Residential Contractor Program Evaluation
Phase II Final Report

Volume 6--Appendix G: Residential Contractor Program Market Effects Evaluation

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Introduction

1.1 Overview

This report presents work completed to accomplish the third objective of the RCP Study, an assessment of near-term market effects for the single family portion of the 1999 California Residential Contractor Program (RCP).[1] The RCP, started in May 1999, provides incentives in the form of program vouchers for the installation or performance of energy efficient measures in existing single family homes. The research completed for this part of the study entailed identifying key market effects indicators, collecting data on those indicators from participant and nonparticipant contractors, and testing a series of hypotheses for near-term market effects.

The remainder of this Section presents the approach used in the analysis, describes the data collection effort, and presents a preview of the results.

1.2 Approach

The assessment of near-term market effects entailed testing a series of distinct hypotheses relating to the potential effects of specific program interventions. Self-reported impacts from contractors were used to determine if the RCP has had a discernable influence on contractors' awareness, perceptions, and behaviors relating to energy efficiency measures. In addition, participant and nonparticipant survey responses were compared.[2] Where a change was found, program attribution and sustainability were assessed.

[1] The multifamily element of the program is not included in this analysis due to minimal program activity during program year 1999.

[2] Due to the potential for self-selection into the program, comparisons between participants and nonparticipants may be weak evidence of program-induced effects. In some cases, these comparisons are enhanced by also considering a third group of respondents, nonparticipants who received training under the program but have not yet submitted vouchers.

Indicators of market effects were identified for this study using previous research from the Baseline Study[3] and milestones identified by the utilities in the program design. The following is a general list of indicators used to develop the survey questions and test hypotheses for market effects.

- Cost effectiveness of energy efficient measures,
- Increase in jobs,
- Changes in efficiency levels recommended and installed,
- Changes in contractor practices,
- Increase in awareness of energy efficiency measures,
- Increase in awareness of whole-system treatments (HVAC only),
- Ownership of diagnostic equipment (HVAC only),
- Increase in contractors offering diagnostic services (HVAC only),
- Consumer awareness and demand,
- Equipment availability, and
- Availability of qualified labor.

For each of these, contractors were asked to report their perceptions. Information on specific efficiency levels marketed and installed was not collected. Due to the proximity of the completion of the Baseline Study, it was felt that not enough time had elapsed in order for this data to be useful. Rather, contractors were asked if they had made changes in the efficiency levels of the measures they recommended or installed since the previous year.

Hypothesized market effects were formed using the indicators described above. Table 1-1 presents the hypotheses and the related indicators. Data on contractor perceptions of consumer demand and the availability of high efficiency equipment and qualified labor were also collected.

[3] Wirtshafter Associates Inc. et al. California Residential Retrofit and Repair Baseline Contractor Survey: Supplemental Report of the Residential Standard Performance Contract Program Evaluation. February 2000.

Table 1-1: Hypothesized Market Effects

Hypothesis	Indicator
By training contractors and by providing experience in working with high efficiency equipment and duct measures, the RCP increased contractors' awareness of the energy efficiency benefits of these measures.	• Increase in awareness of energy efficiency measures • Cost effectiveness of energy efficient measures
By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of jobs for contractors	• Increase in jobs
By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the level of energy efficiency achieved per job	• Changes in efficiency levels recommended and installed
By providing training for contractors on diagnostic/tune-up procedures, RCP improved these practices.	• Changes in contractor practices
By offering incentives for packages of measures, the RCP increased contractor awareness of whole-system treatments. By offering incentives for packages of measures, the RCP increased the number of customers who are aware of whole-system treatments.	• Increase in awareness of whole-system treatments
By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of contractors who provide HVAC diagnostics	• Increase in contractors offering diagnostic services • Ownership of diagnostic equipment

1.3 Data

A set of preliminary in-depth interviews with HVAC contractors was conducted. This information was used to refine the questions for use in the telephone surveys with the remaining contractors. HVAC contractors were chosen for the initial set of in-depth interviews as these contractors are exposed to a broader set of measures under the program than are the remaining contractors.

Sample Design

For this study, participant contractors were defined as contractors who were approved under the program and had requested or submitted a program voucher by December 31, 1999.[4]

[4] The program year ran from May through December of 1999.

Nonparticipants were defined as all other licensed contractors providing services to the existing single family homes in California.

HVAC, window, and insulation contractors were surveyed.[5] For each type of contractor surveyed, roughly equal numbers of contractors were contacted from each utility area. Table 1-2 presents the targeted and completed sample sizes for this part of the study.

Table 1-2: Targeted and Completed Sample Sizes

Contractor	Type of Survey	Program Participation	Targeted Sample	Completed Sample
HVAC (including HVAC contractors offering diagnostics)	In-depth	Participants	5 to 10	9
	In-depth	Nonparticipants	5 to 10	8
	Short	Participants	15	15
	Short	Nonparticipants	65	66
Windows	Short	Participants	15	15
	Short	Nonparticipants	65	65
Insulation	Short	Participants	15	10
	Short	Nonparticipants	65	30
Total			***255 to 260***	***218***

As shown, all of the targets were reached with the exception of the short surveys done with insulation contractors. In this case, it was found that most of the insulation contractors listed by the licensing board were out of business. For this reason, the targets were unreachable.

Interview Guides and Survey Instruments

The in-depth and short surveys were designed to collect information on changes in contractors' attitudes and practices regarding energy efficient measures incentivized by the program, background characteristics on the contractors' businesses, and perceptions regarding customer demand and market potential. Questions designed to collect data to test market effect hypotheses asked about beliefs or business practices, if they had changed over the past year, why they had changed, and if the change would continue in the absence of the program. Copies of the survey instruments used are provided in Attachment A.

Data Changes

Upon reviewing the collected data, the following modifications were made to the participant and nonparticipant categories.

[5] Electrical/lighting contractors were omitted from the analysis, as they were not directly targeted by the program.

- Thirty-two respondents were originally classified as nonparticipants yet had participated after the 1999 program year. These responses were eliminated from the analysis.
- Twenty-four respondents were by definition nonparticipants but had attended some or all of the required training for the RCP and were planning to participate in the program in 2000. The data belonging to these respondents were classified in a separate group called "nonparticipants with training."
- One HVAC contractor, originally classified as a participant, was found to be a nonparticipant and was subsequently categorized as such for the analysis.

Market effect hypotheses for each type of contractor were tested by analyzing the self-reported impacts of respondents for evidence of changes induced by the RCP. Mean responses of participants and nonparticipants were compared for each hypothesis. Due to the variability of company sizes, responses were weighted by a variable representing the number of homes worked in during 1999.

1.4 Preview of Results

Results of this analysis indicate that the 1999 RCP has had some effect on the market. In particular, changes in HVAC contractor awareness and practices were found. Specifically, some of the stronger findings supporting the market effect hypotheses are the following:

- Sufficient evidence was found to support a program-related change in HVAC contractors' awareness of the benefits of duct testing and sealing. In addition, evidence was found to show that participants are recommending more high efficiency measures as a result of the program. Due to the sustainable nature of awareness, and to evidence from survey responses showing recommendations for high efficiency measures will continue without the program, these effects are likely to be sustainable.
- Sufficient evidence was found to support the hypothesis that the level of energy efficiency per job was increased as a result of the RCP for HVAC contractors. Moreover, these changes directly relate to duct testing and sealing methods that were learned in the training sessions offered by the program.
- Sufficient evidence was found to support the hypothesis that the RCP increased the number of HVAC contractors who offer diagnostic services. This result is true for both air conditioning maintenance and duct testing. While the sample sizes are smaller for air conditioning maintenance as nearly all contractors had been offering this service, the results for duct testing are strong. A significant proportion of contractors surveyed started this service as a result of the program and plan to continue it.
- Evidence was found to support an increase in the number of window contractor jobs due to the RCP. The program effected this change in two ways: through

program incentive vouchers and through increased customer awareness. To the extent jobs increased via the latter, this change is sustainable.

- Evidence was found to support an increase in the number of insulation contractor jobs due to the RCP. However, as some of the increase was reportedly due to the use of program vouchers, this change may not outlive the program.

The remainder of this report is organized as follows: Sections 2 through 4 present summaries of the analysis and findings for near-term market effects for HVAC, window and insulation contractors respectively. Section 5 presents a summary and conclusions.

2

HVAC Contractors

2.1 Overview

The 1999 single family RCP incentivized a number of energy efficiency measures requiring HVAC services. The following is a brief description of these measures.

- The ENERGY STAR® equipment package requires installation of a high efficiency gas furnace, heat pump or air conditioner along with accompanying duct testing services and a programmable thermostat in order to qualify for the program incentive. In addition, duct sealing must be performed if needed to reduce duct leakage to required levels.
- The basic diagnostic tune-up involves checking and correcting refrigerant charge and evaporator coil airflow on central air conditioners and heat pumps.
- Duct testing, a process of pressure testing the existing duct system for air leakage, is offered as a separate measure or with a diagnostic package.
- Duct testing and duct sealing are offered as a package. In addition, they can be combined with the basic diagnostic tune-up; this is called the advanced diagnostic tune-up.
- Programmable thermostats are eligible for incentives only if another program measure is installed.

Training sessions in duct testing and sealing procedures, basic diagnostic tune-up procedures (offered in the SoCal Gas / Edison area only), and combustion appliance safety testing procedures (offered in the PG&E area only) were available for contractors.

For this study, the following hypothesized market effects were tested for HVAC contractors:

- By training contractors and by providing experience in working with high efficiency equipment and duct measures, the RCP increased contractors' awareness of the energy efficiency benefits of these measures.
- By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of jobs for contractors.
- By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the level of energy efficiency achieved per job.

- By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of contractors who provide HVAC diagnostics.
- By providing training for contractors on diagnostic/tune-up procedures, RCP improved these practices.
- By offering incentives for packages of measures, the RCP increased contractor awareness of whole-system treatments.
- By offering incentives for packages of measures, the RCP increased the number of customers who are aware of whole-system treatments, duct diagnostics and sealing, and diagnostic tune-up procedures.

These hypotheses were tested by analyzing survey responses for changes in market effect indicators, and changes found were also assessed for program attribution and sustainability. In addition to collecting information needed to test these hypotheses, contractors were asked questions regarding their perceptions of consumer demand and market potential. While these perceptions are not direct indicators of the near-term market effects researched in this study, they provide information on how contractors' views of the market are changing, especially in relation to the program.

This Section first examines the above hypotheses for near-term market effects attributable to the program, then presents information collected on contractors' perceptions of the market.

2.2 Testing the Hypothesized Market Effects

HVAC Hypothesis One: Increased Awareness

By training contractors and by providing experience in working with high efficiency equipment and duct measures, the RCP increased contractors' awareness of the energy efficiency benefits of these measures.

This hypothesis was tested by looking at self-reported changes in several indicators of awareness and by comparing mean responses of participants and nonparticipants. Nonparticipants with training were looked at separately, as these individuals have selected to participate in the program and have had some or all of the required training, but they had not yet processed any program vouchers. The indicators considered are the following:

- Change in efficiency levels considered energy efficient,
- Change in rating of cost effectiveness of high efficiency equipment and duct measures, and
- Increase in recommendations to customers for more efficient equipment and duct measures.

Changes in Efficiency Levels

Contractors were asked to identify what efficiency levels (SEER[6] and AFUE[7] ratings) they considered energy efficient for central air conditioners, heat pumps,[8] and gas furnaces. In addition, they were asked if their views had changed over the past year. Table 2-1 presents the results.

As shown, participants reported higher efficiency levels for all equipment ratings. However, nonparticipants and nonparticipants with training were not far behind. Furthermore, on the average, all groups reported levels above code. The standard errors show that the differences in means between participants and nonparticipants are significant with the possible exception of heat pumps, which are marginally significant.[9,10] Differences in means between nonparticipants with training and either participants or nonparticipants are insignificant for air conditioners and heat pumps and significant for gas furnaces. However, given that the ratings are close and all are above code, these results do not present much evidence of program-induced changes in awareness.

When respondents were asked if they had changed their opinion of what is high efficiency in the past year, most participants said no. In fact, less than 2% of participants had changed their views on any of the efficiencies. More nonparticipants reported changing their views: nearly 3% for air conditioning, 6% for heat pumps, and 11% for furnaces. The greatest evidence of change was found among nonparticipants with RCP training. Of these, approximately 20% (three individuals) changed their views on all equipment efficiencies.

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6 A Seasonal Energy Efficiency Ratio (SEER) measures the cooling efficiency of an electric air conditioner or heat pump. The program requires a minimum SEER of 12. The Title 24 standard is a SEER of 10.

7 The Annual Fuel Utilization Efficiency (AFUE) is a measure of the seasonal energy efficiency of gas heating equipment. The program requires a minimum AFUE of 90%. The Title 24 standard is an AFUE of 78%.

8 Respondents were also asked about Heating Season Performance Factors (HSPF), a measure of the seasonal efficiency of an electric heat pump. Most respondents did not supply data on this, however, as they lacked experience with heat pumps and familiarity with the ratings.

9 Sample sizes for the heat pump questions are reduced as many contractors reported they did not install heat pumps and therefore did not answer the questions.

10 Significance throughout this analysis is reported at the 95% level of confidence.

Table 2-1: Contractor Views of Equipment Efficiency Levels

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Central Air Conditioners:				
SEER considered high efficiency	13.0 (0.17) n = 23	12.3 (0.17) n = 49	12.5 (0.31) n = 11	12.6 (0.12) n = 83
Have changed opinion of what is high efficiency in past year	1.0% (0.02) n = 23	2.6% (0.02) n = 49	20.2% (0.13) n = 11	4.4% (0.02) n = 83
Heat Pumps:				
SEER considered high efficiency	12.5 (0.22) n = 18	11.9 (0.24) n = 38	12.0 (0.07) n = 8	12.2 (0.14) n = 64
Have changed opinion of what is high efficiency in past year	1.7% (0.03) n = 18	6.3% (0.04) n = 38	19.8% (0.15) n = 8	6.4% (0.03) n = 64
Gas Furnaces:				
AFUE considered high efficiency	90.6% (0.50) n = 23	88.14% (0.70) n = 47	84.7% (1.58) n = 11	88.6% (0.50) n = 81
Have changed opinion of what is high efficiency in past year	1.0% (0.02) n = 23	11.0% (0.05) n = 47	20.2% (0.13) n = 11	8.5% (0.03) n = 81

Values are weighted means. Weighted standard errors are shown in parentheses.

These results are consistent with what one would expect. Participants are typically the types of contractors that stay abreast of changes in the industry. They got involved in the program early and have probably participated in many other programs before this one. They have known about high efficiency equipment for a long time. Nonparticipants don't get involved and typically don't stay abreast of innovations in their industry, as they tend to be more skeptical. Nonparticipants with training, however, are new learners. They entered the program late (hence have not had any vouchers yet) but have been through the training and have gained new knowledge about energy efficient products and methods.

Respondents who reported changing their ideas of ratings of high efficiency were further asked why they had changed. Table 2-2 presents the results for those respondents who reported changing their views in the past year. As shown, two-thirds of participants who had changed their views did so due to the RCP. Furthermore, 1% of nonparticipants and 15% of

nonparticipants with training who had changed their views reported changing due to the program. The sample sizes reporting these results are low. It is not surprising to find few changes in this area, however, as high efficiency equipment has been promoted in the market for some time.

Table 2-2: Changes in Views of Efficiency Levels Due to RCP

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Change in opinion of efficiency levels is due to RCP	66.7% (0.47) n = 2	1.2% (0.05) n = 7	14.8% (0.25) n = 3	8.6% (0.08) n = 12

Values are weighted means. Weighted standard errors are shown in parentheses.

Other reasons given by respondents for why they had changed their views include the following:

- Information from utilities,
- Manufacturers' literature, and
- More experience with higher efficiency equipment.

Changes in Cost Effectiveness

Respondents were asked to rate, on a scale of one to five, the cost effectiveness for their region of central air conditioners with SEER 12, gas furnaces with AFUE 90%, and high efficiency heat pumps. The scale was structured so that a response of one meant "not at all cost effective," and a response of five meant "very cost effective." Respondents who indicated they did not know what an efficient level of efficiency was were not included, hence the low sample sizes for heat pump responses. Table 2-3 presents the results.

As shown, cost effectiveness ratings for all respondents are fairly close. In considering the differences between participant and nonparticipant responses, the standard errors show that the differences in means between these groups are insignificant. For the most part, differences in mean responses for nonparticipants with training and the other groups are also insignificant or only marginally significant. One exception to this is for air conditioner ratings: nonparticipants with training on the average rated these significantly more cost effective than did the other groups. As a whole, these results are not surprising considering high efficiency equipment has been in the market and promoted through previous programs for some time.

Table 2-3: Contractor Ratings of Cost Effectiveness for Equipment

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Central Air Conditioners:				
Cost effectiveness of SEER 12 air conditioners (1 to 5 scale)	4.0 (0.27) n = 23	4.2 (0.17) n = 48	4.9 (0.15) n = 11	4.2 (0.13) n = 82
Rating changed in past year	2.5% (0.03) n = 23	2.2% (0.02) n = 48	17.5% (0.13) n = 10	4.4% (0.02) n = 81
Heat Pumps:				
Cost effectiveness of high efficiency heat pumps (1 to 5 scale)	3.6 (0.22) n = 10	3.0 (0.96) n = 4	2.8 (0.57) n = 4	3.4 (0.23) n = 18
Rating changed in past year	0.0% (0.00) n = 10	0.0% (0.00) n = 4	8.9% (0.16) n = 4	1.6% (0.03) n = 18
Gas Furnaces:				
Cost effectiveness of AFUE 90% gas furnace (1 to 5 scale)	3.2 (0.24) n = 23	3.6 (0.23) n = 46	3.8 (0.48) n = 11	3.5 (0.16) n = 80
Rating changed in past year	0.0% (0.00) n = 23	0.2% ((0.01) n = 45	17.5% (0.13) n = 10	2.5% (0.02) n = 78

Values are weighted means. Weighted standard errors are shown in parentheses.

A small number of respondents reported changing their views over the past year. These changes may suggest some influence from the program. To test this, respondents who reported changing their ratings over the past year were asked why they had changed. As shown in Table 2-4, none of the participants and a small percentage of nonparticipants and nonparticipants with training reported that their changes were due to the program.

Table 2-4: Changes in Cost Effectiveness Ratings for Equipment Due to RCP

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Change in opinion of cost effectiveness is due to RCP	0.0% (0.00) n = 1	8.3% (0.28) n = 2	13.9% (0.35) n = 2	9.9% (0.15) n = 5

Values are weighted means. Weighted standard errors are shown in parentheses.

Other reasons given by respondents for why they had changed their views include the following:

- The ENERGY STAR® program,
- Manufacturers' literature, and
- Information from utilities.

Changes in Cost Effectiveness for Duct Testing and Sealing

In addition to looking at equipment, respondents were also asked to rate the cost effectiveness of duct testing and duct sealing on the same one to five scale. As shown in Table 2-5, all groups rated the services similarly. In fact, the standard errors show that any apparent difference between mean responses of these groups is insignificant.

Table 2-5: Contractor Ratings of Cost Effectiveness for Duct Services

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Cost effectiveness	3.8 (0.31) n = 23	3.6 (0.19) n = 46	4.3 (0.42) n = 11	3.8 (0.16) n = 80
Rating changed in past year	43.9% (0.11) n = 23	22.0% (0.06) n = 46	44.5% (0.17) n = 10	33.8% (0.05) n = 79
Rating changed due to RCP	69.3% (0.13) n = 14	0.9% (0.09) n = 2	96.8% (0.10) n = 4	53.9% (0.11) n = 20

Values are weighted means. Weighted standard errors are shown in parentheses.

A number of respondents reported changing their views on duct services over the past year. Considering that ducts have not been promoted as much as high efficiency equipment in previous programs, this is not surprising. When those who reported changing their views

were asked why they had changed, a majority of participants and nonparticipants with training identified the program as the reason. These results suggest that the program has had an effect in this area.

Changes in Recommendations

As another indicator of contractors' awareness of the benefits of high efficiency equipment, respondents were asked if they had made any changes in their recommendations to customers over the past year. As shown in Table 2-6, a greater percentage of participants than nonparticipants are recommending higher efficiency equipment this year. Moreover, the percentage of participants and nonparticipants with training that are recommending diagnostics and duct sealing more than they did a year ago is higher than nonparticipants. Furthermore, the standard errors indicate that the differences in means between groups are significant.

Table 2-6: Contractor Changes in Recommendations

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Recommend higher efficiency equipment more than a year ago	43.0% (0.11) n = 23	29.5% (0.07) n = 49	17.2% (0.12) n = 11	32.9% (0.05) n = 83
Recommend diagnostics or duct sealing more than a year ago	22.3% (0.09) n = 23	11.6% (0.05) n = 49	24.4% (0.14) n = 11	17.4% (0.04) n = 83
Changes due to RCP	60.5% (0.13) n = 15	1.1% (0.03) n = 12	100% (0.00) n = 2	57.4% (0.09) n = 29
Changes will continue	17.9% (0.15) n = 8	100% (0.00) n = 1	100% (0.00) n = 2	52.5% (0.15) n = 12

Values are weighted means. Weighted standard errors are shown in parentheses.

To determine whether these changes were due to the RCP, respondents who reported increased recommendations were asked why they made the changes. Over 60% of participants and 100% of trained nonparticipants who reported recommending these measures more this year also reported that their recommendations were a result of the RCP. In addition, one nonparticipant credited the program for changing. When asked if they would continue in the absence of the program, 18% of the participants who reporting changing due to the program said they would continue. Similarly, the few trained nonparticipants and

nonparticipants in general who changed as a result of the program reported they would continue. Although the sample sizes are small, this is some evidence of a program effect.

Summary of Hypothesis One Results

The hypothesis that the RCP increased contractors' awareness of the benefits of high efficiency measures was examined by comparing responses from participants and nonparticipants on several key indicators. In addition, self-reported changes were examined. The results are as follows.

- All respondents reported high efficiency ratings for equipment. A few reported changing their views in the past year due to the program. However, due to the small sample sizes these results are too weak to indicate a market effect.
- No differences were found between participants and nonparticipants for cost effectiveness ratings of high efficiency equipment. While a small percentage of nonparticipants and nonparticipants with training reported changing their views due to the program, the sample sizes are too small to indicate a market effect.
- No differences were found between participants and nonparticipants for cost effectiveness ratings of duct services. However, when looking at self-reported changes in cost-effectiveness ratings, 70% of the 14 participants who had changed their views reported that the change was due to the program. In addition, 97% of the four nonparticipants with training who had changed their views did so due to the program. This evidence suggests a program-related change in awareness.
- All respondents reported recommending more high efficiency equipment and duct services than they did a year ago. The percentages for participants were significantly higher than for nonparticipants. Moreover, when looking at self-reported changes, 61% of the 15 participants who are recommending more this year attributed their change to the RCP, and 18% of them will continue to do it without the program. This suggests a program-induced change in the market.

In summary, sufficient evidence was found to support a program-related change in contractors' awareness of the benefits of duct testing and sealing. Moreover, evidence was found to show that participants are recommending more high efficiency measures as a result of the program. Due to the sustainable nature of awareness, and to evidence from survey responses showing recommendations for high efficiency measures will continue without the program, these effects are likely to be sustainable.

HVAC Hypothesis Two: Increased Jobs

By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of jobs for contractors.

This hypothesis was tested by looking at the following indicators:

- Increases in the number of retrofit jobs over the past year, and
- Increases in the number of diagnostic jobs over the past year.

To support the hypothesis, more participants than nonparticipants would need to have experienced an increase in jobs. As further evidence, the self-reported impacts were considered.

Increase in Retrofits

Table 2-7 presents the mean responses for questions regarding increases in retrofit jobs. As shown, a similar proportion of participants and nonparticipants reported an increase in jobs over the past year.

Table 2-7: Increases in Retrofit Jobs

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Increase in number of retrofit jobs	37.0% (0.10) n = 23	38.3% (0.07) n = 49	51.1% (0.16) n = 11	39.6% (0.05) n = 83
Amount of increase	17.2% (6.17) n = 8	25.3% (2.24) n = 17	14.1% (2.63) n = 4	20.1% (2.38) n = 29

Values are weighted means. Weighted standard errors are shown in parentheses.

Surprisingly, nonparticipants with RCP training reported the highest percentage for contractors with increased jobs. This group had not processed any RCP vouchers, so increased jobs were not directly through the program. When asked about this further, these respondents explained that the program had influenced their marketing efforts. For example, during the in-depth interviews with HVAC contractors, several respondents described how they had responded to requests for RCP work (or marketed on their own) and, after explaining to the customer what the job would cost and what proportion would be covered by the voucher, the customer decided against proceeding with the incentivized measure. This was especially true for duct sealing, they explained. However, they would often get a job from that customer anyway – for some reduced service that was not covered by the program vouchers. So, even though these respondents are not submitting program vouchers, they are experiencing increased work through the program.

It is interesting to note that only one participant identified RCP vouchers as the cause of the increased jobs. The remaining participants who attributed their increased jobs to the RCP explained that they were promoting themselves more. As one contractor put it, he advertises

the fact that he is an RCP-approved contractor. Reasons given by nonparticipants for job increases include the following:

- The economy is better,
- Customers are more receptive and aware,
- We hired more employees,
- We are marketing more,
- Older people want comfort at home, and
- Equipment is available.

Table 2-8 presents information on contractors' self-reported impacts. As shown, 45% of the participants and 81% of the nonparticipants with training who reported an increase in jobs attributed it to the RCP. In addition, one nonparticipant attributed his increased jobs to the program, explaining that customers are more aware of the benefits retrofits because of the program. Furthermore, the majority of these respondents who credited the RCP with their increased jobs indicated that they thought the increase would continue even without the program.

Table 2-8: Increases in Jobs Due to RCP

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Increase due to RCP	44.7% (0.17) n = 10	0.5% (0.01) n = 22	81.2% (0.20) n = 5	30.6% (0.08) n = 37
Increase is sustainable	80.0% (0.23) n = 4	0.0% (0.00) n = 1	100.0% (0.00) n = 2	88.9% (0.13) n = 7

Values are weighted means. Weighted standard errors are shown in parentheses.

Increase in Diagnostics

Contractors were also surveyed regarding increases in jobs for diagnostic services. Air conditioning maintenance and duct testing were asked about separately.

Table 2-9 presents the mean responses regarding increases in air conditioning maintenance jobs. Note that these questions were asked only of contractors who had been offering this

service for more than one year,[11] and therefore the sample sizes are lower than the completed sample of contractors.

Table 2-9: Increases in AC Maintenance Jobs

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Increase in number of ac maintenance jobs	72.3% (0.12) n = 16	57.1% (0.08) n = 44	81.0% (0.12) n = 11	66.1% (0.06) n = 71
Amount of increase	19.3% (5.71) n = 9	18.5% (3.40) n = 19	21.4% (9.46) n = 5	19.3% (2.84) n = 33
Increase due to RCP	33.0% (0.16) n = 10	0.5% (0.01) n = 23	21.2% (0.20) n = 5	16.9% (0.06) n = 38
Increase is sustainable	1.8% (0.07) n = 5	100% (0.00) n = 1	100% (0.00) n = 1	25.1% (0.18) n = 7

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, more participants than nonparticipants reported an increase in air conditioning maintenance jobs (72% versus 57%). The proportion of nonparticipants with training reporting an increase is even higher. Moreover, the difference in these means is significant. While this result with nonparticipants with training may seem unusual, it was found during the in-depth interviews that contractors are getting new jobs through the program without the use of vouchers (this effect is explained in more detail above). The estimated amount of the increase experienced by respondents is essentially the same. Furthermore, a third of the participants and a fifth of the nonparticipants with training who reported an increase in jobs attributed the increase to the RCP.

One-third of the participants reported that their increase in these jobs was due to the RCP. However, most of the participants who credited the program for their increase in jobs explained they thought it was due to the vouchers and not sustainable. One nonparticipant attributed his increase to the program and explained that customers are more receptive as a result of the RCP. Similarly, one nonparticipant with training credited the program for his increase and explained that he knew more now and was able to market the service better.

[11] In order to determine if an increase had been experienced over the past year, contractors needed to have offered the service in the previous year.

Contractors who reported offering duct testing services for more than one year were also asked about increases in the past year for those types of jobs. The results are presented in Table 2-10. Note the sample sizes are very small for the participants. This is because, as will be seen when testing hypothesis four, many of the participant contractors surveyed just started this service in the past year.

Table 2-10: Increases in Duct Testing Jobs

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Increase in number of duct testing jobs	70.4% (0.32) n = 3	41.0% (0.12) n = 19	63.7% (0.24) n = 5	54.9% (0.10) n = 27
Amount of increase	26.8% (4.64) n = 2	14.9% (1.05) n = 4	29.2% (20.0) n = 2	24.1% (4.48) n = 8
Increase due to RCP	100% (0.00) n = 2	0.0% (0.00) n = 6	52.0% (0.50) n = 2	53.7% (0.17) n = 10
Increase is sustainable	0.0% (0.00) n = 2	N/A	100% (0.00) n = 1	20.6% (0.29) n = 3

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, a higher proportion of participants than nonparticipants reported an increase in duct testing jobs. Furthermore, differences in these means are significant. It is important to remember that these numbers reflect only responses of contractors who had been offering this service for more than year. Other duct testing jobs may have been experienced by contractors who started offering this service during the past year. Furthermore, nonparticipants who report that they offer duct testing services may not be referring to the duct testing service incentivized by the RCP. For example, one nonparticipant interviewed in-depth explained that he offered duct testing and his method was to visually inspect the ducts.[12]

When looking at the self-reported impacts, it is interesting to note that the two participants who reported an increase in duct testing jobs attributed it to the program. They further explained that this was due to the program vouchers. It is not surprising, therefore, that

[12] This issue was clarified in the telephone surveys by asking each respondent who reported offering duct testing if they also owned duct testing equipment.

neither thought the increase would continue without the program. Of the two nonparticipants with training who reported an increase in jobs, one thought it was due to the program and would be sustainable. This result seems unlikely since this respondent had not yet processed any vouchers under the program. However, as described previously, some contractors have obtained non-incentivized jobs from customers inquiring about the program. Overall, when taken by themselves, these results are too weak to be used as evidence for a sustainable market effect due to the small sample sizes.

Summary of Hypothesis Two Results

The hypothesis that the RCP increased jobs for contractors was examined by comparing responses from participants and nonparticipants on whether or not their jobs had increased over the past year. Retrofits and diagnostics were asked about separately.

The results for retrofit jobs are as follows:

- Both participants and nonparticipants experienced similar increases in jobs.
- Nonparticipants with training reported higher increases in jobs than did the other groups. The majority of these respondents identified their increased marketing efforts related to the RCP program as the reason they had more jobs. In addition, some are receiving work from customers who initially ask about RCP measures but end up choosing other services instead.
- A majority of nonparticipants with training and 45% of participants attributed their increased jobs to the RCP. For the most part, this is not due to vouchers but to marketing benefits and increased customer awareness generated by the program.
- Most respondents who attributed their increased jobs to the RCP also thought the effect would outlive the program. As vouchers are not driving this increase in jobs, this is most likely true.

The following presents a summary of the results for increases in diagnostic jobs.

- More participants and nonparticipants with training, who had been offering air conditioning maintenance for more than a year, reported increases in these jobs over the past year than did nonparticipants.
- A third of the participants surveyed thought the increase in air conditioning maintenance jobs was due to the program. Most of these identified the program vouchers as the cause and expected the increase to diminish without the program.
- One nonparticipant and one nonparticipant with training also identified the RCP as increasing the number of air conditioning maintenance jobs for them. However, due to the small sample sizes, this is weak evidence of a market effect when taken by itself.

- A greater proportion of participants and nonparticipants with training, who had been offering duct testing for more than a year, reported increases in these jobs over the past year than did nonparticipants. However, the sample size for participants is very small.
- Two participants experienced an increase in duct testing jobs and attributed it to the program. However, they felt it was due to the vouchers and would not be sustainable without the program.
- One nonparticipant with training attributed his increase in duct testing jobs to the program and thought the effect was sustainable.

In summary, some evidence to support an increase in retrofit and diagnostic jobs that could be attributed to the RCP was found. Interestingly, most respondents thought the increase for retrofit jobs was due to better marketing and customer awareness related to the program rather than actual incentivized jobs obtained through the program. For diagnostic jobs, however, they felt the increase was due to the incentive and therefore would not continue without the program. Furthermore, due to small sample sizes, the results for this hypothesis are weak.

HVAC Hypothesis Three: Increased Energy Efficiency Per Job

By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the level of energy efficiency achieved per job.

This indicators considered to test this hypothesis are the following:

- Changes in equipment installation practices over the past year, and
- Changes in duct sealing practices over the past year.

In order to support a change in the market due to the program, more participants than nonparticipants would need to have changed their procedures, or, alternatively, respondents would need to attribute their changes to the program.

Equipment Installation

As shown in Table 2-11, more participants than nonparticipants reported changing their equipment installation procedures over the past year. Furthermore, the difference in means between these groups is significant. When looked at more closely, the majority of these changes were the addition of duct sealing or duct testing measures. Moreover, 80% of these participants identified the RCP program as the reason for making the change and 56% of these reported they would continue even in the absence of the program.

Table 2-11: Changes in Equipment Installation Practices

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Changes in equipment installation procedures	37.8% (0.10) n = 23	24.5% (0.06) n = 49	11.7% (0.10) n = 11	27.8% (0.05) n = 83
Installing more high efficiency equipment	1.3% (0.03) n = 13	26.2% (0.16) n = 9	0.0% (0.00) n = 2	11.9% (0.07) n = 24
Including duct measures when installing equipment	70.4% (0.13) n = 13	30.9% (0.16) n = 9	89.3% (0.31) n = 2	54.7% (0.10) n = 24
Changes in installation procedures are due to RCP training	80.1% (0.12) n = 13	0.0% (0.00) n = 9	0.0% (0.00) n = 2	41.3% (0.10) n = 24
Changes in installation procedures due to RCP are sustainable	56.3% (0.20) n = 7	N/A	N/A	56.3% (0.20) n = 7

Values are weighted means. Weighted standard errors are shown in parentheses.

Duct Sealing

As another indicator of energy efficiency gains, respondents were asked if they had made any changes in the past year in the way they sealed ducts. As shown in Table 2-12, roughly equal percentages of participants and nonparticipants with training reported making changes. Moreover, these percentages are significantly higher than that reported for nonparticipants. For the most part, the types of changes reported included using better quality tapes and sealing with mastic. Eighty-five percent of participants and nearly 50% of nonparticipants with training attributed these changes to the program training they received. Furthermore, 46% of the participants and 94% of the nonparticipants with training who identified RCP training as the cause of their changes said that they would continue in the absence of the program.

Table 2-12: Changes in Duct Sealing Procedures

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Changes in duct sealing procedures	56.1% (0.11) n = 23	23.9% (0.06) n = 48	56.3% (0.16) n = 11	40.7% (0.05) n = 82
Changes are due to RCP training	84.6% (0.10) n = 15	0.0% (0.00) n = 5	48.5% (0.22) n = 6	53.7% (0.10) n = 26
Changes due to RCP training are sustainable	45.8% (0.16) n = 11	N/A	93.6% (0.17) n = 3	54.1% (0.14) n = 14

Values are weighted means. Weighted standard errors are shown in parentheses.

Summary of Hypothesis Three Results

The hypothesis that the RCP training improved the level of energy efficiency per job for contractors was examined by comparing responses from participants and nonparticipants on whether or not they had changed equipment installation practices or duct sealing methods. In addition, self-reported program attribution was considered. The results are as follows.

- More participants than nonparticipants reported changing equipment installation procedures over the past year. For the most part, these changes consisted of the addition of duct sealing or testing measures along with equipment installation.
- The majority of these participants reported changing as a result of the RCP. Furthermore, they said they would continue these practices even without the program.
- The difference in duct sealing methods made by the RCP training is evident. A majority of participants and nonparticipants with training identified their RCP training as the reason they improved their practices in the past year.
- These respondents also reported that they would continue with these improved practices even without the program.

In summary, sufficient evidence was found to support the hypothesis that energy efficiency gains per job were increased as a result of the RCP. Moreover, these changes directly relate to duct testing and sealing methods that were learned in the training sessions offered by the program.

HVAC Hypothesis Four: Increase in Contractors Who Offer Diagnostics

By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of contractors who provide HVAC diagnostics.

This hypothesis was tested by asking contractors when and why they started performing diagnostic services. In order to support a change in the market due to the program, more participants than nonparticipants would need to have started this service as a result of the program. In addition, self-reported program attribution was considered.

As shown in Table 2-13, nearly every respondent reported offering air conditioning maintenance diagnostics. Moreover, 11% of participants reported that they had started offering this service within the past year. When compared with nonparticipants, only 2% of whom reported starting this service within the past year, it appears that the program has had an effect in this area. Furthermore, the difference in means between participants and nonparticipants is significant.

Table 2-13: Contractors Offering AC Maintenance Services

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Provides service	100.0% (0.00) n = 23	98.6% (0.02) n = 49	100.0% (0.00) n = 11	99.3% (0.01) n = 83
Started service in past year	10.8% (0.07) n = 23	2.0% (0.02) n = 45	0.0% (0.00) n = 11	5.1% (0.02) n = 79
Started as a result of RCP	76.5% (0.17) n = 7	0.0% (0.00) n = 1	N/A	61.9% (0.18) n = 8
Will continue service without RCP	100% (0.00) n = 5	N/A	N/A	100% (0.00) n = 5

Values are weighted means. Weighted standard errors are shown in parentheses.

As further evidence of a market effect, 77% of those participants who reported starting this service in the past year said they did so as a result of the RCP, and all of these said they would continue the service even without the program.

Respondents were also asked about duct testing services. As shown in Table 2-14, many more participants offer this service than do nonparticipants (96% compared to 41%). In addition, 82% of nonparticipants with RCP training reported offering this service. Furthermore, the differences in means between these groups are significant. Reasons given for not offering the service include the following:

- There is no demand for it from customers,
- It is not cost effective,
- The equipment is expensive,
- We do it but only for new construction,
- We are too busy already, and
- We don't have the manpower.

Table 2-14: Contractors Offering Duct Testing Services

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Provides service	96.2% (0.04) n = 23	41.1% (0.07) n = 49	81.9% (0.12) n = 11	67.6% (0.05) n = 83
Started service in past year	61.8% (0.10) n = 23	2.0% (0.02) n = 49	30.1% (0.15) n = 11	28.5% (0.05) n = 83
Started as a result of RCP	91.1% (0.07) n = 19	0.0% (0.00) n = 1	100% (0.00) n = 4	89.4% (0.06) n = 24
Will continue service without RCP	86.9% (0.09) n = 14	N/A	100% (0.00) n = 4	89.0% (0.08) n = 18

Values are weighted means. Weighted standard errors are shown in parentheses.

Most participants (62%) and 30% of nonparticipants with training started offering duct testing services within the past year. The differences between these groups and nonparticipants, of which 2% reported starting in the past year, are significant. Further, nearly all participants and nonparticipants with training who started this service in the past year also reported that they started as a result of the RCP and would continue offering the service even without the program.

Summary of Hypothesis Four Results

The hypothesis that the RCP training increased the number of contractors who offer diagnostic services was examined by comparing responses from participants and nonparticipants on when they began offering this service and why. Services for air conditioning maintenance and duct testing were looked at separately. In addition, self-reported program attribution was considered.

The results for air conditioning maintenance are as follows:

- Nearly all respondents, participants and nonparticipants, offer this service and most have been doing so for years.
- Significantly more participants than nonparticipants reported starting the service in the past year and most of these started as a result of their participation in the RCP.
- All participants who started as a result of the RCP will continue offering this service even without the program.

The following summarizes the results for duct testing:

- The percentages for participants and nonparticipants with training who offer duct testing were twice that of nonparticipants.
- Two-thirds of participants and 1/3 of nonparticipants with training started these services in the past year. These proportions are significantly larger than that for nonparticipants.
- Nearly all these who reported starting in the past year did so because of the program.
- Most who started offering duct testing as part of the RCP will continue even without the program.

In summary, sufficient evidence was found to support the hypothesis that the RCP increased the number of contractors who offer diagnostic services. This result is true for both air conditioning maintenance and duct testing. While the results for air conditioning maintenance are based on smaller sample sizes (as nearly all contractors had been offering this service for more than a year), the results for duct testing are strong. A significant proportion of contractors surveyed started this service as a result of the program and plan to continue it.

HVAC Hypothesis Five: Improved Diagnostics

By providing training for contractors on diagnostic/tune-up procedures, RCP improved these practices.

This hypothesis was tested by looking at changes in procedures contractors had made over the past year in air conditioning maintenance and in duct testing. These questions were asked only of contractors who had been offering these services for more than one year. For this reason, sample sizes are smaller than the completed sample of surveyed contractors. In order to support the hypothesis, more participants than nonparticipants would need to have made changes in their procedures. In addition, self-reported attribution to the program was considered.

Air Conditioning Maintenance

As shown in Table 2-15, roughly half of participants and nonparticipants with training reported making changes in the past year in the way they perform air conditioning maintenance. In comparison, only 19% of nonparticipants reported making these changes. Moreover, when evaluating the standard errors for these means, the differences between groups are significant.

Table 2-15: Changes in Air Conditioning Maintenance Procedures

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Changes in air conditioning maintenance procedures	58.7% (0.13) n = 16	19.2% (0.06) n = 44	50.2% (0.16) n = 11	37.9% (0.06) n = 71
Changes are due to RCP training	96.4% (0.07) n = 8	0.0% (0.00) n = 9	86.1% (0.20) n = 4	70.2% (0.10) n = 21
Changes due to RCP training are sustainable	48.0% (0.20) n = 7	N/A	100.0% (0.00) n = 3	60.5% (0.16) n = 10

Values are weighted means. Weighted standard errors are shown in parentheses.

The following are some of the changes that respondents described making in the way they perform air conditioning maintenance:

- We use fluorescent dyes,
- We check for cracked fireboxes,
- We have new testing equipment,
- We test the electronics and controls now, and
- We are more accurate and thorough.

When looking at self-reported program attribution in Table 2-15, it is evident that most of the participants and nonparticipants with training who reported making changes did so because of the program. Moreover, all of the nonparticipants with training and nearly half of the participants who changed due to the RCP stated they would continue with these procedures even without the program.

Duct Testing

Contractors were asked if they had changed any of their procedures in the past year. As these questions were asked only of contractors who had been offering duct testing services for more than one year, the sample sizes are lower than the completed sample. In particular, the sample of participants is comprised of only three respondents, as most participants had started offering duct testing only in the past year. Table 2-16 presents the results.

Table 2-16: Changes in Duct Testing Procedures

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Changes in duct testing procedures	48.1% (0.35) n = 3	0.0% (0.00) n = 19	0.0% (0.00) n = 5	16.0% (0.07) n = 27
Changes are due to RCP training	100% (0.00) n = 1	N/A	N/A	100% (0.00) n = 1
Changes due to RCP training are sustainable	100% (0.00) n = 1	N/A	N/A	100% (0.00) n = 1

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, nearly half of the participants offering duct testing made changes in the past year. In comparison, none of the nonparticipants reported changes. However, this result represents changes reported by one participant and therefore is weak evidence of a market effect. When asked what changes he had made, the respondent explained he was "conforming with RCP standards." It is not surprising then that the participant attributed his changes to the program and reported that he would continue them after the program ended.

Summary of Hypothesis Five Results

The hypothesis that the RCP training improved diagnostic procedures was examined by comparing the proportion of participants and nonparticipants who had made changes in the past year. In addition, responses regarding what changes they had made year and why were

examined. Services for air conditioning maintenance and duct testing were looked at separately. The following summarizes the results.

- For air conditioning maintenance, a significantly higher proportion of participants and nonparticipants with training reported making changes over the past year in the way they perform this service than did nonparticipants.
- Of these participants and participants with training who reported changes, most said they were due to the RCP. Of these, nearly half the participants and all of the nonparticipants with training reported that the changes were sustainable.
- For duct testing, nearly 50% of the participants who had been offering duct testing services changed their procedures in the past year. In comparison, no nonparticipants changed their procedures. However, this result represents one respondent and is therefore too weak to use as evidence of a market effect.

In summary, some evidence was found to support the hypothesis that the RCP improved diagnostic procedures for participant contractors. The evidence is sufficient for air conditioning maintenance. For duct testing, however, the sample sizes are too small to support a market effect.

HVAC Hypothesis Six: Increased Contractor Awareness of Whole-System Treatments

By offering incentives for packages of measures, the RCP increased contractor awareness of whole-system treatments.

This hypothesis was tested by asking contractors if, when they installed equipment, they considered changes to the distribution system that would affect the overall efficiency of the HVAC system. Further, respondents were asked if they had increased this tendency over the past year. Those who reported they had were further asked why they had done so. Responses of participants, nonparticipants, and nonparticipants with RCP training were compared.

Contractors Considering Overall Efficiency

As shown in Table 2-17, each of the participants and the nonparticipants with training reported that they consider the changes in the distribution system that may effect the overall efficiency of the HVAC system. Nearly all of the nonparticipants, 92%, also reported that they consider this. However, it is important to note that of those respondents that reported they are concerned with the overall efficiency of the HVAC system, not all of them offer duct testing. While a majority of participants (96%) and nonparticipants with training (82%) reported that they do offer duct testing, only 44% of nonparticipants reported that they offered duct testing. The percentage of nonparticipants that offer duct testing services similar

to those offered by RCP approved contractors might be even smaller. One nonparticipant that was interviewed in-depth reported offering duct testing, but when he was asked if his company owned duct testing equipment, he said that he didn't feel that any equipment is necessary to do duct testing. He went on to explain that to test ducts, "all you have to do is inspect the duct system visually." For this reason, it should be assumed that the percentage of nonparticipants that actually do duct testing might be fewer than 44%.[13]

Table 2-17: Contractors Aware of Whole-System Treatments

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Contractors considering changes in the distribution system that may effect the overall efficiency of the HVAC system	100.0% (0.00) n = 23	92.0% (0.04) n = 49	100.0% (0.00) n = 11	96.1% (0.02) n = 83
Contractors reporting they offer whole-system treatments and duct testing	96.2% (0.04) n = 23	43.7% (0.08) n = 42	81.9% (0.12) n = 11	69.8% (0.05) n = 76

Values are weighted means. Weighted standard errors are shown in parentheses.

Based on the results shown in Table 2-17, significantly more participants and nonparticipants with training reported offering whole-system treatments than did nonparticipants. Moreover, when the respondents are further limited to those who offer duct testing, the differences are even more significant. This suggests the program may have had an effect in this area.

Changes in Offering Whole-System Treatments

HVAC contractors were asked if their tendency to offer whole-system treatments changed over the past year. This question was asked only of those contractors who reported that they both consider changes in the distribution system that may effect the overall efficiency of the HVAC system and that offer duct testing. As shown in Table 2-18, more nonparticipants (30.5%) reported making a change than did participants (11.5%). In addition, nearly two-thirds of nonparticipants with training reported making a change. The lower proportion of participants making changes suggests that some participants were doing this before the RCP program. In fact, three participants that were interviewed in-depth said they had not made a change and explained that they had always offered whole-system treatments. It is also not surprising that 66% of nonparticipants with training reported offering whole-system

[13] To clarify this issue, during the telephone surveys every respondent who reported offering duct testing was also asked if they owned the equipment.

treatments more over the past year since all of these HVAC contractors have recently taken the training offered by the RCP.

Table 2-18: Increase in Whole-System Services Offered

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Contractors offering whole-system treatments more over the past year	11.5% (0.07) n = 22	30.5% (0.12) n = 17	66.2% (0.17) n = 9	26.2% (0.06) n = 48
Contractors offering whole-system treatments more in the past year due to RCP	42.5% (0.17) n = 9	0.0% (0.00) n = 2	82.0% (0.17) n = 6	45.4% (0.12) n = 17
Change of offering more whole-system treatments is sustainable	90.7% (0.13) n = 6	N/A	100.0% (0.00) n = 4	97.7% (0.05) n = 10

Values are weighted means. Weighted standard errors are shown in parentheses.

Nearly 43% of participants that reported offering more whole-system treatments over the past year did so due to the RCP. Even more nonparticipants with training reported making the change due to the RCP – approximately 82%, while none of the nonparticipants attributed the change to the RCP. Furthermore, nearly all respondents identifying the RCP as the reason they changed said that they would continue to off whole-system treatments without the program.

Reasons given by nonparticipants for the offering whole-system treatments more over the past year include the following:

- We are marketing it more,
- Customers are more aware, and
- I know more about it now.

Contractors giving these responses were further asked if the program had an influence on customer awareness or their own knowledge or marketing practices. Both nonparticipants indicated it had not, as reflected in Table 2-18.

Summary of Hypothesis Six Results

The hypothesis that the RCP increased contractors' awareness of whole-system treatments was examined by comparing responses from participants and nonparticipants regarding

changes they had made over the previous year in offering whole-system treatments. The following summarizes these results.

- Nearly all respondents reported that they consider changes in the distribution system that may affect the overall efficiency of the HVAC system. However, many nonparticipants claim to consider changes in the distribution system that may effect the overall efficiency of the HVAC system, but nearly half of them do not offer duct testing.
- More nonparticipants than participants reported offering more whole-system treatments over the past year. However, the proportion of nonparticipants with training that reported similar changes is greater than that of nonparticipants.
- When looking at self-reported impacts, 42% of participants and 82% of nonparticipants report increasing their whole-system treatments due to the program.
- Most respondents who reported changing due to the program also indicated they would continue these practices even without the RCP.

In summary, some evidence was found to support a program-related change in contractors' awareness of whole-system treatments. While the percentage of participants who reported increasing their offers is much less than nonparticipants, the majority of nonparticipants with training reported increasing their offers of whole-system treatments over the past year. Furthermore, the survey responses indicate that most attribute this to the RCP and will continue even without the program.

HVAC Hypothesis Seven: Increased Customer Awareness of Whole-system Treatments

By offering incentives for packages of measures, the RCP increased the number of customers who are aware of whole-system treatments, duct diagnostics and sealing, and diagnostic tune-up procedures.

This hypothesis was tested by asking contractors to report their perspectives on changes in their customers' awareness of duct sealing and testing treatments. In addition, respondents were asked if their customers were more willing to do these treatments and why. To support the hypothesis, respondents would need to attribute increases in customer awareness and willingness to the RCP.

As shown in Table 2-19, 62% of participants and 67% of nonparticipants with training reported that customers are more aware of the benefits of duct sealing and duct testing than they previously were. Nearly half of the nonparticipants interviewed, 45%, also feel that

customers are more aware than they used to be. Furthermore, the differences between these groups are significant.

Table 2-19: Contractors' Perceptions of Customer Whole-Service Awareness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Customers more aware of the benefits of duct sealing and duct testing	61.9% (0.10) n = 23	45.0% (0.07) n = 48	67.3% (0.15) n = 11	54.5% (0.06) n = 82
Increased customer awareness is due to RCP	56.0% (0.13) n = 16	44.7% (0.14) n = 14	63.6% (0.22) n = 6	52.8% (0.08) n = 36

Values are weighted means. Weighted standard errors are shown in parentheses.

Table 2-19 also shows that a large proportion of each group who reported increased awareness also indicated it was due to the RCP. Because these results may include responses from contractors who do not themselves offer these services, the results were also considered for the subset of respondents who offer duct testing. Interestingly, while the means did not change for participants and nonparticipants with training, they did change for nonparticipants. Specifically, none of the nonparticipants attributed the increased customer awareness to the RCP.

Many contractors also pointed out that most customers do not know anything about the benefits of duct testing until they educate the customers themselves. Other reasons given by respondents for increased customer awareness included the following:

- Information from utilities,
- Home improvement shows,
- Manufacturers' literature,
- News articles and television specials on clean air, and
- Research on the Internet.

Contractors that reported that their customers are more aware of the benefits of duct sealing and duct testing were further asked if their customers were also more willing to have these services performed. Table 2-20 presents the mean responses. As shown, nearly all of the nonparticipants and nonparticipants with training and half of the participants reported increased customer willingness. Furthermore, one-fourth of the participants and more than half of the nonparticipants with training identified the RCP as the reason for the increase.

Table 2-20: Contractors' Perceptions of Customer Willingness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Customers more willing to do duct sealing and duct testing	53.2% (0.12) n = 18	97.6% (0.04) n = 16	97.4% (0.07) n = 6	79.0% (0.07) n = 40
Increased customer willingness is due to RCP	24.5% (0.12) n = 14	0.0% (0.00) n = 12	50.3% (0.25) n = 5	17.1% (0.07) n = 31

Values are weighted means. Weighted standard errors are shown in parentheses.

Nonparticipants identified the following reasons for increased customer willingness:

- They are more aware,
- Information customers receive from utilities,
- We are selling them on it,
- Information from the media,
- Energy prices are high and they want to save money, and
- They want more comfort in their home.

Respondents were queried further to see if the utility information or customer awareness were related to the RCP program. Nonparticipants indicated it was not, as reflected in Table 2-20.

Summary of Hypothesis Seven Results

The hypothesis that the RCP increased customers' awareness of whole-system treatments was examined by comparing responses from participant and nonparticipant contractors regarding their perceptions of changes in their customers' awareness of duct sealing and testing treatments as well as their willingness to do these treatments. In addition, self-reported program attribution was considered. The following summarizes these results.

- A majority of participants and nonparticipants with training and 45% of nonparticipants reported that customers are more aware of the benefits of duct sealing and testing than they were one year ago.
- The majority of those participants and nonparticipants with training who reported their customers are more aware identified the RCP as the reason.
- Many respondents who reported customers are more aware also reported that their customers are more willing to do these treatments.

- One-fourth of participants and half of the nonparticipants with training identified the program as the reason customers are more willing to do whole-system treatments.

In summary, some evidence was found to support a program-induced change in customer awareness of whole-system treatments. Moreover, due to the sustainable nature of awareness, this change is expected to continue even in the absence of the program. The result is somewhat weakened, however, by the finding that many respondents believe their customers are willing to do the treatments based on reasons unrelated to the program.

2.3 Contractors' Perceptions of the Market

HVAC contractors were asked about their perceptions of customer awareness and market potential. While this information is not direct evidence of changes in contractors' attitudes or practices effected by the program, it is weak evidence that there may be changes in customers' beliefs or behaviors.

Customer Awareness

Respondents were asked to rate on a scale of one to ten how aware their customers were of the RCP. The scale was structured so that one meant "unaware," and ten meant "very aware." Responses are presented only for contractors who reported being aware of the program themselves. Table 2-21 presents the results. As shown, all responses are relatively low and significantly not different from each other.

Table 2-21: HVAC Contractors' Ratings of Customers' Awareness of RCP

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Customers aware of RCP (1 to 10 scale)	3.26 (0.56) n = 14	3.45 (0.38) n = 20	3.06 (0.77) n = 9	3.28 (0.30) n = 43

Values are weighted means. Weighted standard errors are shown in parentheses.

Furthermore, contractors were asked how much influence, on a scale of 1 to 10, the RCP has had on customer demand for high efficiency equipment, duct sealing, and duct testing. A one on the scale represented "no influence," and a ten represented "very high influence." Again, responses are reported only for respondents who reported being aware of the program themselves. As shown in Table 2-22, all respondents reported relatively low ratings of influence of the RCP on customer demand. In addition, the differences in the means are not significant.

Table 2-22: HVAC Contractors' Ratings of RCP Influence on Customer Demand

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Influence of RCP on customer demand for high efficiency equipment (1 to 10 scale)	4.07 (0.61) n = 19	4.00 (0.62) n = 22	3.29 (0.75) n = 9	3.91 (0.37) n = 50
Influence of RCP on customer demand for duct sealing (1 to 10 scale)	4.44 (0.71) n = 19	3.50 (0.51) n = 22	3.72 (0.85) n = 9	4.01 (0.39) n = 50
Influence of RCP on customer demand for duct testing (1 to 10 scale)	4.70 (0.72) n = 19	3.56 (0.53) n = 21	3.70 (0.85) n = 9	4.16 (0.40) n = 49

Values are weighted means. Weighted standard errors are shown in parentheses.

These results are not surprising, however, as the program has been in effect less than one year and has not been marketed to a large extent.

Market Potential

Contractors were asked what potential they saw in their area for upgrading existing homes with heating and cooling equipment and with duct services. Table 2-23 presents the mean responses on these questions.

Table 2-23: Contractors' Perceptions of Market Potential for Equipment

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Homes in area that could still upgrade heating & cooling equipment for reasonable cost	56.3% (4.38) n = 23	57.2% (2.80) n = 43	82.4% (6.07) n = 11	60.5% (2.44) n = 77
Owners likely to have work done	38.5% (5.97) n = 23	24.4% (2.54) n = 42	35.3% (7.50) n = 11	31.7% (2.74) n = 76

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, participants and nonparticipants both estimated that nearly 60% of the homes in their area could have their heating and cooling equipment upgraded for a reasonable cost. The difference in the means between these two groups is not significant. Nonparticipants with training, however, did report a significantly higher proportion of homes than either of the other groups.

Table 2-23 also shows that participants estimated that nearly 40% of the owners of these homes were likely to have the work done. The proportions reported for nonparticipants and nonparticipants with training are 25% and 35% respectively; however, these are not significantly different from each other.

A similar result was found when HVAC contractors were asked about the percentage of homes that could reduce their duct leakage for a reasonable cost. As shown in Table 2-24, participants and nonparticipants agreed that approximately 57% of the homes in their area could reduce their duct leakage, while nonparticipants with training reported a higher percentage (86.6%). The responses for the percentage of owners likely to have the work done were between 19% and 25%; however, the differences in means between these groups are not significant.

Table 2-24: Contractors' Perceptions of Market Potential for Ducts

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Homes in area that could still upgrade ducts for reasonable cost	57.7% (7.81) n = 23	57.2% (3.52) n = 41	86.6% (5.31) n = 10	61.6% (3.53) n = 74
Owners likely to have work done	22.7% (5.5) n = 23	18.9% (2.26) n = 39	24.6% (7.3) n = 10	21.3% (2.48) n = 73

Values are weighted means. Weighted standard errors are shown in parentheses.

Contractors were further asked if the percentages of customers likely to do the upgrades had changed in the past year and why. As shown in Table 2-25, nearly half of both the participants and nonparticipants with training reported that they had. In comparison, less than one-fifth of the nonparticipants had changed their estimations. Furthermore, many more participants reported that this increase was due to the RCP than did the nonparticipants and the nonparticipants with training.

Table 2-25: Changes in Likelihood of Upgrading Homes

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Likelihood of customers upgrading has changed in past year	49.3% (0.11) n = 22	18.9% (0.06) n = 45	52.5% (0.16) n = 11	35.7% (0.05) n = 78
Change in likelihood is due to RCP	82.9% (0.10) n = 14	28.5% (0.20) n = 6	32.7% (0.23) n = 5	58.9% (0.10) n = 25
Change in likelihood is sustainable	34.2% (0.17) n = 9	100.0% (0.00) n = 1	100.0% (0.00) n = 1	49.7% (0.16) n = 11

Values are weighted means. Weighted standard errors are shown in parentheses.

Each of the contractors who attributed the change to the RCP was also asked whether they thought the change was sustainable. As shown, approximately 34% of the participants who attributed the change to the RCP reported that homeowners would continue the tendency if the program were discontinued.

Product and Labor Availability

HVAC contractors were also asked if they would have any trouble expanding their services if there was an increase in demand for HVAC retrofits or diagnostics. As shown in Table 2-26, the proportions of respondents who reported that they would have trouble expanding their services are low for all groups. (Note that only the contractors that reported offering duct testing were asked if they would have trouble expanding services for duct testing and duct sealing.)

Table 2-26: HVAC Contractors' Ability to Expand Services

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Would have trouble expanding services for HVAC retrofits	8.8% (0.06) n = 23	12.5% (0.05) n = 48	16.4% (0.12) n = 11	11.6% (0.04) n = 82
Would have trouble expanding services for ac maintenance	21.1% (0.09) n = 23	17.0% (0.05) n = 48	13.6% (0.11) n = 11	18.1% (0.04) n = 82
Would have trouble expanding services for duct testing and duct sealing	9.1% (0.06) n = 22	6.8% (0.06) n = 20	14.9% (0.13) n = 9	9.4% (0.04) n = 51

Values are weighted means. Weighted standard errors are shown in parentheses.

The only potential problem that most respondents reported was finding qualified labor. As shown in Table 2-27, approximately 70% of participants reported they would have trouble finding qualified labor, while 57% of nonparticipants and 60% of nonparticipants with training would have the same problem.

Table 2-27: HVAC Contractors' Barriers to Expansion

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Would have trouble finding qualified labor	69.4% (0.10) n = 23	56.9% (0.07) n = 49	59.8% (0.16) n = 11	62.1% (0.05) n = 83
Would have trouble finding high efficiency air conditioning and heating units	0.0% (0.00) n = 23	2.2% (0.02) n = 49	0.0% (0.00) n = 11	1.1% (0.01) n = 83
Would have trouble acquiring diagnostic equipment	0.0% (0.00) n = 22	0.0% (0.00) n = 20	0.0% (0.00) n = 9	0.0% (0.00) n = 51

Values are weighted means. Weighted standard errors are shown in parentheses.

Respondents were also asked if they would have trouble finding high efficiency air conditioning units and heating units. As shown in Table 2-27, only a small percentage of the HVAC contractors reported that they would have trouble finding high efficiency air conditioning. Contractors who reported offering duct testing equipment were asked if they

would have trouble acquiring diagnostic equipment in response to high demand. As shown, none of the respondents reported that acquiring diagnostic equipment would be a problem.

Summary of Market Perceptions

Contractors were asked to report their perceptions of customer awareness, market potential, and their ability to expand their services in response to heavy demand. The results are as follows:

- All respondents reported on average low awareness among customers of the RCP.
- Similarly, all respondents reported on average little influence from the RCP on customer demand for high efficiency equipment, duct testing, and duct sealing.
- High potential for upgrade work was reported by all groups; however, relatively low estimates of the likelihood of owners willing to have the work done were reported.
- Approximately half of the participants thought the likelihood of customers upgrading had increased in the past year. Most reported this increase due to the RCP.
- A majority of respondents reported that finding qualified labor would be difficult if they saw an increase in demand for their services.

3

Window Contractors

3.1 Overview

The 1999 RCP offered incentives for the installation of high performance windows. Windows installed under the program were required to have a U-value of 0.4 or less and a solar heat gain coefficient that varied across climate zones. Contractors participating in the program were offered training in window installation standards.

For this study, the following hypothesized market effects were tested for window contractors:

- By training contractors and by providing experience in working with high performance windows, the RCP increased contractors' awareness of the energy efficiency benefits of these products.
- By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of jobs for contractors.
- By providing training to contractors on installation methods, the RCP increased the level of energy efficiency achieved per job.

In addition to questions related to these hypotheses, contractors were also asked questions regarding their perceptions of consumer demand and market potential. While these perceptions are not direct evidence of the near-term market effects researched in this study, they provide information on how contractors' views of the market are changing.
This Section first examines the above three hypotheses for near-term market effects attributable to the program, then presents information collected on contractors' perceptions of the market.

3.2 Testing the Hypothesized Market Effects

Windows Hypothesis One: Increased Awareness

By training contractors and by providing experience in working with high performance windows, the RCP increased contractors' awareness of the energy efficiency benefits of these products.

This hypothesis was tested by looking at several indicators of awareness and comparing mean responses of participants and nonparticipants. In addition, self-reported impacts attributed to the program were assessed. Nonparticipants with training were looked at separately, as these individuals have selected to participate in the program and have had some or all of the required training but have not yet processed program vouchers. The indicators considered are the following:

- Change in U-value considered energy efficient,
- Change in rating of cost effectiveness of windows with a U-value of 0.4, and
- Increase in recommendations to customers for more efficient windows.

Each of these indicators is considered in more detail below.

Changes in U-Values

Contractors were asked to identify what they considered an energy efficient U-value. In addition, they were asked if their views had changed over the past year. Table 3-1 presents the results.[14]

Table 3-1: Window Contractors' Awareness of U-Values

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
U-value considered energy efficient now	0.34 (0.02) n = 13	0.61 (0.07) n = 22	0.32 (0.02) n = 6	0.42 (0.04) n = 41
Have changed opinion of what U-value is considered energy efficient over past year	13.3% (0.10) n = 13	40.9% (0.11) n = 22	3.0 % (0.08) n = 6	21.1% (0.06) n = 41
U-values considered energy efficient changed in past year due to RCP	100% (0.00) n = 1	0.0% (0.00) n = 5	0.0% (0.00) n = 2	36.5% (0.18) n = 8

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, participants surveyed reported an average U-value of 0.34 as energy efficient. This, along with the average U-value of 0.32 reported by trained nonparticipants, is below the program requirement of 0.4. Nonparticipants, however, reported an average U-value of

[14] Note that total responses are less than the 70 completed surveys due to 17 responses of "I don't know" and 12 other responses that could not be used in the analysis.

0.61, considerably higher than the value reported by respondents exposed to the program. Furthermore, the differences in means between these groups are significant.

When asked if they would have answered differently a year ago, one participant (representing 13% of the sample) reported that he had changed his views in the past year and that this was due to what he had learned in the RCP. In comparison, 41% of nonparticipants had changed their views in the past year. None of these, however, reported changes due to the program. Rather, they attributed their change in beliefs to information learned from trade shows and suppliers, increased product availability, and more experience with high performance windows. It is interesting to note that nonparticipants with RCP training reported the lowest U-value of the three groups. The two nonparticipants with training that changed their views in the past year said that this was due to more information available from suppliers and magazines.

These results suggest that there has been little change in this area due to the program. This is not surprising, as high performance windows have been in the market for some time.

Changes in Cost Effectiveness

Respondents were also asked how cost effective they considered windows with a U-value of 0.4 (the highest value eligible for program incentives).[15] Table 3-2 presents the results.[16]

[15] This scale (and all similar scales in this study) was structured so that one represented not at all cost effective and five represented very cost effective.

[16] Responses from contractors who did not report a U-value in the previous table were eliminated from this analysis.

Table 3-2: Window Contractors' Awareness of Cost Effectiveness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Cost effectiveness of windows with U-value of 0.4 or less (1 to 5 scale)	2.9 (0.42) n = 13	3.7 (0.31) n = 21	4.8 (0.21) n = 6	3.3 (0.24) n = 40
Belief in cost effectiveness of windows with U-values of 0.4 or below changed in past year.	16.9% (0.11) n = 13	27.4% (0.10) n = 21	0.0% (0.00) n = 6	18.5% (0.06) n = 40
Above change due to RCP.	78.4% (0.41) n = 2	0.0% (0.00) n = 4	N/A	42.1% (0.22) n = 6

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, nonparticipants with training reported the highest ratings of cost effectiveness for this measure. Furthermore, participants reported slightly lower ratings than did nonparticipants. Nearly 17% of participants and 27% of nonparticipants reported that their ratings of cost effectiveness had changed since the previous year. As these differences are significant, these results suggest that the program has not had a discernable effect on how cost effective contractors rate these windows.

When looking at self-reported impacts, however, 78% of the participants reported changing their views as a result of information learned from the RCP. As this result represents the response of one contractor, however, the evidence is too weak to support a market effect.

One explanation for these responses may be that participants, who on average identified 0.34 as an efficient U-value, find a window rated 0.4 less cost effective than what they typically use. In comparison, nonparticipants, who on average identified 0.61 as an efficient U-value, find a value of 0.4 more cost effective than do participants. It is interesting to note that more nonparticipants are changing their views about this than are participants. This suggests that the sources of information identified by respondents (seminars, trade shows, and trade magazines) are having an effect on the market.

Changes in Recommendations

As another indicator of contractors' awareness of the benefits of energy efficient windows, respondents were asked if they had made any changes in their recommendations to customers over the past year. As shown in Table 3-3, nearly equal proportions of participants and nonparticipants reported recommending more efficient windows than in the previous year. In

comparison, a significantly lower proportion of nonparticipants with training reported making these changes.

Table 3-3: Window Contractors' Changes in Recommendations

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Contractors recommending more efficient windows over the past year	40.0% (0.13) n = 15	40.4% (0.07) n = 47	25.0% (0.16) n = 8	38.6% (0.06) n = 70
Recommending more high performance windows in past year due to RCP	69.2% (0.21) n = 6	0.0% (0.00) n = 19	0.0% (0.00) n = 2	27.1% (0.09) n = 27
Change of recommending more high performance windows is sustainable	100% (0.00) n = 4	N/A	N/A	100% (0.00) n = 4

Values are weighted means. Weighted standard errors are shown in parentheses.

Most of the comments from respondents regarding the changes they made in their recommendations revealed that they were recommending more low-E windows and more vinyl windows.

When looking at self-reported impacts, nearly 70% of participants stated that their changes were due to the RCP. Furthermore, when asked if they would continue this practice without the program they unanimously reported that they would.

Summary of Hypothesis One Results

The hypothesis that the RCP increased contractors' awareness of the benefits of energy efficient windows was examined by comparing responses from participants and nonparticipants on several key indicators. The results are as follows.

- Participants and nonparticipants with training reported an efficient U-value of close to .3 while nonparticipants reported close to .6. However, only 13% of participants and 3% of nonparticipants with training reported that this was a change from the previous year, while 41% of nonparticipants reported a change from the previous year.
- While one participant contractor reported changing his idea of what U-value is considered energy efficient and attributed the change to the RCP, this is weak evidence due to the small sample size and will not be considered evidence of a market effect.

- More nonparticipants than participants reported changing their views on the cost effectiveness of high performance windows over the past year. This suggests that the program has not had an effect in this area.
- One participant did report changing his views due to the program on the cost effectiveness of windows with a U-value of 0.4; however, due to the small sample size, this evidence by itself is too weak to support a market effect.
- Participants and nonparticipants reported similar ratings on the cost effectiveness of high performance windows. The lack of a significant difference between these groups suggests the program has not had an effect in this area.
- 70% of participants (four respondents) who had made changes in their recommendations over the past year identified the RCP as the reason for changing. In addition, all of these reported they would continue these practices even without the program.

In summary, all of the indicators considered for this hypothesis showed weak results. The strongest finding was that four participants reported that they are now recommending more high performance windows to their customers as a result of being involved with the program. In addition, all said they would continue the practice even in the absence of the program.

Windows Hypothesis Two: Increased Jobs

By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of jobs for contractors.

This hypothesis was tested by asking contractors if the number of jobs in which they had installed windows in existing homes had increased, decreased, or stayed the same over the past year. To support the hypothesis, more participants than nonparticipants would need to attribute an increase in jobs to the program or, alternatively, a significant number of respondents would need to attribute an increase of jobs to the program.

As shown in Table 3-4, 98% of participants reported an increase in jobs. Of the nonparticipants, 63% in general and 33% of those with training reported increases. Furthermore, differences in means for all three groups are significant. This result suggests that there is a difference between participants and nonparticipants and the program could have had an effect in this area.

Table 3-4: Increase in Jobs for Window Contractors

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Increase in number of jobs	98.0% (0.04) n = 15	63.4% (0.07) n = 47	33.2% (0.18) n = 8	75.3% (0.05) n = 70
Amount of increase	29.7% (3.96) n = 14	35.1% (4.81) n = 29	33.6% (5.88) n = 6	32.1% (2.87) n = 49
Increase due to RCP	58.1% (0.14) n = 14	28.1% (0.08) n = 31	59.4% (0.22) n = 6	45.2% (0.07) n = 51

Values are weighted means. Weighted standard errors are shown in parentheses.

It is interesting to note that all three groups reported similar estimates of how much their jobs had increased, with the averages ranging between 30 and 35 percent. Reasons given for the increase included the following:

- With the cost of new homes, more people would rather refurbish their existing home than move,
- RCP vouchers,
- Customers are more aware of the benefits,
- Our reputation is spreading,
- The economy is better, and
- We are advertising more.

When respondents who reported an increase in jobs over last year were asked why their jobs had increased, 58% of participants reported the change was due to the RCP. Moreover, nearly two-thirds of them reported that this was due to RCP vouchers; other reasons included increases in customer awareness and contractor advertising. Similarly, 59% of nonparticipants with training attributed their increase to the program. Interestingly, 28% of nonparticipants also reported an increase in jobs due to the program. While this seems surprising, nonparticipants further clarified that customers were more aware about windows now and some thought the program was the reason.

Summary of Hypothesis Two Results

The hypothesis that the RCP increased the number of jobs for window contractors was examined by asking respondents if their jobs in the past year had increased and why. The results are as follows.

- Both participants and nonparticipants reported increased jobs over the past year. Furthermore, more participants than nonparticipants reported an increase. This suggests the program may have had an effect in this area.
- A majority of both participants and nonparticipants with training attributed the increase to the RCP. In addition, 28% of nonparticipants also attributed an increase to the program.
- Most participants who attributed the increase to the program identified the incentive vouchers as the reason. In these cases, the change is probably not sustainable.
- Nonparticipants and nonparticipants with training who attributed an increase to the program identified increased consumer awareness as the reason. Approximately 1/3 of the participants who attributed changes to the program also identified increased customers awareness as the primary reason for the increase. In these cases, the change probably is sustainable.
- Overall, there is some evidence of a weakly sustainable market effect attributable to the program.

In summary, evidence was found to support an increase in the number of contractor jobs due to the RCP. The program effected this change in two ways: through program incentive vouchers and through increased customer awareness. To the extent jobs increased via the latter, this change is sustainable.

Windows Hypothesis Three: Increased Level of Energy Efficiency Per Job

By providing training to contractors on installation methods, the RCP increased the level of energy efficiency achieved per job.

This hypothesis was tested by asking contractors if they had changed their installation practices over the past year. In addition, contractors were asked to explain what changes they had made and why. In order to support a change in the market due to the program, more participants than nonparticipants would need to have changed their procedures. In addition, self-reported impacts attributed to the training they received through the program were considered.

As shown in Table 3-5, nearly 20% of participants and 31% of nonparticipants reported changing their installation practices in the past year. In addition, 8% of the nonparticipants with training reported changed their procedures. Furthermore, differences in the means of these groups are significant. Based on these results, it appears the program did not have an effect in this area.

Table 3-5: Changes in Practices of Window Contractors

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Changes in installation procedures	19.8% (0.11) n = 15	30.9% (0.07) n = 47	7.9% (0.10) n = 8	24.6% (0.05) n = 70
Changes in installation procedures are due to RCP training	57.1% (0.49) n = 2	0.0% (0.00) n = 6	0.0% (0.00) n = 1	18.9% (0.14) n = 9
Changes in installation procedures due to RCP are sustainable	100% (0.00) n = 1	N/A	N/A	100% (0.00) n = 1

Values are weighted means. Weighted standard errors are shown in parentheses.

Respondents described making the following changes over the past year. Note that the first two bullets are from participants and the remaining bullets are from nonparticipants.

- Adding a membrane seal,
- Bolting the window in more places,
- More preparation before going to job site,
- Spraying foam or using vinyl paper to seal leaks,
- Using a different chalking, and
- Putting insulation in air gaps.

Table 3-5 further shows that one participant, representing 57% of the participants reporting changes, identified the RCP training he received as the reason for changing. In addition, he reported that he would continue the changes in the absence of the program. The small sample size, however, weakens this result considerably. Reasons given by nonparticipants for changing installation practices included the following:

- To meet building codes,
- "It's just better quality,"
- "A customer asked me to do it on a door and I adopted it as my standard," and
- "We wanted to offer better products to our customers."

Summary of Hypothesis Three Results

The hypothesis that the RCP training had improved the level of energy efficiency per job was evaluated by comparing responses from participants and nonparticipants on changes they had

made in their installation practices over the past year and by evaluating self-reported impacts of the program. The following results were observed.

- In comparing participants and nonparticipants, no evidence was found to suggest that the program had caused contractors to change their practices.
- One participant who reported changes attributed them to the program. However, this result is too weak to support a market effect.

In summary, this hypothesis was not supported by the survey responses. While some contractors are changing their practices, most are doing it as a result of market stimuli other than the RCP training.

3.3 Contractor Perceptions of the Market

Window contractors were asked about their perceptions of customer awareness and market potential. While this information is not direct evidence of changes in contractors' attitudes or of practices affected by the program, it is weak evidence that there might be changes in customers' beliefs or behaviors.

Customer Awareness

Respondents were nearly unanimous regarding the increased customer awareness of the benefits of high performance windows. The results are presented in Table 3-6. While the difference in the mean response between participants and nonparticipants is significant, it is clear that nearly all respondents believe that customer awareness has increased. As shown, 60% of participants and 19% of nonparticipants reported that this increase in awareness was due to the RCP.

Table 3-6: Window Contractors' Reports of Customer Awareness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Customers more aware of benefits of hp windows	100% (0.00) n = 15	97.1% (0.02) n = 47	96.8% (0.07) n = 8	98.3% (0.02) n = 70
Above due to RCP	60.3% (0.13) n = 15	18.5% (0.06) n = 44	0.0% (0.00) n = 7	34.6% (0.06) n = 66
Customers more willing to install hp windows	79.6% (0.11) n = 15	95.3% (0.03) n = 44	91.9% (0.11) n = 7	88.5% (0.04) n = 66
Above due to RCP	67.6% (0.14) n = 12	29.1% (0.07) n = 41	86.3% (0.15) n = 6	48.0% (0.07) n = 59

Values are weighted means. Weighted standard errors are shown in parentheses.

Respondents who reported customer awareness had increased were further asked if customers were more willing to install high performance windows. As shown, mean responses were again high across groups. Interestingly, more nonparticipants and nonparticipants with training reported customers were more willing than did participants. When asked why they thought customers were more willing, respondents supplied the following reasons:

- Information from the utilities,
- The Internet,
- They learn from the media that it will make a more comfortable house,
- Prices are reasonable,
- They want to save energy costs,
- They want to keep up their home's resale value,
- We educate them,
- To cut down on noise, and
- It looks better.

The responses from nonparticipants with training presented in Table 3-6 are interesting in that none attributed consumer awareness to the program (most identified the Internet or other media as the reason customers were more aware), yet a majority of them identified the program as the reason customers were more willing to install high performance windows.

Furthermore, when asked to clarify this issue, most explained that customers were doing it to save energy costs and the program was influencing them.

Contractors were also asked how cost effective they thought their customers considered windows with U-values of 0.4 or less. Specifically, they were asked to provide a rating from a scale of one to five where one meant "not at all cost effective," and five meant "very cost effective." As shown in Table 3-7, all ratings are close, and participants and nonparticipants with training reported higher ratings for their customers than did nonparticipants. Only a small percentage of these respondents had changed their ratings in the past year.

Table 3-7: Window Contractors' Reports of Customer Beliefs of Cost Effectiveness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Cost effectiveness of windows with U-value of 0.4 or less according to customers (1 to 5 scale)	3.3 (0.29) n = 13	2.6 (0.32) n = 19	3.9 (0.13) n = 6	3.1 (0.19) n = 38
Customers' beliefs of cost effectiveness of windows with U-values of 0.4 or below changed in past year.	5.0% (0.06) n = 13	18.8% (0.09) n = 19	9.5% (0.13) n = 6	9.6% (0.05) n = 38
Above change due to RCP.	26.7% (0.44) n = 2	10.3% (0.22) n = 3	0.0% (0.00) n = 1	14.3% (0.16) n = 6

Values are weighted means. Weighted standard errors are shown in parentheses.

One participant, representing 27% of participants who had changed their ratings, attributed the change to the RCP. Interestingly, one nonparticipant contractor also attributed a change to the RCP and explained that the program had increased customer awareness of the savings associated with high performance windows.

Respondents were further asked to rate on a scale of one to ten how aware their customers were of the RCP. The scale was structured so that one represented "not at all aware," and ten represented "very aware." A similar scale question asked what influence the RCP has had on customer demand for high performance windows. For this question, the scale of one to ten was structured so that one meant "no influence," and ten meant "very high influence." Table 3-8 presents the results only for those respondents who reported that they were aware of the program themselves.

Table 3-8: Window Contractors' Ratings of RCP Influence on Customers

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Customers aware of RCP (1 to 10 scale)	5.2 (0.65) n = 15	3.3 (0.45) n = 24	4.5 (0.62) n = 5	4.6 (0.37) n = 44
Influence of RCP on customer demand (1 to 10 scale)	5.0 (0.36) n = 15	4.3 (0.57) n = 24	2.9 (0.48) n = 5	4.6 (0.30) n = 44

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, participants on average reported higher ratings for both questions than did nonparticipants or nonparticipants with training. It should be noted, however, that all responses are close and most of the differences are only marginally significant.

Market Potential

Participant contractors reported higher estimates of market potential than did nonparticipants. As shown in Table 3-9, participants estimated that over 71% of homes in their area could still be upgraded cost effectively. This is a significant different from nonparticipants who estimated market potential at closer to 60%. The differences between nonparticipants and nonparticipants with training are insignificant for this question.

Table 3-9: Window Contractors' Reports of Market Potential

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Homes in area that could still upgrade for reasonable cost	71.1% (5.09) n = 15	58.7% (2.64) n = 42	54.3% (5.60) n = 6	63.6% (2.38) n = 63
Owners likely to have work done	48.1% (5.10) n = 15	27.5% (3.39) n = 33	13.8% (3.28) n = 6	35.7% (3.01) n = 54
Likelihood of having work done changed over past year	85.3% (0.09) n = 15	72.3% (0.08) n = 32	72.6% (0.20) n = 6	78.2% (0.06) n = 53
Above changed in past year due to RCP	64.9% (0.13) n = 15	21.1% (0.007) n = 32	8.0% (0.12) n = 6	40.0% (0.07) n = 53
Change is sustainable	82.5% (0.17) n = 6	85.2% (0.20) n = 4	100.0% (0.00) n = 1	83.5% (0.12) n = 11

Values are weighted means. Weighted standard errors are shown in parentheses.

Contractors were further asked what proportion of the owners of these homes were likely to complete the work. As shown in Table 3-9, participants on the average reported that nearly half of the owners would do so. In comparison, nonparticipants thought only 28% of owners would upgrade, and nonparticipants with training reported only 14%. Furthermore, these differences are significant.

Table 3-9 further shows that the majority of respondents reported that the likelihood of owners upgrading their homes had increased over the past year. In addition, 65% of participants thought it had increased as a result of the program. Twenty-one percent of nonparticipants and 8% of nonparticipants with training indicated the same. Furthermore, the majority of those identifying the RCP as causing this change also reported that the increased likelihood would continue even with the program.

Product and Labor Availability

Window contractors were also asked if they would have any trouble expanding their services if there was an increase in demand for high performance windows. As shown in Table 3-10, 11% of participants indicated this would be a problem for them. In comparison, only 8% of nonparticipants acknowledged problems in expanding their services. Furthermore, the differences in means between these groups are significant.

Table 3-10: Window Contractors' Ability to Expand Services

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Would have trouble expanding services	10.5% (0.08) n = 15	7.5% (0.04) n = 47	0.0% (0.00) n = 8	8.1% (0.03) n = 70
Would have trouble obtaining high performance windows	0.0% (0.00) n = 15	0.4% (0.01) n = 47	0.0% (0.00) n = 15	0.2% (0.01) n = 70
Would have trouble hiring qualified labor	48.7% (0.13) n = 15	40.6% (0.07) n = 47	77.8% (0.16) n = 8	46.8% (0.06) n = 70

Values are weighted means. Weighted standard errors are shown in parentheses.

When asked another way, the responses changed. As shown in Table 3-10, essentially no one indicated a problem in obtaining high performance windows. However, when asked about hiring qualified labor, roughly half the participants, 40% of the nonparticipants, and 78% of the nonparticipants with training agreed this would be a problem.

Summary of Market Perceptions

Contractors were asked to report their perceptions on customer awareness, demand, and market potential and on what influence the RCP had on these areas. The results are as follows:

- All respondents reported high ratings of customer awareness of high performance windows. Similarly, they reported high ratings for customer willingness to install high performance windows.
- A majority of participants attributed the high awareness and willingness to the RCP. In addition, a number of nonparticipants with training attributed the program for increased customer willingness.
- Participants and nonparticipants with training reported higher ratings of customers' beliefs of the cost effectiveness of high performance windows than did nonparticipants.
- Participants reported a higher rating of customer awareness than did nonparticipants. A similar result was found for ratings of the program's influence on customer demand for high performance windows.
- Participants estimated 71% of the homes in their area could still be upgraded cost effectively and that 48% of the owners were likely to have the work done.

Nonparticipants estimated 59% of the homes in their area could still be upgraded and only 28% of the owners were likely to have the work done. Similarly, nonparticipants with training estimated 54% of the homes in their area could be upgraded at a reasonable cost and 14% of owners were likely to have the work done.

- A majority of participants attributed this market potential to the RCP and believed that it was sustainable even without the program.
- Relatively few respondents reported problems in expanding their services if they were to experience high customer demand.
- When asked about finding qualified labor, however, contractors in all three groups agreed this was a problem.

4

Insulation Contractors

4.1 Overview

The RCP offers incentives for the installation of energy efficient insulation. Attic insulation installed under the program is required to have an R-value of at least 30, while R-13 is the minimum for wall insulation. However, if there is insufficient room to install R-30 insulation in the attic, the program does allow for contractors to add R-19, and higher, to the existing attic insulation, as long as the post-retrofit attic insulation totals R-30 or greater. Contractors participating in the program are offered specialized training in the installation of wall insulation.

For this study, the following hypothesized market effects were tested:

- By training contractors and by providing experience in working with insulation with higher R ratings, the RCP increased contractors' awareness of the energy efficiency benefits of these products.
- By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of jobs for contractors.
- By training contractors in installation methods, the RCP improved these practices.

In addition to information needed to test these hypotheses, contractors were also asked questions regarding their perceptions of consumer demand and market potential. While these perceptions are not direct evidence of the near-term market effects researched in this study, they provide information on how contractors' views of the market are changing.

This Section first examines the above three hypotheses for near-term market effects attributable to the program, then presents information collected on contractors' perceptions of the market.

4.2 Testing of Hypothesized Market Effects

Insulation Hypothesis One: Increased Awareness

By training contractors and by providing experience in working with insulation with higher R ratings, the RCP increased contractors' awareness of the energy efficiency benefits of these products.

This hypothesis was tested by looking at self-reported changes in several indicators of awareness and by comparing mean responses of participants and nonparticipants. Nonparticipants with training were looked at separately, as these individuals have selected to participate in the program and have had some or all of the required training, but they had not yet processed any program vouchers. The indicators considered are the following:

- Change in rating of cost effectiveness of R-30 attic insulation and R-13 wall insulation, and
- Increase in recommendations to customers for more efficient insulation.

Each of these indicators is considered in more detail below. In addition, attributions to the program and sustainability of changes are addressed.

Changes in Cost Effectiveness

Respondents were asked to rate, on a scale of one to five, the cost effectiveness for their region of R-30 attic insulation and R-13 wall insulation. The scale was structured so that a response of one meant "not at all cost effective," and a response of five meant "very cost effective." Table 4-1 presents the results.

Table 4-1: Insulation Contractors' Awareness of Cost Effectiveness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Cost effectiveness of R-30 insulation in attics (1 to 5 scale)	4.70 (0.18) n = 10	4.08 (0.25) n = 16	3.83 (0.39) n = 7	4.31 (0.16) n = 33
Cost effectiveness of R-13 insulation in walls (1 to 5 scale)	4.25 (0.20) n = 10	3.96 (0.34) n = 16	4.09 (0.35) n = 7	4.12 (0.17) n = 33

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, participants on average reported the highest ratings of cost effectiveness for both R-30 insulation in attics and for R-13 insulation in walls. In fact, participants rated the cost

effectiveness of R-30 attic insulation a 4.7, meaning that most of these respondents consider it "very cost effective." Moreover, the differences in means between participants and the other two groups are significant. When looking at responses for wall insulation, however, the differences in mean responses for participants and the other groups are insignificant. Similarly, the differences in means between nonparticipants and nonparticipants with training are insignificant.

Each respondent was also asked if their ratings of cost effectiveness had changed since the previous year. All respondents reported that they would not have answered the cost effectiveness question any differently a year ago.

Changes in Recommendations

As another indicator of contractors' awareness of the benefits of more efficient insulation, respondents were asked if they had made any changes in their recommendations to customers over the past year. As shown in Table 3-3, nearly one-third of nonparticipants reported recommending more efficient insulation over the past year, compared to 24% of nonparticipants with training and 10% of participants.

Table 4-2: Insulation Contractors' Changes in Recommendations

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Contractors recommending more efficient insulation over the past year	9.6% (0.10) n = 10	33.1% (0.12) n = 16	23.8% (0.17) n = 7	20.6% (0.07) n = 33
Recommending more efficient insulation in the past year due to RCP	100.0% (0.00) n = 1	80.5% (0.23) n = 4	7.1% (0.18) n = 3	66.6% (0.18) n = 8
Change of recommending more efficient insulation is sustainable	100.0% (0.00) n = 1	100.0% (0.00) n = 1	0.0% (0.00) n = 1	97.4% (0.11) n = 3

Values are weighted means. Weighted standard errors are shown in parentheses.

The result that fewer participants than nonparticipants with training have changed their recommendations in the past year is consistent with what one would expect. As mentioned in Section 2, participants are typically the types of contractors who stay abreast of changes in the industry. They got involved in the program early and have probably participated in many other programs before this one. Nonparticipants with training, however, are new learners. They entered the program late (hence have not had any vouchers yet) but have been through the training and have gained new knowledge about energy efficient products and methods.

The respondents who reported recommending more efficient insulation were further asked why they changed their recommendations. Of these, 81% of nonparticipants and 100% of participants stated that they had done this due to the RCP. Approximately 7% of nonparticipants with training claimed that the change in their recommendations was due to RCP. It should be noted that while the weighted average for nonparticipants is 80.5%, this corresponds to only one of four attributing the change to the RCP. In addition, note that only one participant reported making a change in his recommendations, and, since he attributes the change to the RCP, the table shows that 100% of participants changed their recommendations due to the RCP. On the other hand, the weighted average for nonparticipants with training is 7%, which corresponds to one of three of the respondents attributing the change to the RCP. Furthermore, both the participant and the nonparticipant who attributed changing their recommendations to the RCP also reported that they would continue this practice without the program.

In addition, it is interesting that this nonparticipant explained that he began recommending more insulation in the last year because he is more aware of energy savings. He credited the RCP for making him aware of the benefits of insulation with higher R ratings.

Summary of Hypothesis One Results

The hypothesis that the RCP increased contractors' awareness of the benefits insulation with higher R ratings was examined by comparing responses from participants and nonparticipants on several key indicators and by analyzing self-reported changes. The results are as follows.

- Participants reported the highest ratings of cost effectiveness for efficient attic insulation. No differences were found between groups for cost effectiveness ratings on wall insulation.
- None of the insulation contractors has changed their views about cost effectiveness over the past year.
- More nonparticipants than participants reported recommending insulation with higher R ratings than they have in the past. This suggests that the RCP has not had much affect in this area.
- Three contractors (one from each group) reported changing their recommendations over the past year due to the program. However, these sample sizes are too small to support a market effect in this area.

In summary, evidence was not found to support a change in contractors' awareness of the benefits of more efficient insulation that could be attributed to the RCP.

Insulation Hypothesis Two: Increased Jobs

By training and certifying contractors and by providing incentives to customers (thus stimulating demand), the RCP increased the number of jobs for contractors.

This hypothesis was tested by asking contractors if the number of jobs in which they had installed insulation in existing homes had increased, decreased or stayed the same over the past year. To support the hypothesis, more participants than nonparticipants would need to experience an increase in jobs, or respondents would need to attribute an increase in jobs to the RCP.

Insulation contractors surveyed were asked if there had been any change in the number of jobs over the past year in which they had installed insulation in existing homes. As shown in Table 3-4, many more participants (54%) and nonparticipants with training (35%) reported an increase in jobs than did nonparticipants (6%). Moreover, the differences in the means between nonparticipants and the other two groups are significant.

Table 4-3: Increases in Jobs for Insulation Contractors

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Increase in number of jobs	54.3% (0.17) n = 10	6.4% (0.06) n = 16	34.9% (0.19) n = 7	34.0% (0.08) n = 33
Percentage jobs increased	40.4% (10.05) n = 4	12.5% (5.59) n = 2	25.0% (0.00) n = 1	35.3% (7.01) n = 7
Increase due to RCP	92.6% (0.15) n = 4	0.0% (0.00) n = 2	0.0% (0.00) n = 1	66.5% (0.19) n = 7

Values are weighted means. Weighted standard errors are shown in parentheses.

The respondents who reported that they had experienced an increase in the number of jobs were also asked by what percentage jobs had increased. Participants reported that their jobs had increased on the average by nearly 40%. Nonparticipants reported less of an increase, approximately 13%, while those with training reported a 25% increase.

When these respondents were asked why the number of jobs had increased, 93% of participants reported the change was due to the RCP. Two of these participants identified program vouchers as the reason for the increased jobs, while one attributed the increase to his association with the LCH and the other felt that “the economy is good, people are spending

more." None of the nonparticipants reported that the increase in the number of jobs was due to the RCP. The reasons given by nonparticipants for their increase in business were:

- Customers wanting to save money on their energy bill,
- People have more money and times are good, so they are investing in their homes, and
- We are promoting retrofits.

Summary of Hypothesis Two Results

The hypothesis that the RCP increased the number of jobs for insulation contractors was examined by asking respondents if their jobs in the past year had increased and why. The results are as follows.

- More participants and nonparticipants with training reported an increase in jobs over the past year than did nonparticipants. This suggests the program may have had an effect in this area.
- Nearly 93% of participants reporting increased jobs attributed the increase to the RCP.
- Two of the three participants that attributed the increase in the number of jobs to the program identified program vouchers as the influencing factor, while the other attributed it to his association with the LCH. Because these elements will end with the program, these effects are probably not sustainable.

In summary, evidence was found to support an increase in the number of contractor jobs due to the RCP. However, as some of the increase was reportedly due to the use of program vouchers, this change may not outlive the program.

Insulation Hypothesis Three: Increased Level of Energy Efficiency Per Job

By training contractors in installation methods, the RCP improved these practices.

This hypothesis was tested by asking contractors if they had changed their installation practices over the past year. In addition, contractors were asked to explain what changes they had made and why. In order to support a change in the market due to the program, more participants than nonparticipants would need to have changed their procedures, or respondents would need to attribute the change to the training they received through the RCP.

As shown in Table 3-5, 12.6% of participants and nearly 2% of nonparticipants with training reported changing their installation practices in the past year. Furthermore, the differences in

means between nonparticipants and the other two groups are significant. Changes reported include the following:

- Since attending RCP courses, we now drill more holes per distance restriction.
- We give more attention to using barriers around heat producing devices.
- We do a more thorough check on the workmanship when a job is completed.

Table 4-4: Changes in Practices of Insulation Contractors

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Changes in installation procedures	12.6% (0.11) n = 10	0.0% (0.00) n = 16	1.7% (0.05) n = 7	6.0% (0.04) n = 33
Change due to RCP training	100.0% (0.00) n = 2	N/A	100.0% (0.00) n = 1	100.0% (0.00) n = 3
Change is sustainable	100.0% (0.00) n = 2	N/A	100.0% (0.00) n = 1	100.0% (0.00) n = 3

Values are weighted means. Weighted standard errors are shown in parentheses.

Respondents that reported making a change in their installation procedures were further asked what caused them to make a change. Table 3-5 shows that the two participants and the one nonparticipant with training who reported changes attributed them to the RCP training. Next, these respondents were asked whether they would continue with their new installation procedures even if the program was discontinued. Each of the three respondents reported that they would continue installing insulation in their current manner, even in the absence of the program.

Summary of Hypothesis Three Results

The hypothesis that the RCP training improved installation practices was evaluated by comparing responses from participants and nonparticipants on changes they had made in their installation practices over the past year. In addition, self-reported program attribution was considered. The following results were observed.

- Approximately 13% of participants reported changing their practices since the previous year compared none of the 16 nonparticipants. In addition, nearly 2% of the nonparticipants with training also reported changing their practices.

- Both of the participants who reported changes attributed them to the program. However, as this result is represented by only two respondents, it is somewhat weak.

In summary, some evidence was found to support the hypothesis that the training provided to contractors by the RCP improved installation methods. However, due to the small sample sizes the evidence is too weak to conclude that the RCP has had an effect in this area.

4.3 Contractor Perceptions of the Market

Insulation contractors were asked about their perceptions of customer awareness and market potential. While this information is not direct evidence of changes in contractors' attitudes or practices effected by the program, it is weak evidence that there may be changes in customers' beliefs or behaviors.

Customer Awareness

When asked about customers' awareness of the benefits of more efficient insulation, 88% of participants and 68% of nonparticipants with training felt that customers were more aware than they previously were. Only 46% of the nonparticipants agreed. Furthermore, the differences in means between these groups are significant.

Table 4-5: Insulation Contractors' Reports of Customer Awareness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Customers more aware of benefits of insulation with higher R rating	88.2% (0.11) n = 10	45.7% (0.13) n = 16	67.6% (0.19) n = 7	69.5% (0.08) n = 33
Increased customer awareness is due to RCP	25.9% (0.20) n = 6	63.1% (0.15) n = 11	0.0% (0.00) n = 6	28.8% (0.10) n = 23

Values are weighted means. Weighted standard errors are shown in parentheses.

Each of the respondents who reported increase customer awareness were asked why they think that customers are more aware. Nearly 26% of participants reported that this increase in awareness was due to the RCP. As shown in Table 4-5, 63% of nonparticipants, or three of the 11 respondents, also reported that they believe customers are more aware due to the RCP. Other reasons given by respondents for increased customer awareness include the following:

- Information from the utilities,
- Advertisements or brochures from manufacturers,
- Promotion by contractors, and
- The high cost of energy.

Of these, information from the utilities was mentioned the most followed by advertisements or brochures from manufacturers.

Respondents who reported increased customer awareness were also asked if their customers were more willing to have this higher efficient insulation installed. Nearly all of these respondents reported that their customers are indeed more willing to install insulation with higher R ratings. As shown in Table 4-6, most participants (74%) attributed this to the program, while none of nonparticipants or nonparticipants with training identified the RCP as the reason for the increase. Two of the five participants who attributed the increased willingness to the RCP mentioned program vouchers as the reason.

Table 4-6: Insulation Contractors' Reports of Customer Willingness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Customers more willing to install insulation with higher R rating	81.8% (0.17) n = 6	87.3% (0.11) n = 11	94.3% (0.10) n = 6	85.6% (0.07) n = 23
Increased customer willingness due to RCP	74.0% (0.22) n = 5	0.0% (0.00) n = 8	0.0% (0.00) n = 4	40.3% (0.12) n = 17

Values are weighted means. Weighted standard errors are shown in parentheses.

Contractors were also asked to rate on a scale of one to five how cost effective their customers considered R-30 attic insulation and R-13 wall insulation. The scale was structured so that one meant "not cost effective," and five meant "very cost effective." The results are presented in Table 3-7.

Table 4-7: Insulation Contractors' Reports of Customer Beliefs of Cost Effectiveness

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Cost effectiveness of R-30 insulation in attics (1 to 5 scale) according to customers (1 to 5 scale)	4.09 (0.26) n = 9	3.25 (0.52) n = 15	3.73 (0.48) n = 5	3.72 (0.26) n = 29
Cost effectiveness of R-13 insulation in walls (1 to 5 scale) according to customers (1 to 5 scale)	4.10 (0.22) n = 9	3.20 (0.51) n = 15	3.68 (0.40) n = 5	3.69 (0.25) n = 29

Values are weighted means. Weighted standard errors are shown in parentheses.

As shown, all responses are close to each other. Moreover, participant ratings are only marginally significantly different from nonparticipant ratings. When asked if they would have answered this question any differently a year ago, all respondents answered negatively.

Insulation contractors who were themselves aware of the RCP were also asked to rate on a scale of one to ten how aware their customers were of the program.[17] In addition, they were asked to rate the influence the RCP had on customer demand.[18] As shown in Table 3-8, all of the respondents reported that customers are not very aware of the RCP. In fact, the differences in mean responses between groups are insignificant.

[17] The scale was structured so that one meant "unaware," and ten meant "very aware."

[18] The scale was structured so that a one on the scale represented "no influence," and a ten represented "very high influence."

Table 4-8: Insulation Contractors' Ratings of RCP Influence on Customers

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Customers aware of RCP (1 to 10 scale)	4.0 (0.60) n = 10	2.9 (0.7) n = 14	2.2 (0.34) n = 7	3.2 (0.38) n = 31
Influence of RCP on customer demand for attic insulation of R-30 (1 to 10 scale)	5.3 (0.98) n = 10	3.3 (0.98) n = 11	1.1 (0.13) n = 6	3.9 (0.6) n = 27
Influence of RCP on customer demand for wall insulation of R-13 (1 to 10 scale)	5.7 (1.03) n = 10	3.3 (1.03) n = 10	1.0 (0.07) n = 6	4.1 (0.64) n = 26

Values are weighted means. Weighted standard errors are shown in parentheses.

For RCP influence on customer demand for efficient insulation, the mean responses of participants and nonparticipants are only marginally different from each other. However, the mean ratings of nonparticipants with training are significantly lower those of the other groups.

Market Potential

Contractors were asked to estimate the market potential for insulation upgrades in their area. Table 3-9 presents the mean responses. On the average, all respondents reported close to 40% of the homes in their area could be upgraded with attic insulation cost effectively. At first glance, participants appear to have estimated higher market potential for attic upgrades than the other groups. However, the standard errors for these means are high and the differences between groups are marginal at best. When asked what percentage of owners were likely to have this work done, participants reported the lowest estimate of 29%. For wall insulation, the differences between mean responses are insignificant due to high standard errors.

Table 4-9: Insulation Contractors' Reports of Market Potential

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Homes in area that could still upgrade attic insulation for a reasonable cost	47.4% (5.68) n = 10	33.2% (7.03) n = 14	40.6% (10.95) n = 7	42.6% (4.11) n = 31
Owners likely to have attic insulation upgraded	29.0% (5.43) n = 10	47.0% (7.06) n = 13	67.8% (12.89) n = 6	41.6% (5.03) n = 29
Homes in area that could still upgrade wall insulation for a reasonable cost	56.3% (9.63) n = 10	38.6% (9.63) n = 10	33.9% (11.73) n = 7	46.9% (5.79) n = 30
Owners likely to have wall insulation upgraded	22.8% (3.85) n = 10	42.2% (7.96) n = 12	62.5% (14.52) n = 6	35.8% (5.16) n = 28
Above changed in past year	32.6% (0.16) n = 10	20.2% (0.11) n = 14	32.4% (0.19) n = 7	29.8% (0.08) n = 31
Changed due to RCP	68.2% (0.23) n = 5	0.0% (0.00) n = 4	0.0% (0.00) n = 1	37.6% (0.16) n = 10
Change is sustainable	2.7% (0.11) n = 3	N/A	N/A	2.7% (0.11) n = 3

Values are weighted means. Weighted standard errors are shown in parentheses.

When asked if they would have answered differently a year ago, nearly a third of participants and nonparticipants with training and one-fifth of nonparticipants answered affirmatively. Furthermore, a majority of participants reported the reason they changed their views was due to the program.

Insulation contractors were also asked if they would have trouble finding qualified labor in the event they had an opportunity to expand their businesses due to increased demand. As shown in Table 4-10, approximately 84% of nonparticipants reported they would have trouble, while only 26% of participants and 7% of nonparticipants with training would have the same problem. Moreover, these differences are significant due to the low standard errors of the means.

Table 4-10: Insulation Contractors' Ability to Find Qualified Labor

Indicator	Participants	Non-participants	Non-participants with training	All Respondents
Have trouble finding qualified labor	25.9% (0.15) n = 10	83.9% (0.09) n = 16	6.8% (0.10) n = 7	41.4% (0.09) n = 33

Values are weighted means. Weighted standard errors are shown in parentheses.

Summary of Market Perceptions

Contractors were asked to report their perceptions on customer awareness, demand and market potential and what influence the RCP had on these areas. The results are as follows:

- A majority of respondents reported that customers are more aware of benefits of insulation with higher R ratings.
- Approximately one-fourth of participants and two-thirds of nonparticipants attributed this increased awareness to the RCP.
- Nearly 86% of all respondents reported that customers are more willing to install of insulation with higher R ratings than they were a year ago.
- Nearly 75% of participants attributed the willingness of customers to install more efficient insulation to the RCP and only two of the five participants that attributed this willingness to the RCP program mentioned vouchers. In comparison, none of the nonparticipants or nonparticipants with training attributed the willingness to the RCP.
- All respondents reported on average high cost effectiveness ratings for attic and wall insulation.
- All respondents reported on average low ratings of customer awareness of the RCP.
- No significant differences were reported between participants and nonparticipants for the number of homes that could be upgraded cost effectively.
- A majority of nonparticipants reported that they would have trouble finding qualified labor in the face of high demand for their services, while only a small percentage of participants and nonparticipants with training would have the trouble.

5

Summary and Conclusions

5.1 Overview

This report presents the results of an assessment of near-term market effects for the 1999 California Residential Contractor Program (RCP). The RCP, started in May 1999, provides incentives to contractors in the form of program vouchers for the installation or performance of energy efficient measures in existing single family homes.

A number of indicators of market effects were identified during the initial stages of this study. In particular, these indicators were drawn from the RCP Baseline Study[19] and included the following:

- Cost effectiveness of energy efficient measures,
- Increase in jobs,
- Changes in efficiency levels recommended and installed,
- Changes in contractor practices,
- Increase in awareness of energy efficiency measures,
- Increase in awareness of whole-system treatments (HVAC only),
- Ownership of diagnostic equipment (HVAC only),
- Increase in contractors offering diagnostic services (HVAC only),
- Consumer awareness and demand,
- Equipment availability, and
- Availability of qualified labor.

Using these indicators, a set of hypothesized market effects were then developed. Hypotheses included proposed changes in contractor awareness, increased jobs, increased levels of energy efficiency per job, improved installation practices, and (for HVAC contractors) increases and changes in diagnostics. In-depth interviews and telephone surveys were designed to collect data from HVAC, window and insulation contractors working in the existing homes market. Survey responses were then used to test the hypotheses using comparisons between participant and nonparticipant responses and self-reported impacts.

[19] Wirtshafter et. al. Op. Cit.

When effects that could be attributed to the program were found, the issue of sustainability was also addressed.

The remainder of this Section presents a summary of the results found for HVAC, window and insulation contractors. Results are presented for both near-term market effects and for contractors' perceptions of customer awareness and market potential

5.2 Results for HVAC Contractors

Based on the in-depth interviews and telephone surveys with HVAC contractors, this analysis found the following results.

Market Effects

- Sufficient evidence was found to support a program-related change in contractors' awareness of the benefits of duct testing and sealing. In addition, evidence was found to show that participants are recommending more high efficiency measures as a result of the program. Due to the sustainable nature of awareness, and to evidence from survey responses showing recommendations for high efficiency measures will continue without the program, these effects are likely to be sustainable.
- Some evidence to support an increase in retrofit and diagnostic jobs that could be attributed to the RCP was found. Interestingly, most respondents thought the increase for retrofit jobs was due to better marketing and customer awareness related to the program rather than actual incentivized jobs obtained through the program. For diagnostic jobs, however, they felt the increase was due to the incentive and therefore would not continue without the program. Furthermore, due to small sample sizes, the results for this hypothesis are weak.
- Sufficient evidence was found to support the hypothesis that the level of energy efficiency per job was increased as a result of the RCP. Moreover, these changes directly relate to duct testing and sealing methods that were learned in the training sessions offered by the program.
- Sufficient evidence was found to support the hypothesis that the RCP increased the number of contractors who offer diagnostic services. This result is true for both air conditioning maintenance and duct testing. While the sample sizes are smaller for air conditioning maintenance as nearly all contractors had been offering this service, the results for duct testing are strong. A significant proportion of contractors surveyed started this service as a result of the program and plan to continue it.
- Some evidence was found to support the hypothesis that the RCP improved diagnostic procedures for participant contractors. The evidence is sufficient for air conditioning maintenance. For duct testing, however, the sample sizes are too small to support a market effect.

- Some evidence was found to support a program-related change in contractors' awareness of whole-system treatments. While the percentage of participants who reported increasing their offers is much less than nonparticipants, the majority of nonparticipants with training reported increasing their offers of whole-system treatments over the past year. Furthermore, the survey responses indicate that most attribute this to the RCP and will continue even without the program.
- Some evidence was found to support a program-induced change in customer awareness of whole-system treatments. Moreover, due to the sustainable nature of awareness, this change is expected to continue even in the absence of the program. The result is somewhat weakened, however, by the finding that many respondents believe their customers are willing to do the treatments based on reasons unrelated to the program.

Market Perceptions

- All respondents reported on average low awareness among customers of the RCP.
- Similarly, all respondents reported on average little influence from the RCP on customer demand for high efficiency equipment, duct testing and duct sealing.
- High potential for upgrade work was reported by all groups; however, relatively low estimates of the likelihood of owners willing to have the work done were reported.
- Approximately half of the participants thought the likelihood of customers upgrading had increased in the past year. Most reported this increase due to the RCP.
- A majority of respondents reported that finding qualified labor would be difficult if they saw an increase in demand for their services.

5.3 Results for Window Contractors

The following summarizes the results of the hypothesis testing for near-term market effects based on the surveys of window contractors.

Market Effects

- All of the indicators considered for this hypothesis showed weak results. The strongest finding was that four participants reported that they are now recommending more high performance windows to their customers as a result of being involved with the program. In addition, all said they would continue the practice even in the absence of the program.
- Evidence was found to support an increase in the number of contractor jobs due to the RCP. The program effected this change in two ways: through program incentive vouchers and through increased customer awareness. To the extent jobs increased via the latter, this change is sustainable.

- This hypothesis was not supported by the survey responses. While some contractors are changing their practices, most are doing it as a result of market stimuli other than the RCP training.

Market Perceptions

- All respondents reported high ratings of customer awareness of high performance windows. Similarly, they reported high ratings for customer willingness to install high performance windows.
- A majority of participants attributed the high awareness and willingness to the RCP. In addition, a number of nonparticipants with training attributed the program for increased customer willingness.
- Participants and nonparticipants with training reported higher ratings of customers' beliefs of the cost effectiveness of high performance windows than did nonparticipants.
- Participants reported a higher rating of customer awareness than did nonparticipants. A similar result was found for ratings of the program's influence on customer demand for high performance windows.
- Participants estimated 71% of the homes in their area could still be upgraded cost effectively and that 48% of the owners were likely to have the work done. Nonparticipants estimated 59% of the homes in their area could still be upgraded and only 28% of the owners were likely to have the work done. Similarly, nonparticipants with training estimated 54% of the homes in their area could be upgraded at a reasonable cost and 14% of owners were likely to have the work done.
- A majority of participants attributed this market potential to the RCP and believed that it was sustainable even without the program.
- Relatively few respondents reported problems in expanding their services if they were to experience high customer demand.
- When asked about finding qualified labor, however, contractors in all three groups agreed this was a problem.

5.4 Results for Insulation Contractors

The following summarizes the results of the hypothesis testing for near-term market effects based on the surveys of insulation contractors.

Market Effects

- Evidence was not found to support a change in contractors' awareness of the benefits of more efficient insulation that could be attributed to the RCP.

- Evidence was found to support an increase in the number of contractor jobs due to the RCP. However, as some of the increase was reportedly due to the use of program vouchers, this change may not outlive the program.
- Some evidence was found to support the hypothesis that the training provided to contractors by the RCP improved installation methods. However, due to the small sample sizes the evidence is too weak to conclude that the RCP has had an effect in this area.

Market Perceptions

- A majority of respondents reported that customers are more aware of benefits of insulation with higher R ratings.
- Approximately one-fourth of participants and two-thirds of nonparticipants attributed this increased awareness to the RCP.
- Nearly 86% of all respondents reported that customers are more willing to install of insulation with higher R ratings than they were a year ago.
- Nearly 75% of participants attributed the willingness of customers to install more efficient insulation to the RCP and only two of the five participants that attributed this willingness to the RCP program mentioned vouchers. In comparison, none of the nonparticipants or nonparticipants with training attributed the willingness to the RCP.
- All respondents reported on average high cost effectiveness ratings for attic and wall insulation.
- All respondents reported on average low ratings of customer awareness of the RCP.
- No significant differences were reported between participants and nonparticipants for the number of homes that could be upgraded cost effectively.
- A majority of nonparticipants reported that they would have trouble finding qualified labor in the face of high demand for their services, while only a small percentage of participants and nonparticipants with training would have the trouble.

5.5 Conclusions

Results of this analysis indicate that the 1999 RCP has had some effect on the market. In particular, changes in HVAC contractor awareness and practices were found. Specifically, some of the stronger findings are the following:

- Increased awareness among HVAC contractors of the benefits of duct testing and sealing,
- Increased level of energy efficiency per job for HVAC contractors,
- Increased number of HVAC contractors who offer diagnostics,

- Increased number of jobs for window contractors, and
- Increased number of jobs for insulation contractors.

Moreover, all but the latter two are expected to persist after the program, according to the responses of surveyed contractors. To the extent the latter two are due to program vouchers, however, they may not be sustainable.

As the majority of incentivized measures and training offered through the program is targeted at HVAC contractors, it is not surprising that these market players were found to have experienced the greatest amount of change from the program. In particular, program benefits in the area of duct sealing and duct testing are evident. For this reason, future market effect evaluations for the RCP should concentrate on these areas. Furthermore, as the program targets licensed contractors with established businesses, any gains in the area of equipment efficiency awareness will be minimal.

Interestingly, the time required by the RCP for a willing participant to incorporate into the program created a new category of player in the market. Specifically, these are the contractors who had joined the program, received training and certification, but had not yet actually participated by obtaining a voucher for incentivized work. These individuals gained the knowledge from the training and started using it in their marketing and practices. Therefore, in many ways they respond and behave as full participants. In a way, they are like new converts as they have joined the ranks of RCP-approved contractors only recently and are enthusiastic about what they are learning. True participants, on the other hand, are more representative of the contractors who typically participate in energy efficiency programs. In addition, they may have incorporated many of the changes advocated by the program into their business some time ago. The comparison of survey responses from both of these groups with true nonparticipants is an interesting exercise. It is suggested that future RCP market effect evaluations consider this third player and what additional information their role brings to the analysis.

Attachment A

Survey Instruments

HVAC Contractor with Diagnostics Interview Guide (in-depth)

Introduction

Hello, my name is _____ and I am calling from RER. I am conducting research for the utilities in California on their Residential Contractor Program. The Residential Contractor Program offers incentives to existing residences for energy efficiency measures installed by approved contractors. May I please speak with _____?

Verification

Verify that the respondent
1) is an HVAC contractor,
2) provides retrofits to the residential existing homes market, and
3) specializes in single family homes.

Background

Questions 1 – 6 are designed to gain background information on the contractor so we know what kinds of services he offers and how big his company is.

1. Are you aware of the Residential Contractor Program? ____ yes ____ no
(if yes) Are you approved to work under that program? ____ yes ____ no
(if yes) Have you submitted any vouchers under the program? ____ yes ____ no

2. What contractor licensed practices does your company provide to existing residences?
   - _____ B1-General contracting
   - _____ C36-plumbing,
   - _____ C2-insulation
   - _____ C17-Glazing
   - _____ C20-HVAC ,
   - _____ C10-electrical,
   - _____ C?- Refrigeration
   - _____ C? Sheet Metal
   - _____ mobile home
   - _____ HIC-home improvement
   - _____ D65-weatherization
   - _____ Other _____

3. Which of the following services do you provide in the RCP program?
   - _____ checking and correcting refrigerant charge and evaporator coil air flow on central air conditioners and heat pumps
   - _____ duct sealing
   - _____ duct testing
   - _____ installing ENERGY STAR gas furnaces
   - _____ installing ENERGY STAR central air conditioners and central heat pumps
   - _____ installing programmable thermostats
   - _____ installing attic and wall insulation
   - _____ installing high performance windows
   - _____ installing efficient gas water heaters
   - _____ installing pipe insulation
   - _____ installing water-saving showerheads
   - _____ installing hard-wired fluorescent fixtures
   - _____ installing screw-in compact fluorescent lights

4. How long have you worked as a contractor, and how much of that time have you worked in California?

5. How many employees work in your company?

6. In how many single family existing homes (including mobile homes) did your company work last year?

Business Practices

7. What SEER rating do you consider to be high efficiency for central air conditioners?

   _____ SEER

And what AFUE rating do you consider to be high efficiency for gas furnaces?

   _____ AFUE

And also what SEER and heating season performance factor do you consider to be high efficiency for heat pumps?

   _____ SEER _____ HSPF

8. Would you have answered this any differently a year ago?

   ____ yes ____ no

9. *(if yes)* Why?

   Probe for:
   - ____ *RCP training*
   - ____ *RCP incentives*
   - ____ *customer demand*
   - ____ *Other:* _____

Note: if respondent answers SEER 10 or less, AFUE 80 or less, or HSPF 6.8 or less, explain what levels are considered high efficiency for the remaining questions in this survey.

10. How cost effective do you think these measures are (very cost effective, somewhat cost effective, not cost effective)?

	Very	Somewhat	Not
High efficiency central acs:	____	____	____
High efficiency gas furnaces:	____	____	____
High efficiency heat pumps:	____	____	____
Duct sealing:	____	____	____

11. Would you have answered this any differently a year ago?

____ yes ____ no

(if yes) Why?

Probe for:

____ *RCP training*

____ *RCP incentives*

____ *customer demand*

____ *Other:* _____

12. How cost effective do you think your customers consider these measures?

	Very	Somewhat	Not
High efficiency central acs:	____	____	____
High efficiency gas furnaces:	____	____	____
High efficiency heat pumps:	____	____	____
Duct sealing:	____	____	____

13. Would you have answered this any differently a year ago?

____ yes ____ no

(if yes) Why?

Probe for:

____ *customer demand*

____ *Other:* _____

Retrofits

14. When did you start performing HVAC retrofits?

If answer is more than 1 year ago, skip to Q17. If answer is within the past year, continue with Q15.

15. Why did you decide to begin offering these services? *probe for following factors:*
    ____ *RCP training*
    ____ *RCP incentives*
    ____ *customer demand*
    ____ *competition*
    ____ *Other:* _____

If answer indicates program is the cause, continue with Q16. Else, skip to Q17.

16. Will you continue to offer these services even if the RCP is discontinued?
    ____ yes ____ no

(if no) Why not?
    Probe for:
    Lack of customer demand
    other

Questions 17 – 19 are designed to test the hypothesis that RCP has influenced the number of jobs.

17. Has the number of jobs in which you've performed retrofits increased, stayed the same or decreased over the past year?
    ____ Increased -- by how much? _____
    ____ Stayed the same
    ____ Decreased -- by how much? _____

If answer is increased, continue with Q18. Else, skip to Q20.

18. Why has it increased?
    probe for relation to program:
    ____ *RCP training*
    ____ *RCP incentives*
    ____ *customer demand has increased (probe for if RCP has produced new jobs that contractor would not have gotten otherwise)*
    ____ *contractor has been promoting retrofits more*
    ____ *Other:* _____

If answer indicates program is the cause, continue with Q19. Else, skip to Q20.

19. Do you anticipate that this increase in the number of jobs will continue if the RCP program is discontinued?

____ yes ____ no

(if no) Why not?

Probe for:
Lack of customer demand
Not cost effective
other

Questions 20 – 28 are designed to test the hypothesis that RCP has influenced efficiency gains.

20. Over the past year, has there been any change in your recommendations to your customers for installing central air conditioners and heat pumps?

____ yes ____ no

if yes, please describe.

Probe to see if they are recommending higher SEER levels than they did a year ago.

And during that same time, has there been any change in your recommendations to your customers for installing gas furnaces?

____ yes ____ no

if yes, please describe.

Probe to see if they are recommending higher AFUE levels than they did a year ago.

Also, has there been any change in your recommendations to your customers for duct sealing and duct testing?

____ yes ____ no

if yes, please describe.

Probe to see if they are recommending this more now than they did before.

21. *(if no)* Why not?

Probe for:
Lack of customer demand
Not cost effective
other

If all answers are no, then RCP has not influenced respondent in this area. Skip to Q24. If any answer is yes, RCP has possibly influenced them. Continue with Q22.

22. *(if yes to Q20)* Why did you make these changes?

probe for relation to program:
____ *RCP training*
____ *RCP incentives*
____ *Other:* _____

If answer indicates program is the cause, continue with Q23. Else, skip to Q24.

23. Will you continue _____ (*describe change here – making more recommendations or whatever they indicated in Q20*) even if the RCP program is discontinued?

____ yes ____ no

(if no) Why not?

Probe for:
Lack of customer demand
Not cost effective
other

24. Now, what about actually installing these items -- over the past year, has there been any change in your installation of these measures?

acs and heat pumps: ____ yes ____ no
furnaces: ____ yes ____ no
Duct sealing with duct testing in retrofits: ____ yes ____ no

If yes, please describe the change.
Probe to see if they are installing higher efficiency equipment and are performing more duct sealing and duct testing.

25. *(if no)* Why not?

Probe for:
Lack of customer demand
other

If all answers are no, then RCP has not influenced respondent in this area. Skip to Q28. If any answer is yes, RCP has possibly influenced them. Continue with Q26.

26. Why?

probe for relation to program:
____ *RCP training*
____ *RCP incentives*
____ *customer demand has increased*
____ *contractor has been promoting more*
____ *Other:* _____

If answer indicates program is the cause, continue with Q27. Else, skip to Q28.

27. Do you anticipate that you would continue _____ (*describe change here – installing higher efficient equipment or whatever they indicated in Q24*) even if the RCP program were discontinued?

____ yes ____ no

(if no) Why not?

Probe for:

Lack of customer demand
Not cost effective
other

Questions 28 – 30 are designed to test the hypothesis the RCP training improved installation practices.

28. Have you or other employees at your company taken the training offered by RCP in duct sealing?

____ yes ____ no

This question is designed to verify that the respondent has taken the RCP training. If answer is no, probe to see if respondent qualified for RCP in another manner.

29. If so, how many employees have taken the training?

30. Do you use any different installation procedures and/or materials for duct sealing than you did a year ago?

____ yes ____ no

If answer is yes, RCP training has possibly influenced this respondent. Continue with Q31. If answer is no, probe further with "What about the jobs you did with RCP vouchers? Are these typical of your usual services or did you do something different for the program?" If answer is still no, RCP training has not influenced this respondent in this area. Skip to Q34.

31. *(If yes)* Please describe what you do differently.

32. Why did you start this practice or start using this product?

probe for relation to program:

____ *RCP training*
____ *RCP requirements*
____ *customer demand*
____ *Other:* _____

If answer indicates program is the cause, continue with Q33. Else, skip to Q34.

33. Will you continue to use these procedures and/or materials for duct sealing even if the RCP program is discontinued?

____ yes ____ no

(if no) Why not?

Probe for:
Lack of customer demand
Not cost effective
other

Diagnostics

34. Do you provide diagnostic services for ac maintenance?

____ yes ____ no

Note: if respondent is a nonparticipant, we may need to explain what we mean by ac maintenance. We mean checking and correcting the refrigerant charge and evaporator coil air flow on central air conditioners and heat pumps.

35. Do you provide duct testing services?

____ yes ____ no

(if answer to Q35 is yes): So, your company owns duct testing equipment? ___ yes ___ no
(if answer to Q35 is no): Why don't you provide this service? *Probe for:*

cost of equipment
lack of customer demand
other

If answers to both Q34 and Q35 are no, skip to Q54. If answer to either is yes, continue with Q36.

Questions 36 – 38 are designed to test the hypothesis that RCP influenced the number of contractors who offer these services.

36. When did you start providing these services?

For ac maintenance: _____
Duct testing: _____

If both answers are more than a year ago, then RCP has not influenced this respondent to offer diagnostics. Skip to Q39. If either answer is within the past year, RCP has possibly influenced them. Continue with Q37.

37. Why did you decide to begin offering these services? *ask separately for ac maintenance and duct testing and probe for following factors:*

RCP training
RCP incentives
Assistance in purchasing duct testing equipment
customer demand
Other: _____

If answer indicates program is the cause, continue with Q38. Else, skip to Q48.

38. Will you continue to offer these services even if the RCP is discontinued? *ask separately for ac maintenance and duct testing*

ac maintenance: ____ yes ____ no
duct testing: ____ yes ____ no

(if no) Why not?

Probe for:
Lack of customer demand
Not cost effective
other

If either answer to Q36 was more than a year ago, continue with Q39. If both answers were less than a year ago, skip to Q48. The remaining questions in this section are asked only of respondents who have been offering diagnostics for more than 1 year.

Questions 39 - 42 are designed to test the hypothesis that RCP influenced the number of jobs and the hypothesis that RCP influenced efficiency gains since an increase in the use of diagnostics would imply gains in efficiency.

39. Has the number of homes in which you've performed diagnostics for ac maintenance increased, stayed the same or decreased over the past year?

____ Increased -- by how much? _____
____ Stayed the same
____ Decreased -- by how much? _____

40. And how about duct testing? Has the number of homes in which you've performed duct testing increased, stayed the same or decreased over the past year?

____ Increased -- by how much? _____
____ Stayed the same
____ Decreased -- by how much? _____

If answer for both Q39 and Q40 is stayed the same, skip to Q43. Else, continue with Q41.

41. Why has it increased or decreased?
probe for relation to program:
____ *RCP training*
____ *RCP incentives*
____ *Assistance in purchasing duct testing equipment*
____ *customer demand has increased (probe for if RCP has produced new jobs that contractor would not have gotten otherwise)*
____ *contractor has been promoting diagnostics more*
____ *Other:* _____

If answer indicates program is the cause, continue with Q42. Else, skip to Q43.

42. Do you anticipate that this change in the number of diagnostic jobs for will continue if the RCP program is discontinued?
____ yes ____ no

(if no) Why not?
Probe for:
Lack of customer demand
Not cost effective
other

Questions 43 – 47 are designed to test the hypothesis that RCP training improved installation practices.

43. Have you taken the training offered by RCP in
duct testing? ____ yes ____ no *(ask for all areas)*
basic diagnostic / tune-up? *(ask for all areas)* ____ yes ____ no
combustion appliance safety testing? (*ask for PG&E & SDG&E areas only*)
____ yes ____ no

This question is designed to verify that the respondent has taken the RCP training. If answer is no, probe to see if respondent qualified for RCP in another manner.

44. Are you performing diagnostic services any differently than you did 1 year ago?
For ac maintenance: ____ yes ____ no
Duct testing: ____ yes ____ no

If answer to either is yes, RCP training has possibly influenced this respondent. Continue with Q45. If answer is no, probe further with "What about the jobs you did with RCP vouchers? Are these typical of your usual services or did you do something different for the

program?" If answer is still no, RCP training has not influenced this respondent in this area. Skip to Q48.

45. *(if yes)* Please describe what you are doing differently.

46. Why did you start doing this differently?
probe for relation to program:
____ *RCP training*
____ *RCP requirements*
____ *customer demand*
____ *Other:* _____

If answer indicates program is the cause, continue with Q47. Else, skip to Q48.

47. Will you continue to use these procedures even if the RCP program is discontinued?
____ yes ____ no

(if no) Why not?
Probe for:
Lack of customer demand
Not cost effective
other

Whole-System Treatments

Questions 48 - 54 are designed to test the hypothesis that RCP increased contractor awareness of whole-system treatments.

48. When making recommendations to your customers, do you typically consider your customers' energy usage?
____ yes ____ no

50. In addition to installing heating and cooling equipment, do you also consider changes to the distribution system that may affect the overall efficiency of the HVAC system?
____ yes ____ no

(if no) Why not?
Probe for:
Lack of customer demand
Not cost effective
other

If answer to Q50 is no, respondent is unaware of whole-system treatments. Skip to Q55. Else, continue with Q51.

51. Do you typically consider treating the whole HVAC system when providing HVAC services to your customers?

52. Has your tendency to offer whole-system treatments changed over the past year?

____ Increased -- by how much? _____
____ Stayed the same
____ Decreased -- by how much? _____

If answer is stayed the same, RCP has not influenced this respondent in this area. Skip to Q55. If answer is increased or decreased, RCP has possibly influenced them. Continue with Q53.

53. Why has it increased or decreased?

probe for relation to program:
____ *RCP training*
____ *RCP incentives*
____ *customer demand has increased*
____ *contractor has been promoting them more*
____ *competition*
____ *Other: _____*

If answer indicates program is the cause, continue with Q54. Else, skip to Q55.

54. Will you continue to offer these services even if the RCP is discontinued?

____ yes ____ no

(if no) Why not?

Probe for:
Lack of customer demand
Not cost effective
other

Perceptions of Customer Demand

Questions 55 - 57 are designed to test the hypothesis that RCP increased customer awareness of whole-house systems and treatments.

55. Are your customers more aware of the need to do duct sealing and duct testing than they used to be?

____ yes ____ no

What about comprehensive treatments in general? Are your customers more aware of the need to do these then they used to be?

____ yes ____ no

If both answers are no, skip to Q58. Else, continue with Q56.

56. Why are they more aware?

probe for relation to program:

____ *RCP incentives*
____ *RCP contractors marketing duct sealing treatments*
____ *RCP contractors marketing other comprehensive treatments*
____ *Other:* _____

57. Are your customers more willing to do these treatments?

____ yes ____ no

(if yes) Why are they more willing?

probe for relation to program:

____ *RCP incentives*
____ *RCP contractors marketing duct sealing treatments*
____ *RCP contractors marketing other comprehensive treatments*
____ *Other:* _____

(if no) Why not?

Probe for:
Not cost effective
other

Questions 58 - 62 are designed to learn contractors' perceptions of market potential.

58. In your opinion, what percentage of the homes in your area could still upgrade their heating and cooling equipment for a reasonable cost? What about reducing their duct leakage?

heating equipment _____%
cooling equipment _____%
ducts _____%

59. Of these homes, in what percentage are the owners likely to have the work done?

heating equipment _____%
cooling equipment _____%
ducts _____%

60. Have these percentages of customers likely to do the work changed over the past year?

____ yes ____ no

If answer is no, skip to Q63. Else, continue with Q61.

61. Why has it changed?

probe for relation to program:

____ *RCP incentives*
____ *RCP contractors marketing services*
____ *Consumers more informed*
____ *Other:* _____

62. In your opinion, will homeowners continue with this tendency even without RCP vouchers?

____ yes ____ no

(if no) Why not?

Probe for:
Not cost effective
other

63. In your opinion, what influence would you say the RCP program has had on the level of customer demand for the following measures? Please answer on a scale of 1 to 10 where 1 indicates no influence and 10 indicates very high influence.

High efficiency equipment _____
Duct sealing _____
Duct testing _____

If any answer is above 1, continue with Q64. Else, skip to Q66.

64. In your opinion, will this increased demand continue after the program is discontinued?

____ yes ____ no

65. Why?

Product Availability and Attributes

66. If you were to experience a high demand for HVAC retrofits, would you have any trouble expanding your services?

____ yes ____ no

And what about a high demand for diagnostic services for ac maintenance, would you have any trouble expanding those services?

____ yes ____ no

And also what about a high demand for duct testing, would you have any trouble expanding those services?

____ yes ____ no

67. Would you have trouble finding high efficiency air conditioning and heating units?
____ yes ____ no
Would you have trouble finding qualified labor? ____ yes ____ no
(ask this only of diagnostic contractors:) Would you have trouble acquiring diagnostic equipment? ____ yes ____ no

If answer is yes to anything in Q67, continue with Q68. Else, skip to Q69.

68. Why would you have trouble?

69. Do you have any concerns about recommending or installing high efficiency equipment?
What about sealing ducts?
What about performing diagnostics?

HVAC Contractor Survey

Introduction

Hello, my name is _____ and I am calling on behalf of the California utilities. I am conducting research on their Residential Contractor Program *[note: if respondent is in SDG&E area, say the Residential Energy Efficiency Contractor Program]*. The Residential Contractor Program (RCP) offers incentives to existing residences for energy efficiency measures installed by approved contractors. May I please speak with _____?

Verification

Before we get started, I'd like to ask you a few questions to make sure I'm talking to the appropriate person in your firm.

a) Are you a licensed HVAC contractor? ____ yes ____ no
b) Do you provide services to the residential existing homes market? ____ yes ____ no
c) Do you specialize in single family homes? ____ yes ____ no

If respondent answers no to any of above, terminate.

Background

1a. Are you aware of the Residential Contractor Program *[note: if respondent is in SDG&E area, say the Residential Energy Efficiency Contractor Program]*?

1b. Have you submitted any vouchers under the RCP program for HVAC services?

2. What contractor licenses does your company hold?
Check all that apply:

- _____ B1 General contracting
- _____ C36 plumbing,
- _____ C2 insulation
- _____ C17 Glazing
- _____ C20 HVAC ,
- _____ C10 electrical,
- _____ C38 Refrigeration
- _____ C43 Sheet Metal

_____ mobile home
_____ HIC-home improvement
_____ D65-weatherization
_____ Other _____

3. Which of the following services does your company provide?
_____ checking and correcting refrigerant charge and evaporator coil air flow on central air conditioners and heat pumps
_____ duct sealing
_____ duct testing
_____ installing ENERGY STAR gas furnaces
_____ installing ENERGY STAR central air conditioners and central heat pumps
_____ installing programmable thermostats
_____ installing attic and wall insulation
_____ installing high performance windows
_____ installing efficient gas water heaters
_____ installing pipe insulation
_____ installing water-saving showerheads
_____ installing hard-wired fluorescent fixtures
_____ installing screw-in compact fluorescent lights

4. How long have you worked as a contractor, and how much of that time have you worked in California?
____ years worked as contractor ____ years worked in California

5. How many employees work in your company?
____ number of employees

6. In how many single family existing homes (including mobile homes) did your company work last year?
____ homes

High Efficiency Equipment

Now I'd like to ask you some questions about high efficiency HVAC equipment and services.

7. What SEER rating do you consider to be high efficiency for central air conditioners?
_____ SEER

8. What AFUE rating do you consider to be high efficiency for gas furnaces?
_____ AFUE

9. What SEER and heating season performance factor (HSPF) do you consider to be high efficiency for heat pumps?

_____ SEER _____ HSPF

10. Would you have answered these any differently a year ago?

Central air conditioners: yes or no
Gas furnaces: yes or no
Heat pumps: yes or no

If answered no to all, skip to Q13.

11. *(For every yes answer in Q10)* Why would you have answered this differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
check all that apply:

a) have more experience with this product because customers are asking for it more
b) learned about this from the RCP program
c) learned about this from trade magazines or trade shows
d) other

12. *(if answered a to Q11)* Do you think customers are asking for it more due to the RCP program?

13. In your opinion, how cost effective are the following types of equipment for your region? Please answer on a scale of 1 to 5, where 1 represents not at all cost effective and 5 represents very cost effective.

a) Central air conditioning with a SEER 12 rating: 1 to 5
b) Gas furnaces with an AFUE rating of 90: 1 to 5
c) High efficiency heat pumps: 1 to 5

14. Would you have answered any of these differently a year ago?

a) Central air conditioning with a SEER 12 rating: yes or no
b) Gas furnaces with an AFUE rating of 90: yes or no
c) High efficiency heat pumps: yes or no

If answered no to all, skip to Q17.

15. (*for each yes response in Q14*) Why would you have answered it differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

check all that apply:

a) have more experience with this product because customers are asking for it more
b) learned about this from training required for the RCP program
c) learned about this from trade magazines or trade shows
d) other

16. *(if answered a to Q15)* Do you think customers are asking for it more due to the RCP program?

17. In your opinion, how cost effective is duct testing and sealing in existing homes in your region? Please answer on a scale of 1 to 5, where 1 represents not at all cost effective and 5 represents very cost effective.

18. Would you have answered this any differently a year ago?

If answered no, skip to Q21.

19. Why would you have answered it differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) have more experience with duct testing and/or sealing because customers are asking for it more
b) learned about duct testing and/or sealing from training required for the RCP program
c) learned about duct testing and/or sealing from trade magazines or trade shows
d) other

20. *(if answered a to Q19)* Do you think customers are asking for it more due to the RCP program?

21. On a scale of 1 to 5, how cost effective do you think your customers consider these measures?

a) Central air conditioning with SEER 12 rating: 1 to 5
b) Gas furnaces with an AFUE rating of 90: 1 to 5
c) High efficiency heat pumps: 1 to 5
d) Duct testing and sealing: 1 to 5

22. Would you have answered any of these differently a year ago?

a) Central air conditioning with SEER 12 rating: yes or no
b) Gas furnaces with an AFUE rating of 90: yes or no
c) High efficiency heat pumps: yes or no

d) Duct sealing: yes or no

If answered no to all, skip to Q25.

23. (*for each yes response in Q22*) Why would you have answered it differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) customers are more informed now due to the Internet

b) customers are more informed now due to the RCP program

c) customers are more informed now because we are promoting it more

d) customers are more informed now from information they get from the utilities or other organizations

e) RCP vouchers

f) other

24. (*If answered c to Q23)* Are you promoting it more now because of the RCP program?
(If answered d to Q23) Is this information related to the RCP program?

Retrofits

25. Has the number of jobs in which you've performed HVAC retrofits increased, stayed the same or decreased over the past year?

a) Increased -- by how much? _____

b) Stayed the same

c) Decreased -- by how much? _____

If answered b, skip to Q30.
If answered c, skip to Q29.

26. (*if answered increased in Q25*) What do you think is the primary reason it has increased?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) customers are more aware/receptive of the benefits of retrofits

b) our company is promoting retrofits more

c) RCP vouchers

d) our reputation as a contractor

e) business, in general, is increasing

f) other

27. (*if answered a or b to Q26*) Is this due to the RCP program?

If answered yes to Q27 or if answered c to Q26 or if response to Q26 includes RCP program, ask Q28. Else, skip to Q30.

28. Do you anticipate that this increase in the number of jobs will continue if the RCP program is discontinued?

a) yes
b) no

29. (*if answered decreased in Q25*) What do you think is the primary reason it has decreased?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) mild weather
b) it's too expensive or not cost effective
c) other

30. Over the past year, has there been any change in your recommendations to your customers for installing the following equipment in existing homes?

a) central air conditioners and heat pumps: yes or no
b) gas furnaces: yes or no

If answered no to both, skip to Q35.

31. (*if yes to either in Q30*) What are those changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) recommending higher efficiency equipment
b) recommending a different refrigerant
c) we now look at air flow (or air distribution, or duct leakage)
d) other

32. Why did you make these changes in your recommendations?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive
d) it's more profitable
e) other

33. *(If answered a, c or d to Q32)* Is this due to the RCP program?

If answered yes to Q33 or if answered b to Q32 or if response to Q32 includes RCP program, ask Q34. Else, skip to Q35.

34. Will you continue these changes even if the RCP program is discontinued?

a) yes
b) no

35. Over the past year, has there been any change in your recommendations to your customers for duct testing and duct sealing?

a) yes
b) no

If answered no, skip to Q40.

36. (*if yes to Q35*) What are those changes to your recommendations?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) we didn't recommend duct testing and/or sealing before and we do now
b) we recommend to test and/or seal the ducts differently than we did before
c) we recommend to test and/or seal the ducts more often now than we did before
d) other

37. Why did you make these changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive
d) it's more profitable
e) other

38. *(If answered a, c, or d to Q37)* Is this due to the RCP Program?

If answered yes to Q38 or if answered b to Q37 or if response to Q37 includes RCP program, ask Q39. Else, skip to Q40.

39. Will you continue these changes even if the RCP program is discontinued?

a) yes
b) no

40. Now, I want to ask you about actually installing these items -- over the past year, has there been any change in your installation of the following equipment in existing homes?

a) central air conditioners and heat pumps: yes or no

b) gas furnaces: yes or no

If answered no to both, skip to Q45.

41. (*if yes to either in Q40*) What are those changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) install higher efficiency equipment

b) use combustion appliance safety (CAS) testing now

c) we now include testing and/or sealing ducts

d) other

42. Why did you make these changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it

b) learned about it from training required for RCP program

c) customers are more aware/receptive

d) it's more profitable

e) other

43. *(If answered a, c, or d to Q42)* Is this due to the RCP Program?

If answered yes to Q43 or if answered b to Q42 or if response to Q42 includes RCP program, ask Q44. Else, skip to Q45.

44. Will you continue these changes even if the RCP program is discontinued?

a) yes

b) no

45. Have you or other employees at your company taken the training offered by RCP in duct sealing?

a) yes

b) no

If answered no to Q45, skip to Q47.

46. (*If yes to Q45*) How many employees have taken the training?

47. Over the past year, has there been any change in the way you perform duct sealing?

a) yes
b) no

If answered no to Q47, skip to Q52.

48. (*if yes to Q47*) What are those changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) we didn't offer duct sealing before and we do now
b) we use different methods or products to seal the ducts than we did before
c) we use different equipment to test the ducts now
d) other

49. Why did you make these changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive
d) it's more profitable
e) other

50. *(If answered a, c, or d to Q49)* Is this due to the RCP Program?

If answered yes to Q50 or if answered b to Q49 or if response to Q49 includes RCP program, ask Q51. Else, skip to Q52.

51. Will you continue these changes even if the RCP program is discontinued?

a) yes
b) no

Diagnostics – AC Maintenance

52. Do you provide a diagnostic service for ac maintenance where you check and correct the refrigerant charge and evaporator coil air flow?

a) yes
b) no

If answer to Q52 is no, skip to Q67.

53. When did you start providing this service?

If answer is more than 1 year ago, skip to Q57.

54. Why did you decide to begin offering ac maintenance? *(Do not read list. Listen to response and record. Then check all of the options that response applies to.)*
response:_____

a) it's a good selling tool
b) customers want it
c) started as part of RCP program
d) other

55. (*if answered a or b to Q54*) Is this due to RCP vouchers?

If answered yes to Q55 or if answered c to Q54 or if response to Q54 includes RCP program, ask Q56. Else, skip to Q57.

56. Will you continue to offer this service even if the RCP is discontinued?

After answering Q56, skip to Q67. Q57 – 66 are asked only of respondents who answered more than 1 year to Q53.

57. Has the number of homes in which you've performed diagnostics for ac maintenance increased, stayed the same or decreased over the past year?

a) Increased -- by how much? _____
b) Stayed the same
c) Decreased -- by how much? _____

If answered b or c to Q57, skip to Q61.

58. *(if answered increased to Q57)* Why has it increased?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) we're marketing it more
b) customers want it or are more receptive
c) RCP vouchers
d) other

59. (*if answered a or b to Q58*) Is this due to the RCP program?

If answered yes to Q59 or if answered c to Q58 or if response to Q58 includes RCP program, ask Q60. Else, skip to Q61.

60. Do you anticipate that this increase in the number of diagnostic jobs will continue if the RCP program is discontinued?

____ yes ____ no

61. *If respondent is in SCE/SoCal area, ask:*
Have you taken the training offered by the RCP in basic diagnostic ac tune-ups?
If respondent is not in SCE/SoCal area, ask:
Have you taken the training offered by the RCP in combustion appliance safety testing?

62. Are you performing diagnostics for ac maintenance any differently than you did 1 year ago?

If answered no to Q62, skip to Q67.

63. *(if answered yes to Q62)* Please describe what you are doing differently.
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) more in-depth or more accurate
b) use better equipment
c) other

64. Why did you start doing this differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) able to charge more; it's more profitable
b) RCP program
c) customers asked for it
d) other

65. (*if answered a or c to Q64*) Is this due to the RCP program?

If answered yes to Q65 or if answered b to Q64 or if response to Q64 includes RCP program, ask Q66. Else, skip to Q67.

66. Will you continue to use these procedures even if the RCP program is discontinued?

____ yes ____ no

Diagnostics – Duct Testing

67. Do you provide duct testing services?
    a) yes
    b) no

If answered no to Q67, skip to Q69.

68. *(if answered yes to Q67)* So, your company owns duct testing equipment?
    a) yes
    b) no

69. *(if answered no to Q68)* Why don't you provide this service?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
    a) cost of equipment
    b) lack of customers asking for this service
    c) waiting to take classes or get equipment
    d) other

If answered no to Q67, skip to Q84 after asking Q69.

70. When did you start providing duct testing services?

If answer is more than 1 year ago, skip to Q74.

71. Why did you decide to begin offering duct testing services? *(Do not read list. Listen to response and record. Then check all of the options that response applies to.)*
response:_____
    a) it's a good selling tool
    b) customers want it
    c) started as part of RCP program
    d) other

72. (*if answered a or b to Q71)* Is this due to RCP vouchers?

If answered yes to Q72 or if answered c to Q71 or if response to Q71 includes RCP program, ask Q73. Else, skip to Q74.

73. Will you continue to offer these services even if the RCP is discontinued?

After answering Q73, skip to Q84. Q74 – 83 are asked only of respondents who answered more than 1 year to Q70.

74. Has the number of homes in which you've performed duct testing increased, stayed the same or decreased over the past year?

a) Increased -- by how much? _____
b) Stayed the same
c) Decreased -- by how much? _____

If answered b or c to Q74, skip to Q78.

75. (*If answered increased to Q74*) Why has it increased?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) we're marketing it more
b) customers want it or are more receptive
c) RCP vouchers
d) other

76. (*if answered a or b to Q75*) Is this due to the RCP program?

If answered yes to Q76 or if answered c to Q75 or if response to Q75 includes RCP program, ask Q77. Else, skip to Q78.

77. Do you anticipate that this change in the number of duct testing jobs will continue if the RCP program is discontinued?

____ yes ____ no

78. Have you taken the training offered by RCP in duct testing?

79. Are you performing duct testing any differently than you did 1 year ago?

If answered no to Q79, skip to Q84.

80. *(if answered yes to Q79)* Please describe what you are doing differently.
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) more in-depth or more accurate
b) use better equipment
c) other

81. Why did you start doing this differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) able to charge more; it's more profitable
b) RCP program
c) customers asked for it
d) other

82. (*if answered a or c to Q81*) Is this due to the RCP program?

If answered yes to Q82 or if answered b to Q81 or if response to Q81 includes RCP program, ask Q83. Else, skip to Q84.

83. Will you continue to use these procedures even if the RCP program is discontinued?

____ yes ____ no

Whole-System Treatments

84. When making recommendations to your customers for heating and cooling systems, do you typically consider your customers' energy usage?

____ yes ____ no

85. In addition to installing heating and cooling equipment, do you also consider changes to the distribution system that may affect the overall efficiency of the HVAC system?

____ yes ____ no

If answer to Q85 is no, skip to Q90.

86. Has your tendency to offer whole-system treatments changed over the past year?

a) Increased -- by how much? _____
b) Stayed the same
c) Decreased -- by how much? _____

If answered b or c to Q86, skip to Q90.

87. *(If answered increased to Q86)* Why has it increased?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) we're marketing it more
b) we offer more services now

b) customers want it or are more receptive
c) RCP vouchers
d) other

88. (*if answered a, b, or c to Q87*) Is this due to the RCP program?

If answered yes to Q88 or if answered c to Q87 or if response to Q87 includes RCP program, ask Q89. Else, skip to Q90.

89. Will you continue to offer these services even if the RCP is discontinued?
____ yes ____ no

Perceptions of Customer Demand

90. In your opinion, are your customers more aware of the benefits of duct sealing and duct testing than they used to be?
____ yes ____ no

If answered no to Q90, skip to Q96.

91. Why do you think they more aware?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
a) we educate them
b) information from utilities
c) RCP program
d) they learn from the internet or other media
e) other

92. (*if answered a or b to Q91*) Is this due to the RCP program?

93. In your opinion, are your customers more willing to do these treatments?
____ yes ____ no

If answered no to Q93, skip to Q96.

94. Why do you think they more willing?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
a) we educate them and sell them on it
b) utilities have been educating them about it

c) RCP vouchers
d) they want to save energy costs
d) other

95. (*if answered a, b or d to Q94*) Is this due to the RCP program?

96. In your opinion, how aware are your customers of the RCP program? Please answer on a scale of 1 to 10 where 1 indicates they are unaware of the program and 10 indicates they are very aware of the program.

Market Potential

97. In your opinion, what percentage of the homes in your area could still upgrade their heating and cooling equipment for a reasonable cost? What about reducing their duct leakage?

heating equipment _____%
cooling equipment _____%
ducts _____%

98. Of these homes, in what percentage are the owners likely to have the work done?

heating equipment _____%
cooling equipment _____%
ducts _____%

99. Have these percentages of customers likely to do the work changed over the past year?

____ yes ____ no

If answered no to Q99, skip to Q103.

100. *(if answered yes to Q99)* Why has it changed?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) contractors educate them and sell them on it
b) utilities have been educating them about it
c) RCP vouchers
d) they want to save energy costs
e) other

101. (*if answered a, b or d to Q100*) Is this due to the RCP program?

If answered yes to Q101 or if answered c to Q100 or if response to Q100 includes RCP program, ask Q102. Else, skip to Q103.

102. In your opinion, will homeowners continue with this tendency even if the RCP program is discontinued?

____ yes ____ no

103. In your opinion, what influence would you say the RCP program has had on the level of customer demand for the following measures? Please answer on a scale of 1 to 10 where 1 indicates no influence and 10 indicates very high influence.

High efficiency equipment	1 to 10
Duct sealing	1 to 10
Duct testing	1 to 10

Product Availability

104. If you were to experience a high demand for HVAC retrofits, would you have any trouble expanding your services?

____ yes ____ no

105. What about a high demand for diagnostic services for ac maintenance, would you have any trouble expanding those services?

____ yes ____ no

106. And also what about a high demand for duct testing and sealing, would you have any trouble expanding those services?

____ yes ____ no

107. Would you have trouble finding high efficiency air conditioning and heating units?

____ yes ____ no

108. Would you have trouble finding qualified labor? ____ yes ____ no

109. Would you have trouble acquiring diagnostic equipment? ____ yes ____ no

Insulation Contractor Survey

Introduction

Hello, my name is _____ and I am calling on behalf of the California utilities. I am conducting research on their Residential Contractor Program *[note: if respondent is in SDG&E area, say the Residential Energy Efficiency Contractor Program]*. The Residential Contractor Program (RCP) offers incentives to existing residences for energy efficiency measures installed by approved contractors. May I please speak with _____?

Verification

Before we get started, I'd like to ask you a few questions to make sure I'm talking to the appropriate person in your firm.

a) Are you a licensed insulation contractor? ____ yes ____ no
b) Do you provide services to the residential existing homes market? ____ yes ____ no
c) Do you specialize in single family homes? ____ yes ____ no

If respondent answers no to any of above, terminate.

Background

1a. Are you aware of the Residential Contractor Program *[note: if respondent is in SDG&E area, say the Residential Energy Efficiency Contractor Program]*?

1b. Have you submitted any vouchers under the RCP program for insulation services?

2. What contractor licenses does your company hold?
Check all that apply:

_____ B1 General contracting
_____ C36 plumbing,
_____ C2 insulation
_____ C17 Glazing
_____ C20 HVAC ,
_____ C10 electrical,
_____ C38 Refrigeration
_____ C43 Sheet Metal

_____ mobile home
_____ HIC-home improvement
_____ D65-weatherization
_____ Other _____

3. Which of the following services do you provide?
_____ checking and correcting refrigerant charge and evaporator coil air flow on central air conditioners and heat pumps
_____ duct sealing
_____ duct testing
_____ installing ENERGY STAR gas furnaces
_____ installing ENERGY STAR central air conditioners and central heat pumps
_____ installing programmable thermostats
_____ installing attic and wall insulation
_____ installing high performance windows
_____ installing efficient gas water heaters
_____ installing pipe insulation
_____ installing water-saving showerheads
_____ installing hard-wired fluorescent fixtures
_____ installing screw-in compact fluorescent lights

4. How long have you worked as a contractor, and how much of that time have you worked in California?
____ years worked as contractor ____ years worked in California

5. How many employees work in your company?
____ number of employees

6. In how many single family existing homes (including mobile homes) did your company work last year?
____ homes

Cost Effectiveness

Now I'd like to ask you some questions about insulation.

(questions 7 through 11 deleted)

12. In your opinion, how cost effective are the following levels of insulation for existing homes in your region? Please answer on a scale of 1 to 5, where 1 represents not at all cost effective and 5 represents very cost effective.

a) R-19 insulation in attics: 1 to 5
b) R-30 insulation in attics: 1 to 5
c) R-13 insulation in walls: 1 to 5

13. Would you have answered any of these differently a year ago?
a) R-19 insulation in attics: yes or no
b) R-30 insulation in attics: yes or no
c) R-13 insulation in walls: yes or no

If answered no to all, skip to Q16.

14. (*for each yes response in Q13*) Why would you have answered it differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
check all that apply:
a) have more experience with this product because customers are asking for it more
b) learned about this from training required for the RCP program
c) learned about this from trade magazines or trade shows
d) other

15. (*if answered a to Q14*) Do you think customers are asking for it more due to the RCP program?

16. On a scale of 1 to 5, how cost effective do you think your customers consider these measures?
a) R-19 insulation in attics: 1 to 5
b) R-30 insulation in attics: 1 to 5
c) R-13 insulation in walls: 1 to 5

17. Would you have answered any of these differently a year ago?
a) R-19 insulation in attics: yes or no
b) R-30 insulation in attics: yes or no
c) R-13 insulation in walls: yes or no

If answered no to all, skip to Q20.

18. *(for each yes response to Q17*) Why would you have answered it differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
a) customers are more informed now due to the internet

b) customers are more informed now due to the RCP program

c) customers are more informed now because we are promoting it more

d) customers are more informed now from information they get from the utilities or other organizations

e) RCP vouchers

f) other

19. (*if answered c to Q18*) Are you promoting it more now because of the RCP program? *(If answered d to Q18)* Is this information related to the RCP program?

Retrofits

20. Has the number of jobs in which you've performed insulation retrofits increased, stayed the same or decreased over the past year?

a) Increased -- by how much? _____

b) Stayed the same

c) Decreased -- by how much? _____

If answered b, skip to Q25.
If answered c, skip to Q24.

21. (*if answered increased in Q20*) What do you think is the primary reason it has increased? *(Do not read list. Listen to response and record. Then check all of the options that response applies to.)*
response:_____

a) customers are more aware/receptive of the benefits of retrofits

b) our company is promoting retrofits more

c) RCP vouchers

d) our reputation as a contractor

e) business, in general, is increasing

f) other

22. (*if answered a, b or e in Q21*) Is this due to the RCP program?

If answered yes to Q22 or if answered c to Q21 or if response to Q21 includes RCP program, ask Q23. Else, skip to Q25.

23. Do you anticipate that this increase in the number of jobs will continue if the RCP program is discontinued?

a) yes

b) no

24. (*if answered decreased in Q20*) What do you think is the primary reason it has decreased?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) mild weather
b) it's too expensive or not cost effective
c) other

25. Over the past year, has there been any change in your recommendations to your customers for installing the following kinds of insulation in existing homes?

a) attic insulation: yes or no
b) wall insulation: yes or no

If answered no to both, skip to Q30.

26. (*if answered yes to either in Q25*) What are those changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) recommending higher R levels than before
b) other

27. Why did you make these changes in your recommendations?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive
d) it's more profitable
e) other

28. (*if answered a, c or d to Q27*) Is this due to the RCP program?

If answered yes to Q28 or if answered b to Q27 or if response to Q27 includes the RCP program, ask Q29. Else, skip to Q30.

29. Will you continue these changes even if the RCP program is discontinued?

30. Now, I want to ask you about actually installing these measures -- over the past year, has there been any change in your installation of the following kinds of insulation in existing homes?

a) attic insulation: yes or no
b) wall insulation: yes or no

If answered no to both, skip to Q35.

31. (*if answered yes to either inQ30*) What are those changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) install higher R levels than before
b) other

32. Why did you make these changes?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive
d) it's more profitable
e) other

33. (*if answered a, c or d to Q32*) Is this due to the RCP program?

If answered yes to Q33 or if answered b to Q32 or if response to Q32 includes the RCP program, ask Q34. Else, skip to Q35.

34. Will you continue these changes even if the RCP program is discontinued?

a) yes
b) no

35. Have you or other employees at your company taken the training offered by RCP for installing wall insulation?

a) yes
b) no

If answered no to Q35, skip to Q37.

36. (*If answered yes to Q35*) How many employees have taken the training?

37. Do you use any different installation procedures for wall insulation than you did a year ago?

a) yes

b) no

If answered no to Q37, skip to Q42.

38. (*if answered yes to Q37*) What are those different procedures?
response:_____

39. Why did you start this practice?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive
d) it's more profitable
e) other

40. (*if answered a, c, or d to Q39*) Is this due to the RCP program?

If answered yes to Q40 or if answered b to Q39 or if response to Q39 includes the RCP program, ask Q41. Else, skip to Q42.

41. Will you continue to use these installation procedures for wall insulation even if the RCP program is discontinued?

a) yes
b) no

Perceptions of Customer Demand

42. In your opinion, are your customers more aware of the benefits of installing the following kinds of insulation than they used to be?

Attic insulation: yes or no
Wall insulation: yes or no

If answered no to both, skip to Q48.

43. Why do you think they more aware?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) we educate them
b) information from utilities
c) RCP program

d) they learn from the internet or other media
e) other

44. (*if answered a or b to Q43*) Is this due to the RCP program?

45. In your opinion, are your customers more willing to install the following kinds of insulation than they used to be?

Attic insulation: yes or no
Wall insulation: yes or no

If answered no to both, skip to Q48.

46. *(if answered yes to Q45)* Why do you think they more willing?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) we educate them and sell them on it
b) utilities have been educating them about it
c) RCP vouchers
d) they want to save energy costs
d) other

47. (*if answered a, b or d to Q46*) Is this due to the RCP program?

48. In your opinion, how aware are your customers of the RCP program? Please answer on a scale of 1 to 10 where 1 indicates they are unaware of the program and 10 indicates they are very aware of the program.

Market Potential

49. In your opinion, what percentage of the homes in your area could still upgrade their attic and wall insulation for a reasonable cost?

Attic insulation _____%
Wall insulation _____%

50. Of these homes, in what percentage are the owners likely to have the work done?

Attic insulation _____%
Wall insulation _____%

51. Have these percentages of customers likely to do the work changed over the past year?

____ yes ____ no

If answered no, skip to Q55.

52. *(if answered yes to Q51)* Why has it changed?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) contractors educate them and sell them on it
b) utilities have been educating them about it
c) RCP vouchers
d) they want to save energy costs
d) other

53. (*if answered a, b or d to Q52*) Is this due to the RCP program?

If answered yes to Q53 or if answered c to Q52 or if response to Q52 includes the RCP program, ask Q54. Else, skip to Q55.

54. In your opinion, will homeowners continue with this tendency even without RCP vouchers?

____ yes ____ no

55. In your opinion, what influence would you say the RCP program has had on the level of customer demand for the following measures? Please answer on a scale of 1 to 10 where 1 indicates no influence and 10 indicates very high influence.

a) Attic insulation of R-19: 1 to 10
b) Attic insulation of R-30: 1 to 10
c) Wall insulation of R-13: 1 to 10

Product Availability

57. If you were to experience a high demand for insulation retrofits, would you have any trouble expanding your services?

____ yes ____ no

58. Would you have trouble finding qualified labor?____ yes ____ no

Window Contractor Survey

Introduction

Hello, my name is _____ and I am calling on behalf of the California utilities. I am conducting research on their Residential Contractor Program *[note: if respondent is in SDG&E area, say the Residential Energy Efficiency Contractor Program]*. The Residential Contractor Program (RCP) offers incentives to existing residences for energy efficiency measures installed by approved contractors. May I please speak with _____?

Verification

Before we get started, I'd like to ask you a few questions to make sure I'm talking to the appropriate person in your firm. I'd just like to verify that you:

a) Are you a licensed window contractor? ____ yes ____ no
b) Do you provide services to the residential existing homes market? ____ yes ____ no
c) Do you specialize in single family homes? ____ yes ____ no

If respondent answers no to any of above, terminate.

Background

1a. Are you aware of the Residential Contractor Program *[note: if respondent is in SDG&E area, say the Residential Energy Efficiency Contractor Program]*?

1b. Have you submitted any vouchers under the RCP program for window installations?

2. What contractor licenses does your company hold?
Check all that apply:

_____ B1 General contracting
_____ C36 plumbing,
_____ C2 insulation
_____ C17 Glazing
_____ C20 HVAC ,
_____ C10 electrical,
_____ C38 Refrigeration
_____ C43 Sheet Metal
_____ mobile home

_____ HIC-home improvement
_____ D65-weatherization
_____ Other _____

3. Which of the following services do you provide?
   _____ checking and correcting refrigerant charge and evaporator coil air flow on central air conditioners and heat pumps
   _____ duct sealing
   _____ duct testing
   _____ installing ENERGY STAR gas furnaces
   _____ installing ENERGY STAR central air conditioners and central heat pumps
   _____ installing programmable thermostats
   _____ installing attic and wall insulation
   _____ installing high performance windows
   _____ installing efficient gas water heaters
   _____ installing pipe insulation
   _____ installing water-saving showerheads
   _____ installing hard-wired fluorescent fixtures
   _____ installing screw-in compact fluorescent lights

4. How long have you worked as a contractor, and how much of that time have you worked in California?
   ____ years worked as contractor ____ years worked in California

5. How many employees work in your company?
   ____ number of employees

6. In how many single family existing homes (including mobile homes) did your company work last year?
   ____ homes

High Performance Windows

Now I'd like to ask you some questions about windows.

7. What U value of window do you consider to be energy efficient?

8. Would you have answered this differently a year ago?

If answered no to Q8, skip to Q11.

9. Why would you have answered this differently?

(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
check all that apply:

a) have more experience with this product because customers are asking for it more
b) learned about this from the RCP program
c) learned about this from trade magazines or trade shows
d) other

10. *(if answered a to Q9)* Do you think customers are asking for it more due to the RCP program?

11. In your opinion, how cost effective are windows with a U-factor of 0.4 or less in your region? Please answer on a scale of 1 to 5, where 1 represents not at all cost effective and 5 represents very cost effective.

12. Would you have answered this differently a year ago?

If answered no to Q12, skip to Q15.

13. (*if answered yes to Q12*) Why would you have answered it differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
check all that apply:

a) have more experience with this product because customers are asking for it more
b) learned about this from training required for the RCP program
c) learned about this from trade magazines or trade shows
d) other

14. (*if answered a to Q13*) Do you think customers are asking for it more due to the RCP program?

15. On a scale of 1 to 5, how cost effective do you think your customers consider windows with a U-factor of 0.4 or less?

16. Would you have answered any of these differently a year ago?

If answered no to Q16, skip to Q19.

17. Why would you have answered it differently?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)

response:_____

a) customers are more informed now due to the internet

b) customers are more informed now due to the RCP program

c) customers are more informed now because we are promoting it more

d) customers are more informed now from information they get from the utilities or other organizations

e) RCP vouchers

f) other

18. (*if answered c to Q17*) Are you promoting it more now because of the RCP program? *(If answered d to Q17)* Is this information related to the RCP program?

Retrofits

19. Has the number of jobs in which you've installed windows in existing homes increased, stayed the same or decreased over the past year?

a) Increased -- by how much? _____

b) Stayed the same

c) Decreased -- by how much? _____

If answered b, skip to Q24.
If answered c, skip to Q23.

20. (*if answered increased in Q19*) What do you think is the primary reason it has increased? *(Do not read list. Listen to response and record. Then check all of the options that response applies to.)*
response:_____

a) customers are more aware/receptive of the benefits of retrofits

b) our company is promoting retrofits more

c) RCP vouchers

d) our reputation as a contractor

e) business, in general, is increasing

f) other

21. (*if answered a, b or e in Q16*) Is this due to the RCP program?

If answered yes to Q21 or if answered c to Q20 or if response to Q20 includes the RCP program, ask Q22. Else, skip to Q24.

22. Do you anticipate that this increase in the number of jobs will continue if the RCP program is discontinued?

a) yes

b) no

23. (*if answered decreased in Q19*) What do you think is the primary reason it has decreased?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) mild weather
b) it's too expensive or not cost effective
c) other

24. Over the past year, has there been any change in your recommendations to your customers for windows?

If answered no to Q24, skip to Q29.

25. (*if answered yes to Q24*) What are those changes?
response:_____

26. Why did you make these changes in your recommendations?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive
d) it's more profitable
e) other

27. (*if answered a, c or d to Q22*) Is this due to the RCP program?

If answered yes to Q27 or if answered b to Q26 or if response to Q26 includes the RCP program, ask Q28. Else, skip to Q29.

28. Will you continue these changes even if the RCP program is discontinued?

29. Now, I want to ask you about actually installing these measures -- over the past year, has there been any change in your installation of windows?

If answered no to Q29, skip to Q34.

30. (*if answered yes to Q29*) What are those changes?
response:_____

31. Why did you make these changes?

(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive
d) it's more profitable
e) other

32. (*if answered a, c or d to Q27*) Is this due to the RCP program?

If answered yes to Q32 or if answered b to Q31 or if response to Q31 includes the RCP program, ask Q33. Else, skip to Q34.

33. Will you continue these changes even if the RCP program is discontinued?

a) yes
b) no

34. Have you or other employees at your company taken the training offered by RCP for installing windows?

a) yes
b) no

If answered no to Q34, skip to Q36.

35. How many employees have taken the training?

36. Do you use any different procedures for window installation than you did a year ago?

a) yes
b) no

If answered no to Q36, skip to Q41.

37. What are those different procedures?
response:_____

38. Why did you start this practice?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) our competition does it
b) learned about it from training required for RCP program
c) customers are more aware/receptive

d) it's more profitable
e) other

39. (*if answered a, c, or d to Q28*) Is this due to the RCP program?

If answered yes to Q39 or if answered b to Q38 or if response to Q38 includes the RCP program, ask Q40. Else, skip to Q41.

40. Will you continue to use these procedures for window installation even if the RCP program is discontinued?
a) yes
b) no

Perceptions of Customer Demand

41. In your opinion, are your customers more aware of the benefits of installing high performance windows than they used to be?

If answered no to Q41, skip to Q47.

42. Why do you think they more aware?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
a) we educate them
b) information from utilities
c) RCP program
d) they learn from the internet or other media
e) other

43. (*if answered a or b to Q38*) Is this due to the RCP program?

44. In your opinion, are your customers more willing to install high performance windows than they used to be?

If answered no to Q44, skip to Q47.

45. Why do you think they more willing?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____
a) we educate them and sell them on it
b) utilities have been educating them about it
c) RCP vouchers

d) they want to save energy costs
d) other

46. (*if answered a, b or d to Q45*) Is this due to the RCP program?

47. In your opinion, how aware are your customers of the RCP program? Please answer on a scale of 1 to 10 where 1 indicates they are unaware of the program and 10 indicates they are very aware of the program.

Market Potential

48. In your opinion, what percentage of the homes in your area could still upgrade their windows for a reasonable cost?

49. Of these homes, in what percentage are the owners likely to have the work done?

50. Have these percentages of customers likely to do the work changed over the past year?

If answered no to Q50, skip to Q54.

51. Why has it changed?
(Do not read list. Listen to response and record. Then check all of the options that response applies to.)
response:_____

a) contractors educate them and sell them on it
b) utilities have been educating them about it
c) RCP vouchers
d) they want to save energy costs
d) other

52. (*if answered a, b or d to Q46*) Is this due to the RCP program?

If answered yes to Q52 or if answered c to Q51 or if response to Q51 includes the RCP program, ask Q53. Else, skip to Q54.

53. In your opinion, will homeowners continue with this tendency even without RCP vouchers?

____ yes ____ no

54. In your opinion, what influence would you say the RCP program has had on the level of customer demand for high performance windows? Please answer on a scale of 1 to 10 where 1 indicates no influence and 10 indicates very high influence.

Product Availability

55. If you were to experience a high demand for high performance windows, would you have any trouble expanding your services?

56. Would you have trouble obtaining high performance windows?

57. Would you have trouble hiring qualified labor?