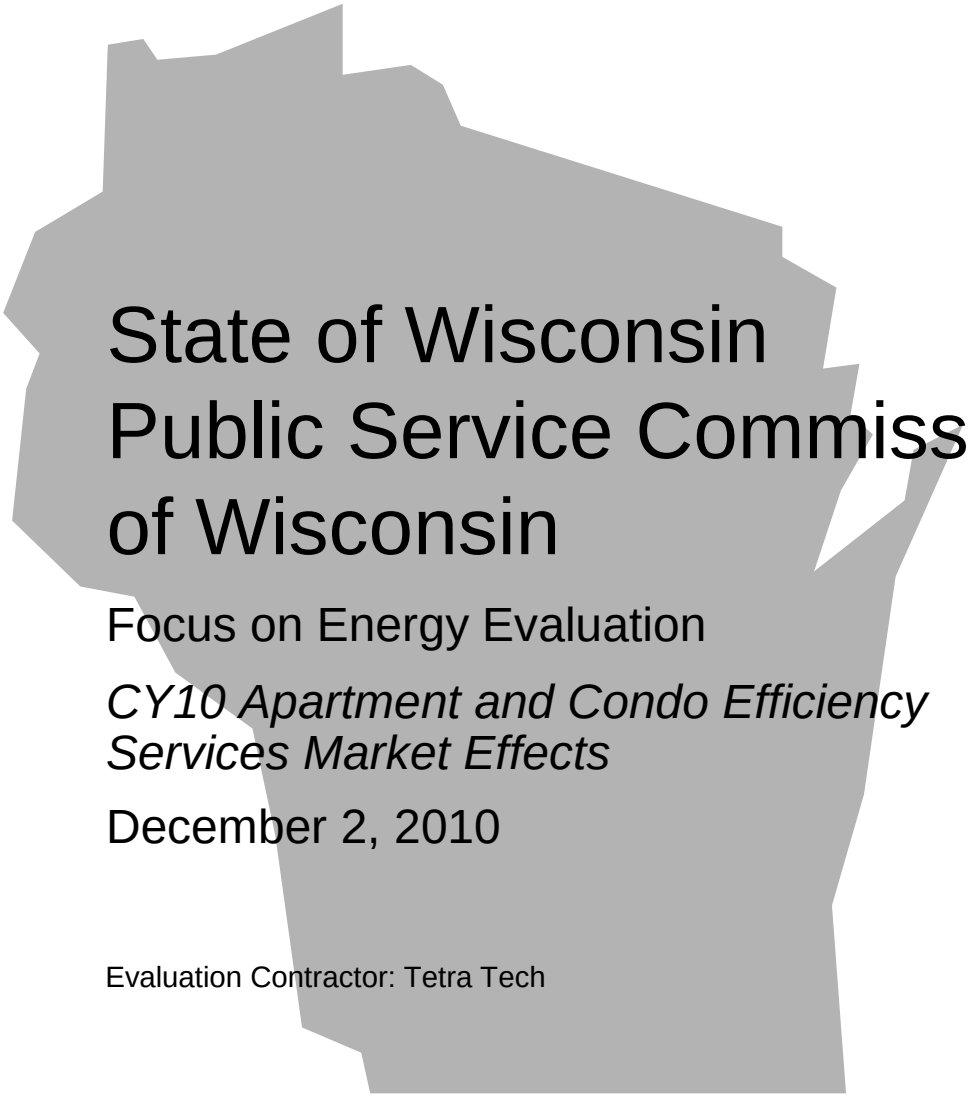
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State of Wisconsin Public Service Commission of Wisconsin

Focus on Energy Evaluation

CY10 Apartment and Condo Efficiency Services Market Effects

December 2, 2010

Evaluation Contractor: Tetra Tech

Prepared by: Kimberly Bakalars, Jeremy Kraft, Laura Schauer, and Chelsea Merchant, Tetra Tech

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The power is within you.

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1. EXECUTIVE SUMMARY

1.1 OVERVIEW

The Apartment and Condo Efficiency Services (ACES) program offers a full range of energy efficiency services and measures to owners and managers of apartments and condominiums to encourage the installation of high efficiency equipment in their buildings. The program consists of three components:

- New Construction, offering services and measures to new construction projects
- Whole Building Existing, offering services and measures to existing building projects
- In-unit Direct Install, offering measures directly to units in multi-family buildings.[1]

This report presents the evaluation team's findings on what, if any, influence the Whole Building Existing component has had on the multi-family high efficiency retrofit market in Wisconsin and additional analysis on nonparticipant spillover. This study used two different methods to estimate spillover—a market-based approach and a participating contractor self-report approach. It also contains findings on process-related issues including the multi-family sales process, barriers to contractor participation, influence from contractors on customers, and influence from the program on customers.

The analysis for this report drew upon one primary research activity—telephone surveys with a random sample of contractors in Wisconsin and Michigan (with a sub-sample of contractors that have participated with the ACES program in 2010).

Tetra Tech conducted 267 structured interviews with contractors. The interviews were conducted between August 25 and September 29, 2010. Sampling was conducted in both the Wisconsin and Michigan market at the contractor level and was stratified by contractor end-use specialization. Our sample was limited to heating, lighting, and water heating and screened out contractors that do not work in the multi-family sector.

1.2 KEY FINDINGS

1.2.1 Program impacts

The ACES program is influencing contractor sales practices. Comparing Michigan and Wisconsin contractors' responses to questions within the contractor survey, we see that the program is not only influencing customers directly, but also influencing customer purchasing decisions through influence on Wisconsin contractors.

Market-based findings estimate that the ACES program is likely responsible for some level of untracked savings from the sales of high efficiency equipment. Based on a comparison of sales data reported by heating contractors in Wisconsin and Michigan, the Wisconsin market shows an increase in overall high efficiency sales in multi-family buildings

[1] This component was temporarily suspended in June of 2010.

when adjusted for program activity in both states. This increase is, in essence, spillover resulting from the program.

Participating contractor self-reported results identified nonparticipant spillover of two percent of overall savings. A majority of nonparticipant spillover savings were attributed to boiler tune and clean services, which is a service that the program no longer offers. However, we applied additional rigor used in our analysis that found savings that could be attributed to the program without outliers skewing results. Previous research only asked participating contractors to estimate the sales of "program-eligible" equipment outside of the program without specifically telling them what was eligible. To avoid confusion, this research provided examples of what equipment would be considered "program-eligible." In addition, contractors were asked to report their program-eligible sales as a percentage of their overall sales. We confirmed these percentages by converting them to an estimated number of projects based on program tracking data.

As the program tracking database did not have contact information for many of the participating contractors, our analysis is limited by the small number of 2010 participating contractors we were able to interview. Greater consistency in tracking contractors involved with the ACES program would allow for more robust nonparticipant spillover analysis.

1.2.2 Program operations

Customers are influenced by both their contractors and the program. Contractors reported that not all of their customers initially request high efficiency equipment and that in many situations, they are able to convince their customers that high efficiency equipment is the right choice for them. They also reported that the program is effective in convincing customers to upgrade to high efficiency equipment and accelerate their purchases.

There is a large untapped pool of contractors in Wisconsin that are good candidates for new trade allies. The main reason that contractors have not participated in the ACES program is that they were not aware of its existence. While multi-family work is a very small percentage of their overall business, those that have not participated believe that their multi-family customers would be interested in the services offered. Furthermore, the contractors reported that they most often look to their manufacturers' representatives or the Internet for additional information regarding high efficiency equipment. This finding suggests those avenues would be the most effective for engaging additional contractors. Raising awareness among these contractors could boost program participation in the future.

For contractors that were aware of the program, lack of interest in high efficiency equipment is the main reason for nonparticipation. This finding suggests limited "lost opportunities" among contractors that are aware of the program but have not participated in the past three years. Lost opportunities are likely when contractors do not actively promote the program due to negative previous experiences such as an unreasonable administrative burden for participation.

1.3 RECOMMENDATIONS

1.3.1 Program impacts

Consider implementing market effects research in concert with customer self-report research to account for spillover implemented by Wisconsin contractors. By comparing the Wisconsin market to the Michigan market, we were able to identify untracked attributable savings from high efficiency heating equipment installed in multi-family buildings. Based on these findings, we believe these savings are, at least in part, due to ACES program activity. Due to limited contractor interviews, we are unable to draw conclusions regarding the lighting and water heating markets although there is evidence to suggest untracked savings in those markets as well. Since this research was not intended to adjust program impacts, we do not recommend any change to the program-level or end-use level attribution rates.

Improve consistency in documenting which contractors sell or install rebated equipment. While program staff are making an effort to track this information, greater consistency in recording this information would allow for a more robust evaluation. In this study, a significant percentage of the contractors were missing contact information or had information that was incorrect.

Greater consistency is important as it both aids the evaluation of nonparticipant spillover and supports primary customer research. In order to effectively evaluate nonparticipant spillover, a sample of participating contractors needs to be contacted. Their responses are then evaluated in conjunction with the savings that they delivered through the program. This effort requires that each measure be linked to a contractor with contact name, mailing address, and phone number. In addition, when during the customer surveys customers identified the contractor as being the primary influence in their decision to install program-eligible equipment, supporting interviews were then conducted with that contractor. While customers are often able to provide this information, having program records as a back-up would increase the overall response rate of the effort.

The PSCW should continue to consider primary research with customers for determining free-ridership for this program. While methods exist for estimating program attribution using reported sales data, many contractors were unable to recall how much of their multi-family sales received incentives. This recall issue is most likely due to the small amount of multi-family work in which these contractors typically engage; a characteristic that is unlikely to change over time. In addition, contacting contractors in a comparison state is an expensive endeavor as researchers lack any branding to convince respondents that study participation is to their benefit. Customer research, with follow-up calls to influential contractors (as identified by the customers), though not without its weaknesses, remains the most cost-effective option for evaluating savings attributable to the ACES program.

1.3.2 Program operations

Marketing efforts targeted towards contractors should utilize manufacturers or distributors of equipment and online resources. Contractors reported that they most frequently contact their manufacturing representative or conduct research online when looking for information about high efficiency options for multi-family buildings. While a majority of program marketing is directed at customers, engaging contractors through these two

channels could increase the overall awareness of the program in the state and minimize lost opportunities for installation of high efficiency equipment in multi-family buildings.

1.4 ORGANIZATION OF THIS REPORT

The remainder of this report summarizes the research background and study methodology (Section 2), our findings (Section 3), and a brief summary and recommendations are presented (Section 4). The original research plan and contractor survey instrument can be found in Appendix A and Appendix B, respectively. An interim memo detailing research progress and proposed changes is included as Appendix C. As part of that memo, a refusal conversion letter sent to contractors during the research period is included in Appendix D. The response rate table can be found in Appendix E.

2. RESEARCH BACKGROUND AND METHODOLOGY

2.1 OVERVIEW

The Apartment and Condo 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 program launched in its current form on January 1, 2007, after undergoing a significant redesign process in 2006. In June 2010, the Direct Install portion was suspended due to budgeting concerns.

This report presents the evaluation team's findings on what, if any, influence the Whole Building Existing component has had on the multi-family high efficiency retrofit market in Wisconsin. Program theory suggests several possible ways these changes could have taken place. First, the program influences building owners directly by offering financial and technical assistance to multi-family building owners to encourage the installation of high efficiency equipment in their buildings. Program theory suggests that this assistance should encourage a greater uptake of high efficiency equipment in multi-family buildings, a traditionally difficult market. The program also offers site assessments by Energy Advisors that can help building owners identify potential areas for upgrades.[2]

In addition, the program can have an influence on participating contractors (i.e., contractors that have been involved with a project that received ACES funds). These contractors may become better able to market, recommend, and install high efficiency equipment due to their participation in the program. This increased experience with high efficiency equipment in multi-family properties may increase their overall ability to sell high efficiency equipment to customers without ACES funds (i.e., nonparticipating customers). Finally, the program may have influenced nonparticipating contractors (i.e., contractors that have not been involved with a project that has received ACES funds) to change their business practices in order to keep up with competing contractors that do actively participate in the program.

This research identifies untracked market effects on the contractor market in Wisconsin because of activity in the Whole Building component. Data collection was conducted in August and September of 2010 to assess the sales and recommendation practices of Wisconsin contractors. Both participating and nonparticipating contractors were included in our research efforts. To form a comparison group, research was also conducted in the same period with Michigan contractors.

2.2 BACKGROUND

This research is an extension of the CY09 market effects research.[3] The goal of this research is to determine whether and how the ACES Whole Building program component is changing

[2] Though required for custom projects, only a small percentage of prescriptive projects receive an assessment.

[3] Jeremy Kraft, Kimberly Bakalars, and Bryan Ward, PA Consulting Group. *Apartment and Condominium Efficiency Services Program: Whole Building Supply-side Impacts*. March 19, 2010.

the practices of market actors because of their experience with the program. In addition, it presents what effect, if any, the program is having on the adoption of energy efficient heating, lighting, and domestic hot water measures in the Wisconsin multi-family retrofit market. These findings are compared with previous net impact research (e.g., customer attribution research, previous contractor market effects research). However, because of the scope of this research activity, we are not at this time integrating the findings of this research with previous net-to-gross results to alter the overall program net savings.

In addition, this research further explores nonparticipant spillover[4]. For this effort, we organized the research objectives into five categories. These categories, and means for assessing the issues, are summarized below.

2.2.1 Explore contractors' roles in the customer sales process

The interview asked contractors about the level of energy efficiency awareness multi-family building owners have. It also gathered information on the reported level of influence, via either technical assistance or the financial incentives, that the program had on customers' decisions to install energy efficient equipment.

2.2.2 Understand why contractors do not engage with the program and what, if anything, the program could do to gain their participation

The interview asked in-state nonparticipating contractors about program awareness, reasons for attrition (if a previous participant), and their opinions about the current and potential future program designs. In addition, the interview asked about where contractors go for information regarding energy efficiency if not through a Focus program.

2.2.3 Estimate the effect the ACES program has had on the adoption of high efficiency equipment in the Wisconsin multi-family retrofit market

Wisconsin and Michigan contractors were asked about their overall sales of energy efficient equipment to the multi-family sector. By comparing the reported sales of program-eligible equipment to multi-family customers by Wisconsin contractors with the reported sales of program-eligible equipment to multi-family customers by Michigan contractors, we assess what impact Focus on Energy has had on the multi-family high efficiency equipment retrofit market in Wisconsin.

As part of this analysis, we also compared the multi-family contractor market in both states. This state-to-state analysis is needed to support the assumption that Michigan and Wisconsin are similar markets that are suitable for comparison. Our comparison includes company size, company services, cross-state market activity, awareness and involvement in rebate programs, and barriers to energy efficiency.

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

2.2.4 Investigate other projects done outside the ACES program and any associated spillover savings

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.

The survey uses the same methodology for quantifying nonparticipant spillover savings as was used in the CY09 research but with additional questions to provide greater rigor. To address high nonparticipant spillover sales estimates that were reported by several contractors in the CY09 research, we added questions confirming the estimated amount of program-qualifying equipment installed outside of the program in the context of what was installed through the program and what overall effect the program had on sales of energy efficient equipment. We also added text to clarify what would constitute “program-eligible” for each type of contractor. These additions are intended to ensure realistic sales estimations from contractors.

2.2.5 Follow-up with contractors that report nonparticipant spillover sales estimate outliers

We also planned to conduct quantitative follow-up interviews with contractors that report nonparticipant spillover savings that are identified as outliers to confirm and better understand their sales patterns. These calls would have confirmed the responses given during the first interview and further explore why this equipment did not receive program incentives. Based on review of the nonparticipant spillover responses, we did not need to follow-up with any contractors as no outliers were identified.

2.3 METHODOLOGY

By comparing the percentage of sales of program-eligible equipment in both Wisconsin and a state without a history of energy-efficiency programs, we can estimate the amount of high-efficiency sales that occurred because of the program. The assumption behind this estimate is that Focus program activity is the only difference between the two states and therefore, the driving force behind any difference in sales over time. This methodology determines the share of sales that would be non-rebated (i.e., occurring in absence of a program) and the share that is attributable to the program.

These comparisons are weighted by the contractor-reported multi-family sales revenue[5] to account for larger firms having more of an effect on statewide sales patterns.

2.3.1 Sampling

This research on the Wisconsin multi-family retrofit high efficiency market relies on primary data collection conducted with Wisconsin and Michigan contractors to inform any program

[5] Survey item A3b applied to estimated annual revenue obtained from Survey Sampling International.

effects. As discussed in the *Apartment and Condo Efficiency Services Market Effects Research Plan* submitted for review to the PSCW and WECC, this analysis employs a cross-sectional design. Therefore, we sampled from two populations for a quasi-experimental design: Wisconsin contractors (including participating and nonparticipating) and Michigan contractors.

Our first population consisted of contractors in Wisconsin that were likely to have installed or sold equipment that would be eligible for the ACES program. Filtering by SIC codes, we purchased listed sample of likely HVAC (SIC codes 171100, 171101, 171104, 171199), lighting (SIC code 173199), and domestic hot water (SIC code 171102) contractors in Wisconsin. SIC codes that were limited to new construction contractors were not included in the sample. In addition, during the interview, we removed contractors from our sample that did not report any work in the multi-family sector. The sample was by stratified by contractor type with the goal of completing 70 interviews per stratum for 210 completed interviews with Wisconsin contractors. Responses from this random sample would be used to better understand motivations for program participation, barriers to program participation, and estimate any untracked market effects in Wisconsin.

This random sample was supplemented with a census of contractors that have participated in the program since January 1, 2010, obtained from the program tracking database. This census was included in order to better estimate any nonparticipant spillover and responses from this census of participating contractors would **only** be used for that objective. However, we did crosscheck this list of contractors with our purchased sample to identify any overlap[6]. While several cases were identified as part of both groups, we were not able to complete interviews with those contractors. If we had, they would have been asked both the market effects battery and the nonparticipant spillover battery.

Our second population consisted of contractors in Michigan. Again, we purchased listed sample of likely HVAC, lighting, and domestic hot water contractors. Michigan was selected as it is similar to Wisconsin in terms of demographics and climate and has energy efficiency programs that launched relatively recently. Even though Michigan utilities do offer multi-family programs, the offerings are relatively new, with many launching in late 2009. All of the Midwestern states reviewed have implemented programs, but by selecting a territory without a long history of energy efficiency offerings, these programs are less likely to have influenced contractors in that state. We can therefore conclude with greater confidence that any differences identified are a result of the mature Focus programs. A detailed discussion of why we selected Michigan as a comparison state can be found in Appendix A. Analysis of any differences between Wisconsin and Michigan is discussed later in Section 2.6.

2.3.2 Response rate

Calling occurred from August 25 and September 29, 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. Tetra Tech conducted 267 surveys with the contractors across both states. The full response rate is displayed in Appendix E.

[6] Due to naming inconsistencies, there was no accurate way to check the purchased sample against program records.

Table 2-1. Response Rate Summary

State	Equipment Type	Completed Surveys	Response Rate
Wisconsin	Participating[7]	13	50%
	Heating	70	43%
	Lighting	32	22%
	Water heating	41	25%
Michigan	Heating	74	13%
	Lighting	19	12%
	Water heating	18	10%

While the response rate is reasonable for participating Wisconsin contractors, more than half of the starting sample either had no contact information associated with them or the contact information was incorrect. Phone look-ups were conducted on all records in an effort to include these contractors. However, the missing contact information resulted in few participating contractors available for the study.

As discussed in the September 17 memo*, Progress Report for the Apartment and Condo Efficiency Services Existing Building Contractor Market Effects Study*[8], completing interviews with Michigan contractors was more difficult than expected. In order to report on our findings in a timely fashion and stay within our evaluation budget, we focused on heating contractors. This focus allowed us to complete the targeted number of interviews (70) to provide more robust quantitative findings for one group of contractors, although a 13 percent response rate may possibly introduce a self-selection bias. Findings on other groups will be reported as well, though only qualitatively.

As part of this effort, refusal conversion letters were also sent to contractors that we contacted but who refused to complete the interview. This letter is included in Appendix D.

2.4 OTHER MULTI-FAMILY PROGRAMS IN COMPARISON TERRITORIES

Our findings primarily rely on a comparison of the sales of high efficiency equipment in two multi-family markets: Wisconsin and Michigan. We attempt to identify the effect that the program has had on the Wisconsin market by comparing contractor sales in Wisconsin to contractor sales in Michigan.

There are, of course, limitations to this analysis. We assume that all of the sales of rebated equipment in the multi-family market are associated with the ACES program rather than other programs. A review of DSIRE records indicates that We Energies also offers rebates for

[7] This group includes contractors with contact information who provided work for customers who participated in the ACES program from January 1 to June 23, 2010. Other contractors may have done work for ACES participants but ended up in the random sample due to missing contact information or projects performed outside the sampled timeframe.

[8] Jeremy Kraft, Kimberly Bakalars, and Laura Schauer, Tetra Tech. *Progress Report for the Apartment and Condo Efficiency Services Existing Building Contractor Market Effects Study.* September 17, 2010.

multi-family property owners that install energy efficient heating, lighting, and water heating equipment.[9] However, while the size of this program is unknown, it is only limited to buildings with two to eight units and, therefore, should have limited overlap with the ACES program (which includes buildings with four or more units).

In addition to We Energies, federal tax credits on high efficiency equipment were available in both states during our analysis timeframe. However, in both Wisconsin and Michigan, these credits were available in equal measure with identical requirements. Therefore, we feel that these credits affected both markets equally and do not affect our comparison.

2.5 COMPARISON OF WISCONSIN AND MICHIGAN CONTRACTORS INTERVIEWED

Our comparison of the program area and control area assumes that the only difference between Michigan and Wisconsin is the existence of the ACES program. To test this assumption, we used data collected during the telephone interview to compare the markets. This comparison is based on several metrics including company size, company services, self-reported cross-state market activity (most likely in the Upper Peninsula of Michigan), awareness of and involvement in rebate programs, influential factors in the decision to purchase energy efficiency, and changes in practices.

Size and service offerings are similar between states. Our results suggest comparable markets in terms of average contractor size. We compared the average number of full time employees at each company as reported in the phone interview. For heating and water heating contractors, the average size is relatively similar with Wisconsin companies being slightly larger. For lighting, Michigan firms are significantly larger. However, this average is driven by one outlier in the Michigan data; a company with 200 full-time employees—which is 162 more employees than the next largest Michigan company. These results, presented in Table 2-2, suggest comparable markets in terms of the average company's size.

Table 2-2. Average Number of Full-time Employees by Contractor Type

Contractor Type	Number of Full-time Employees per Wisconsin Company	Number of Full-time Employees per Michigan Company
Heating	8.8	8.3
Lighting	8.4	20.9[10]
Water heating	5.6	4.8

Source: A4a

Though differences exist, the markets are also comparable in terms of services offered. We asked the contractors about what services their companies offered. We categorized the installation services in terms of new construction, major renovation or remodeling projects, and routine replacement of existing equipment.

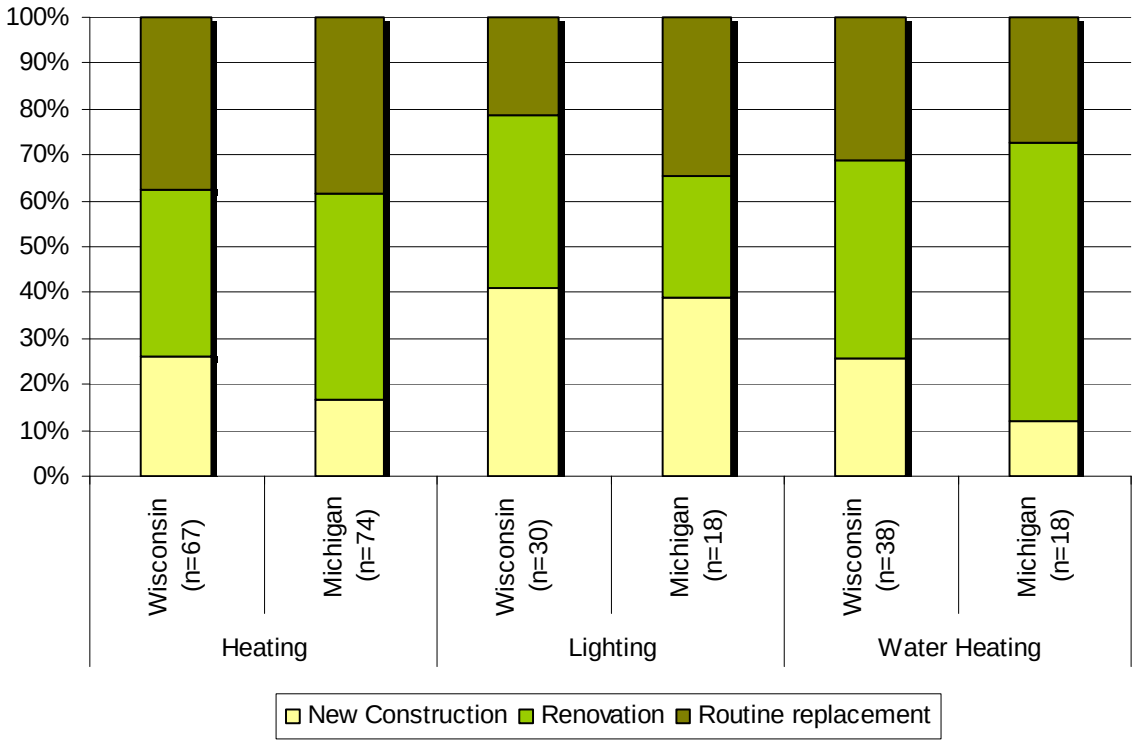
[9] http://www.we-energies.com/business/property_management/multi_family_overview.pdf.

[10] The average number of full-time employees for Michigan lighting companies with the large outlier removed was 10.9.

This comparison identifies some differences between the two states. First, Michigan heating contractors are less likely to work in new construction than their Wisconsin counterparts are. The same is found with Michigan water heating contractors. This difference is possibly due to Michigan's more dire economic conditions depressing the new housing market. In addition, these Michigan contractors are more likely to work in renovation projects than the Wisconsin heating and water heating contractors.

Second, Wisconsin lighting contractors are more likely to work on renovation projects than their Michigan counterparts. While both Michigan and Wisconsin lighting contractors work on similar levels of new construction projects, Michigan lighting contractors are more likely to work on routine replacement projects. Figure 2-1 compares the percentage of overall company sales across both Michigan and Wisconsin contractors.

Figure 2-1. Average Percentage of Overall Company Sales by State and Service



Source: A6 series

The greatest difference identified in this comparison is the variation in work in new construction. However, as our analysis deals only with retrofit work, we believe these differences do not constitute a threat to the validity of our results.

There is little overlap in operations across states. Our comparison analysis identified only six Wisconsin contractors and one Michigan contractor that conducted work in both states. This finding suggests that Wisconsin and Michigan are independent markets viable for comparison. Using self-reported data from the telephone survey, we compared the amount of work that a contractor conducted in the comparison state. On average, in both states and across all equipment types, contractors report less than one percent of their sales occurring in the comparison state, with a large majority (97 percent of all contractors interviewed) reporting that none of their sales occur in the comparison state. This finding suggests independent markets across the two states. Additional analysis about how contractors that report sales in both states compare to those that only report sales in one state would be limited by the small number of contractors that reported two-state sales.

Involvement in energy efficiency is similar across both states. While an ideal comparison territory would not have any territory-specific energy efficiency programs, secondary research indicates that Michigan's programs are relatively new. To assess the level of program activity, we compared the reported percentage of sales to multi-family projects that received a financial incentive through an energy efficiency program. These estimates ranged from 33 percent reported by Wisconsin heating contractors to eight percent by Wisconsin water heating contractors. As our analysis needed to account for program activity in the comparison territory, we estimated the amount of sales that occurred without program assistance in Michigan, in essence, removing the program-assisted sales from our analysis.

According to contractors, there are similarities in multi-family customers' purchasing considerations. As shown in Table 2-3, contractors report that, based on their experience, multi-family customers in both states consider similar factors when deciding to purchase new energy efficiency equipment for their properties. In both states, across all types of contractors, the first cost of equipment was a primary consideration. Payback on equipment and energy savings were also influential.

However, across the contractor types, a higher proportion of Wisconsin contractors felt the multi-family customers they worked with were interested in the payback on equipment and energy savings, while Michigan contractors reported a much higher proportion of customers concerned with the first cost of equipment. Although not significantly different, there is a pattern across contractor categories and by state that suggests multi-family customer decision-making is beginning to move past incentives to other factors in Wisconsin.

Table 2-3. Factors Influencing Purchase Decisions by State

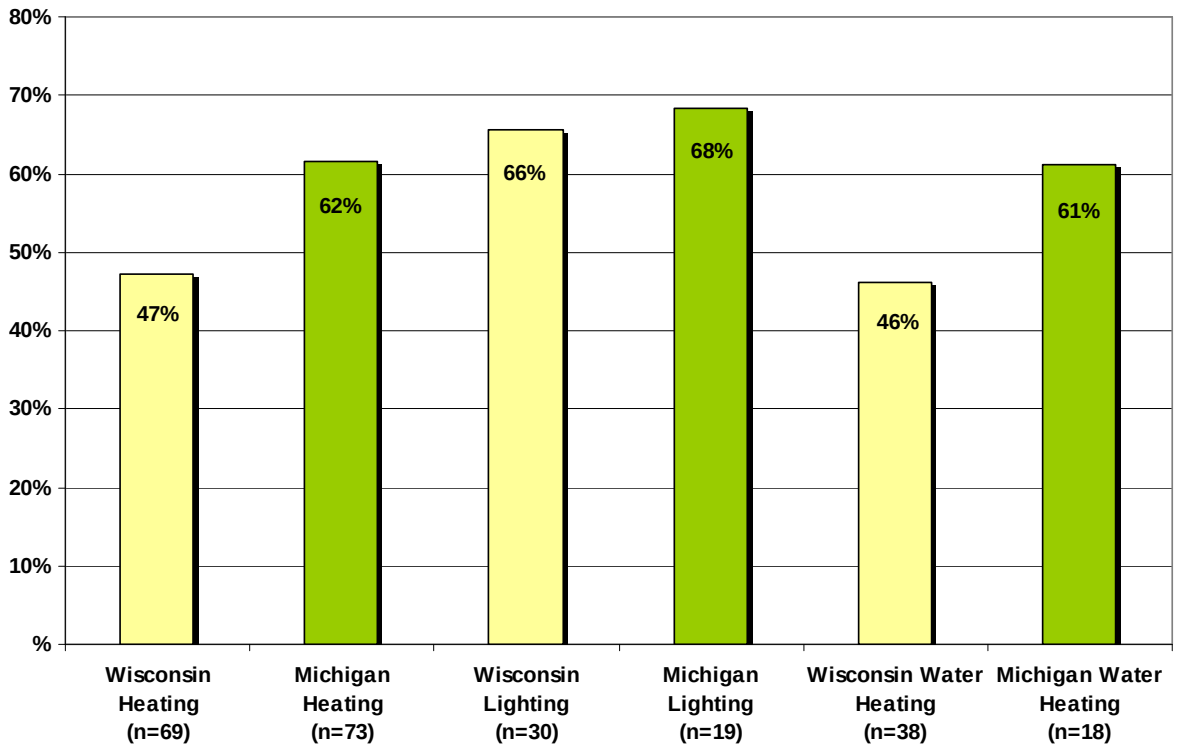
Factors Influencing the Decision to Install Energy Efficiency Equipment	Heating		Lighting		Water Heating	
	Wisconsin (n=66)	Michigan (n=70)	Wisconsin (n=30)	Michigan (n=17)	Wisconsin (n=35)	Michigan (n=18)
First cost of equipment	55%	71%	56%	77%	49%	72%
Payback on the equipment	16%	9%	25%	12%	14%	11%
Energy savings	12%	3%	9%	6%	8%	6%
Recommendations from designer	2%	0%	0%	0%	0%	6%
Recommendation from a contractor	3%	3%	0%	0%	8%	0%
Need to replace failed equipment	5%	1%	3%	0%	3%	0%
Need to upgrade old equipment	2%	3%	0%	0%	8%	0%
Financial assistance	3%	6%	0%	0%	3%	6%
Customer motivation	0%	1%	3%	6%	0%	0%
Utility cost	0%	1%	0%	0%	0%	0%
Quality of equipment	2%	1%	0%	0%	0%	0%
Efficiency of equipment	2%	0%	0%	0%	0%	0%
Other	0%	0%	3%	0%	8%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: R1

Contractors' recommendation practices have changed over the years. In order to gauge the overall direction of the high efficiency market, we asked contractors if their business practices have changed in regards to the incentivized equipment since January 2007[11]. A large percentage of contractors reported that their recommendation or installation practices have changed in the last three years. Figure 2-2 shows that Michigan contractors reported changes with greater frequency than did Wisconsin contractors. Lighting contractors were very similar while Wisconsin heating and water heating contractors reported changes 15 percentage points lower than Michigan contractors reported.

[11] January 1, 2007, was chosen as a reference date due to the program re-design that occurred in 2006.

Figure 2-2. Percentage of Contractors with Changed Recommendation or Installation Practices since 2007



Source: P2a

However, this question does not specify what those changes were; it only asks if they occurred. It also does not ask specifically about recommendation changes in the multi-family market. One possible explanation for the difference between Michigan and Wisconsin contractors is that the Wisconsin market is more mature in terms of energy efficiency. For example, the Efficient Heating & Cooling program has been offered by Focus on Energy for several years. This program may have influenced Wisconsin contractors to adjust their sales practices to account for energy efficiency before 2007. Therefore, these results should only be considered an indicator that practices are in flux in both territories but are not necessarily the result of any particular program intervention.

Contractors that indicated their recommendation or installation practices had changed since January 2007 provided the reason behind the change. Primary reasons mentioned were the initial cost reduction from financial incentives available from multiple sources that make the equipment more attractive to the consumer, the higher efficiency of the new products out on the market, and contractor decisions to actively promote energy efficient equipment.

3. DETAILED RESULTS

The following section reports the detailed results of our research. It is broken into three sub-sections; one for each equipment type included in our research: heating, lighting, and water heating. The results are divided by equipment type to present the findings at a more easily digestible level. Additionally, only the heating contractor results are based on sufficient sample to review results at the desired level of precision (±10 percent at the 90 percent confidence interval).

Each equipment section is organized by our primary research objectives including a characterization of the multi-family sales process, contractor influence on multi-family customers, any barriers to participation for the contractors, program influence on customers, average efficiency levels, and the estimated program effect on the Wisconsin market (though the discussion on program effect for the lighting and water heating contractors is limited due to the small number of interviews).

3.1 HEATING CONTRACTORS

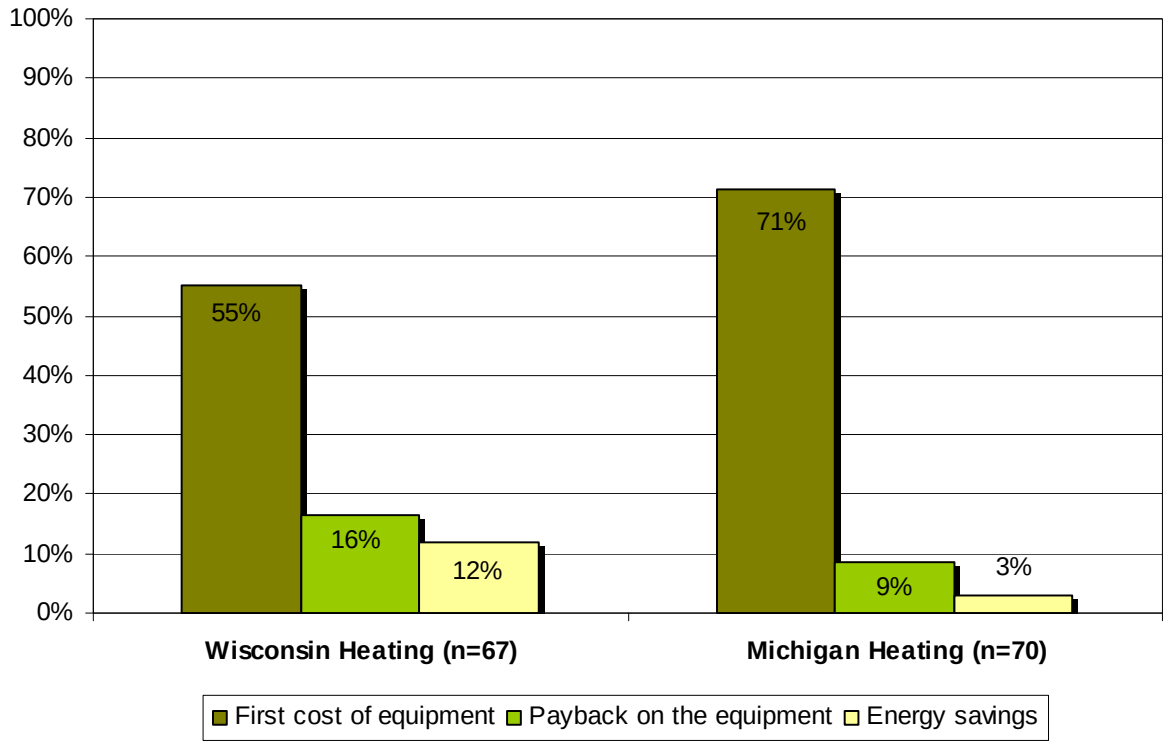
3.1.1 Characterization of the multi-family sales process

For multi-family projects, heating contractors typically work with building owners (71 percent), property managers (37 percent), general contractors (11 percent), maintenance staff (10 percent), and others including government agencies, developers, and builders. However, most heating contractors report relatively few sales to multi-family properties (between 14 and 16 percent of all sales) with most sales being in commercial or single-family buildings.

Figure 3-1 below shows the top three factors, accounting for over 80 percent of opinions, that all heating contractors feel first influence their customers' decisions on purchasing high efficiency equipment. As expected, first cost of the equipment is the factor with the most influence on multi-family customers' decision to purchase high efficiency equipment. While first cost is the primary influence, it is less so for Wisconsin customers than for Michigan customers. Payback on the equipment is also an important factor for Wisconsin customers.

Energy savings is estimated to influence about twelve percent of Wisconsin heating customers. None of the Wisconsin contractors mentioned the recommendation from Focus on Energy "Energy Advisor" as influential over customers. However, as the Energy Advisor primarily works with the customer and not the contractor, his or her influence may not be apparent to the participating contractor.

Figure 3-1. Top Three Factors Heating Contractors Feel First Influence Multi-family Customer Decisions on High Efficiency Equipment



Source: R1

As shown previously in Figure 2-2, more Michigan heating contractors (62 percent) reported changes to recommendation practices than did Wisconsin heating contractors (47 percent). However, the reasons for their reported changes vary. Michigan heating contractors are twice as likely to report financial incentives as the reason for their change in practice as are Wisconsin heating contractors. When asked why their recommendation or installation practices have changed, Michigan contractors suggested that most of those incentives were coming from sources other than utility programs, such as federal rebates and tax credits. A few of the heating contractors were concerned that interest in energy efficient equipment will decrease significantly in Michigan once the tax credit ends this year.

> *"Basically through the tax incentives; when they drop it this year, it's really going to affect things."*

Michigan heating contractors are also more likely than Wisconsin heating contractors are to attribute the change in recommendations to an increase in public demand for energy efficient equipment and increased awareness of energy efficient equipment by both consumers and themselves.

> *"Energy efficiency equipment; that's what everyone is looking for."*

> *"Because of people's awareness of the energy efficiency equipment."*

Table 3-1 shows the frequency with which contractors reported reasons for their changes in practice.

Table 3-1. Reasons for Changes to Recommendation and Installation Practices

Reasons for Change in Recommendation Practices	Wisconsin Heating (n=33)	Michigan Heating (n=45)	Total (n=78)
Financial incentives (federal, tax credits, utility rebates)	12%	31%	23%
New products are more efficient	21%	16%	18%
Contractor practice is to promote energy efficient equipment	24%	7%	14%
Changes in code or laws	12%	9%	10%
Energy efficient equipment is more accessible/cost has decreased	6%	9%	8%
Improved quality and warranties on energy efficient equipment	12%	4%	8%
Public emphasis on energy efficiency and higher demand	0%	7%	4%
To reduce energy costs for my customers	3%	4%	4%
Increased consumer or contractor awareness	0%	4%	3%
Increased use of tankless water heaters	3%	0%	1%

Source: P2b

In contrast, Wisconsin heating contractors attribute more of their changes in recommendation practices to their decision to actively promote energy efficient HVAC equipment.

> *"Basically, we need to provide the utmost efficient equipment possible."*
>
> *"We have changed the format of the bids to make the high efficiency equipment more colorful, and let customers know rebates are available."*
>
> *"We are putting in much higher efficiency equipment."*

Wisconsin heating contractors also feel that the higher efficiency of new products, improved quality of energy efficient products, and changes in code has caused them to change their recommendations on energy efficient equipment.

> *"95 percent wasn't available."*
>
> *"You've gotten newer style equipment; there's been updates all the time."*
>
> *"Because of the equipment; it's more reliable. Technology has gotten so that I'm a little more confident in the equipment."*
>
> *"Efficiency standards have gone up."*

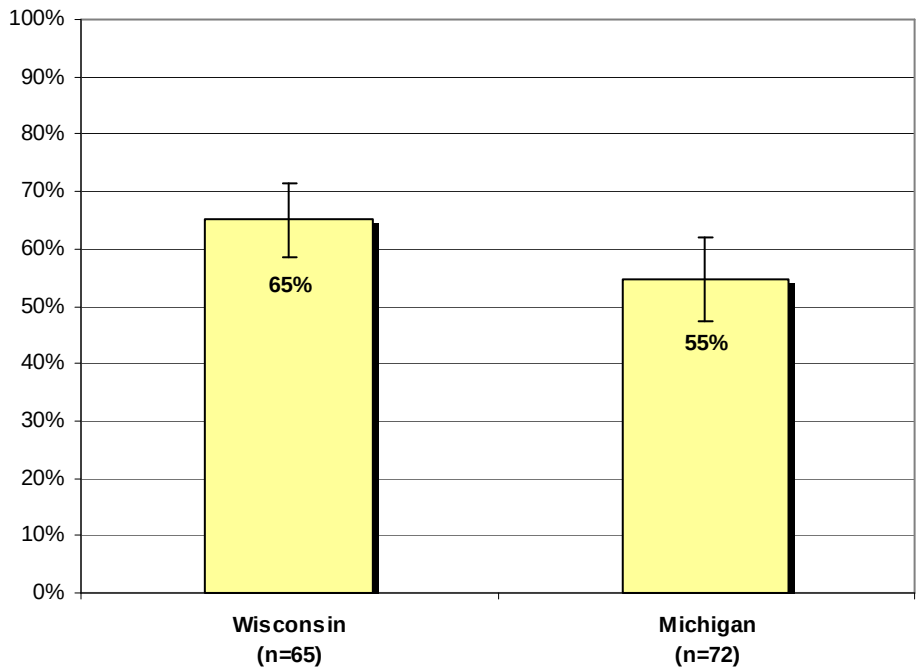
3.1.2 Contractor influence on customer decision

Analysis of contractors' responses regarding the level of influence they have on their customers' purchase decision suggests that contractors in both states have some level of influence with multi-family building owners. State-by-state comparison suggests that Wisconsin contractors have more influence than their Michigan counterparts.

First, not all Wisconsin customers are aware of the ACES program before contacting their contractor. We asked contractors that worked on ACES projects what percentage of their multi-family customers were already aware of the incentives available through the ACES program when they contacted them. For heating equipment, contractors believed that half of the customers were already aware of the ACES program rebates before they contact a contractor for a project.

When compared to Michigan, our findings suggest that Wisconsin multi-family building owners are slightly more aware of the efficiency options available to them than Michigan building owners are. Contractors in both states were asked to estimate what proportion of their customers understands the high efficiency options available to them when they consider new equipment (Figure 3-2). All contractors report that at least half of their customers understand the high efficiency options available to them. Wisconsin heating contractors estimate about 65 percent of their customers understand the efficiency options available, 10 percent higher than the percentage estimated by Michigan heating contractors.

Figure 3-2. Percentage of Customers Who Understand High Efficiency Heating Options Available[12]

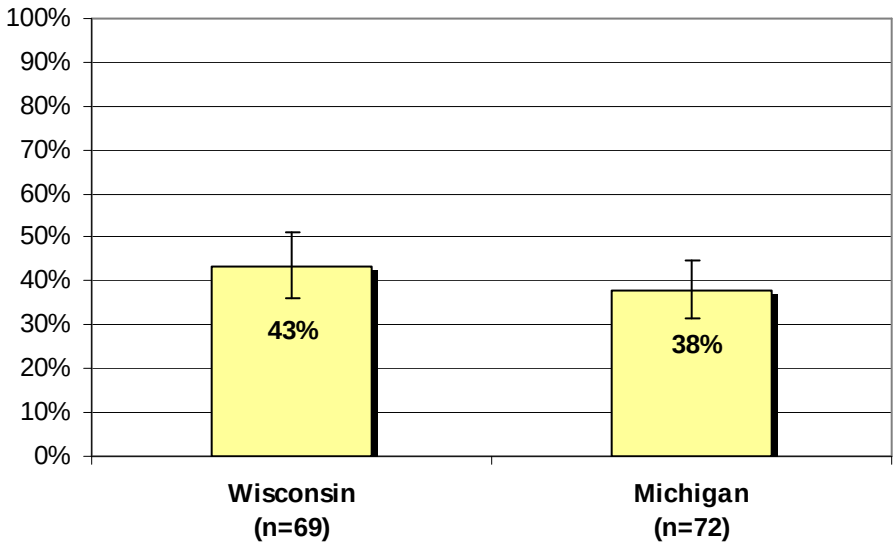


Source: R4A

[12] Error bars, represented on all graphs by the vertical line centered above the percent on the bar, represent 90 percent confidence intervals.

Survey data also show that customers are more likely to request high efficiency heating equipment in Wisconsin than in Michigan, suggesting an increased interested in energy efficiency. As part of the survey, contractors were asked to estimate what percentage of their customers initially request high efficiency options when they are considering new equipment (Figure 3-3). Wisconsin heating contractors estimate about 43 percent of their customers initially request the high efficiency option, slightly higher than the percentage estimated by Michigan heating contractors.

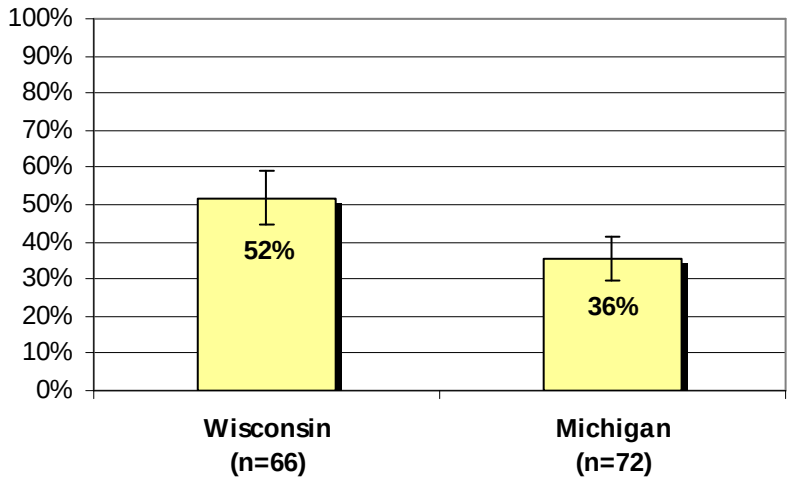
Figure 3-3. Percentage of Customers Who Initially Request High Efficiency Options



Source: R4B

In addition, our findings suggest Wisconsin contractors are more likely to convince customers to upgrade to high efficiency heating equipment than are their Michigan counterparts. The survey asked contractors what percentage of their customers bought high efficiency equipment who did not initially request it. Figure 3-4 shows that Wisconsin heating contractors' estimates of customers who purchased high efficiency equipment they did not initially request were, on average, over 15 percent higher than estimates from Michigan contractors.

Figure 3-4. Percentage of Customers that Bought High Efficiency Equipment Not Initially Requested



Source: R4C

Based on the results from the three figures above, we see that the program is not only influencing customers directly, but also influencing customers' purchasing decisions through influence on the contractors.

3.1.3 Contractor barriers to program participation

We asked heating contractors that were part of our random sample whether or not they were aware of the program and if they were, whether they have participated in the ACES program[13]. Of the 70 contractors that we interviewed as part of our random sample of Wisconsin firms, 37 percent had worked on a Focus on Energy multi-family project since January 1, 2007. Twenty-one percent of the contractors had not participated in the ACES program since 2007, but they were aware of the program. The remaining contractors were unaware of the program. Table 3-2 displays the combined results of asking a random sample of Wisconsin heating contractors about program participation and their awareness of the ACES program.

In speaking with Wisconsin contractors, we have found that although they may be very active in residential and commercial programs offered by Focus, they often are not familiar with the ACES program. This is in part due to the small proportion of their customers and sales that come from the multi-family market. As reported earlier, on average only about 10 percent of their customers are multi-family, making up less than 16 percent of their total sales. The multi-family market is not the priority for many contractors, as the projects can be few and far between.

[13] Due to naming inconsistencies, there was no accurate way to check the purchased sample against program records.

Table 3-2. Wisconsin Heating Contractors' Relationship with ACES Program

Contractor's Relationship with Program	Heating Contractors (n=70)
Participating	37%
Nonparticipating but aware	21%
Unaware	41%
Total	**100%**

Source: A1A and NP1A

We asked those heating contractors that had not heard of the ACES program before the call, if their multi-family customers would be interested in the program. Overall, 72 percent of unaware heating contractors thought that their multi-family customers would be interested in participating in the program (Table 3-3).

Table 3-3. Potential Customer Interest in ACES Program

Would your Multi-family Customers be Interested in this Program?	Heating Contractors (n=29)
Yes	72%
No	17%
Don't know	10%
Total	**100%**

Source: NP1B

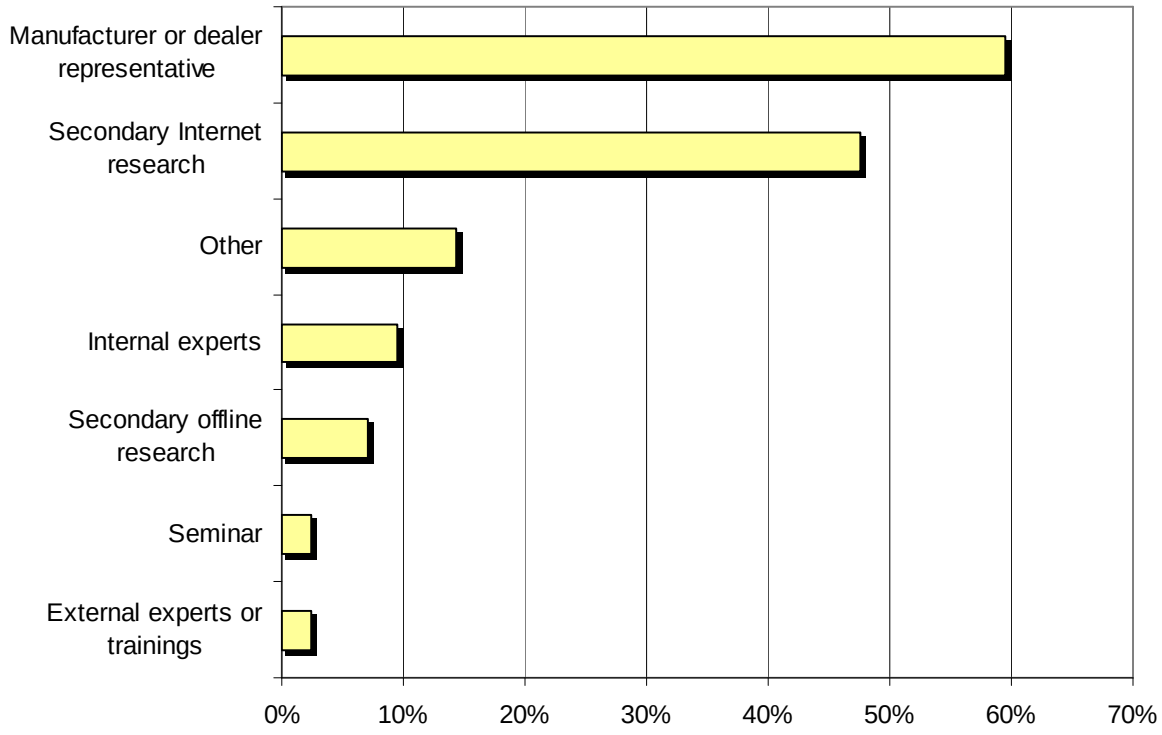
We asked the 10 nonparticipating heating contractors that were aware of the program why they had not participated (NP3b). Most contractors reported either that they have tried to participate but have not yet had the opportunity (n=3) or their multi-family customers were not interested in high efficiency equipment due to the increased cost (n=2). Other reported reasons included not having enough information on how to participate in the ACES program and not being on the participating trade ally list for the program. The remaining respondents reported that they did not know why they have not participated.

We also asked nonparticipating heating contractors about what they would change about the ACES program (NP4). The majority were satisfied with program and would change nothing (n=8). However, some did have suggestions. The most common response was to increase the rebate amount to customers. One contractor stated, "*there isn't enough bite in [the rebate]*" and therefore does not use the program frequently due to the low rebate amount. Contractors also mentioned that the paperwork was lengthy and difficult to fill out and that the program could use more incentives for clean and tune services.

In terms of marketing, contractors suggested that additional customer awareness efforts could increase program participation. In particular, a brochure was recommended as program collateral to add a more tangible angle to such efforts. This brochure could outline the different types of program equipment backed by Focus on Energy in order to add legitimacy to the higher efficiency purchase. One other notable response was that contractors did not know enough about the program to answer customer questions. This comment suggests that Focus on Energy could make a more aggressive effort to educate contractors about the existence and practices of the program as a whole.

Based on contractors' responses, one of the most effective routes the program could take to educate them about program benefits would be through partnerships with manufacturers and distributors of energy efficiency equipment or through an increased online presence. We asked Wisconsin contractors what sources of information they use when looking for information about energy efficiency equipment for multi-family projects (Figure 3-5). Sixty percent of heating contractors reported they speak with their manufacturer or distributor of the equipment about energy efficient options. Additionally, 48 percent of heating contractors turn to the Internet to learn more about energy efficient equipment for multi-family properties. Other methods included offline research and internal experts.

Figure 3-5. Sources of Information used by Wisconsin Heating Contractors for Energy Efficiency Equipment for Multi-family Buildings



Source: NP1E

The program currently markets the program both through distributors and through a strong online presence (including the Focus website, Facebook, and YouTube). These findings suggest these approaches are correctly targeted, but based on low overall program awareness, may not have fully taken hold.

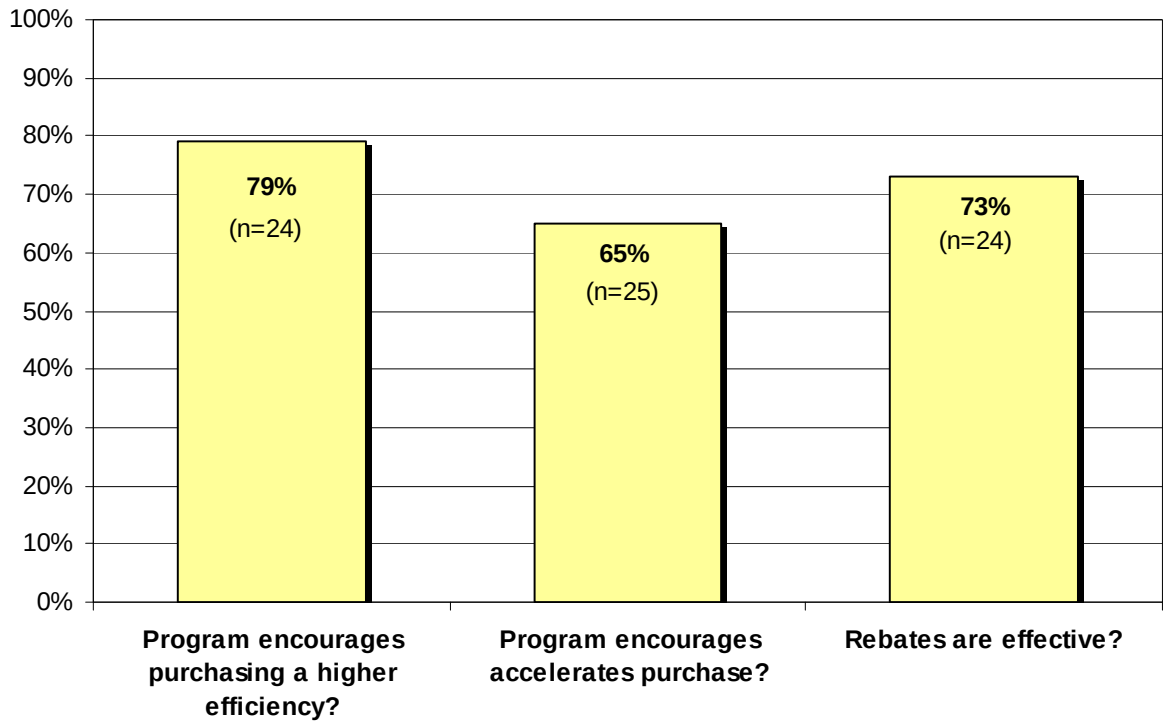
3.1.4 Program influence on customers

Based on contractor-reported sales practices and program effectiveness, Wisconsin contractors believe that the program is an effective tool for encouraging high efficiency installation in multi-family properties. This finding, based on survey data, suggests that the

program is capable of influencing untracked market effects. The amount of untracked effects are assessed in the following section.

We asked participating contractors about the effectiveness of the program in changing customers' behavior. We asked them whether they agreed that the ACES program was encouraging customers to purchase higher efficiency equipment than they otherwise would have and whether they agreed that the program was encouraging customers to purchase high efficiency equipment sooner than they otherwise would have. A large majority of participating Wisconsin heating contractors (79 percent) agreed that the program was effective at encouraging customers to purchase higher efficiency equipment. Likewise, they also frequently agreed that program was effective at encouraging acceleration though not as strongly as encouraging the upgrade. We also asked all contractors in the state if they thought the rebates were effective. Again, a majority of participating contractors reported that they agreed that the rebates are an effective means to alter customer behavior. Figure 3-6 displays the percentage of Wisconsin heating contractors that agreed with the statements about the influence the program has on customers' decisions.

Figure 3-6. Percentage of Wisconsin Heating Contractors that Agree the ACES Program is Effective



Source: R5A, R5B, R6A

For those heating contractors that reported they did not think that rebates were effective (n=10), we asked why they felt that way. A majority of these contractors reported that the rebates were not high enough. Typical responses included:

"I don't believe they're significant enough to make a difference in a person's life."

"Because they have to spend so much money buying the high efficient equipment. The owners just want to get by with spending the least amount of money that they need to."

Other responses included that the program is too restrictive in what equipment is eligible for incentives, the paperwork required is too complex, and that the eligible equipment does not save the energy expected (specifically ECM furnaces).

We also asked Wisconsin heating contractors if they agreed that the ACES program had influenced any change in their recommendation or installation practices. A majority (60 percent) of all of the participating heating contractors reported that they agreed that the program has influenced their practices. Table 3-4 details contractors' level of agreement that the program has influenced their practices.

Table 3-4. Level of Agreement that the Program has Influenced Practices of Wisconsin Heating Contractors

Level of Agreement	Participating Heating Contractors (n=25)
Strongly agree	12%
Agree	48%
Neither agree nor disagree	0%
Disagree	24%
Strongly disagree	16%
Total	**100%**

Source: P5a

3.1.5 Efficiency level comparison

Finally, the average annual fuel utilization efficiency (AFUE) rating of equipment installed outside of the program is another possible indicator of program influence. As stated previously, participating contractors may be more likely to install higher efficiency equipment more often outside of the program than those contractors that have not participated in the program.

However, when asked the average AFUE rating of furnaces and boilers installed in multi-family properties outside of the program, the average rating was almost identical between participating and nonparticipating Wisconsin contractors. Participating contractors reported a slightly lower furnace rating (91.5 to 92.4) and an identical high boiler rating (89.8). Table 3-5 lists the average AFUE rating by equipment type and participation status.

Table 3-5. Average AFUE Rating of Equipment Installed Outside of Program in Wisconsin, by Equipment Type and Contractor Participation

Equipment Type	Wisconsin Contractor Participation in ACES	Average AFUE Rating	Confidence Interval
Furnaces	Participating (n=24)	91.5	± 0.9
	Nonparticipating (n=39)	92.4	±1.0
Boilers	Participating (n=20)	89.8	±1.9
	Nonparticipating (n=37)	89.8	±1.2

Source: P9 series, weighted by estimate annual multi-family revenue

3.1.6 Estimated program effect on the Wisconsin multi-family high efficiency market

The following section presents our findings on the estimated effect the ACES program has had on the Wisconsin multi-family retrofit market that has not been tracked by the program. Using methodology detailed in the *Business Programs: Supply-side Evaluation*[14] developed by KEMA as part of the CY09 evaluation, this section produces an estimate of untracked attributable savings (UAS)—energy savings that might be attributable to the ACES program, but are not currently tracked and claimed by the program. It also produces an estimate of nonparticipant spillover as reported by participating contractors.

Our analysis, discussed in detail in this section, estimates that in 2010 the ACES program could be responsible for up to 690,231 in additional kWh savings and 57,630 in additional therms savings for heating equipment that is not currently being tracked by the program. These amounts represent 57 percent of the gross kWh savings and 36 percent of the gross therm savings. This estimation primarily relies on the comparison of the Wisconsin market to the Michigan market and uses market data to account for both participant and nonparticipant spillover.

At a high level, we estimated the effect the ACES program is having on the multi-family heating retrofit market in Wisconsin by comparing reported Wisconsin high efficiency sales to reported Michigan high efficiency sales. We asked contractors in both states to report the percentage of multi-family projects with high efficiency equipment and the percentage of those projects that received incentives. To avoid any confusion about what was considered program-eligible, interviewers reminded contractors about what efficiency levels of equipment would be considered program-eligible. The questions used were:

P3 During the past year, in what percentage of your multi-family projects did you install high efficiency [incentivized equipment]?

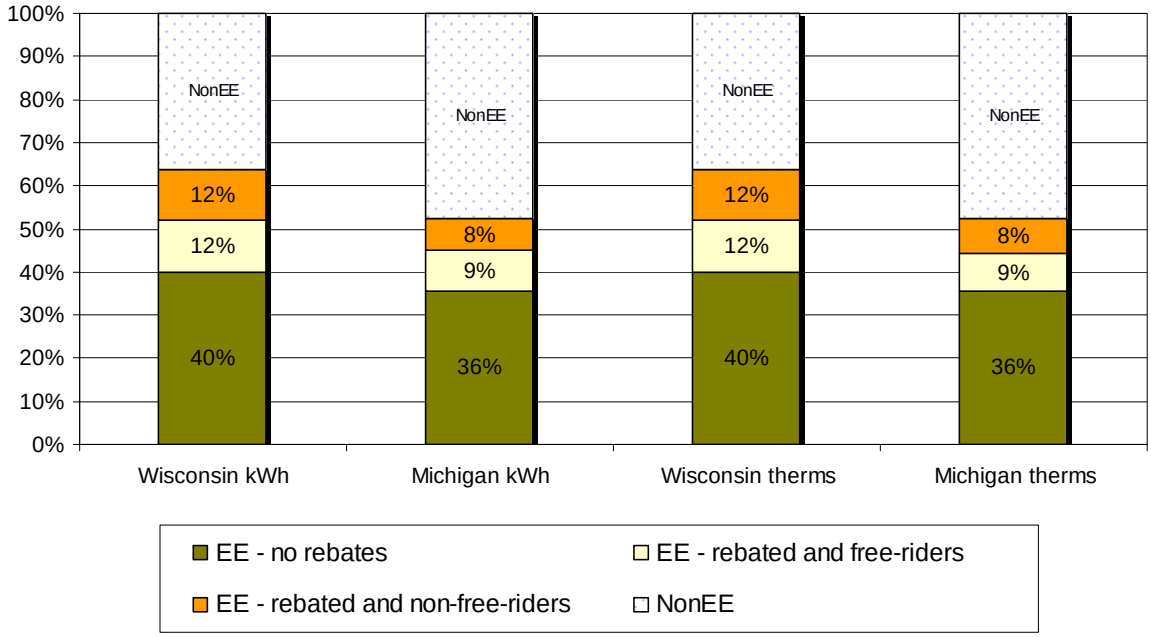
P4 And what percentage of those projects received financial incentives from a state or federal energy efficiency program (IF WISCONSIN: such as Focus on Energy)?

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

The rationale for this comparison is that Michigan, with some adjustments, acts as a control group where we can determine the level of baseline high efficiency sales. By identifying the level of baseline sales in Michigan, we can identify what, if any, increase in sales have occurred in Wisconsin above and beyond this baseline amount.

Figure 3-7 briefly summarizes that overall share of energy efficiency (EE) equipment contractors reported in the Wisconsin and Michigan territories. These shares were identified using contractor self-report sales data and previous evaluation research on free-ridership. The results are weighted by estimated annual revenue from multi-family projects to account for the contractor market share. Both kWh and therm free-ridership rates are weighted by savings, resulting in different rates for each fuel.

Figure 3-7. Share of Multi-family Heating Equipment Sales by State



Source: P3, P4, CY09 Impact Evaluation, other evaluation research

This analysis makes several assumptions that we have tried to mitigate as much as possible. These assumptions are:

1. The only difference between the two territories is the existence of the ACES program. Our previous comparison of the contractor markets in the two states suggests that this assumption is, to some extent, correct.

2. The Michigan sales without rebates and the free-rider sales **would have** occurred without the program and the non-free-rider sales **would not have** occurred. Heating programs did operate in Michigan and were likely to have some effect on the market. However, our adjustment of the baseline by removing rebated, non-free-rider sales is a realistic method to mitigate its effect.

3. We also assume that the Michigan programs are too new to have had significant supply-side or spillover effects yet. Therefore, we can estimate a valid baseline by removing estimated direct program effects.

4. Similarly, the ACES program is responsible for all of the untracked savings. Both the Business Programs and the Efficient Heating and Cooling program operate in Wisconsin and incentivize similar equipment to what is offered through the ACES program. While these programs operate in different markets, there is likely some spillover effect (from both customers and contractors) from these programs on the sales of high efficiency equipment in multi-family buildings.

5. Heating contractors are accurately able to report the percentages of high efficiency and standard efficiency multi-family sales. Reporting error is a concern for any methodology that relies on self-reported data. This concern is especially problematic for this sector as multi-family work makes up a small percentage of contractors' overall sales. However, careful interviewer training and survey design can mitigate this problem. In addition, almost a quarter of the respondents could not identify the amount of multi-family sales that received a rebate. For our analysis, we replaced "don't know" responses with the mean response[15] of that contractor type for each state.

A. MICHIGAN BASELINE

First, we estimate that as a baseline between 45 and 48 percent[16] of the overall Michigan sales to multi-family buildings are high efficiency.

To arrive at these values, we used heating sales data as reported by Michigan contractors to create an estimate of the high efficiency sales that occurred without a rebate. We also used the reported amount of sales that occurred with a rebate. However, we needed to adjust this figure for any free-riders that received a rebate in Michigan. Assuming that all of the rebated sales would not have occurred without the rebate (i.e., none of the sales are free-riders) would overstate the baseline in Michigan. Based on evaluation research of the heating market that we are conducting separate from this evaluation in the Michigan market, we assumed that the Michigan heating free-ridership rate is 55 percent and 52 percent, for kWh and therms respectively.

[15] "Don't know" responses were removed from the numerator and denominator and the mean percentage was calculated. That mean was then substituted for each "Don't know" response so all cases were valid. The mean response in Wisconsin and Michigan was 48 and 37 percent respectively.

[16] This range is a result of using separate kWh and therm NTG ratios in calculating the baseline value.

Using these values, we are able to estimate the baseline by summing the non-rebated high efficiency sales and the free-rider rebated high efficiency sales. The calculation in summary is:

Michigan Baseline Share = Michigan Free-rider Share + Michigan Non-rebated High Efficiency Share

Where:

Michigan Free-rider Share = Michigan Total Share of Sales Rebated x Michigan Free-ridership Rates from Evaluation Research

Michigan Non-rebated High Efficiency Share = Michigan Overall High Efficiency - Michigan Total Share of Sales Rebated

Table 3-6 details the calculation.

Table 3-6. Michigan Baseline Heating Market Calculation

Label	Description of Sales Share	Share of Overall Michigan Multifamily Market	
		kWh	Therms
A	Overall high efficiency (survey item P3)	52%	52%
B	Non-rebated high efficiency sales (A-C)	36%	36%
C	Total share of sales rebated (survey items P4*P3)	17%	17%
D	Free-ridership rates from research	55%	52%
E	Program-attributed (C*(1-D))	8%	8%
F	Free-riders (C*D)	9%	9%
G	**Michigan baseline (F+B)**	**45%**	**44%**

Source: P3, P4, secondary Michigan evaluation research

B. WISCONSIN UNTRACKED ATTRIBUTABLE SALES

Using the Michigan baseline and the assumption that the only difference between Wisconsin and Michigan is the existence of the Focus programming, we were able to determine that between 14 percent and nine percent (weighted by kWh and therms respectively) of the overall sales in Wisconsin are high efficiency sales attributable to the program that are untracked.

As in Michigan, we needed to adjust the percentage of the reported rebated sales for any free-riders that received a rebate. Based on customer evaluation research of the ACES program that we conducted in 2009, we assumed that the Wisconsin heating free-ridership rate is 78 percent and 55 percent, for kWh and therms respectively.

To calculate the untracked attributable sales, we subtract the Michigan baseline and the tracked (i.e., rebated) attributable sales from the overall share of high efficiency sales in Wisconsin. The calculation in summary is:

Wisconsin UAS = Wisconsin Overall High Efficiency Share – Wisconsin Program-attributed Share – Michigan Baseline

Where:

Wisconsin Program-attributed Share = Wisconsin Total Share of Sales Rebated x (1 – Free-ridership Rates from CY09 Impact Study)

Table 3-7 details this calculation. Again, the results are weighted by estimated annual revenue from multi-family projects to account for the contractor market share.

Table 3-7. Wisconsin Heating Untracked Attributable Sales Calculation

Label	Description of Sales Share	Share of Overall Multifamily Market	
		kWh	Therms
A	Overall high efficiency (survey item P3)	64%	64%
B	Non-rebated high efficiency sales (A-C)	40%	40%
C	Total share of sales rebated (survey items P4*P3)	24%	24%
D	Free-ridership rates from CY09 impact study	78%	55%
E	Program-attributed (C*(1-D))	5%	11%
F	Free-riders (C*D)	19%	13%
G	Michigan baseline	45%	44%
H	**Wisconsin UAS (A-E-G)**	**14%**	**9%**

Source: P3, P4, CY09 ACES Impact Research

C. WISCONSIN UNTRACKED ATTRIBUTABLE SAVINGS

When the untracked attributable sales estimates are applied to the ACES program gross savings, the Focus program could be responsible for up to 690,231 in additional kWh savings and 57,630 in additional therms savings for heating equipment that is not currently being tracked by the program. To calculate these values, we first must calculate the untracked attributable sales as a percentage of gross tracked sales. To do this, we divide the Wisconsin UAS by the overall percentage of rebated high efficiency sales. Applying the UAS as a percentage of gross sales to the gross savings as identified in the program tracking database yields the savings (in kWh and therms) that are untracked and attributable to the program. Combining these savings with the tracked attributable savings (previously identified NTGR applied to the gross savings) results in the net savings attributable to program. Dividing the net savings by the gross identifies a NTG ratio that includes both free-ridership and spillover. In summary, the calculation is:

Wisconsin NTGR with Spillover = Total Attributable Share / Total Share of Sales Rebated

Where:

Wisconsin Total Attributable Share = Wisconsin UAS + Program-attributable Rebated High Efficiency Sales

Table 3-8 details these steps for Wisconsin heating equipment.

Table 3-8. Untracked Attributable Sales as Savings Calculation

Label	Description of Sales Share	Wisconsin	
		kWh	Therms
A	Gross savings from program tracking database	1,209,797	159,043
B	Untracked attributable sales share	14%	9%
C	NTG rates from CY09 impact study	22%	45%
D	Program-attributable rebated high efficiency sales	5%	11%
E	Total attributable share (B+D)	19%	20%
F	Total share of sales rebated	24%	24%
G	UAS as percentage of gross (B/F)	57%	36%
H	UAS as savings (G x A)	690,231	57,630
I	Tracked attributable savings (NTG * A)	263,736	71,092
J	**NTGR with Spillover (E/F) or ((H+I)/A)**	**79%**	**81%**

Source: P3, P4, CY09 Impact Study

When compared with previously attribution research, these results show a large increase in the NTGR—57 percentage points for kWh and 36 percentage points for therms. An increase in the NTGR is expected as this methodology contains spillover savings (both participant and nonparticipant). However, previous estimates of spillover suggested ranges from one percent to ten percent of gross savings. One possible explanation for the larger increase is the previous estimates of spillover have been very conservative, focusing on participating customers and participating contractors. The market-based analysis presented here would include any spillover associated with participating contractors and spillover associated with nonparticipating contractors—an additional source not previously evaluated.

D. PARTICIPATING CONTRACTOR NONPARTICIPANT SPILLOVER

In addition to estimating the program's effect on the Wisconsin heating market by measuring untracked attributable savings, we also measure the level of nonparticipant spillover reported by participating contractors. Using this methodology in addition to the state-to-state comparison provides a supporting, albeit conservative, look at how the program has affected the high efficiency market in Wisconsin. As the state comparison methodology discussed above provides a broader market view, it includes the nonparticipant spillover savings identified by participating contractors. In other words, these two approaches are not additive; instead, they provide two different looks at the same untracked savings.

As part of this evaluation, participating contractors reported an estimated nonparticipant spillover savings of 0 kWh and 995 therms overall. The following section discusses our methodology for estimating nonparticipant savings values from participating contractors and the factors that drive nonparticipant spillover. This methodology is similar to that used in the CY09 market effects research but with additional questions added for greater rigor.

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 that had participated in the program since January 1, 2010, were asked (by measure category) what percentage 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 percentage 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 percentage of that eligible equipment did not receive an incentive through the program. To ensure consistency across contractors and that contractors understood what types of equipment were program-eligible, interviewers prompted them with examples of what program-eligible equipment included. 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. To mitigate over-reporting or question misinterpretation, we verified the amount of sales that did not receive an incentive through the program.

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 estimate 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?

V2a (IF V1 = YES) What percentage of all of this program-eligible **[measures]** you specified, sold and/or installed for Wisconsin customers since January 2010 did not receive an incentive?

V2b To confirm, your company sold approximately **[calculated qty][17] [measures]** that would have been eligible for the program that did not receive a rebate since January 2010. To be eligible for the program, these projects would include **[eligible equipment]**.

Is that correct?

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 3-9 details the assignment of the spillover rate.

Table 3-9. Preliminary Nonparticipant "Like" Spillover

Number of Agreements to V4 Series	Preliminary Nonparticipant "Like" Spillover Rate	Number of Contractors Selecting
Three agreements	100%	5
Two agreements	50%	0
One or zero agreements	0%	1

[17] Calculated quantity = Program quantity/(1-(V2A/100)) rounded to the nearest whole number.

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 found that all records were consistent and none of the records were removed from the spillover analysis.

Of the 15 contractors[18] surveyed, six contractors 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 3-10 details the therm savings estimates; no kWh savings were identified.

Table 3-10. Estimated Nonparticipant Spillover Savings by Measure Category

Measure	Total Therm Savings	Estimated Therm Spillover Savings	Nonparticipant Spillover Therm Rate
Heating equipment	4,753	42	1%
Lighting equipment	N/A	N/A	N/A
Hot water heating equipment	85	21	25%
Insulation	261	0	0%
Boiler tune & clean	41,000	932	2%
Total	**46,099**	**995**	**2%**

Of the six contractors that reported program-eligible sales outside of the program, five 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. Table 3-11 details the responses to each statement.

Table 3-11. Program Influence on Spillover Savings

Statement	Number of Contractors that Agree with Statement (n=6)
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	6
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	5
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	5

[18] Two contractors worked with two end-use categories.

The reasons that program-eligible equipment was not incentivized through the program included emergency placement of equipment and a lack of knowledge about the program at the time of the sale.

Comparing the nonparticipant spillover identified in Table 3-10 with the amount of untracked savings identified through our market assessment (Table 3-8) shows that the market assessment identifies a greater amount of untracked savings. However, this is not an "apples to apples" comparison. The market assessment includes both participating and nonparticipating contractors while the nonparticipant spillover assessment here is limited to participating contractors. Theory suggests that the program may have influenced nonparticipating contractors as well and any savings from program-attributable savings from nonparticipating contractors would not be included in the nonparticipant spillover estimate. In addition, our spillover methodology is conservative and limited to "like" spillover whereas the market assessment takes a broader view of program influence.

3.2 LIGHTING CONTRACTORS

As a result of the low number of completes with lighting contractors, the results in this section are presented as qualitative, not quantitative, and should be viewed as such. However, we believe the results are interesting and useful as comparisons.

3.2.1 Company characteristics

Interviews were conducted with 30 Wisconsin lighting contractors and 19 Michigan lighting contractors. Table 3-12 below summarizes and compares characteristics of lighting contractors in both states. In terms of number of full-time employees, lighting firms in Michigan are significantly larger (20.9 employees), on average, than are firms in Wisconsin (8.4 employees). However, this average is driven by one outlier in the Michigan data; a company with 200 full-time employees—which is 162 employees more than the next largest Michigan company.

Wisconsin lighting contractors are involved with twice as many multi-family projects per year compared with Michigan lighting contractors, yet the Michigan contractors report a slightly higher percentage of sales from multi-family properties.

Table 3-12. Lighting Contractor Characteristics

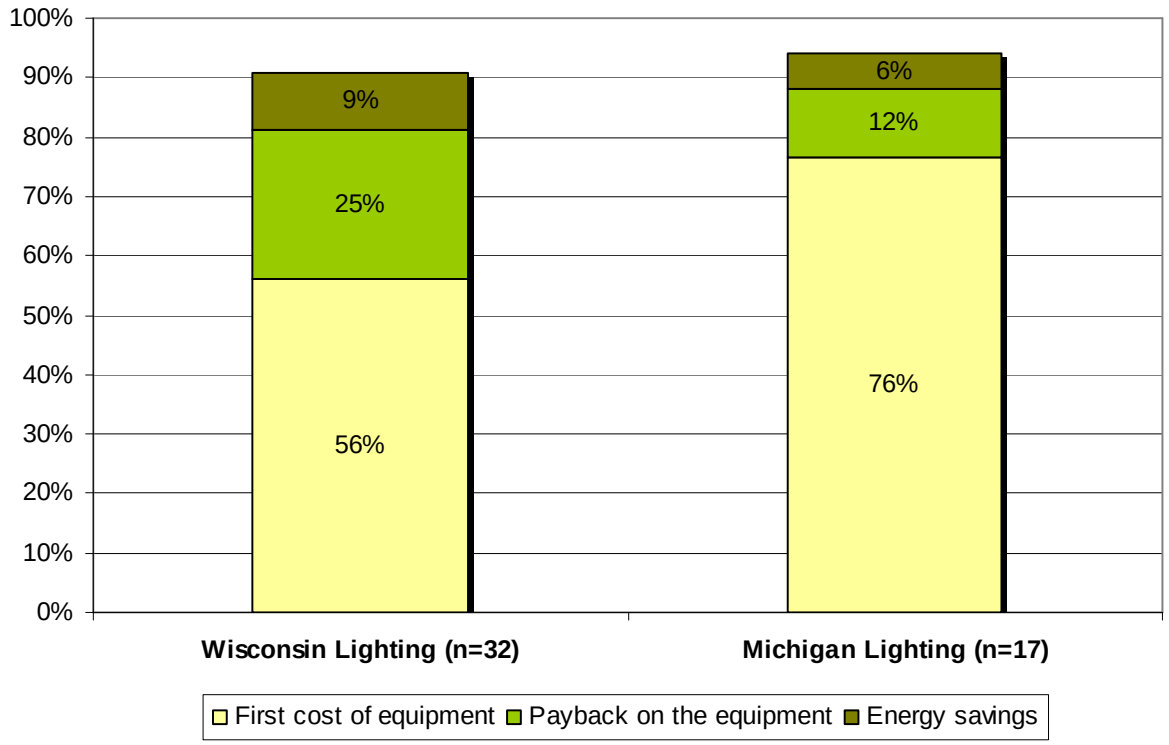
Characteristic	Wisconsin Lighting Contractors (n=32)	Michigan Lighting Contractors (n=18)
Average number of employees	8.4	20.9
Number of multi-family project per year	14.2	5.6
Percentage of sales from multi-family properties	9.3%	12.0%
Market breakdown		
Percentage of sales from new construction	41%	38%
Percentage of sales from major renovation and remodeling projects	38%	26%
Percentage of sales from routine replacement	21%	34%

Wisconsin lighting contractors are more likely to work on renovation projects than their Michigan counterparts. In addition, while both Michigan and Wisconsin lighting contractors work on similar levels of new construction projects, Michigan contractors are more likely to work on retrofit projects.

3.2.2 Characterization of the multi-family sales process

Figure 3-8 below shows the top three factors, accounting for over 90 percent of opinions, that lighting contractors feel first influence their customers' decisions on purchasing high efficiency equipment. As expected, first cost of the equipment is the factor with the most influence on multi-family customers' decision to purchase high efficiency lighting equipment. While first cost is the primary influence, it is less so for Wisconsin customers than for Michigan customers. Payback on the lighting equipment is also an important factor for Wisconsin customers.

Figure 3-8. Top Three Factors Lighting Contractors Feel First Influence Multi-Family Customer Decisions on High Efficiency Lighting Equipment



Source: R1

3.2.3 Contractor influence on customer decision

All lighting contractors were asked to estimate what proportion of their customers understands the high efficiency options available to them when they are considering new equipment. Wisconsin lighting contractors estimate about 53 percent of their customers

understand the efficiency options available, only three percent higher than the percentage estimated by Michigan lighting contractors.

All lighting contractors also estimated what percentage of their customers initially request high efficiency options when they are considering new equipment. Wisconsin lighting contractors estimate about 43 percent of their customers initially request the high efficiency option, compared with 34 percent of Michigan lighting contractors.

Last, we asked all lighting contractors what percentage of their customers bought high efficiency equipment who did not initially request it. Wisconsin lighting contractors' estimates (56 percent) were over 15 percent higher than estimates from Michigan lighting contractors (37 percent).

On a scale of one to five, where one means strongly agree and five means strongly disagree, we asked participating contractors to indicate their level of agreement with statements about the effectiveness of the program in changing customers' behavior. All seven participating Wisconsin lighting contractors agreed (response of one or two) that the program was effective at encouraging customers to purchase higher efficiency equipment and that the program was effective at encouraging acceleration of installations. They also all agreed that the program encourages customers to buy a higher quantity of high efficiency equipment.

We also asked participating contractors in Wisconsin if they thought the rebates offered by Focus on Energy were effective. Four of five Wisconsin lighting contractors agreed (responses of one or two) that the rebates are an effective means to alter customer behavior.

3.2.4 Lighting contractor barriers to program participation

We asked contractors that were part of our random sample whether or not they were aware of the program and whether they have participated in the ACES program. Table 3-13 displays the combined results of asking Wisconsin lighting contractors about program participation and their awareness of the ACES program. Half of the Wisconsin lighting contractors are currently unaware of the program. Of those that are aware, less than half (22 percent) have participated in the ACES program.

Table 3-13. Wisconsin Lighting Contractors' Relationship with ACES Program

Contractor's Relationship with Program	Lighting Contractors (n=32)
Participating	22%
Nonparticipating but aware	28%
Unaware	50%
Total	**100%**

Source: A1A and NP1A

However, though there are many contractors that report they are unaware of the program, contractors do think their customers would be interested in the program services. Seventy-five percent of Wisconsin lighting contractors thought that their multi-family customers would be interested in participating in the program.

We asked nonparticipating contractors that were aware of the program why they had not participated (NP3b). Most of the lighting contractors reported that their multi-family customers were not interested in high efficiency equipment (n=3). Other reported reasons included that it took too much paperwork to participate in the program (n=1) or they were just unaware of the program.

Seventy-one percent of lighting contractors reported they speak with their manufacturer or distributor of the equipment when looking for information about energy efficiency equipment for multi-family projects. Additionally, 38 percent of lighting contractors turn to the Internet to learn more about energy efficient equipment for multi-family properties. Other methods included offline research and internal experts.

3.2.5 Estimated program effect on the Wisconsin multi-family high efficiency market

While large percentages of contractors reported that their practices have changed in the last three years, Michigan lighting contractors reported changes with similar frequency as Wisconsin lighting contractors (68 percent and 66 percent, respectively). Lighting contractors that indicated their recommendation or installation practices had changed since January 2007 provided most frequently mentioned the higher efficiency of the new products out on the market, contractor decisions to actively promote energy efficient equipment, and the increased accessibility of energy efficient equipment at a lower price as reasons for the changes (Table 3-14).

Michigan lighting contractors are more likely to report accessibility, public emphasis on energy efficiency, and increased awareness as reasons for their change in practice than Wisconsin lighting contractors. Specific reasons from Michigan lighting contractors included:

> *"Because the industry has provided us with many, many applications, products, light fixtures, lamps, etc. Big emphasis on energy savings these days."*
>
> *"CFLs have been more accessible. I've been reading more in Consumer Report."*

Table 3-14. Reasons for Changes to Lighting Recommendation and Installation Practices

Reasons for Change in Recommendation Practices	Wisconsin Lighting (n=21)	Michigan Lighting (n=13)	Total (n=33)
New products are more efficient	33%	38%	35%
Contractor practice is to promote energy efficient equipment	29%	8%	21%
Energy efficient equipment is more accessible/cost has decreased	5%	31%	15%
Financial incentives (federal, tax credits, utility rebates)	10%	8%	9%
Public emphasis on energy efficiency and higher demand	0%	23%	9%
Increased consumer or contractor awareness	0%	23%	9%
Changes in code or laws	5%	0%	3%
Improved quality and warranties on energy efficient equipment	5%	0%	3%
To reduce energy costs for my customers	5%	0%	3%

Source: P2b

In contrast, Wisconsin lighting contractors attribute more of their changes in recommendation practices to their decision to actively promote energy efficient equipment.

> *"I'm pushing all the T8 and high fluorescent; I recommend high output in garages and even in commercial buildings."*
>
> *"Promoting more fluorescent exterior fixtures, more LED, more controls and sensors. We've totally changed how we wire parking garages."*

Wisconsin lighting contractors feel that the higher efficiency of new products has caused them to change their recommendations on energy efficient equipment, as well as the financial incentives offered through the ACES program.

> *"More LED now than there used to be."*
>
> *"Equipment upgrade (LEDs). They've been able to be more aggressive and have more to offer as far as high efficiency equipment. Need to stay on top of all that is offered."*
>
> *"Because there's been a lot of technical advances that have dictated a lower operating cost on some of the newer technology."*
>
> *"Because of your rebate program and the lights that you allow."*
>
> *"Due to the rebates through Focus on Energy and the cost of living."*

We also asked participating Wisconsin contractors if they agreed that the ACES program had influenced any change in their recommendation or installation practices. Five of the seven Wisconsin lighting contractors agreed that the program has influenced their practices.

Lighting contractors reported that more than half of their overall sales were program-eligible. Wisconsin lighting contractors felt that 69 percent of their multi-family projects would be eligible for incentives in the ACES program, while Michigan lighting contractors felt that 59 percent of their multi-family projects were high efficiency equipment (Table 3-15).

Table 3-15. Program-eligible Lighting Equipment Sales

	Wisconsin Lighting (n=30)	Michigan Lighting (n=19)
Percentage of multi-family lighting projects with program-eligible equipment (P3)	69%	59%
Percentage of overall multi-family sales that received a financial incentive (P4)	18%	19%
Percentage of multi-family lighting projects with program-eligible equipment adjusted for rebated equipment	51%	40%

Source: P3, weighted by estimated annual revenue
Source: P4, adjusted to overall multi-family sales and weighted by estimated annual revenue
Source: P3 (adjusted by P4), weighted by estimated annual revenue

However, these sales do not occur without outside influence. Eighteen percent of program-eligible equipment in Wisconsin received and incentive, as well as 19 percent of the energy efficient equipment in Michigan. If the incentivized sales are removed from the program-eligible sales, the proportion of high efficiency equipment sold by Wisconsin lighting contractors is eleven percent higher than that sold in Michigan.

Another measure of program influence is the amount of program-eligible equipment that contractors keep in stock. While contractors handling other equipment are cutting down on the amount of equipment in general that they have on stock, approximately half of lighting contractors, 13 of 27 Wisconsin lighting contractors and 9 of 17 Michigan lighting contractors, keep equipment in stock.

However, even with half of the lighting contractors stocking high efficiency equipment, a small portion meets program eligibility requirements. Wisconsin lighting contractors (n=11) reported on average that 18 percent of their inventory met program eligibility last year and Michigan lighting contractors (n=6) reported a slightly higher average of 25 percent.

Finally, to estimate overall market effects, we used the method discussed in detail in Section 3.1.6 to estimate the untracked attributable savings for lighting equipment. Using that methodology, we estimated 3,613,201 in kWh savings from untracked attributable savings. These savings represent 45 percent of the gross kWh savings for lighting since January 1, 2010.

3.3 WATER HEATING CONTRACTORS

As mentioned previously with the lighting contractor results, due to the low number of completes with water heating contractors, the results in this section are presented as qualitative, not quantitative, and should be viewed as such. However, we believe the results are interesting and useful as comparisons.

3.3.1 Company characteristics

Interviews were conducted with 39 Wisconsin water heating contractors and 18 Michigan water heating contractors. Table 3-16 summarizes and compares characteristics of water heating contractors in both states. In terms of number of full-time employees, water heating firms in Wisconsin and Michigan are similarly sized. Although Michigan water heating contractors average eight more multi-family projects per year, the percentage of multi-family sales are the same for Wisconsin and Michigan water heating contractors.

Table 3-16. Water Heating Contractor Characteristics

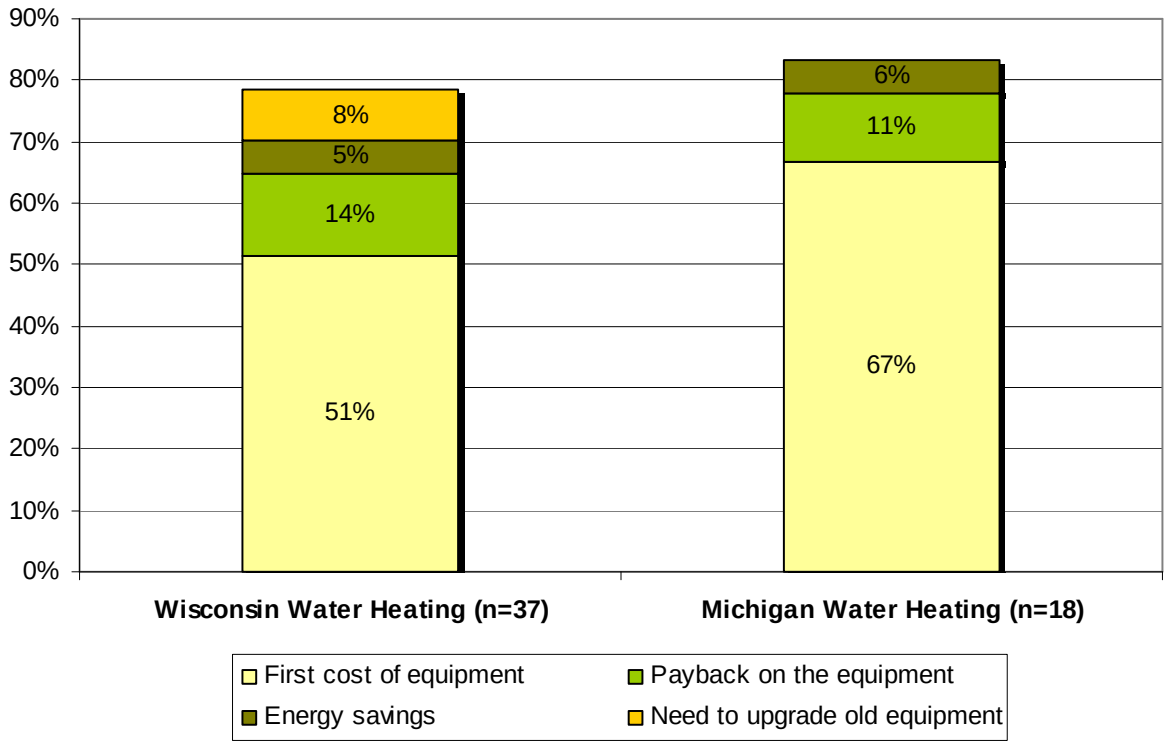
Characteristic	Wisconsin Water Heating Contractors (n=39)	Michigan Water Heating Contractors (n=18)
Average number of employees	5.6	4.8
Number of multi-family project per year	11.6	19.6
Percentage of sales from multi-family properties	13%	14%
Market breakdown		
Percentage of sales from new construction	25%	12%
Percentage of sales from major renovation and remodeling projects	42%	60%
Percentage of sales from routine replacement	30%	27%

As with heating contractors, Wisconsin water heating contractors are more likely to work on new construction projects than their Michigan counterparts. In addition, while both Michigan and Wisconsin water heating contractors work on similar levels of routine replacement projects, Michigan contractors are more likely to work on renovation projects.

3.3.2 Characterization of the multi-family sales process

Figure 3-9 below shows the top four factors, accounting for 80 percent of opinions, that water heating contractors feel first influence their customers' decisions on purchasing high efficiency equipment. As expected, first cost of the equipment is the factor with the most influence on multi-family customers' decision to purchase high efficiency equipment. While first cost is the primary influence, it is less so for Wisconsin customers than for Michigan customers. Payback on the equipment and upgrade of old equipment are also important factors for Wisconsin customers.

Figure 3-9. Top Four Factors Contractors Feel First Influence Multi-family Customer Decisions on High Efficiency Water Heating Equipment



Source: R1

3.3.3 Contractor influence on customer decision

Contractors were asked to estimate what proportion of their customers understands the high efficiency options available to them when they are considering new equipment. Wisconsin water heating contractors estimate about 55 percent of their customers understand the efficiency options available, just four percent higher than the percentage estimated by Michigan water heating contractors. Both Wisconsin and Michigan water heating contractors estimate almost one-third of their customers initially request high efficiency options when they are considering new equipment.

The next step was to ask contractors what percentage of their customers bought high efficiency equipment who did not initially request it. Michigan water heating contractors estimated 13 percent more customers (44 percent) purchased high efficiency equipment they did not originally request than did Wisconsin water heating contractors (31 percent).

On a scale of one to five, where one means strongly agree and five means strongly disagree, we asked participating contractors to indicate their level of agreement with statements about the effectiveness of the program in changing customers' behavior. Six of the seven participating Wisconsin water heating contractors agreed (response of one or two) that the program was effective at encouraging customers to purchase higher efficiency equipment and five of seven agree that the program was effective at encouraging acceleration of

installations. Seventy-eight percent (n=36) also agreed that the program encourages customers to buy a higher quantity of high efficiency equipment.

3.3.4 Contractor barriers to program participation

Water heating contractors had the lowest level of ACES program awareness of the three contractor types we spoke with; only 44 percent were aware of the program (Table 3-17). Of the 39 Wisconsin water heating contractors interviewed, 15 percent had worked on a Focus on Energy multi-family project since January 1, 2007, but another 29 percent have not, even though they are aware of the ACES program. Although water heating contractors reported the lowest awareness of the program, they felt their customers would be the most interested in the program (78 percent).

Table 3-17. Wisconsin Contractors' Relationship with ACES Program

Contractor's Relationship with Program	Water Heating Contractors (n=39)
Participating	15%
Nonparticipating but aware	29%
Unaware	56%
Total	**100%**

Source: A1A and NP1A

We asked nonparticipating contractors that were aware of the program why they had not participated (NP3b). Most contractors reported that they have tried to participate but have not yet had the opportunity (n=3). Other reasons included their multi-family customers were not interested in high efficiency equipment due to the increased cost (n=1) or dissatisfaction with the program (n=1).

3.3.5 Estimated program effect on the Wisconsin multi-family high efficiency market

In order to gauge the overall direction of the high efficiency market, we asked contractors about if their business practices have changed since January 2007[19]. Michigan contractors reported changes with greater frequency than Wisconsin contractors did (61 percent compared to 46 percent). Water heating contractors that indicated their recommendation or installation practices had changed since January 2007 provided the reason behind the change. Primary reasons mentioned were the higher efficiency of the new products out on the market, financial incentives, and the availability of tankless water heaters (Table 3-18).

[19] January 1, 2007 was chosen as a reference date due to the program re-design that occurred in 2006.

Table 3-18. Reasons for Changes to Recommendation and Installation Practices

Reasons for Change in Recommendation Practices	Wisconsin Water Heating (n=33)	Michigan Water Heating (n=45)	Total (n=78)
New products are more efficient	22%	27%	24%
Financial incentives (federal, tax credits, utility rebates)	33%	0%	21%
Tankless water heaters	11%	18%	14%
Energy efficient equipment more accessible/cost has decreased	6%	18%	10%
Improved quality and warranties on energy efficient equipment	0%	27%	10%
Contractor practice is to promote energy efficient equipment	6%	0%	3%
Changes in code or laws	6%	0%	3%
To reduce energy costs for my customers	6%	0%	3%
Public emphasis on energy efficiency and higher demand	0%	9%	3%
Increased consumer or contractor awareness	0%	9%	3%

Source: P2b

Even though Michigan water heating contractors reported changes to recommendation practices at a higher rate than Wisconsin heating contractors, the reasons for their reported changes vary. Michigan water heating contractors are more likely than Wisconsin water heating contractors to attribute the change in recommendations to more accessible energy efficient equipment and better quality equipment.

> *"I went to a better product and changed the brand."*
>
> *"Which equipment is priced right, and the durability of the equipment; the changing of the manufacturing."*

In contrast, Wisconsin water heating contractors attribute more of their changes in recommendation practices to the financial incentives available.

> *"Mostly because of the Focus on Energy program and government programs."*
>
> *"Because of the money the homeowner receives back; it costs more, but the owner gets money back."*

We also asked Wisconsin water heating contractors if they agreed that the ACES program had influenced any change in their recommendation or installation practices. Five of the six contractors agreed that the program has influenced their practices.

As shown in Table 3-19, water heating contractors reported only about one-third of their multi-family sales were program-eligible equipment. A smaller proportion of Wisconsin sales received an incentive, resulting in a higher proportion of program-eligible sales in Wisconsin.

Table 3-19. Program-eligible Water Heating Equipment Sales

	Wisconsin Water Heating (n=37)	Michigan Water Heating (n=18)
Percentage of multi-family water heating projects with program-eligible equipment (P3)	23%	23%
Percentage of overall multi-family sales that received a financial incentive (P4)	4%	13%
Percentage of multi-family water heating projects with program-eligible equipment adjusted for rebated equipment	19%	10%

Source: P3, weighted by estimated annual revenue
Source: P4, adjusted to overall multi-family sales and weighted by estimated annual revenue
Source: P3 (adjusted by P4), weighted by estimated annual revenue

Another measure of program influence is the amount of program-eligible equipment that contractors keep in stock. Seven of 17 Wisconsin water heating contractors and two of five Michigan water heating contractors, keep equipment in stock.

Finally, to estimate overall market effects, we used the method discussed in detail in Section 3.1.6 to estimate the untracked attributable savings for water heating equipment. Using that methodology, we estimated 39,378 in kWh savings and 1,721 therms from untracked attributable savings. These savings represent 18 percent of the gross kWh savings and 8 percent of the gross therm savings for water heating equipment since January 1, 2010.

4. SUMMARY AND RECOMMENDATIONS

This final section of the report briefing summarizes our findings and present several recommendations for consideration.

4.1 SUMMARY OF FINDINGS

The ACES program, working in concert with contractors, provides incentives for high efficiency equipment to multi-family buildings owners. This incentive is designed to mitigate two prominent barriers to the installation of high efficiency equipment: the initial cost of investment and long payback periods. As these projects are more complex than projects in single-family residences, contractors play a greater role in working with the building owner in selecting the equipment. Previous customer research and our current contractor research suggest that customers are not aware of the efficiency options available to them and look to their selected contractors to help them select high efficiency equipment.

Given this high level of involvement with participating contractors, program theory suggests that program activity, including the availability of financial incentives, Energy Advisor interaction, and Focus-sponsored informational sessions, has altered the Wisconsin market. At a high level, our research supports this hypothesis for the heating market showing an increase in the non-rebated sales of high efficiency equipment when compared to baseline (i.e., the Michigan heating market). This increase is in addition to the program-attributable installation of high efficiency equipment.

However, a significant percentage of the contractors in Wisconsin are either entirely unaware of the program or they are aware but have not participated in it. This unawareness is not necessarily due to a lack of marketing or education on part of the program team. Instead, the multi-family market is relatively small when compared to single-family homes and commercial properties. Many contractors have limited opportunities to work on multi-family projects and when they do, often encounter building owners that are not initially interested in high efficiency options. Yet, despite the limited nature of their multi-family work, most of the contractors that were not aware of the program reported that their customers would be interested in hearing about incentives for energy efficient equipment. Therefore, the existence of a large pool of contractors that have not been engaged by the ACES program, but are interested in its benefits, suggest that there is potential for additional untracked market effects.

To this end, our research found that participating contractors suggested few changes to the program. Many believe it is effective in influencing customers' purchase decisions in regards to efficiency level. They also believe that the rebates are an effective mechanism for encouraging high efficiency options, though a small percentage believe that they are too small considering the incremental cost of high efficiency options in multi-family buildings. In addition, contractors reported that they most frequently turn to their manufacturing or distribution representative or the Internet when looking for additional information regarding high efficiency equipment.

While more Michigan heating contractors reported changes to their recommendation practices than Wisconsin heating contractors, their reasons for changing practices varied and at least anecdotally support the market effect theory. Michigan heating contractor changes were more likely to be motivated by financial incentives, at least half of which came from

federal rebates or tax credits that will be ending soon, and an increase in public awareness and demand not mentioned as frequently by Wisconsin contractors.

On the other hand, Wisconsin heating contractors were much more likely to report that it was their own decision to actively promote energy efficient equipment that led to the changes in recommendations they are making regarding energy efficient equipment. Due to the difference in the amount of heating contractors providing this response by state, our analysis suggests that the ACES program had some influence. Secondary reasons for Wisconsin heating contractor changes in recommendation practices focused on the higher efficiency levels of new equipment along with the improved quality.

Finally, though based on a small number of interviews with contractors that have participated since January 1, 2010, our research did identify a small amount of nonparticipant spillover.

4.2 RECOMMENDATIONS

The following recommendations to program staff are based on the results of this research effort and the experience of the evaluation team with the ACES program.

Improve consistency in documenting which contractors sell or install rebated equipment. While program staff are making an effort to track this information, greater consistency in recording this information would allow for a more robust evaluation. In this study, a significant percentage of the contractors were missing contact information or had information that was incorrect. This increased tracking could take the form of either additional data fields in the tracking database or additional training of data entry staff.

Greater consistency is important as it both aids the evaluation of nonparticipant spillover and supports primary customer research. In order to effectively evaluate nonparticipant spillover, a sample of participating contractors needs to be contacted. Their responses are then evaluated in conjunction with the savings that they delivered through the program. This effort requires that each measure be linked to a contractor with contact name, mailing address, and phone number. In addition, when during the customer surveys customers identified the contractor as being the primary influence in their decision to install program-eligible equipment, supporting interviews were then conducted with that contractor. While customers are often able to provide this information, having program records as a back-up would increase the overall response rate of the effort.

The PSCW should continue to consider primary research with customers for determining free-ridership for this program. While methods exist for estimating program attribution using reported sales data, many contractors were unable to recall how much of their multi-family sales received incentives. This recall issue is most likely due to the small amount of multi-family work in which these contractors typically engage; a characteristic that is unlikely to change over time. In addition, contacting contractors in a comparison state is an expensive endeavor as researchers lack any branding to convince respondents that study participation is to their benefit. Customer research, with follow-up calls to influential contractors (as identified by the customers), though not without its weaknesses, remains the most cost-effective option for evaluating savings attributable to the ACES program.

Consider implementing market effects research in concert with customer self-report research to account for spillover implemented by Wisconsin contractors. By comparing

the Wisconsin market to the Michigan market, we were able to identify untracked attributable savings from high efficiency heating equipment installed in multi-family buildings. Based on these findings, we believe these savings are, at least in part, due to ACES program activity. Due to limited contractor interviews, we are unable to draw conclusions regarding the lighting and water heating markets although there is evidence to suggest untracked savings in those markets as well. Since this research was not intended to adjust program impacts, we do not recommend any change to the program-level or end-use level attribution rates.

Marketing efforts targeted towards contractors should utilize manufacturers or distributors of equipment and online resources. Contractors reported that they most frequently contact their manufacturing representative or conduct research online when looking for information about high efficiency options for multi-family buildings. While a majority of program marketing is directed at customers, engaging contractors through these two channels could increase the overall awareness of the program in the state and minimize lost opportunities for installation of high efficiency equipment in multi-family buildings.

Subject **Focus on Energy Evaluation**

Apartment and Condo Efficiency Services Market Effects Research Plan (Draft)

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Acknowledgement: Ralph Prahl, Prahl & Associates, contributed critical review

Date July 30, 2010

This memo discusses the planned survey objectives, sampling strategy, and planned analysis for the proposed market effects research of the Apartment and Condo Efficiency Services (ACES) Whole Building component. The draft questionnaire that will be fielded as part of this research is included for review.

Background

The proposed research is intended to be an extension of the CY09 market effects research[20]. The goal of this research is to determine whether and how the ACES Whole Building program component is changing the practices of market actors as a result of their experience with the program and what effect, if any, the program is having on the adoption of energy efficient heating, lighting, and domestic hot water measures in the Wisconsin multi-family retrofit market. These findings will be compared with previous net impact research (e.g., customer attribution research, previous contractor market effects research). However, at this time, we do not propose integrating the findings of this research with previous net-to-gross results in order to alter the overall program net savings.

In addition, the proposed research is designed to further explore nonparticipant spillover[21]. The primary research activities will be structured interviews with participating, nonparticipating, and out-of-state contractors. Our current schedule is to field these interviews in mid-August with the final report delivered on November 23, 2010.

[20] Jeremy Kraft, Kimberly Bakalars, and Bryan Ward, PA Consulting Group. *Apartment and Condominium Efficiency Services Program: Whole Building Supply-side Impacts*. March 19, 2010.

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

Survey Objectives

This section identifies the key research issues that this survey intends to address.

Explore the contractor's role in the customer sales process. Contractors are in a unique position to influence customers as to what energy efficient equipment, if any, is installed at buildings participating with the ACES Whole Building program component. Past interviews with both participating Whole Building customers and the contractors employed by those customers (i.e., participating contractors) indicate that Whole Building projects involve a contractor very early on in the decision process. Additionally, while the Whole Building program on-site assessments identify possible energy savings within a building and provide recommendations to building owners, database analysis and conversations with program staff indicate that a majority of the projects do not receive an assessment before installation.[22] Ultimately, the final decision about which specific equipment and mix of measures are installed is up to the customer and his or her chosen contractor.

The interview will ask contractors about the level of energy efficiency awareness multi-family building owners have and the level of influence that the program has on the customers' decisions to install energy efficient equipment, either through technical assistance provided or the financial incentives.

Investigate other projects done outside the ACES program and any associated spillover savings. The survey uses the same methodology for quantifying nonparticipant spillover savings as was used in the CY09 research but with additional questions to provide greater rigor. To address very high nonparticipant spillover sales estimates that were reported by several contractors in the CY09 research, we have added questions confirming the estimated amount of program-qualifying equipment installed outside of the program in the context of what was installed through the program (V2b[23]) and what overall effect the program had sales of energy efficient equipment (V4d). We have also added text to clarify what would constitute "program-eligible" for each type of contractor (V1). These additions are intended to ensure realistic sales estimations from contractors and are indicated in the nonparticipant spillover battery as "NEW."

Follow-up with contractors that report nonparticipant spillover sales estimate outliers. We also plan to conduct quantitative follow-up interviews with contractors that report nonparticipant spillover savings that are identified as outliers to confirm and better understand their sales patterns. As we cannot assume a normal distribution of spillover sales, we will identify outliers on a case-by-case basis. We will be looking for cases that report a percentage of program-eligible sales outside of the program that is at least two standard deviations greater than the mean at the end-use level.

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[22] Over 90 percent of the measures installed in 2010 are prescriptive and a large majority of the properties using prescriptive forms do not receive an assessment.

[23] For reference, we have included the question numbering in parenthesis. These questions are located in the draft questionnaire appended to this memo.

These calls will confirm the responses given during the first interview and further explore why this equipment did not receive program incentives. Based on these calls, we will make adjustments to that contractor's reported nonparticipant spillover.

Estimate the effect the ACES program has had on the adoption of high efficiency equipment in the Wisconsin multi-family retrofit market. The interview asks Wisconsin contractors and contractors in a comparison state (Michigan) about their overall sales of energy efficient equipment to the multi-family sector. By comparing the reported sales of program-eligible equipment to multi-family customers by in-state contractors with the reported sales of program-eligible equipment to multi-family customers by out-of-state contractors, we can assess what impact Focus on Energy has on had on the multi-family high efficiency equipment retrofit market in Wisconsin.

As part of this analysis, we will also compare the multi-family contractor market in both states. This state-to-state analysis is needed to support the assumption that the comparison state and Wisconsin are similar markets that are suitable for comparison. Our comparison will include company size, company services, cross-state market activity, awareness and involvement in rebate programs, and barriers to energy efficiency.

Understand why contractors do not engage with the program and what, if anything, the program could do to gain their participation. The interview will ask in-state nonparticipating contractors about program awareness, reasons for attrition (if a previous participant), and their opinions about the current and potential future program designs. In addition, the interview will ask about where contractors go for information regarding energy efficiency if not through a Focus program.

Sampling Strategy

As this market effects analysis will employ a cross-sectional analysis, the sampling strategy encompasses three populations for a quasi-experimental design: Wisconsin contractors (including participating and nonparticipating), out-of-state contractors, and a census of contractors that have participated in the program since January 1, 2010. The first two groups are comparison groups. By comparing results across these two populations at the industry sector level (e.g., comparing heating contractors with heating contractors), we will estimate the net impact of the program on sales of energy efficient equipment. These surveys will explore contractor sales patterns without direct program intervention, the contractors' perspective on typical customer behaviors, and what kind of market effects, if any, has occurred in Wisconsin as a result of direct and indirect Focus activities.

In order to identify differences in sales patterns between different types of equipment, we will stratify our sample by contractor type. So that we focus on equipment that accounts for a majority of the savings, we are limiting our sample to contractors that sell or install heating equipment (including boilers and furnaces), lighting equipment, and domestic hot water equipment. Contractors that only provide boiler clean and tune services or install household appliances such as clothes washers, dishwashers, or refrigerators are not included, as those measures are no longer being offered through the program. Likewise, contractors that install insulation or air sealing measures are not included as those measures make up a small portion of the overall program savings in 2010 (only one percent of overall kWh and therm

savings). We will identify these contractors based on assigned Standard Industrial Classification (SIC) codes.

Wisconsin Contractors

Our first population will consist of contractors in the state of Wisconsin that are likely to have worked with multi-family customers. Filtering by SIC codes, we will purchase listed sample of likely HVAC, lighting, and domestic hot water contractors in Wisconsin. Using a list of contractors that are known to have participated in the program since January 1, 2007,[24] contractors will be flagged as participating or nonparticipating. As mentioned previously, this sample will be stratified by contractor type (again using SIC codes as well as screening through the survey) with the goal of completing 70 interviews per stratum for a total of 210 completed interviews with Wisconsin contractors.

Out-of-state Contractors

Our second population will consist of contractors in Michigan, a comparison state. Again filtering by SIC codes, we will purchase listed sample of likely HVAC, lighting, and water heating contractors. This sample will be stratified by contractor type with the goal of completing 70 interviews per stratum for a total of 210 completed interviews with comparison state contractors.

In choosing the comparison state, we would ideally identify a state that has a similar demographic make-up and climate to Wisconsin in which no energy efficiency programs are currently operating or have operated in the past. Any differences identified between Wisconsin and the comparison state could be attributed to the Focus program. However, all similar states considered have some level of energy efficiency programs currently in operation. While some of the states do not specifically have a multi-family program, it is likely that contractors will have been influenced by their experience with single family and commercial programs, especially if those programs have been operating successfully for a number of years.

Table 1 lists the Midwestern states considered as a comparison state and how their characteristics compare with those of Wisconsin. Population and demographic data were obtained from the 2000 Census and energy efficiency program data were obtained from secondary research and evaluator experience. Exact launch dates of the energy efficiency programs were not available for all states. Therefore, only estimates of maturity are given.

[24] This cut-off date was chosen due to the ACES program re-design that occurred in 2006. Likewise, contractors were not consistently tracked before 2007.

Table 1. State-by-state Comparison

State	Total Population	Number of Renter-occupied Housing Units	Per Capita Income (1999)	Percentage of Households in Buildings with 5+ units	Existence of Energy Efficiency Programs	Maturity of Energy Efficiency Programs
Wisconsin	5,363,675	641,672	21,271	14%	Yes	High
Illinois	12,419,293	1,487,504	23,104	20%	Yes	Medium
Iowa	2,926,324	301,589	19,674	11%	Yes	Medium
Michigan	9,938,444	976,313	22,168	13%	Yes	Low
Indiana	6,080,485	654,126	20,397	11%	Yes	Medium
Minnesota	4,919,479	471,466	23,198	15%	Yes	High

Based on these comparisons, we have selected Michigan as a comparison state. Even though Michigan utilities do offer multi-family programs, the offerings are relatively new, with many launching in late 2009. In addition, the multi-family program has been recently suspended in community jurisdictions due to funding issues. By selecting a territory without a long history of energy efficiency offerings, these programs are less likely to have influenced contractors in that state. We can therefore conclude that any differences identified are a result of the mature Focus programs with greater confidence. In addition, Michigan provides a state with similar climate and demographic characteristics.

Participating Contractors

Our third population is a census of contractors (excluding those contacted as part of the 2009 evaluation) that have been involved with ACES projects since January 1, 2010. We are specifically including this population in this research in order to estimate nonparticipant spillover performed by participating contractors that changed their practices as a result of program participation. Therefore, this population will only be asked the battery of questions relating to nonparticipant spillover unless one of the contractors in this sample was also randomly selected as a Wisconsin contractor. In that situation, the contractor will be asked both the nonparticipant spillover battery and all applicable questions from the reminder of the survey.

Of the 169 Whole Building projects in 2010, seven projects do not have a contractor associated with the measures implemented. Of the remaining projects, the database identifies 108 unique contractors, 18 of which completed an interview as part of the 2009 evaluation. So as to not overly burden them with program evaluation research, these 18 contractors will not be included in the sample. In total, these screened contractors worked on 35 of the 169 projects and a majority (15 of the 18) only worked with one or two projects. Once these previously-interviewed contractors have been screened out, our census of participating contractors will include 90 firms in Wisconsin.

Table 2 lists the number of contractors within each of our proposed populations and the stratum within those populations. It also lists the number of contractors with which we expect to complete interviews. In total, we plan to complete 465 interviews with contractors that serve the multi-family market.

Table 2. ACES Contractor Sampling Plan

State	Contractor Type	Number of Contractors[25]	Target Number of Completed Interviews
Wisconsin	Domestic hot water	1,090	70
	Heating	1,743	70
	Lighting	641	70
	Census of participating contractors	90	45
	State total	3,564	255[26]
Michigan	Domestic hot water	1,641	70
	Heating	3,086	70
	Lighting	940	70
	State total	5,667	210
Grand total		**9,231**	**465**

Planned Analysis

The following section discusses our planned analysis of the primary contractor research. In summary, this analysis will yield four different estimates of the program's influence including contractor-reported sales and stocking estimates of high efficiency equipment, nonparticipant spillover, direct contractor influence on customers, and contractor-reported program influence. Additional items are included in the survey to guide the interview, provide context for analysis, or as part of the process evaluation.

- **Contractor-reported sales and stocking estimates of high efficiency equipment.** By comparing the percentage of sales of program-eligible equipment in both Wisconsin and a state without a history of energy-efficiency programs (P3), we can estimate the amount of high-efficiency sales that occurred as a result of the program. The assumption behind this estimate is that Focus program activity is the only difference between the two states and therefore, the driving force behind any difference in sales over time. The methodology will be similar to the *Business Programs: Supply-side Evaluation* conducted in April 2010[27] in that we will determine the share of sales that would be non-rebated (i.e., occurring in absence of a program) and the share that is attributable to the program.

  These comparisons will be weighted by the contractor-reported multi-family sales revenue (A3b applied to estimated annual revenue obtained from SSI) to account for larger firms having more of an effect in state-wide sales patterns. Also, in order to

[25] These numbers were obtained as part of the listed sample purchase from Survey Sampling International.

[26] The total number of unique Wisconsin contractors with which we speak will be slightly lower than 255 as some contractors will be in both the Wisconsin contractor sample and the census of 2010 participating contractors.

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

speak about the impact at the program level, differences found between contractor types will be weighted by tracked savings for that end-use.

To support the assumption that the only difference between the two states is program activity, we will also examine difference in the contractor market attributes between the two states. These attributes include company size, company services, cross-state market activity, awareness and involvement in rebate programs, and barriers to energy efficiency.

- **Nonparticipant spillover.** The survey uses the same methodology for quantifying nonparticipant spillover savings by participating contractors that changed practices as a result of program participation as was used in the CY09 research but, as mentioned previously, with additional questions to provide greater rigor. To address very high nonparticipant spillover sales estimates that were reported by several contractors in the CY09 research, we have added questions that confirm quantities, motivation, and specify program-eligible equipment with greater detail. These questions have been noted in the questionnaire as "NEW."
- **Direct contractor influence on customers.** The percentage of customers that upgraded their purchase to high-efficiency equipment based on contractors' recommendations indicates the level of influence contractors have on the customers (R4b, R4c). By then assessing what impact the program has had on the contractors' sales patterns (V4a-V4d), we can indirectly estimate the effect the program is having on customers.
- **Contractor-reported program influence.** The self-reported influence of the program on contractors, while subject to social desirability bias, gives an indication of the effect the program has had on contractors' sales and stocking patterns. These results will be best used as consistency checks with other indicators of program influences.

While our analysis will focus on the comparison of sales and stocking estimates, we will include comparisons between all indicators (including past customer research) and the relative strengths and weakness of each one. However, we do not, at this point, intend on creating a point estimate of net-to-gross savings that would factor in these four data points and the previous customer research. As such, these results should be considered as another data point in the on-going evaluation of the ACES Whole Building program component.

Please note the results of this research are not intended to replace direct customer research. Speaking directly with program participants is the most reliable way to obtain information regarding the customer's decision-making process. However, speaking with contractors allows us to better understand trends within the multi-family building energy efficient equipment market. Often, these trends would not be apparent to customers.

Table 3 lists the researchable issue, the planned analysis, and from what population we will obtain information. These metrics will be compared at the contractor level to assess what effect, if any, the program has on different types of contractors.

Table 3. Planned Analysis

Researchable Issue	Planned Analysis	Population
Explore the contractor's role in customer sales process	Estimate program penetration with customers by comparing the percentage of customers who were aware of the program before speaking with the contractor (R2)	Participating contractors
	Estimate self-reported contractor influence on customers by examining the percentage of customers who had already selected high efficiency equipment before speaking with the contractor and the percentage who changed plans after speaking with contractors (R4a, R4b, R4c)	All contractors
Investigate other projects done outside the Apartment and Condo Efficiency Services program and associated spillover.	Estimate the nonparticipant spillover sales and associated savings from participating contractors based on reported sales to nonparticipating customers as a result of their involvement with the program (V1–V4d)	Participating contractors
	Confirm nonparticipant spillover estimates with outlier contractors (follow-up calls)	Participating contractors

Researchable Issue	Planned Analysis	Population
Estimate the effect the ACES program has had on the adoption of high efficiency equipment in the Wisconsin multi-family retrofit market.	Assess program influence on recommendations and sales of high efficiency equipment. This metric is an average of three agree/disagree statements (V4a, V4b, V4c)	Participating contractors
	Identify market change, regardless of program affect, with analysis of the percentage of contractors who have changed installation or recommendation practices since January 1, 2007[28] (P2a)	All contractors
	Assess program influence on changes to contractors' sales and installation of energy efficient equipment (P5a)	Participating contractors
	Estimate the net effect of the program on the sales/installation of high efficiency equipment by comparing the percentage of high efficiency sales in both states weighted by contractor-specific sales to the multi-family market (P3, P4)	All contractors
	Estimate the net effect of the program on the stocking practices with a comparison of the stocking of high efficiency equipment in the past year (P6–P8)	All contractors
Understand why contractors do not engage with the program and what, if anything, the program could do to gain their participation.	Assess program awareness with analysis of the percentage of contractors aware of the program (NP1a)	Wisconsin contractors
	Estimate the potential for additional contractor participation and identify the best channels for reaching them by comparing the percentage of contractors interested in program and preferred source of information regarding energy efficiency (NP1b, NP1c)	Wisconsin contractors
	Identify and prioritize barriers to participation for nonparticipating contractors by with analysis the frequency of reasons for contractor non-engagement (NP3b, NP4)	Nonparticipating Wisconsin contractors

[28] January 1, 2007, was chosen as a reference date due to the program re-design that occurred in 2006.

CONTRACTORID WECC assigned ID

CASEID Tetra Tech assigned ID

PKCUSTOMERID WECC assigned project ID

MEASCODE Project-specific measure
(no longer including appliances or boiler clean and tune)
1 Heating
2 Lighting
3 Water heating
4 Insulation/Air Sealing
5 Other

MEAS1-5 Contractor specific measure

KWH1-5 Contractor specific kWh savings

THERM1-5 Contractor specific therm savings

REP Replicate number assigned

SAMPLE Sample stratum
1 Wisconsin nonparticipating contractors
2 Out-of-state contractors (Michigan)
3 Wisconsin participating contractors – random
4 Wisconsin participating contractors – random & census
5 Wisconsin participating contractors - census

TOTPROJM Total number of projects since January 2010

ELIGIBLE Examples of program eligible equipment

Heating	Furnaces or boilers greater than 90 percent AFUE or boilers with domestic hot water
Lighting	High efficiency lighting equipment including CFLs, High Performance T8 systems, or occupancy sensors
Water heating	Domestic hot water heaters greater than 0.64 EF or tankless hot water heaters
Insulation	Attic, sill box, and foundation insulation to code or greater or air sealing reduction efforts
Other =	Vending machine controls, VFDs, or energy efficient pool heaters

INTRODUCTION

(IF WISCONSIN CONTRACTOR) 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 multi-family building owners. May I speak with [contact name]?

(IF OUT-OF-STATE CONTRACTOR) Hello, my name is [interviewer name], and I am calling on behalf of the State of Wisconsin's Focus on Energy Program as part of a national study about your experiences offering services to multi-family building owners. I'm not selling anything. May I speak with [contact name]?

1 Yes

2 No [attempt to convert]

I'd just like to ask your opinion about (IF PARTICIPATING: this program; ELSE: your experiences providing services to multi-family buildings). 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 Condo 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 (IF IN-STATE: the state of Wisconsin; ELSE: us) better understand contractors' opinions about the types of equipment being rebated through programs.)

(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 equipment you have sold (IF PARTICIPATING: through the Apartment and Condo Efficiency Services Program; ELSE: to multi-family buildings). 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 Condo Efficiency Services Program, feel free to call Mike Plunkett at 608-249-1271, extension 175.)

A1. This interview will focus on your company's recommendation and installation of high efficiency equipment in multi-family properties. Could I confirm that you provide this service to owners of multi-family buildings?

1 Yes

2 No (ATTEMPT TO FIND OTHER KNOWLEDGABLE CONTACT)

D (DON'T KNOW) *(END SURVEY)*

R (REFUSED) *(END SURVEY)*

A1a. *(ASK IF WISCONSIN CONTRACTOR)* And to the best of your knowledge has your company worked on any multi-family projects that have received financial incentives from Focus on Energy?

1 Yes *(SET SAMPLE GROUP TO "PARTICIPATING")*

2 No *(SET SAMPLE GROUP TO "NON-PARTICIPATING")*

D (DON'T KNOW)

R (REFUSED)

A1b. *(ASK IF PARTICIPATING)* And are you the person who has provided services to multi-family properties through the Focus on Energy Apartment and Condo Efficiency Services program?

(ASK IF NONPARTICIPATING OR OUT OF STATE) And are you the person who is most familiar with the services your company provides to multi-family properties?

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 multi-family building projects as commercial.

__ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

A3a. Of your commercial customers, what percentage are multi-family properties?

__ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

A3b. Of your overall sales, what percentage of your revenue is from multi-family properties?

__ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

A3c. And of your overall sales, what percentage of your revenue, if any, is from projects in (IF WISCONSIN: Michigan)(IF MICHIGAN: Wisconsin)?

__ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

A4. And on average, about how many multi-family projects are you involved with in a year?

__ ENTER PROJECTS PER YEAR

E Every other year

D (DON'T KNOW)

R (REFUSED)

A5. How many full-time employees work at this location?

__ ENTER NUMBER OF EMPLOYEES

D (DON'T KNOW)

R (REFUSED)

A6. Approximately what percentage of your company's sales occurs in the three following areas: first, new construction, second, major renovation and remodeling projects, and third, routine replacement or maintenance of existing lighting equipment.

Please tell me the percentage starting with.....

[INSURE THAT TOTAL ADDS TO 100%.]

1 New construction....._____%

2 Major renovation and remodeling projects ....._____%

3 Routine replacement or maintenance of existing equipment_____%

A7. What types of energy efficient equipment or services do you sell or specify for multi-family customers? (INDICATE ALL THAT APPLY; READ IF NECESSARY)

1 Air conditioning equipment
2 Appliances (e.g., clothes washers, dishwashers)
3 Boilers
4 Furnaces
5 Lighting equipment
6 Water heating equipment
7 Building shell (e.g., insulation, windows, air sealing)
8 Other (SPECIFY)
9 (DON'T KNOW)
10 (REFUSED)

OVERVIEW OF FOCUS PARTICIPATION AND PROCESS

(IF PARTICIPATING ONLY CONTRACTOR, SKIP TO NONPARTICIPANT SPILLOVER BATTERY)

(IF NONPARTICIPATING WISCONSIN CONTRACTOR, SKIP TO NEXT SECTION)

(IF COMPARISON STATE CONTRACTOR, SKIP TO NEXT SECTION)

O1. From now on I'll refer to the Focus on Energy Apartment and Condo Efficiency Services program as the Focus ACES program.

When did you first become involved with the Focus ACES Program?

_____ ENTER YEAR
D (DON'T KNOW)
R (REFUSED)

O1a. [SKIP IF O1 = 2010] 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)

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

OVERVIEW OF NONPARTICIPATING WISCONSIN AND COMPARISON STATE CONTRACTORS

(ASK IF NONPARTICIPATNG WISCONSIN CONTRACTOR OR COMPARISON STATE CONTRACTOR. ELSE SKIP TO NEXT SECTION)

NP1a. (*ASK IF NONPARTICIPATNG WISCONSIN CONTRACTOR)* Prior to this call, were you aware of the Focus on Energy Apartment and Condo Efficiency Services Program, sometimes referred to as the "ACES" program?

1 Yes

2 No

D (DON'T KNOW)

R (REFUSED)

NP1b. *(ASK IF UNAWARE OF PROGRAM)* The Focus on Energy Apartment and Condo Efficiency Services Program offers multi-family owners technical expertise as well as rebates to improve the energy efficiency of their apartments and Condominiums.

Do you think your multi-family customers would be interested in this type of program?

1 Yes

2 No

D (DON'T KNOW)

R (REFUSED)

NP1c. (*ASK IF COMPARISON STATE CONTRACTOR)* Prior to this call, were you aware of any energy efficiency programs that offered customers cash incentives for installing high efficiency equipment in Michigan?

1 Yes

2 No

D (DON'T KNOW)

R (REFUSED)

NP1d. (*ASK IF NP1c = YES)* Have you participated in any of these programs in the past three years?

1 Yes

2 No

D (DON'T KNOW)

R (REFUSED)

NP1e. What sources of information do you use when looking for information about energy efficient equipment that would be installed at a multi-family project? (CHECK ALL THAT APPLY)

1 Manufacturer/dealer representative
2 Internal experts
3 External experts or trainings (SPECIFY)
4 Internet research
5 Secondary, offline research (e.g., libraries, reference manuals)
6 Something else (SPECIFY)
D (DON'T KNOW)
R (REFUSED)

(IF UNAWARE OF FOCUS PROGRAM OR A COMPARISON STATE CONTRACTOR, SKIP TO NEXT SECTION)

NP2. How did you first hear about the Focus on Energy Apartment and Condo Efficiency Services Program?

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 (specify)_____
13 Don't know/unsure

NP3a. Prior to 2007, did your company sell or install equipment that received a financial incentive through this program?

1 Yes

2 No

D (DON'T KNOW)

R (REFUSED)

NP3b. (IF NP3A = NO) Why hasn't your company sold or installed equipment that has received an incentive through the Focus ACES program since 2007 (DO NOT READ LIST. INDICATE ALL THAT APPLY)

1 Multi-family customers no longer interested in program-qualifying equipment

2 Too much paperwork for program participation

3 Rebates not large enough

4 Do not believe high efficiency equipment is worth incremental cost

5 Not satisfied with Focus on Energy program in general (SPECIFY)

6 Something else (SPECIFY)

D (DON'T KNOW)

R (REFUSED)

NP4. What, if anything, would you change about the Focus ACES program for multi-family buildings?

RECORD VERBATIM

CUSTOMERS' ROLE IN SELECTING EQUIPMENT

R0. Now I'd like to ask you some questions specifically about your multi-family customers. Who are the typical parties you work with for a multi-family 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 multi-family 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 (ONLY IN-STATE) 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 Energy savings
10 Need to upgrade old equipment (working but in poor condition)
11 Other (SPECIFY)
12 (DON'T KNOW)
13 (REFUSED)

R4a. Now I'd like to talk about your multi-family customers and high efficiency equipment. When you first talk with multi-family customers, what percentage understands the different efficiency options available to them?

__ ENTER PERCENTAGE
D (DON'T KNOW)
R (REFUSED)

R4b. And when you first talk with multi-family customers, what percentage of them specifically tell you that they want to install high efficiency equipment?

__ ENTER PERCENTAGE
D (DON'T KNOW)
R (REFUSED)

R4c. What percentage of your multi-family customers who did not specifically ask for high efficiency equipment end up selecting high efficiency equipment based on your recommendation or proposals?

___ PERCENTAGE
D (DON'T KNOW)
R (REFUSED)

R2. (ASK IF PARTICIPATING) Thinking specifically about the Focus ACES program, what percentage of your multi-family customers are already aware of the incentives available through the program when they contact you?

__ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

R5a. (ASK IF PARTICIPATING) One of the purposes of the program is to encourage multi-family 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. (ASK IF PARTICIPATING) 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 LIGHTING CONTRACTOR AND PARTICIPATING) 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. (ASK IF IN-STATE) (IF PARTICIPATING: With these goals in mind, do; ELSE: Do) you strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree that the customer rebates offered through the Focus ACES 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

RECOMMENDATION AND INSTALLATION PRACTICES

P0. Now, I'd like to ask you some questions about the (IF PARTICIPATING: program-eligible; ELSE: high efficiency equipment) you've sold since 2007).

(IF NOT PARTICIPATING) By "high efficiency," I mean equipment like [eligible].

P2a. Have any of your recommendation or installation practices for [incentivized equipment] changed since January 2007?

1 Yes

2 No

D (DON'T KNOW)

R (REFUSED)

P2b. (IF NONPARTICIPATING OR OUT-OF-STATE AND P2A = YES) Why have your recommendation or installation practices changed since January 2007?

(RECORD VERBATIM)

P3. During the past year, in what percentage of your multi-family projects did you install high efficiency [incentivized equipment]?

__ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

P4. And what percentage of those projects received financial incentives from a state or federal energy efficiency program (IF WISCONSIN: such as Focus on Energy)?

__ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

P5a. (IF PARTICIPATING) 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 HEATING CONTRACTOR) Do you typically carry inventory for the [incentivized equipment] that you install?

1 Yes

2 No *(SKIP TO P9a)*

D (DON'T KNOW) *(SKIP TO P9a)*

R (REFUSED) *(SKIP TO P9a)*

P7. (SKIP IF HEATING CONTRACTOR) What percentage of your inventory met program eligibility criteria in the past year?

__ ENTER PERCENTAGE

D (DON'T KNOW)

R (REFUSED)

P9a. (IF BOILERS SOLD AND PARTICIPATING) Since 2009, what is the average AFUE rating of the boilers you installed in multi-family properties that did NOT participate in the program?

__ AFUE Rating

N NA, nothing installed without Focus ACES incentive

D (DON'T KNOW)

R (REFUSED)

P9b. (IF FURNACES SOLD AND PARTICIPATING) Since 2009, what is the AFUE rating of the furnaces you typically installed in multi-family properties that did NOT participate in the program?

__ AFUE Rating

N NA, nothing installed without Focus ACES incentive

D (DON'T KNOW)

R (REFUSED)

P9c. (IF BOILERS SOLD AND NOT PARTICIPATING) Since 2009, what is the average AFUE rating of the boilers you installed in multi-family properties?

__ AFUE Rating

N NA, nothing installed without Focus ACES incentive

D (DON'T KNOW)

R (REFUSED)

P9d. (IF FURNACES SOLD AND NOT PARTICIPATING) Since 2009, what is the average AFUE rating of the furnaces you installed in multi-family properties?

__ AFUE Rating

N NA, nothing installed without Focus ACES incentive

D (DON'T KNOW)

R (REFUSED)

PROGRAM-INDUCED SPILLOVER ASSESSMENT

(REPEAT V1 – V4D OF PARTICIPATING CONTRACTORS FOR EACH MEASURE IN DATABASE)

V1. Please think about all the program-eligible [measures] you specified, sold, and/or installed for Wisconsin customers since January 2010.

Did you specify, sell, and/or install any of this program-eligible [measures] to customers in Wisconsin without an incentive? [NEW] This would include equipment like [eligible].

1	Yes	
2	No	[SKIP TO V4]
D	(DON'T KNOW)	[SKIP TO V4]
R	(REFUSED)	[SKIP TO V4]

V2a. (IF V1 = Yes) What percentage of all of this program-eligible [measures] you specified, sold and/or installed for Wisconsin customers since January 2010 did <u>not</u> receive an incentive?

_____%

D (DON'T KNOW)

R (REFUSED)

V2b. [NEW] To confirm, your company sold approximately [calculated qty][29] [measures] that would have been eligible for the program that did not receive a rebate since January 2010. To be eligible for the program, these projects would include [eligible equipment].

Is that correct?

1	Yes	
2	No	[SKIP BACK TO V2]
D	(DON'T KNOW)	[SKIP BACK TO V2]
R	(REFUSED)	[SKIP TO V4]

(ASK V3 OF EACH MEASURE WHERE V2 > 0%)

V3. (Since January 2010, 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)

[29] Calculated quantity = Program quantity/(1-(V2A/100)) rounded to the nearest whole number

V4a. Finally, 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.

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 equipment installed through the Focus ACES program.

1 Agree

2 Disagree

D (DON'T KNOW)

R (REFUSED)

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 equipment installed through the Focus ACES program.

1 Agree

2 Disagree

D (DON'T KNOW)

R (REFUSED)

V4d. [NEW] In your own words, could you please describe what effect, if any, that the Focus ACES program has had on your sales of energy efficient equipment.

(RECORD VERBATIM)

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

APPENDIX C: PROGRESS REPORT FOR THE ACES EXISTING BUILDING CONTRACTOR MARKET EFFECTS STUDY

Subject **Focus on Energy Evaluation**

Progress Report for the Apartment and Condo Efficiency Services Market Effect Study

To Carol Stemrich
Public Service Commission of Wisconsin

From Jeremy Kraft, Kimberly Bakalars, and Laura Schauer,
Tetra Tech

Date September 17, 2010

This memo provides an update on our progress with interviewing contractors in Wisconsin and Michigan as part of the market effects research for the Apartment and Condo Efficiency Services (ACES) program. This memo also discusses recommended next steps in light of the data collection progress. This research was described in detail in the *Apartment and Condo Efficiency Services Market Effects Research Plan* delivered to the Public Service Commission of Wisconsin (PSCW) on July 30, 2010.

Progress to Date

Our research plan targeted three groups of contractors in Wisconsin and Michigan: heating contractors, lighting contractors, and water heating contractors. The intent was to complete 70 interviews with each group to identify statistically robust differences between the two states.

We initially projected to field the study for two to three weeks. However, completing interviews with contractors has been far more difficult than expected. As of September 14, we have only completed 40 percent of the total number of interviews and only 22 percent of the Michigan interviews after three weeks of calling. Table 1 lists our progress to date by contractor type.

Table 1. Interview Progress to Date

Stratum	Completed	Targeted	Percentage Completed
Wisconsin heating	53	70	76%
Wisconsin lighting	32	70	46%
Wisconsin water heating	36	70	51%
Michigan heating	14	70	20%
Michigan lighting	19	70	27%
Michigan water heating	13	70	19%
Total	**167**	**420**	**40%**

There are several factors inhibiting our progress. First, our purchased sample contains a high proportion of contractors (almost 20 percent) that do not serve multi-family buildings and are therefore ineligible for the study. Unfortunately, there is no way of identifying these contractors without speaking with someone at the firm knowledgeable about their customers.

Second, we believe it has been more difficult to complete surveys with Michigan contractors given this is not a Michigan-affiliated study. Michigan contractors have only been agreeing to participate in the survey at approximately one-fourth the rate of Wisconsin contractors.

To improve response and make calling more efficient, we are asking reception staff about their target customer base to identify ineligible firms if the main contact is not available. In addition, we have offered to share the results of the study with respondents that complete the survey (in the form of an email alerting them when the study is publicly available on the Focus on Energy website).

We also propose sending out refusal conversion letters on Tetra Tech letterhead to respondents who refused the survey. Given the low cooperation rate, we feel that letters targeted to those who refused may have some effect in increasing response. A copy of the letter is included at the end of this memo for approval.

We also expect that we will fall short of the targeted 45 completed interviews with Wisconsin contractors that have participated with the program in 2010. We included these contractors in the study to identify any nonparticipant spillover because of program participation. Of the census of 78 contractors, 40 records had incorrect or missing contact information. We have been attempting telephone number look-ups to try to obtain correct contact information for these contractors. Another 10 contractors report that they do not work in multi-family buildings and are therefore ineligible for any nonparticipant spillover. To date, we have completed 11 interviews out of the 28 viable contractor records. We will continue to call the remaining records and attempt to complete as many interviews as possible.

Options Going Forward

Despite these efforts, we predict that we will not be able to achieve the desired number of completed interviews in Michigan in time to deliver a draft report on October 19. Additionally, because completing interviews is requiring more interviewer time than anticipated, we will exceed the planned budget value for this study should we attempt to reach the target number of contractors. Below we identify four options for the PSCW's consideration.

Option 1. End data collection on schedule in order to meet the current timeline. The result will be a smaller number of completed interviews, which will mean a larger margin of error around our reported results. The lack of precision for any of the technologies will make it difficult to report statistically valid findings at the measure, or potentially regional, level.

Option 2. Target heating contractors as the highest priority in our interviewing efforts. Concentrating our efforts on one group will allow us to achieve the proposed 70 completes in that group, therefore providing at least one group with statistically robust results. We selected heating contractors as they provide the largest amount of therm savings and the second largest amount of kWh savings in the 2010 program database to date. The disadvantage with this approach is that we will not have the number of proposed surveys for the other

measures. However, results from the lighting and water heating contractors would also be included in the report with qualifiers regarding the margins of error.

We can complete the heating contractors within our current budgeted amount, but would like to revise the timeline for delivering the results. If we only complete the heating contractor segment of the sample, we could provide draft results by November 2.

Option 3. In addition to completing the heating contractors, we would also complete the water heating contractors. This would provide statistically robust results for two groups of equipment. Completing this additional group would require another $7,220 and another two weeks in the field, resulting in a draft report on November 10.

Option 4. Continue to attempt to complete the full number of surveys included in the research plan. The implication of this approach is that we will not meet the established reporting date and that we will overrun the survey budget, but it is an option for consideration.

Our recommendation is to redirect the study as outlined in option 2. This option provides defensible results for the highest saving measure in the program (heating equipment) without change to the budget and only a slight extension in the timeline.

[Date]

[ID]

[Company Name]
[Address]
[City], [State] [Zip]

Dear **[contact],**

We are in the process of conducting a research study on the best practices and market experience of **[type]** contractors in the Midwest. The purpose of this study is to help utility-sponsored energy efficiency programs understand the market for high efficiency equipment in multifamily buildings so they can better design rebate programs to serve that market.

Recently, as part of this study, you may have received a phone call asking about your firm's experience selling and installing high efficiency equipment in multifamily buildings. Your feedback is important, as we would like to have a comprehensive picture of the **[type]** equipment market in Michigan. In addition, the results of this study will be available to the public later this year and should provide you and your firm with insights on the **[type]** equipment market in Michigan.

To complete the survey at your convenience, please call us toll-free at (800) 454-5070 and refer to your ID number at the top right corner of this letter. Likewise, if you have any questions about the study or its use, please contact myself at (608) 316-3631 or Kimberly Bakalars at (608) 316-3633.

Thank you in advance for your help with this important study.

Sincerely,

Jeremy Kraft
Study Coordinator

APPENDIX E: RESPONSE RATE

Table E-1. Contractor Survey Response Rate

	Wisconsin Contractors				Michigan Contractors		
	Participating	Heating	Lighting	Water Heating	Heating	Lighting	Water Heating
Starting sample	78	345	284	286	1100	318	318
No working number	41[30]	80	75	56	270	79	74
No knowledgeable respondent	2	1	0	0	8	3	1
No work in multi-family buildings	9	103	61	63	242	72	54
Adjusted sample	26	161	148	167	580	164	189
Refusal	1	7	15	18	62	18	37
Active sample	9	84	101	108	444	127	134
Completed surveys	13	70	32	41	74	19	18
Response rate	50%	43%	22%	25%	13%	12%	10%

[30] This number includes contractor records in the program tracking database with no contact information associated with them and records with contact information that was incorrect. Phone look-ups were conducted on all records.