These figures are the percentage of customers that reported program influence on a specific aspect of program attribution (efficiency, timing, and quantity). As the two groups were not asked the same questions, our interpretation of the difference is only to inform and support later attribution analysis.

3.5 CONTRACTOR-REPORTED ATTRIBUTION RATES

Analysis of open-ended responses from the 2009 customer research indicates that, when compared to the other program components, Whole Building participants were more likely to report hearing about the program toward the latter end of the participant's planning process or at the point of equipment installation. Likewise, the WECC tracking database shows that customers involved with the Whole Building component of the ACES program often involved contractors at some point in the installation process. Given the unexpected low attribution rate for the Whole Building component, these contractors may be having an influence on the customers' decision-making process that our customer research was not capturing. Therefore, in order to compare contractor-reported program influence with customer-reported program influence, a measure-specific net-to-gross battery was included in the survey questionnaire. When a contractor had worked on a project that was included in the 2009

⁷ According to the 2009 customer research, 67 of 162 Whole Building customers would have installed or purchased less efficient equipment without the program.

⁸ According to the 2009 customer research, 63 of 217 Whole Building customers would have installed or purchased the equipment later without the program.

⁹ According to the 2009 customer research, 49 of 162 Whole Building customers would have installed or purchased a smaller quantity of high efficiency equipment without the program.

customer research, they were asked about program influence on the specific equipment installed as part of that project.

Using the WECC tracking database, we were able to match 165 of the 209 measures included in the 2009 customer research with listed contractors.¹⁰ Of those 165 records, we conducted interviews with contractors that worked on 92 measures. In 25 instances, the contractor was unable to recall specifics about the project; those projects were dropped from analysis. In addition, for three measures the contractors were able to recall the project but were unable to provide responses necessary to calculate program influence. Table 3-5 provides a breakdown of the final number of records included in our analysis.

Table 3-5. Number of Matched and Completed Projects

Category	Number of Records
Total measures included in 2009 customer research	209
Missing or ineligible contractor	44
Sampled projects	165
Completed projects	92
Unable to confirm	25
Recalled but unable to answer influence questions	3
Total number of measures included in analysis	64 ¹¹

Contractors were asked a net-to-gross battery similar with the questions used in the KEMA Business Program evaluation.¹² Likewise, we used a consistent methodology for calculating contractor-reported attribution with two exceptions. First, the attribution rate for boiler clean and tune-up services is equal to the timing attribution estimate. As the KEMA approach does not specifically address boiler clean and tune-up services, following their approach for these measures would result in a mean substitution for the entire measure category. Second, the Business Program evaluation only contacted contractors of projects where the customer stated that the contractor was strongly influential during the decision-making process. However, the ACES customer survey does not contain any questions regarding contractor influence. Therefore, we limit our analysis only to contractors who self-report a strong level of influence on the customer decision-making process.

As part of the battery, contractors were asked what level of influence they felt they had during the customer's decision making process with zero being "no influence" and ten being "a great deal of influence." On average, contractors reported an average influence ranking of 6.3 or a medium to strong level of influence. For the majority of measures (n=39), contractors reported having a strong influence on the customer. Figure 3-1 details the reported measure-specific

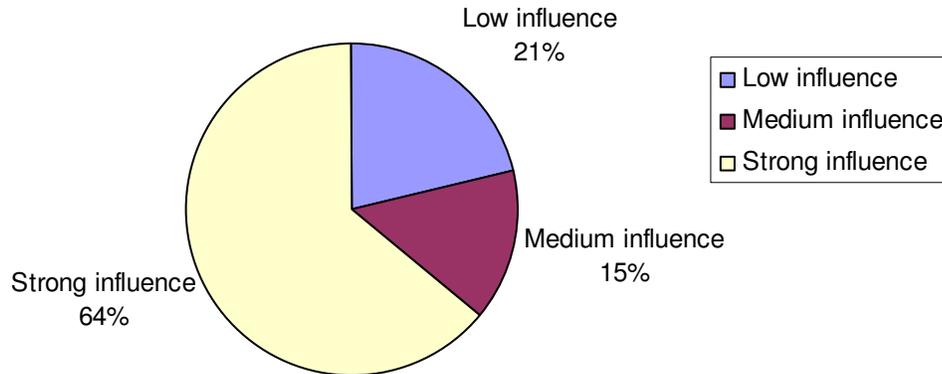
¹⁰ Of the 84 missing records, 40 records were missing contractor data and 44 records were not matched with eligible contractors (i.e., listed as self-install, retail outlets, or no ID listed).

¹¹ These 64 measures are represented by 51 contractors.

¹² Miriam L. Goldberg, J. Ryan Barry, Ben Jones, Paulo Tanimoto, Jeremiah Robinson, and Tammy Kuiken, KEMA, Inc. *Business Programs Impact Evaluation Report: First Five Quarters of the 18-month Contract Period*. April 2, 2009.

influence in three categories. In this analysis, low influence is defined as a ranking of 0 to 3, medium influence as a ranking of 4 to 6, and strong influence as 7 to 10.

Figure 3-1. Distribution of Contractor-reported Measure-specific Influence



Contractors that did not report a strong influence are not included in any further analysis. Only contractors that reported a strong effect on the customer would be able to speak with reliability to that customer's specific decision. Likewise, these contractors are more likely to have influenced that customer's decision to install the high efficiency equipment.

Of the measures included in the contractor attribution analysis, when weighted by kWh savings values contractors reported a higher level of program attribution than was reported by the customers. This reported shift in attribution for equipment is consistent with findings from the in-depth interviews with lighting contractors and analysis of other survey data. Lighting contractors reported that customers are less likely to understand the different efficiency levels of lighting equipment available. As there are many options at many different price points and efficiency levels, lighting contractors are often very involved in selected the correct lighting for different situations. It is possible that this high degree of involvement allows them additional influence on and insight into the customer's purchase decision.

Of the measures included in the contractor attribution analysis, overall, when weighted by therm savings contractors and customers reported very similar program attribution rates with the customers' reported rate being slightly higher. Compared with the customers, contractors reported lower attribution rates for heating equipment but higher attribution rates for boiler clean and tune-up services. A possible explanation for the decrease in reported attribution for heating equipment is the "menu" approach that contractors present to customers when purchasing heating equipment. Speaking with contractors, they frequently offer several options at a range of price points and correspondingly, efficiency levels. Likewise, the increase in attribution for the boiler clean and tune-up services is likely a result of the method in which many contractors offer this service to customers. Open-ended responses and in-depth interviewers indicate that contractors inform their existing customers of the rebate as part of an ongoing service agreement with multifamily properties. In this situation, the customer would have a boiler clean and tune-up service performed in the absence of the program. However, the contractor persuades the customers to upgrade to a more efficient, program-qualifying service due to the program and the customer is less aware of any program influence.

We recognize that without customer-reported contractor influence, it is impossible for this evaluation to completely disentangle the direct and indirect influence the program has on customers. While the 2009 customer research indicates that Whole Building customers became involved with the program because of speaking with contractors, we did not ask the customers to quantify the contractor's influence compared to the program's.

Therefore, it is possible that the program directly influenced a contractor, who in turn directly influenced a customer to purchase energy efficiency equipment and that the customer factored this indirect program (via the contractor) influence into any self-reported attribution. In this situation, if the customer indicates that the low program attribution but the contractor indicates high program attribution, we would be over-reporting program influence. With such limitations, we intend to minimize over-reporting by only including contractors that report a strong influence (as defined above) on the customer.

In order to integrate the contractor-reported attribution and the customer-reported attribution on a program component level, we replaced the customer-reported attribution rate with the contractor-reported attribution rate for measures where the contractor reported a strong influence on the customer and reported a higher program attribution rate than the customer. Of the 39 measures evaluated, the contractor reported a higher attribution rate for 14 measures. The contractor reported the same attribution rate as the customer in another 14 measures. For the remaining 11 measures, the contractor reported lower attribution rates.

The rationale for this substitution is that when the contractor reports a strong influence on the customer and reports a higher level of program influence than the customer reports, we assume that the contractor is aware of some program influence that was not apparent to the customer. In the reverse situation, if a customer reports a higher level of attribution than the contractor reports, we assume that the customer is aware of some program influence that was not apparent to the contractor. This methodology insures that we only replace the customer's responses when there is significant evidence of program influence not accounted for by the customer. As stated above, only 14 measures of the 209 total measures are affected by this substitution (seven percent).

Once combined and weighted by savings, these new rates affect the Whole Building component's overall attribution rate. Table 3-6 lists the previous Whole Building attribution rate and the new rates adjusted for contractor-reported attribution.

Table 3-6. CY09 Attribution Rates

Measure	kWh			Therms			Surveyed
	CY09 Customer Rate	Contractor Adjusted Rate	90% Confidence Interval ¹³	CY09 Customer Rate	Contractor Adjusted Rate ¹⁴	90% Confidence Interval	
AC	67%	67%	+ 39.6%	NA	NA	NA	2
Clothes washer	84%	84%	± 23.7%	83%	83%	± 24.3%	5
Dishwasher	100%	100%	± 0.0%	100%	100%	± 0.0%	1
Heating equipment	22%	22%	± 7.8%	45%	45%	± 9.4%	51
Boiler clean and tune	NA	NA	NA	19%	21%	± 8.2%	39
Lighting	45%	53%	± 5.7%	NA	NA	NA	76
Other	100%	100%	± 4.6%	85%	85%	± 23.6%	4
Refrigerator	71%	71%	± 46.5%	NA	NA	NA	2
Shell	96%	100%	± 10.8%	3%	29%	± 4.1%	7
Water heating equipment	102%	102%	± 0%	45%	52%	± 13.0%	19
Water heating equipment with therm penalties	25%	25%	± 29.2%	24%	24%	± 28.8%	3
Total	48%	54%	+ 4.8%	36%	38%	± 4.6%	209

Overall, the replacement of the customer attribution rates with the contractor attribution has a limited effect on the program component attribution. The contractor replacement increases the kWh attribution by six percentage points. A gain in the lighting attribution is the primary driver of this increase. The contractor replacement also increases the therm attribution rate by two percentage points. This increase is mainly the result of increases in attribution for the boiler clean and tune-up services. There were also attribution increases in building shell improvements and water-heating equipment though these measures have less of an overall effect due to smaller associated savings values.

For comparison, we also conducted an alternative analysis. Instead of replacing the customer's reported attribution rate with the contractor's reported attribution, we replaced the customer's rate with an average of the both the contractor rate and the customer rate. As expected, this alternative method minimized any changes seen overall and resulted in a kWh attribution rate of 51 percent and a therm attribution rate of 37 percent. While this is a more

¹³ As all contractors associated with customer projects were sampled, the confidence interval from the 2009 customer research is reported.

¹⁴ As all contractors associated with customer projects were sampled, the confidence interval from the 2009 customer research is reported.

conservative methodology, we believe that our adopted methodology provides a more clear-cut and consistent approach to assigning program attribution.

Based on contractor-reported program influence, we recommend that the Whole Building component kWh attribution be increased to 54 percent and the therm attribution rate to 38 percent. It is our belief that the contractors involved with customer projects are aware of program influence that customers did not take into account during the 2009 customer survey. This adjustment reflects that program influence.

For future analysis, customers should be asked to rank the influence of various program features, including the contractors as is done in the Business Programs evaluation. We believe that our current methodology accounts for this limitation but the possibility exists that we are placing too much emphasis on the contractors' reported influence and the program's effect on the customer. Again, our methodology only affects a small percentage of the evaluated measures so any bias is minimized.

3.6 CHANGES IN CONTRACTOR PRACTICES

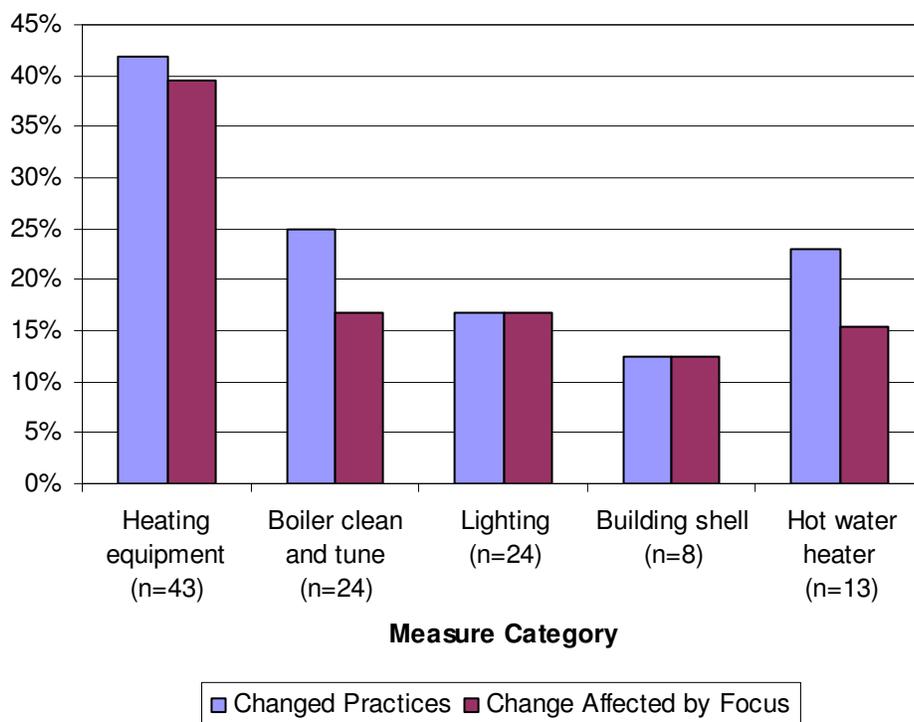
Changes in contractor recommendation, installation, and inventory practices, which they attribute to the program, provide evidence of supply side-effects. Changes in recommendation and installation practices are especially important in affecting lasting change in a market. Stocking practices are important in overcoming barriers related to availability of efficient measures, but are much more easily changed.

Figure 3-2 shows the percentage of contractors who report that the ACES program had an impact on their recommendation or installation practices for the incentivized equipment and the percentage that agree that the ACES program influenced that change. Contractors providing services related to heating equipment were the most influenced by the program. Over 40 percent of all contractors providing services related to heating equipment indicated that they had changed their practices, and just under 40 percent of all the contractors indicated that these changes were influenced by ACES.

The percent of contractors reporting that ACES had influenced changes in their practices was between 10 and 20 percent for all of the measure categories for which a minimal number of contractors responded. Contractors providing building shell services were the least likely to report changing their practices due to ACES, with only one of eight contractors (13 percent) indicating a change.

The heating equipment contractors indicating they had changed their practices on average increased the proportion of projects for which they installed high-efficiency equipment from 23 percent prior to their involvement with Focus to over 50 percent after their involvement with Focus.

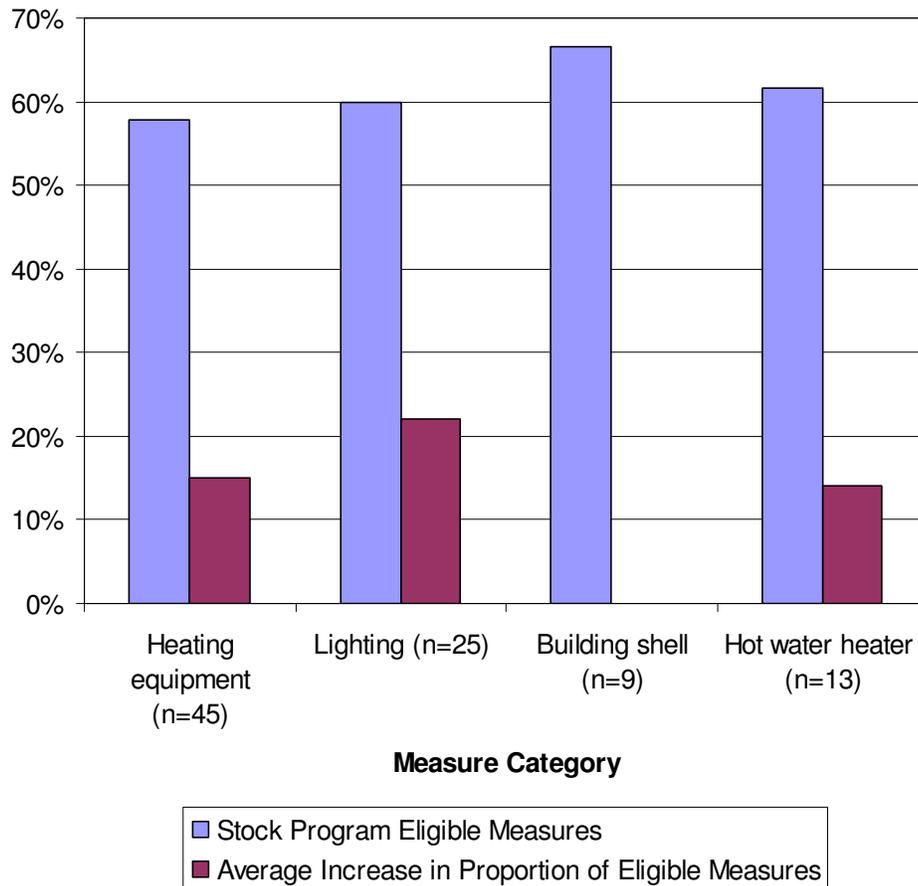
Figure 3-2. Contractors Reporting Changing Recommendation/Installation Practices Since First Providing Services through ACES



Between 58 percent and 67 percent of contractors reported stocking of program eligible measures. Heating equipment contractors were at the low-end at 58 percent and building shell contractors were at the high-end at 67 percent (see Figure 3-3).

Contractors who stocked program eligible equipment were asked about the proportion of the stock that was program eligible prior to their working on an ACES project vs. the proportion of their stock that was program eligible after they had worked on an ACES project. Lighting contractors reported the biggest change in the proportion of their stock that was program eligible, with an average increase of over 20 percent. This was from 37 percent prior to participation to over 60 percent after participation. Heating equipment and hot water heater contractors both had average increases in the proportion of program eligible measures in stock of around 15 percent. For building shell measures, there was no change. However, this is likely due to the nature of building shell measures, since it is generally installation practices and higher volume installation that result in energy savings as opposed to increased efficiency of a specific piece of equipment.

Figure 3-3. Contractors Stocking of Program Eligible Measures



3.7 CONTRACTOR-REPORTED NONPARTICIPANT SPILLOVER

As part of this evaluation, contractors reported an estimated nonparticipant spillover savings of 232,776 kWh and 378,342 therms. The following section discusses our methodology for estimating nonparticipant savings values and the factors that drive nonparticipant spillover.

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

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

Three steps were used to determine nonparticipant “like” spillover:

1. For each contractor, the survey determined the percentage of all program-eligible measures sold, installed, or performed outside the program in Wisconsin.
2. For each contractor, the survey determined whether the sale or installation of program-eligible equipment outside the program was due to the program (nonparticipant spillover).
3. For each contractor, savings associated with this “nonparticipant spillover” equipment were determined by examining the participant database and quantities installed.

Each of these steps is discussed in more detail below.

Using the program database, we identified which measures contractors installed, and how those measures fit into measure categories. For measure categories they installed through the program, contractors were asked what percent of the equipment would have been eligible for the program and what percent of that eligible equipment did not receive an incentive through the program. Those who said some of the eligible equipment did not receive an incentive through the program are included in Step 2 of the nonparticipant spillover analysis.

Using the percentage reported in V3 and the measure-specific savings reported in the program tracking database, we calculated the amount of nonparticipant savings. For example, if a contractor installed measures resulting in 100,000 kWh of savings through the program and reported that 10 percent of all the program-eligible equipment that he or she sold was outside of the program, we impute that, in total, the contractor sold program-eligible equipment that resulted in 111,111 kWh savings. The savings not accounted for in the program-tracking database is then assumed to be the “like” gross nonparticipant spillover savings.

- V1** Did you specify, sell, and/or install any of this program-eligible [measures] to customers in Wisconsin without an incentive?
- V2** (IF VNP2 = YES) What percentage of all of this program-eligible [measures] you specified, sold and/or installed for Wisconsin customers since March 2008 did not receive an incentive?

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

- V4a** I’m going to read you three statements. For each statement, please tell me whether you agree or disagree that this statement applies to your company. There are no right or wrong answers; we just want your honest opinion.

Our past experience specifying/installing/performing **[measure]** through the Focus ACES program has convinced us that this equipment is cost effective or beneficial even without a program incentive.

- V4b** We are better able to identify opportunities to improve energy efficiency by using high efficiency **[measure]** because of what we learned and our previous experience **[with the**

performance of energy efficient services performed/equipment installed] through the Focus ACES program.

- V4c** We are more likely to discuss energy efficient options with all of our customers when developing project plans for **[measure]** because of what we learned and our previous experience **[with the performance of energy efficient services performed/equipment installed]** through the Focus ACES program.

Responses from these three items were used to create a “like” spillover rate. If a contractor agreed with all three statements, 100 percent of the “like” spillover savings was credited to the program. If the contractor only agreed with two statements, 50 percent of the savings was credited. Finally, if the contractor only agreed with one or none of the statements, none of the savings was credited to the program. This rate is applied to the estimated amount of gross nonparticipant savings associated with the reported spillover equipment installed by each contractor (as calculated above). Table 3-7 details the assignment of the spillover rate.

Table 3-7. Preliminary Nonparticipant “Like” Spillover

Number of Agreements to V4 Series	Preliminary Nonparticipant “Like” Spillover Rate	Number of Contractors
Three agreements	100%	87
Two agreements	50%	18
One or zero agreements	0%	21

To improve the reliability of the nonparticipant spillover estimates, open-ended responses regarding program influence and closed-ended responses regarding overall sales were reviewed for inconsistencies. This check resulted in the removal of one record from the spillover analysis.

Of the 108 contractors surveyed, 20 contractors (19 percent) reported selling or installing program-eligible equipment and services that did not receive incentives. Using this methodology, we were able to estimate nonparticipant spillover savings on a measure level for these contractors. Table 3-8 details the estimates. Contractors indicated that the program influenced over 232,000 nonparticipant spillover kWh savings and 380,000 nonparticipant spillover therm savings.

Table 3-8. Estimated Nonparticipant Spillover Savings by Measure Category

Measure	Estimate kWh Spillover Savings	Estimated Therm Spillover Savings
Air conditioning	2,861	48,773
Heating equipment	1,755	58,820
Boiler clean and tune	0	3,528
Lighting equipment	212,586	0
Hot water heating equipment	15,575	267,221
Total	232,776	378,342

On average, contractors reported that 6.5 percent of the all program-eligible equipment that they sold did not receive rebates. A majority (81 percent) did not report selling any program-eligible equipment without a rebate. However, several contractors reported that a large percentage of the program-eligible, high efficiency equipment that they sold since March 2008 did not receive incentives.

For example, a contractor who installed hot water heating equipment stated that 70 percent of his or her program-eligible sales did not receive any incentive. This firm works on approximately 100 multifamily projects a year, which is 28 percent of their overall business. The respondent reported that approximately 64 of the 100 multifamily customers install high efficiency equipment. Of those, the respondent reported that approximately 45 projects install program-eligible equipment without incentives (70 percent of 64 projects). The contractor stated that most of these projects do not apply for incentives, as the customer needed the equipment immediately. The contractor also stated that only ten percent of his or her multifamily customers know about the ACES incentives before talking with the contractor and the firm always recommends high efficiency equipment. This one contractor is responsible for 70 percent of the nonparticipant spillover.

Overall, the contractors that reported program-eligible sales outside of the program reported that the program has affected their sales and installation practices. As discussed above, the contractors were asked to state whether they agree or disagree with three statements regarding the program’s effect on their sales and installation practices. Overall, contractors overwhelmingly agreed with that program has had a positive effect on their sales of high efficiency equipment. Table 3-9 details the responses to each statement.

Table 3-9. Program Influence on Spillover Savings

Statement	Percentage of Contractors that Agree with Statement (n=32)
Past experience specifying/installing equipment through the Focus ACES program convinced them that this equipment is cost effective or beneficial even without a program incentive	94%
Better able to identify opportunities to improve energy efficiency by using high efficiency equipment because of what they learned and previous experience with equipment/practices through the Focus ACES program	78%
More likely to discuss energy efficient options with all customers when developing project plans because of what they learned and previous experience equipment/practices through the Focus ACES program	88%

Customers not wanting the “hassle” of applying, or feeling the incentive was not worth the paperwork, were the two main reasons program-eligible equipment was not incentivized through the program. As with the contractor example mentioned above, “an immediate need” was another reason equipment was not rebated through a program. Table 3-10 lists all the reasons mentioned by contractors along with the frequency.

Table 3-10. Reasons Program-Eligible Equipment Did Not Receive Rebates

Reasons Mentioned	Percentage
Customer did not want the “hassle” of applying	29.2%
Not worth paperwork	20.8%
No time, immediate need	16.7%
Did not know equipment qualified	12.5%
Did not think of it	12.5%
Takes too long for approval	8.3%
Unable to get rebate	4.2%
Other	4.2%
Afraid of losing bid to another contractor	4.2%

Though we have quantified “like” nonparticipant spillover savings, as of this report, we do not recommend crediting the program with spillover savings as the results are driven by a small number of respondents. Spillover savings of this magnitude based on so few respondents are unusual, are unlikely to be reproduced in future research, and suggest a weak casual link between the program’s influence and the savings values. These findings could be in part a result of the large variation among contractors who interact with the Whole Building component. One possible alternative would be to label the contractor listed above as an exception, remove that record from analysis, and credit the program with the remaining savings. An additional alternative would be to credit the savings to the program with the understanding that results of this size are unlikely to be repeated in future evaluations.

APPENDIX A: ACES SUPPLY-SIDE RESEARCH PLAN

Subject Focus on Energy Evaluation

ACES Supply-side Research Plan (Draft)

To Oscar Bloch,
Public Service Commission of Wisconsin
cc Kathy Kuntz, Sara Van de Grift, Mike Plunkett,
WECC

From Kimberly Bakalars, Jeremy Kraft, Bryan Ward, David Sumi
PA Consulting Group

Date November 13, 2009

As specified in the DEP, in addition to the participant self-report surveys, we are proposing supply-side evaluation research for obtaining insights into the net impacts of the ACES program. However, we are proposing to expand the supply-side evaluation in place of a second round of participant self-report surveys as we think additional supply-side insights will be an important part of understanding the impact of the program.

This supply-side task plan describes primary data collection with market actors (contractors, vendors, and other suppliers of energy efficient equipment) in order to supplement end-user self-reports done for the free-ridership (and potential spillover) analysis. Our intent is to provide a fuller picture of net savings when end-user self-reports have been chosen as the primary method but there is potential for the program to have caused systematic supply-side changes in the market.

Specifically, we propose database analysis, semi-structured interviews, and quantitative interviews with participating market actors to elicit their understanding of the program's impacts on their operations (and/or the operations of their suppliers) to advance the adoption of energy efficiency in the construction of multifamily facilities.

Market actor analysis

As a first step, PA will conduct in-depth analysis on the information available for market actors in the ACES database. The analysis will examine:

- Length of involvement with the program (start date, end date, and duration)
- Number of projects completed and savings levels
- Average free-ridership rates by contractor from the last two participant self-report surveys.

This analysis will provide insights that will result in specific questions for the semi-structured interviews with participating market actors to investigate differences in free-ridership rates and program involvement.

Interviews with participating market actors

This type of research with upstream channel market actors can provide meaningful insights for free-ridership (and potential spillover) in the following ways:¹⁵

- Market actors are often more knowledgeable than end-users about the effect of financial incentives on efficiency measures.
- Market actors can estimate the program's impact on their recent sales of program-relevant equipment through the program in terms of how their sales would have differed if program incentives had not been available.
- Market actors can provide information on sales of program-relevant equipment outside the program and the estimate that the program may have had on those sales (spillover).
- Market actors can provide an assessment of how free-ridership rates might differ with different incentive types and/or higher efficiency standards.
- Market actors may report insights that can refine end-user self-report batteries. For example, by suggesting changes to the self-report interpretative algorithm (that converts the raw end-user survey responses into a final net-to-gross score).
- Market actor interview data may suggest future adjustments to end-user self-reported net-to-gross results, when for example the supply-side research yields strong evidence of nonparticipant spillover effects (but at the same time does not call into question the validity of the end-user self-report responses).

Sampling

From WECC's ACES database, we will select participating whole building market actors. This will eliminate any direct install or RHEEP projects. And, to be consistent with the participant survey, we will select cases using the same date range of April 1, 2008, to March 31, 2009. This results in a population of 340 contractors covering 1,150 measures.

From this population, we will conduct in-depth interviews with approximately 10–15 participating market actors. These semi-structured interviews will serve to gather information that will allow for refinement of a set of questions for a quantitative CATI interview, which will provide similar information more cost-effectively—and for a larger sample of contractors—in order to better inform a determination of the program's impact. We will also test methods for requesting actual (quantitative) sales information (both pre-program as well as recent during-program years) to aid in an understanding of whether or not (and the extent to which) the share of high-efficiency measures has increased from pre-program levels.

¹⁵ Drawn from the Focus on Energy Evaluation memo *Integrating Supply-Side Results with End-User Net-to-Gross Self-Reports* (lead author, Ralph Prah).

Survey instrument

The supply-side surveys with participating market actors will facilitate understanding of the program's impacts on their operations and/or the operations of their suppliers to advance the adoption of energy efficiency in the construction of multifamily facilities. The semi-structured and the quantitative interviews will focus on the following researchable issues:

- Contractor's characterization of the Whole Building program component
- Explore the contractor's role in customer sales process
- Determine the contractor's perception of attribution—including influence of the rebate, technical assistance, training, and program existence
- Investigate other projects done outside the ACES program and associate spillover
- Identify changes to contractor practices as a result of doing work through the program, including how it affects their sales practices and standard practice prior to their experience with the program
- Determine the affect of the skills/knowledge/tools acquired through ACES projects on work with nonparticipating customers and customers in other markets.

PA will develop the semi-structured interview guide for review prior to calling. PA will also make the second, more structured CATI survey available for review prior to fielding with the full-scale contractor sample.

Analysis of the interviews

A key aspect of this task is to combine the customer interview results with the market actor interviews in a fashion often referred to as “preponderance of evidence” (as suggested in the California Public Utility Commission Evaluation Protocols). Although there is no standard or established evaluation procedure for quantitatively integrating the self-report data with contractor data, we will seek an outcome that is an informed judgment regarding the most likely range of net program impacts. We will ensure that the logic and presentation of the combination of end-user and supply-side research is credible and defensible to the intended audiences for this Focus evaluation research.

We expect analysis of the market actor data will provide results across the following topics:

- ACES program understanding
- Changes in recommendation practices
- Change in equipment/measure sales
- Impact of the Focus rebate on high efficiency recommendation and sales.

As noted above, quantitatively integrating supply-side research with end-user self-reports is an unresolved issue in evaluation and there is little experience on which to draw. However, the contractor data collected in this research will provide insights regarding estimation of

3 Findings

program influence as measured in terms of recommendation practices, sales changes, and perception of program (including rebate) on those recommendation and sales changes.

APPENDIX B: ACES SUPPLY-SIDE SAMPLING PLAN AND SURVEY

Subject Focus on Energy Evaluation

**Apartment and Condominium Efficiency Services
Supply-side Sampling Plan and Survey (Draft)**

To Oscar Bloch,
Public Service Commission of Wisconsin
cc Kathy Kuntz, Sara Van de Grift, and Mike Plunkett,
WECC

From Kimberly Bakalars, Jeremy Kraft, Bryan Ward, and David Sumi
PA Consulting Group

Acknowledgement: Ralph Prah, Prah & Associates,
contributed critical review and analysis

Date December 23, 2009

This memo discusses the survey objectives, sampling strategy, analysis plan and presents the survey questionnaire for the proposed supply-side research of the Apartment and Condominium Efficiency Services Whole Building component. As discussed previously in the impact report¹⁶ and evaluation plan revision¹⁷, research of the Whole Building component shows significant contractor involvement with the customer. The proposed supply-side research is designed to capture the perspective of the contractor regarding the program's influence on participants, to find out how Focus on Energy has impacted their business practices, and to quantify any energy impacts resulting from those changes in business practices that are not being captured in the program tracking system (nonparticipant spillover).

Survey Objectives

- Explore the contractor's role in the customer sales process.
- Determine the contractor's perception of attribution—including influence of the rebate and program existence. This attribution will be determined on a measure-by-measure basis.
- Investigate other projects done outside the Apartment and Condominium Efficiency Services program and any associated spillover.

¹⁶ Jeremy Kraft, Laura Schauer, Kimberly Bakalars, Bryan Ward, and Pam Rathbun, PA Consulting Group. *ACES CY09 Impact Attribution Report*. December 3, 2009.

¹⁷ Kimberly Bakalars, Jeremy Kraft, Bryan Ward, and David Sumi, PA Consulting Group. *ACES Supply-side Research Plan (Draft)*. November 13, 2009.

- Identify changes to contractor practices as a result of doing work through the program, including how it has affected their sales and inventory practices before their experience with the program.
- Determine the effect skills, knowledge, and/or tools acquired through Apartment and Condominium Efficiency Services projects has had on work with nonparticipating customers and customers in other markets.

Sampling Strategy

Based on initial findings from in-depth interviews with contractors, we propose that we limit our survey sample to contractors who have participated in the program more than once since January 1, 2007, and a census of 2009 contractors associated with customers who responded to the 2009 attribution research, regardless of their level of involvement in the program. This sample plan will also allow us to cover a majority of the post-2007 Whole Building savings from the four measures with the greatest impact: heating equipment, boiler clean and tune services, lighting, and water heating equipment.

As part of our analysis of all contractors who have been involved in the program since January 1, 2007, we found that 159 contractors¹⁸ have participated in the program more than once (active contractors). Initial interviews with 11 contractors from the program database indicate that these are the contractors who have been most affected by the program. In addition to these active contractors, we will also call a census of the contractors who implemented measures for customers who responded to the 2009 attribution survey. This group adds 43 contractors to the sample as there is significant overlap between the high activity group and those contractors involved with the 2009 study. We identified and removed projects that were associated with retail outlets such as Home Depot or local hardware chains.

This stratification ensures that overall results focus on the contractors most likely to provide data consistent with the research objectives, e.g. a focus on the contractors who are most likely to have been affected by the program and that can provide detailed responses to specific projects for which we have conducted previous attribution research. This group also covers a large percentage of the applicable savings. Including both these groups will result in data that cost-effectively covers 81 percent of the post-2007 contractor-associated kWh savings and 83 percent of therm savings for the Whole Building component of the program. All post-2007 Whole Building contractors account for 19 percent of the overall post-2007 program kWh savings and 41 percent of the overall post-2007 therm savings.

PA is aware that due to database design, contractor data are not available for all projects prior to 2009. We are conducting additional database analysis and will consider sampling additional cases currently identified as having been involved in only one project to minimize the effect this might have on data quality. With this sampling strategy, we estimate that we will complete approximately 90 interviews.

¹⁸ Contractor data were aggregated based on ContractorID and contractor contact information was reviewed to check the accuracy of the aggregation.

Analysis Plan

Below we list our planned analysis and how it will address the stated survey objectives. These metrics will be compared at a measure level (e.g., heating versus lighting contractors) to assess how the program affects different types of equipment.

Table 1. Outline of Analysis Plan

Objective	Explore the contractor's role in customer sales process
Analysis	Percentage of customers who were aware of the program before speaking with the contractor (R2)
	Percentage of customers who had already selected high efficiency equipment before speaking with the contractor (R4a)
	Percentage of customers who changed plans on contractor recommendations (R4b, R4c)
Objective	Determine the contractor's perception of attribution—including influence of the rebate and program existence. This attribution will be determined measure-by-measure.
Analysis	Contractors' level of agreement that the rebates are adequate (R6a, R6b, R6c)
	Contractors' level of agreement that the program is effective in convincing customers to purchase high efficiency equipment (R5a, R5b, R5c)
	Measure-level attribution rates as reported by the contractors for specific projects (M3 – M13)
	We will use methodology consistent with the KEMA <i>Business Programs Impact Evaluation Report</i> ¹⁹ of April 2009. When the contractor's reported attribution rate is greater than the customer's rate for that same measure, we will substitute the contractor's rate in our analysis
Objective	Investigate other projects done outside the Apartment and Condominium Efficiency Services program and associated spillover.
Analysis	Estimate of nonparticipant spillover sales and associated savings based on stated sales to nonparticipating customers as a result of their involvement with the program. Any savings estimated from this analysis will be used to credit overall program attribution (V1 – V4c)
Objective	Identify changes to contractor practices as a result of doing work through the program, including how it affects their sales practices and standard practice prior to their experience with the program.
Analysis	Influence of program on recommendation and sales of high efficiency equipment. This metric is an average of three agree/disagree statements (V4a, V4b, V4c)
	Percentage of contractors who have changed installation or recommendation practices since program involvement (P2a)
	Percentage of contractors who changed installation or recommendation practices because of program involvement (P5)
	Comparison of the sales/installation of high efficiency equipment before and after program involvement (P3, P4)

¹⁹ Miriam L. Goldberg, J. Ryan Barry, Ben Jones, Paulo Tanimoto, Jeremiah Robinson, and Tammy Kuiken, KEMA, Inc. *Business Programs Impact Evaluation Report: First Five Quarters of the 18-month Contract Period*. April 2, 2009.

	Comparison of the stocking of high efficiency equipment before and after program involvement (P6 – P10)
Objective	Determine the affect of the skills, knowledge, and/or tools acquired through Apartment and Condominium Efficiency Services projects on work with nonparticipating customers and customers in other markets.
Analysis	Estimate of nonparticipant spillover sales and associated savings (V1 – V4c)

The survey draft originally included in this memorandum has been removed. Please find the final survey used for data collection in Appendix C.

APPENDIX C: ACES WHOLE BUILDING CONTRACTOR QUESTIONNAIRE

Sample variables

CONTRACTORID	WECC assigned ID
CASEID	PA assigned ID
PKCUSTOMERID	WECC assigned project ID
MEASCODE	Project-specific measure
MEAS1-11	Contractor specific measure
KWH1-11	Contractor specific kWh savings
THERM1-11	Contractor specific therm savings
MATCH	Number of customer surveys matched with contractor
REP	Replicate number assigned
SAMPLE	Sample stratum 1 = small contractors 2 = medium contractors 3 = large contractors 4 = non-sampled matched contractors ²⁰
TOTPROJM	Total number of projects since March 2008

Hello, my name is **[interviewer name]**, and I am calling on behalf of the state of Wisconsin's Focus on Energy Program to talk to you about your experiences offering services to multifamily building owners through the Apartment and Condominium Efficiency Services program. May I speak with **[contact name]**?

- 1 Yes
- 2 No [attempt to convert]

I'm not selling anything; I'd just like to ask your opinion about this program. I'd like to assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone.

(Who is doing this study: The Public Service Commission of Wisconsin, which oversees Focus on Energy and the Apartment and Condominium Efficiency Services Program, is overseeing evaluations of the energy efficiency equipment being installed through different programs.)

(Why are you conducting this study: Studies like this help the state of Wisconsin better understand contractors' opinions about the types of equipment being rebated through programs.)

²⁰ These are contractors that were not randomly sampled but were matched with a project from the 2009 customer attribution survey.

(Timing: This survey should take less than 15 minutes of your time. Is this a good time for us to speak with you? IF NOT, SET UP CALL BACK APPOINTMENT OR OFFER TO LET THEM CALL US BACK AT 1-800-445-5070.)

(Sales concern: I am not selling anything; we would simply like to learn about your experience with the [measures type] you have sold through the Apartment and Condominium Efficiency Services Program. Your responses will be kept confidential. If you would like to talk with someone from the Public Service Commission about this study, feel free to call Oscar Bloch at 608-264-8267. If you would like to talk with the Apartment and Condominium Efficiency Services Program, feel free to call Mike Plunkett at 608-249-1271, extension 175.)

Introduction

- A1. This interview will focus on your company's recommendation and installation of high efficiency equipment in multifamily properties. Could I confirm that you provide this service to owners of multifamily buildings?
- 1 Yes
 - 2 No (ATTEMPT TO FIND OTHER KNOWLEDGABLE CONTACT)
 - D (DON'T KNOW) [End survey]
 - R (REFUSED) [End survey]
- A1a. And are you the person who has provided services to multifamily properties through the Focus on Energy Apartment and Condominium Efficiency Services program?
- 1 Yes
 - 2 No (ATTEMPT TO FIND OTHER KNOWLEDGABLE CONTACT)
 - D (DON'T KNOW) [End survey]
 - R (REFUSED) [End survey]
- A2. What percentage of your overall business is commercial versus residential? Please consider multifamily building projects as commercial.
- ___ ENTER PERCENTAGE
 - D (DON'T KNOW)
 - R (REFUSED)
- A3. Of your commercial customers, what percentage are multifamily properties?
- ___ ENTER PERCENTAGE
 - D (DON'T KNOW)
 - R (REFUSED)

- A4. On average, about how many multifamily projects are you involved with in a year?
 ___ ENTER PROJECTS PER YEAR
 E Every other year
 D (DON'T KNOW)
 R (REFUSED)
- A5. What is your typical role with multifamily projects? Are you actively involved in specifying the equipment to install or do you provide equipment to comply with pre-specified plans?
 1 Specify equipment only
 2 Provide equipment only
 4 Specify and provide equipment
 5 Other (SPECIFY)
 D (DON'T KNOW)
 R (REFUSED)
- A6. What types of energy efficient equipment or services do you sell or specify for multifamily customers? (INDICATE ALL THAT APPLY; READ IF NECESSARY)
 1 Air conditioning equipment
 2 Appliances (e.g., clothes washers, dishwashers)
 3 Heating equipment (e.g., boilers, furnaces)
 4 Lighting equipment
 5 Water heating equipment
 6 Building shell (e.g., insulation, windows)
 7 HVAC/Domestic hot water heater clean and tune
 8 Other (SPECIFY)
 9 (DON'T KNOW)
 10 (REFUSED)

<i>Overview of Participation and Process</i>

- Oint. "From now on I'll refer to the Focus on Energy Apartment and Condominium Efficiency Services program as the Focus ACES program."
- O1. When did you first become involved with the Focus ACES Program?
 _____ ENTER YEAR
 Don't know/unsure

- O1a. [SKIP IF O1 is 2009] Since you became involved, how many of those years did you implement projects through the Focus ACES program?
- ___ ENTER NUMBER OF YEARS
- D (DON'T KNOW)
- R (REFUSED)
- O2. How did you first hear about the Focus ACES Program? (INDICATE ALL THAT APPLY. PROBE: ANYTHING ELSE?)
- 1 Spoke with a Focus on Energy contact or Energy Advisor
 - 2 Attended workshop or training seminar and learned about the program
 - 3 Through a manufacturer/supply house/distributor
 - 4 From a customer
 - 5 At a trade show
 - 6 Saw/heard ads for the program (Where? _____)
 - 7 Attended a program-sponsored information session
 - 8 Focus on Energy website
 - 9 Business colleague
 - 10 Apartment owner association
 - 11 Mail or newsletters from Focus on Energy
 - 12 Other _____
 - 13 Don't know/unsure
- O3. What other Focus on Energy programs are you involved with? (INDICATE ALL THAT APPLY. PROBE: ANYTHING ELSE?)
- 1 ENERGY STAR Products (e.g. appliances, furnaces, boilers)
 - 2 Home Performance with ENERGY STAR
 - 3 Targeted Home Performance with ENERGY STAR
 - 4 Wisconsin ENERGY STAR Homes ("WESH")
 - 5 Business Programs (SPECIFY SECTOR IN O3a)
 - 6 Other (SPECIFY)
 - 7 (DON'T KNOW)
 - 8 (REFUSED)

O3a. For which business sector(s)? (INDICATE ALL THAT APPLY. PROBE: ANYTHING ELSE?)

- 1 Agriculture
- 2 Commercial businesses
- 3 Equipment and systems
- 4 Industrial businesses
- 5 New business construction
- 6 School or government
- 7 (DON'T KNOW)
- 8 (REFUSED)

O3b. Are you registered with Focus on Energy as a Market Provider (or Residential Partner)?

- 1 Yes
- 2 No
- D (DON'T KNOW)
- R (REFUSED)

O4. What training or assistance, if any, have you received from Focus on Energy regarding the ACES Program?

VERBATIM RESPONSE

O7. How often do you typically interact with someone from the Focus ACES program?

- 1 Daily
- 2 Weekly
- 3 Monthly
- 4 7–10 times a year
- 5 4–6 times a year
- 6 2–3 times a year
- 7 Once a year
- 8 Never
- D (DON'T KNOW)
- R (REFUSED)

3 Findings

O7a. Do you work with an Energy Advisor from Focus on Energy?

- 1 Yes [ASK O7b]
- 2 No [SKIP to O8a]
- D (DON'T KNOW)
- R (REFUSED)

O7b. How does working with the Energy Advisor benefit you?

VERBATIM RESPONSE

(IF MATCHED SAMPLE ONLY, SKIP TO O9)

O8a. The Focus ACES program database shows that you were involved with approximately [# projects] between March 2008 and Dec 2009. Is that correct?

- 1 Yes
- 2 No (RECORD CORRECT NUMBER OF PROJECTS in O8aFIX)
- D (DON'T KNOW)
- R (REFUSED)

O8b. Do you expect your involvement in the program to increase, decrease or stay the same in the next 12 months?

- 1 Increase
- 2 Decrease
- 3 Stay the same
- D (DON'T KNOW) [SKIP TO O9]
- R (REFUSED) [SKIP TO O9]

O8c. Why will that be the case?

VERBATIM RESPONSE

O9. What are the primary benefits you receive from the Focus ACES program? (PROBE: ANYTHING ELSE?)

VERBATIM RESPONSE

Program Attribution

(M1-M13 ASKED OF CONTRACTORS FOR EACH MATCHING CUSTOMER SURVEY)

M1Int. Now I'm going to ask you a few questions about one of your customers who received a rebate from the Focus ACES program sometime between March 31, 2008, and April 1, 2009.

[MENTION NAME OF CUSTOMER AND PROJECT INFORMATION THAT WILL HELP THE SUPPLIER REMEMBER THE PROJECT. IF THE SUPPLIER DOES NOT REMEMBER THIS CUSTOMER/PROJECT, SKIP TO THE NEXT SECTION]

M1. Prior to this project had your company worked with this customer?

- 1 Yes
- 2 No [SKIP TO M5]
- D (DON'T KNOW) [SKIP TO M5]
- R (REFUSED) [SKIP TO M5]

M2. Prior to this project had your company installed or sold energy efficiency improvements to this customer?

- 1 Yes
- 2 No
- D (DON'T KNOW)
- R (REFUSED)

M3. As far as you know, did **[customer]** have specific plans set aside to install any of this equipment before you talked with them about the program?

- 1 Yes
- 2 Yes, but don't remember specifics
- 3 No
- D (DON'T KNOW)
- R (REFUSED)

- M4. As far as you know, did **[customer]** know about the rebate from the Focus ACES program before you talked with them?
- 1 Yes
 - 2 Yes, but don't remember specifics
 - 3 No
 - D (DON'T KNOW)
 - R (REFUSED)
- M5. If your company had NOT been involved with Focus ACES, how likely is it that you would have offered the same energy efficiency services and/or technologies to the customer? [READ LIST]
- 1 Very likely
 - 2 Somewhat likely
 - 3 Not very likely
 - 4 Very unlikely
 - D (DON'T KNOW)
 - R (REFUSED)
- M6. If the Focus ACES program had not offered a rebate for this high efficiency equipment, how likely do you think the customer would have been to proceed with this same energy efficient equipment?
- 1 Very likely
 - 2 Somewhat likely
 - 3 Not very likely
 - 4 Very unlikely [SKIP TO M13]
 - D (DON'T KNOW) [SKIP TO M13]
 - R (REFUSED) [SKIP TO M13]
- M7. Without the existence of the Focus ACES program, how would the timing of the project have been affected? Would you say that the project would most likely have been undertaken...? [READ LIST]
- 1 At the same time [SKIP TO M9]
 - 2 Earlier
 - 3 Later
 - D (DON'T KNOW) [SKIP TO M9]
 - R (REFUSED) [SKIP TO M9]

- M8. How many months **[earlier/later]**?
 ____ [RECORD NUMBER OF MONTHS]
 D (DON'T KNOW)
 R (REFUSED)
- M8a. How often do you think this owner would have had the program eligible boiler clean and tune performed in the absence of the program?
 1 Every year
 2 Every other year
 3 Once in a while
 4 Never
 D (DON'T KNOW)
 R (REFUSED)
- M9. [SKIP if ME5=1]
 Without the existence of the program, how do you believe the level of efficiency achieved by the project would have been affected? Would the efficiency of the equipment have been... [READ LIST]
 1 The same [SKIP TO M11]
 2 Lesser
 3 Greater [SKIP TO M11]
 D (DON'T KNOW) [SKIP TO M11]
 R (REFUSED) [SKIP TO M11]
- M10. [SKIP if ME5=1]
 High efficiency equipment was installed as part of this project. Without the existence of the Focus ACES program, what type of equipment do you believe this customer would most likely installed... [READ LIST]
 1 As high efficiency as they did install
 2 Standard efficiency
 3 Less efficient than standard
 4 Between standard and the high efficiency they did install
 5 Would not have done anything
 D (DON'T KNOW)
 R (REFUSED)
- M11 [ASK ONLY IF QUANTITY IS APPLICABLE TO PROJECT (e.g., lighting projects)
 SKIP TO M13] Without the existence of the Focus ACES program, would you say that the quantity installed would most likely have been... [READ LIST]

- 1 The same [SKIP TO M13]
- 2 Fewer
- 3 More
- D (DON'T KNOW) [SKIP TO M13]
- R (REFUSED) [SKIP TO M13]

M12 What percentage of the quantity installed would have been installed?

_____ [RECORD PERCENTAGE]

(IF M9=2 THEN M10 SHOULD BE BETWEEN 0 AND 99.)

(IF M9=3 THEN M10 SHOULD BE GREATER THAN 100.)

D (DON'T KNOW)

R (REFUSED)

Mx On a scale from 0 to 10 with 0 meaning no influence, and 10 meaning a great deal of influence, how much influence do you believe your company had on this customer's decision to purchase the high efficiency equipment they did?

_____ [RECORD PERCENTAGE]

D (DON'T KNOW)

R (REFUSED)

M13 [CONFIRMATION QUESTION] Could you describe in your own words what influence you think the Focus ACES program had on this customer's decision to make these specific energy efficiency improvements at the time they did?

RECORD VERBATIM

D (DON'T KNOW)

R (REFUSED)

Customer Role in Selecting Equipment

(IF MATCHED SAMPLED ONLY, END INTERVIEW)

RInt. Now I'd like to ask you some questions specifically about your multifamily customers.

Who are the typical parties you work with for a multifamily project? Select all that apply

- 1 Building owner
- 2 Property manager
- 3 Architect or designer
- 4 Maintenance staff
- 5 Other (SPECIFY)
- D (DON'T KNOW)
- R (REFUSED)

R1. What factors most influence multifamily customers' decisions on whether or not to purchase high efficiency equipment? (RECORD RESPONSES IN ORDER OF MENTION)

- 1 First cost of equipment
- 2 Payback on the equipment
- 3 Green technology/environmental concerns
- 4 Recommendation from Focus on Energy "Energy Advisor"
- 5 Recommendations from designer
- 6 Recommendation from a contractor
- 7 Availability of the high efficiency equipment
- 8 Need to replace failed equipment
- 9 Need to upgrade old equipment (working but in poor condition)
- 10 Other (SPECIFY)
- 11 (DON'T KNOW)
- 12 (REFUSED)
- 13 No more
- 14 Energy savings

R4a1. When you first talk with the multifamily customers, what percentage understand the efficiency options available to them?

___ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

R4a2. When you first talk with the multifamily customers, what percentage of them specifically tell you that they want to install high efficiency equipment?

___ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

R4b. For those customers that haven't already told you that they want high efficiency equipment, do you always, often, sometimes, or rarely offer them a high efficiency option?

1 Always

2 Often

3 Sometimes

4 Rarely

D (DON'T KNOW)

R (REFUSED)

R4c. What percentage of these customers who were not initially planning to purchase high efficiency equipment, or who did not initially know what they wanted, end up selecting high efficiency equipment based on conversations you have with them?

___ PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

R2. What percentage of your multifamily customers already know about the incentive available through the Focus ACES program when they contact you?

___ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

R3. About what percentage of your multifamily customers end up receiving an incentive through the Focus ACES program?

___ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

R5a. One of the purposes of the program is to encourage customers to purchase a higher efficiency of equipment than they would otherwise purchase. Do you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree that the program is accomplishing this?

1 Strongly agree

2 Agree

3 Neither agree nor disagree

4 Disagree

5 Strongly disagree

D (DON'T KNOW)

R (REFUSED)

R5b. The program also encourages customers to purchase high efficiency equipment sooner than they had planned. Do you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree that the program is accomplishing this?

1 Strongly agree

2 Agree

3 Neither agree nor disagree

4 Disagree

5 Strongly disagree

D (DON'T KNOW)

R (REFUSED)

R5c. [ASK ONLY IF LTG or APPL contractor] Finally, the program encourages customers to purchase a higher quantity of high efficiency equipment than they had planned to. Do you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree that the program is accomplishing this?

- 1 Strongly agree
- 2 Agree
- 3 Neither agree nor disagree
- 4 Disagree
- 5 Strongly disagree
- D (DON'T KNOW)
- R (REFUSED)

R6a. Do you strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree that the customer rebates offered through the program are effective?

- 1 Strongly agree
- 2 Agree
- 3 Neither agree nor disagree
- 4 Disagree
- 5 Strongly disagree
- D (DON'T KNOW)
- R (REFUSED)

R6b. (IF R6a = 3, 4, or 5) Why don't you feel the rebates are effective?

RECORD VERBATIM WHY NOT ADEQUATE

Recommendation and Installation Practices
--

(Repeat for each type of equipment in database)

- P1. Our records show that your firm specified, sold, and/or installed **[measure]** to multifamily customers in **[year]** through the Focus ACES program. This includes equipment such as **[measure description]**. Is that correct?

[INTERVIEWER: PLEASE VERIFY EACH TYPE OF EQUIPMENT THAT SHOWS FOR THE VENDOR]

- 1 Yes
 2 No [If incorrect, try to clarify. If not associated with measure, skip to next]
 D (DON'T KNOW)

ME1 = Air conditioning

ME2 = Clothes washers

ME3 = Dishwashers

ME4 = Heating

ME5 = Boiler clean and tune (add skip patterns for P6-10, M6, M9 etc)

ME6 = Lighting

ME7 = Other

ME8 = Refrigeration

ME9 = Building shell

ME10 = Water heating

- P2a. Have any of your recommendation or installation practices for **[incentivized equipment]** changed since you first provided services through the Focus on Energy Apartment and Condominium Efficiency Services program?

- 1 Yes
 2 No [SKIP TO P6]
 D (DON'T KNOW)
 R (REFUSED)

- P3. In what percentage of your multifamily projects did you install/performance high efficiency **[incentivized equipment]** prior to your involvement with Focus ACES?

___ ENTER PERCENTAGE

- D (DON'T KNOW)
 R (REFUSED)

- P4. In what percentage of your multifamily projects did you install/performance high efficiency **[incentivized equipment]** after your involvement with Focus ACES?
- ___ ENTER PERCENTAGE
- D (DON'T KNOW)
- R (REFUSED)
- P5. Do you strongly agree, agree, neither agree nor disagree, disagree or strongly disagree that the Focus ACES program influenced you to change your recommendation or installation practices for **[incentivized equipment]**?
- 1 Strongly agree
- 2 Agree
- 3 Neither agree nor disagree
- 4 Disagree
- 5 Strongly disagree
- D (DON'T KNOW)
- R (REFUSED)
- P6. [SKIP IF ME5=1]
Do you typically carry inventory for the **[incentivized equipment]** that you install?
- 1 Yes
- 2 No
- D (DON'T KNOW)
- R (REFUSED)
- P7. [SKIP IF ME5=1]
(IF P6 = YES) What percentage of your inventory met program eligibility criteria **before** you participated in the program?
- ___ ENTER PERCENTAGE
- D (DON'T KNOW)
- R (REFUSED)
- P8. [SKIP IF ME5=1]
(IF P6 = YES) What percentage of your inventory met program eligibility criteria **after** you participated in the program?
- ___ ENTER PERCENTAGE
- D (DON'T KNOW)
- R (REFUSED)

- P9. [SKIP IF ME5=1]
(IF HEATING; ME4 = 1) In 2009, what was the AFUE rating of the boilers or furnaces you typically installed in multifamily properties that did NOT participate in the program?
- ___ AFUE Rating
- N NA, nothing installed without Focus ACES incentive
- D (DON'T KNOW)
- R (REFUSED)

Program-induced Spillover Assessment

[ASKED FOR EACH MEASURE IN DATABASE]

- V1. Please think about all the program-eligible **[measures]** you specified, sold, and/or installed for Wisconsin customers since March 2008. Did you specify, sell, and/or install any of this program-eligible **[measures]** to customers in Wisconsin without an incentive?
- 1 Yes
- 2 No [SKIP TO V4]
- D (DON'T KNOW) [SKIP TO V4]
- R (REFUSED)
- V2. (IF V1 = Yes) What percentage of all of this program-eligible **[measures]** you specified, sold and/or installed for Wisconsin customers since March 2008 did not receive an incentive?
- _____%
- D (DON'T KNOW)
- R (REFUSED)

V3. (Ask of each measure where V2 > 2%) (Since March 2008, you mentioned that about [___%] of the [measures] you specified and/or installed would have been eligible for an incentive through the Focus ACES program, but did not receive an incentive.) What are the main reasons why your firm didn't request a customer incentive for this program-eligible equipment/service? (DO NOT READ—INDICATE ALL THAT APPLY; PROBE, WHAT ELSE?)

- 1 Not worth the paperwork for our firm to help the customer apply for the incentive
- 2 Customer did not want the hassle of applying for the incentive
- 3 Takes too long for approval
- 4 The equipment would not qualify→Why not?_____
- 5 Outside Focus eligible service territory
- 6 No time – customer needed equipment immediately
- 7 Thought the program had ended
- 8 Didn't know the equipment qualified under program
- 9 Just didn't think of it
- 10 Unable to get rebate (unsure why)
- 11 Other (SPECIFY)
- 12 (DON'T KNOW)
- 13 (REFUSED)

V4Int. I'm going to read you three statements. For each statement, please tell me whether you agree or disagree that this statement applies to your company. There are no right or wrong answers; we just want your honest opinion.

V4a. Our past experience specifying/installing/performing [measure] through the Focus ACES program has convinced us that this equipment is cost effective or beneficial even without a program incentive.

- 1 Agree
- 2 Disagree
- D (DON'T KNOW)
- R (REFUSED)

V4b. We are better able to identify opportunities to improve energy efficiency by using high efficiency [measure] because of what we learned and our previous experience [with the performance of energy efficient services performed/equipment installed] through the Focus ACES program.

- 1 Agree
- 2 Disagree
- D (DON'T KNOW)
- R (REFUSED)

3 Findings

V4c. We are more likely to discuss energy efficient options with all of our customers when developing project plans for **[measure]** because of what we learned and our previous experience **[with the performance of energy efficient services performed/equipment installed]** through the Focus ACES program.

- 1 Agree
- 2 Disagree
- D (DON'T KNOW)
- R (REFUSED)

END. Thank you. Those are the questions I have for you today. Do you have any questions or comments?

APPENDIX D: ACES MARKET ACTOR DATABASE ANALYSIS

Subject Focus on Energy Evaluation

ACES Market Actor Database Analysis

To Oscar Bloch,
Public Service Commission of Wisconsin
cc Kathy Kuntz, Sara Van de Griff, and Mike Plunkett,
WECC

From Jeremy Kraft, Kimberly Bakalars, and Bryan Ward,
PA Consulting Group

Date December 10, 2009

The purpose of this memo is to share the findings from PA Consulting Group’s in-depth analysis of the market actor database, discuss sampling strategy, and layout out the timeline for data collection and reporting.

As the first step of our supply-side evaluation research, we conducted in-depth analysis of the Whole Building data available in the ACES database combined with data collected during the impact analysis. We examined the number and type of contractors involved, their duration and level of program involvement, and average attribution by contractor group. The results of this analysis will be used to inform sampling and content of both the in-depth interviews and quantitative survey research discussed in the *ACES Supply-side Research Plan*²¹.

Program Summary

The ACES database (updated November 19, 2009) contains records for 666 contractors involved with the Whole Building program component. These records cover 3,376 measures and 2,007 projects. Of these contractors, 54 were identified as either self-install projects (as labeled in the database) or retail outlets that would not typically provide contracting services. An example of such a retail outlet is a hardware store that received buy-down incentives for light bulbs or other appliances. Additionally, the database contains information for 2,337 measures for which there is no contractor ID number. Table 1 details the savings, measure, and project information for these different groups.

²¹ Kimberly Bakalars, Jeremy Kraft, Bryan Ward, and David Sumi, PA Consulting Group. *ACES Supply-side Research Plan (Draft)*. November 13, 2009.

Table 1. Summary of Database Contractor Information

Type of Contractor	Frequency	kWh Savings	Therm Savings	Number of Measures	Number of Projects ²²
Contractor	612	16,921,193	2,675,045	3,063	1,792
Self-install	1	165,867	15,819	50	37
Retail outlet	53	3,178,188	6,427	263	178
No contractor ID	1	5,446,088	342,188	2,337	1,029
Total	667	25,711,337	3,039,479	5,713	3,036

The following contractor analysis is limited to the 612 contractors though other records were reviewed for comparison. We do acknowledge that this analysis is limited by the quality of the data in the tracking system. Some of the projects with no contractor ID associated with an installed measure are missing contractor data, as that information was not being tracked at the time of entry into the database. We believe that these limitations are mitigated by restricting analysis to the last three years of activity as data tracking has improved in that period.

Level of Activity

There were significant changes to the Whole Building component of the ACES program in 2006. Table 2 shows the number of contractors involved prior to 2007. Given the program changes in 2006, contractors are grouped into three categories: those involved with projects prior to January 1, 2007, those involved with projects both before and after 2007, and those involved with projects only after January 1, 2007. As a majority of contractors was involved after 2007, our interview sample will exclude contractors that have not participated since January 1, 2007. Table 2 details the number of contractors and their period of involvement.

Table 2. Number of Contractors Involved Before and After 2007

Date of Last Involvement	Number of Contractors
Prior to 2007 only	181
Projects before and after 2007	80
2007 and later only	351
Total	612

Conducting interviews with the lapsed participation group would result in unreliable data regarding the Whole Building program component, as the time passed would create substantial recall error. In addition, those contractors would not make an acceptable nonparticipant or control group as lack of involvement creates a self-selection bias and major design and implementation changes in 2006 would make any results non-applicable to the current program. However, we may conduct a small number of in-depth interviews with this group in order to inform survey design or explore issues that arise during interviews with the recent contractors.

²² These projects are not mutually exclusive as some projects contain measures with identified contractors as well as measures with no identified contractor.

The 431 contractors that have participated in the program after January 1, 2007, participated in 1,011 projects and installed 1,676 measures. These measures account for 8,069,815 kWh savings and 1,544,847 therm savings. Table 3 compares the included contractors with the contractors from the program overall.

Table 3. Pre-2007 Contractors Compared with Post-2007 Contractors

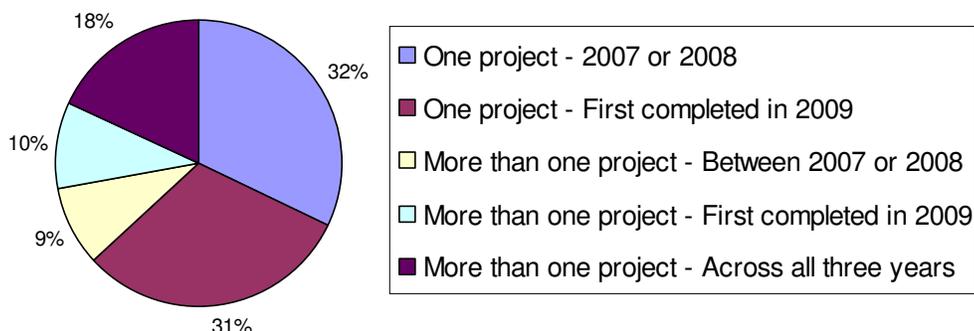
Type of Contractor	Time Period	kWh Savings	Percent of Total	Therm Savings	Percent of Total	Number of Measures	Percent of Total	Number of Projects	Percent of Total
Contractor	2007 and later	8,069,815	48%	1,544,847	58%	1,676	55%	1,011	56%
	2006 and earlier	8,851,378	52%	1,130,197	42%	1,387	45%	781	44%
Self-install	2007 and later	165,867	100%	15,819	100%	50	100%	37	100%
	2006 and earlier	0	0%	0	0%	0	0%	0	0%
Retail outlet	2007 and later	2,210,696	70%	2,134	33%	155	59%	109	61%
	2006 and earlier	967,492	30%	4,293	67%	108	41%	69	39%
No contractor ID	2007 and later	1,798,170	33%	110,338	32%	874	37%	472	25%
	2006 and earlier	3,647,918	67%	231,850	68%	1,463	63%	1,407	75%
Total	2007 and later	12,244,548	48%	1,673,138	55%	2,755	48%	1,629	54%
	2006 and earlier	13,466,788	52%	1,366,340	45%	2,958	52%	1,407	46%

Of those contractors who have participated in the Whole Building component since January 1, 2007, we analyzed the population by the contractors' level of engagement. To do this, we split the contractors into groups based on the frequency and timing of a contractor's involvement with the Whole Building program. This split resulted in five groups:

1. Contractors that completed one project in 2007 or 2008
2. Contractors that first completed one project in 2009
3. Contractors that completed more than one project between 2007 and 2008
4. Contractors that first completed more than one project in 2009
5. Contractors that completed more than one project between 2007 and 2009.

A large percentage (63 percent) of the contractors has only participated in the Whole Building program component once and almost a third of all contractors have participated for the first time in 2009. Figure 1 details the level of contractor activity after 2007.

Figure 1. Level of Contractor Activity After 2007



At a finer level of detail, the database analysis also indicates that different kinds of contractors participate with the program with varying levels of engagement. Limiting our analysis to the five measures with the largest gross savings, several patterns emerge. First, a majority of the heating contractors has past experience with the program (73 percent). The same trend is seen with contractors that performed boiler clean and tune services. This overlap is expected as many of the boiler clean and tune contractors also installed heating equipment. Conversely, a majority of the building shell measures was installed by contractors whom have only completed one project (61 percent). Table 4 details the breakdown of installation by measure.

Table 4. Measure Installation by Contractor Activity

Activity Level	Heating Equipment		Boiler Clean and Tune Services		Lighting Measures		Building Shell Measures		Water Heater Equipment	
	Count	%	Count	%	Count	%	Count	%	Count	%
One project – 2007 or 2008	103	15%	9	5%	23	5%	27	25%	19	21%
One project – First completed in 2009	43	6%	11	6%	81	18%	40	36%	17	18%
More than one project – Between 2007 or 2008	136	20%	15	8%	9	2%	8	7%	17	18%
More than one project – First completed in 2009	41	6%	27	14%	115	26%	17	15%	0	0%
More than one project – Across all three years	365	53%	128	67%	212	48%	18	16%	39	42%
Total	688	100%	190	100%	440	100%	110	100%	92	100%

Attribution

Another step of the database analysis was to link tracking data with the attribution rates from the self-report survey in order to explore any patterns between contractors and program attribution.

Attribution varied significantly depending on the incentive recipient. Linking information regarding who received the incentive to that measure's attribution rate shows that when the measure was paid to a customer, the program was more likely to receive credit for influencing the decision to install. Table 5 shows the difference in attribution for these two groups.

Table 5. Attribution by Incentive Recipient

Check Paid to Contractor or Customer	Attribution (Unweighted)	Attribution (Weighted by kWh)	Attribution (Weighted by Therms)	Number of Measures
Contractor	43.3%	44.2%	39.7%	800
Customer	76.5%	85.4%	58.2%	44
Total²³	45.0%	45.6%	40.6%	844

We also compared attribution rates by the contractor's program activity. We found differences in weighted attribution between these groups. Further analysis at the measure level was limited by size of the groups and the availability of data. Though no logical pattern emerges from this analysis, we feel that the differences found will help inform questions regarding changes in contractor behavior because of the program. As we move forward with data collection, we will include both program attribution by incentive recipient and program attribution by contractor activity as issues on which we will focus. Table 6 details the attribution by level of contractor activity.

²³ As not all fields were complete for all records, some cases were dropped from the analysis. Also, attribution rates across years were aggregated for unique contractors. Therefore, the overall attribution rates reported here do not match attribution rates in previous impact reports.

Table 6. Attribution by Contractor Activity Group

Activity Level	Overall Attribution (Unweighted)	Attribution (Weighted by kWh)	Attribution (Weighted by Therms)	Number of Contractors	Covered kWh Savings	Covered Therm Savings
One project – 2007 or 2008	45.6%	71.9%	54.9%	42	558,310	94,991
One project – First completed in 2009	46.3%	9.2%	41.4%	13	134,989	15,583
More than one project – Between 2007 or 2008	44.8%	11.3%	47.1%	17	339,871	81,667
More than one project – First completed in 2009	49.2%	40.8%	18.1%	14	780,556	20,309
More than one project – Across all three years	50.7%	28.0%	32.7%	51	4,090,136	748,986
Total²⁴	47.8%	32.5%	36.1%	137	5,903,862	961,534

As a large quantity of program component savings is accounted for by the high activity group, this group is having a large effect on Whole Building program component attribution. This analysis covers 73 percent of the kWh savings and 62 percent of the therm savings²⁵ of this contractor population. **Error! Unknown document property name.** Table 7 details the contractors that fall into that group and their associated savings.

Table 7. List of High Activity Contractors

Contractor	kWh Savings	Therm Savings	Measures Installed	Projects
ADS Mechanical	0	3,319	8	2
Area Mechanical Inc.	0	6,651	4	3
BBC Lighting and Supply	253,925	0	38	16
Belknap Plumbing, Heating and Cooling	200,726	-3,947	8	3
Black-Haak Heating Inc.	0	5,611	10	3
Blakeman Plumbing & Heating	0	1,973	4	3
Butters Fetting Co.	392,274	36,191	17	11
Cary Heating and AC	0	3,111	4	3
Chet's Plumbing & Heating Inc.	0	16,002	17	5
City Lights Design Showcase	57,320	0	11	2
Dean Bubolz	14,204	0	6	2
Energy Consultants of Wisconsin	864,208	0	92	18
Energy Expeditors	0	53,181	28	13
Energy Supply Co.	3,136	0	3	3

²⁴ These projects are not mutually exclusive as some projects contain measures with identified contractors as well as measures with no identified contractor.

²⁵ The high coverage rate is due to over-sampling of high saving measures during the impact analysis.

Contractor	kWh Savings	Therm Savings	Measures Installed	Projects
Fluid Handling Inc.	19,090	3,211	2	2
Gas Service and Equipment	9,750	13,895	10	5
Great Lakes Commercial Sales	174,192	8,790	57	26
Groeschel Company	0	5,477	13	5
Gross Heating and AC	773	11,601	10	8
Guillette Heating and AC Inc.	915	0	2	2
HD Supply Facilities Maintenance	256,262	0	44	14
Heating and Cooling Inc.	0	4,465	7	7
Hein Electric-Brookfield	771,246	0	9	7
Hillestad Heating-Madison	2,746	81,102	83	14
Hillestad Refrigeration Inc.	773	57,889	152	34
Hot Water Products	0	8,885	15	6
J&D Heating and Cooling Inc.	0	10,684	24	4
K Kelly Heating and Cooling	0	114,380	443	30
Mared Mechanical	252,052	29,303	10	2
MGM Lighting Solutions	518,518	0	5	3
Mikes Heating and Air Conditioning Inc.	0	5,285	4	2
MMC Heating and Cooling	0	1,407	4	4
North Central Construction Corp	112,503	1,234	6	2
PGA Inc.	-200	11,105	5	2
Rasmussen Plumbing	0	9,393	4	2
Reliable Water Services	0	20,461	10	6
Rockweiler Insulation Inc.	1,014	7,017	24	7
Roth Heating Company Inc.	0	22,901	31	15
Staff Electric	17,946	0	8	4
Steiner Electric Inc.	5,232	1,647	18	2
The Exit Light Co Inc.	40,800	0	9	5
Tri - County Cooling and Heating	0	9,178	4	4
Tweet Garot Mechanical	0	5,411	3	2
Viking Electric Supply Inc.	25,743	0	12	5
Vorpagel	3,060	196	7	3
WA Roosevelt	55,826	0	14	5
Werner Electric	29,427	0	23	3
Wiersgalla Company	0	62,034	5	4
Zien Inc.	6,675	119,943	99	26

SAMPLING STRATEGY

The ACES database contains data for 431 contractors who have participated in the Whole Building program component since January 1, 2007. From this population, as discussed in the *ACES Supply-side Research Plan*, we propose conducting 10–15 semi-structured, in-depth interviews. We intend to conduct several of these interviews with contractors who participated in the program both before and after January 1, 2007 in order to explore what effect any changes in program implementation might have had and to understand long-term program effects on their energy efficiency services offered to the multifamily market.

Information learned from the in-depth interviews will then be used to refine a set of questions for quantitative CATI interviews with a larger sample of the post-2006 contractor population. We are targeting approximately 70 completed interviews with participating contractors.

TIMELINE

The following is our proposed timeline for the ACES supply-side research effort. This timeline includes time for comment and review and accounts for holiday vacation time in late December.

December 11, 2009	Database analysis memo
December 23, 2009	Sampling plan and CATI survey submitted for review
January 6, 2010	Review comments on sampling plan and CATI survey due
January 11, 2010	Field CATI survey
February 16, 2010	Draft supply-side report
March 2, 2010	Review comments on draft report due
March 16, 2010	Final supply-side report