PERFORMANCE TESTED COMFORT SYSTEMS / CLIMATE CRAFTERS

Market Progress Evaluation Report, No. 1

prepared by

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MARKET PROGRESS EVALUATION REPORT #1

Final Report

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The views and opinions of the authors expressed herein do not necessarily reflect those of the Northwest Energy Efficiency Alliance, its board, its members, or its staff.

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EXECUTIVE SUMMARY

The Northwest Energy Efficiency Alliance (the Alliance) is a non-profit group of electric utilities, state governments, public interest groups, and industry representatives committed to bringing affordable energy efficiency products and services to the marketplace.

This report is the first *Market Progress Evaluation Report* to assess the progress of the Northwest Energy Efficiency Alliance's *Performance Tested Comfort Systems (PTCS)/Climate Crafters Program* and its impact on the market. It includes a *Business Model Review* by a small business consultant who is skilled in non-profit start-ups and business planning. To complete the evaluation, the following activities were conducted:

+ **Utility Research:** Fifty surveys were completed – 24 with utilities participating in PTCS and 26 with ones not participating.

+ **Contractor Research:** Thirty-nine surveys were conducted – 23 with certified contractors and 16 with ones not certified.

+ **Consumer Research:** Five hundred surveys were completed with Northwest residents (consumers).

+ **Factory-Distributor Interviews:** Two of the six primary heating equipment suppliers in the Northwest were interviewed.

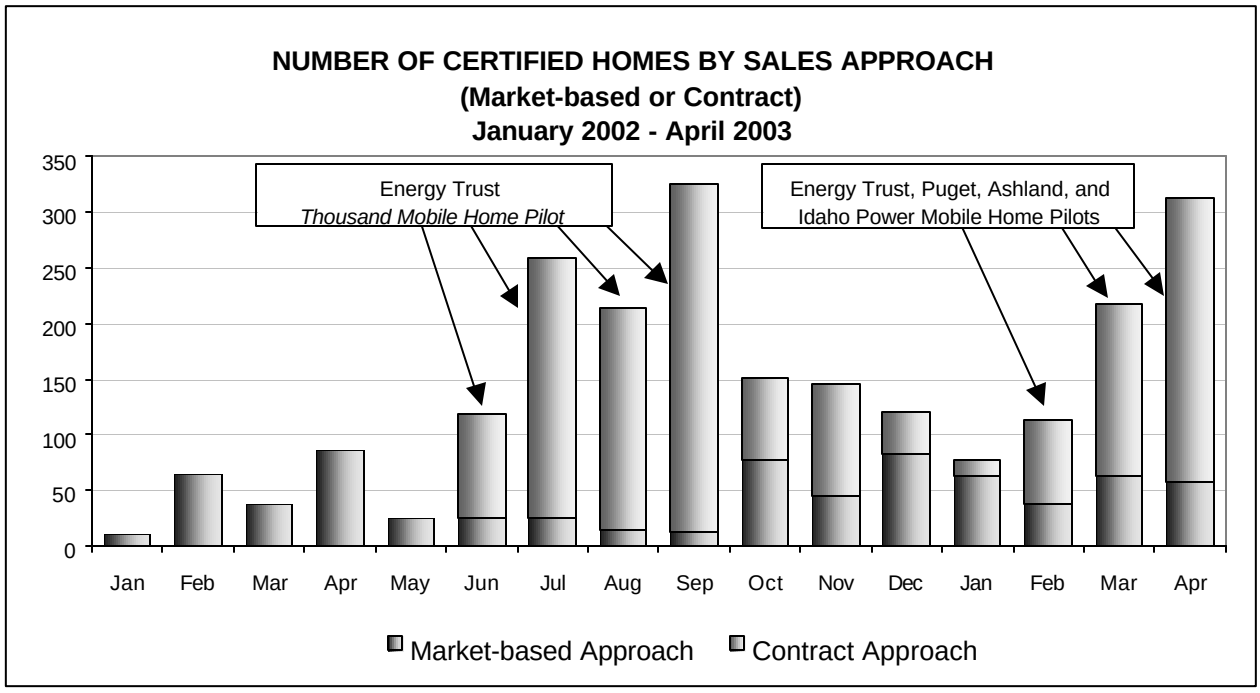
Climate Crafters was originally setup to develop the market for a duct performance testing and sealing specification known as PTCS. In support of this, Climate Crafters became a contractor training and certification organization that relied on certified contractors to deliver PTCS services to residential homeowners. In late 2001, Climate Crafters repositioned itself to target utilities interested in using Bonneville Power's *Conservation and Renewable Discount* (C&RD) credits for duct sealing incentive programs. As Bonneville developed its program, the Regional Technical Forum adopted Climate Crafters' PTCS specifications and made PTCS the regional standard.

Climate Crafters spent most of 2002 in an outreach and training mode, working closely with interested utility partners to certify HVAC and insulation contractors to PTCS standards. The curriculum included *Duct Sealing, Heat Pump O&M Diagnostics,* and *Heat Pump System Design*. When utility and

contractor interest began to slow following the initial training blitz, Climate Crafters offered free primers around the region as a teaser to encourage more utilities and contractors to attend the classes.

After initially using a market-based, cast-a-wide-net approach, Climate Crafters began to evolve its offering into one that enjoyed more demand and was easier to sell. The new approach became known as the *turnkey*, or *targeted contract* for services, and Climate Crafters found considerable utility interest in it. Through these contracts, utilities and the Energy Trust of Oregon hired Climate Crafters to project manage duct-sealing pilots on mobile homes. This work and contract revenue were very important to Climate Crafters because it came at a time when start-up funding from the Alliance was nearly exhausted. *(See Figure ES-1.)*

Figure ES-1: Number of Certified Homes by Sales Approach



The dramatic change in approach, with Climate Crafters channeling resources into the development of its utility contract business, slowed progress in developing the market-driven channel – a major goal of the Alliance.

Ultimately, the market-based approach to PTCS failed because not enough utilities in the region were interested in it, and the ones that were found themselves unable to create sufficient consumer demand for trained contractors, largely because of the expense and utility support required.

A. Accomplishments

Climate Crafters achieved every one of its *2002 Business Plan* goals and Alliance Progress Indicators, and appears on track to achieve its 2003 goals. Since January 2002 (through April 2003), Climate Crafters has also achieved the following:

+ 2,278 PTCS certified ducts homes
+ 527 PTCS certified heat pumps (HP)
+ 39 training classes for contractors (26 duct, 9 HP, 4 system design); plus a series of 13 duct and HP primers
+ 133 contractor firms certified (106 duct, 27 HP)
+ 212 technicians certified (134 duct, 44 HP, 34 ACCA)
+ 257 renewals of PTCS certifications (contractors & techs)
+ 13 utilities reporting certifications each month; 20 utilities reporting program-to-date, 5 new utilities scheduled for 2003

Utility and contractor satisfaction with Climate Crafters' support rated very high in the surveys. Many noted that a lot had been accomplished with few resources.

B. Acceptance of PTCS

Consumers never really became aware of PTCS, or learned much about duct performance testing and sealing. It is one of the disappointments of this program that little effort was devoted to educating the consumer. All parties involved seemed to expect someone else to do it, but it never happened. The notable exception was Clark's TV spots. Consumers did not show much more

than slight interest in it from the survey. Gilmore Research Group, conductors of the research, suggest consumers probably did not understand the program or its value.

Contractors, already busy (making money), sensed consumers did not know much about it and could not overcome the barriers. High start-up costs and excessive annual fees, combined with little profitability from services that lack consumer demand and are too difficult to sell due to long paybacks, really hurt contractor buy-in of PTCS. Instead of purchasing the necessary equipment, certified contractors seem to have taken a wait-and-see attitude towards PTCS, preferring to subcontract utility work to third-party specialists. However, the majority of contractors believed that, if educated, homeowners would be interested in PTCS. Contractors also indicated they would support utility standards, but only if they are in return supported by utility incentives and promotion.

Utilities indicated support for PTCS. Some even went as far as providing pre- and post-tests for contractors. However, it was startling to discover that only one-third of participating utilities surveyed required PTCS on their heat pump programs. Regionally, only 14% of all heat pumps reported installed under Bonneville's C&RD program included PTCS.

The consumer survey shed some light on this. Consumers report they rarely seek out utility company advice or referrals when making decisions on their HVAC systems. The utility, which consumers continue to hold in high regard for credibility, appears out-of-the-loop, without even an opportunity to pitch PTCS. Additionally, the regional HVAC equipment distributors in Portland had never heard of Climate Crafters or PTCS. They did not know utilities were working to certify and train their dealers and contractors. From this, we conclude that utilities and Climate Crafters missed a prime opportunity to work closely with this trade ally who was well positioned to help promote PTCS.

Several non-participating utilities did convey interest in PTCS, and this was backed up when they later signed contracts with Climate Crafters. The targeted contract approach, providing full utility services, continues to prove itself an effective mechanism for deploying PTCS on mobile home pilots throughout the region.

C. Heat Pump Diagnostics

Interest in this service rated fairly low by consumers and contractors. Utilities seem to support it because they are more acutely aware of problems in the field. The required Hand-tool appears to be stirring up quite a ruckus in the contractor community. The majority of contractors cite a host of drawbacks, indicating their dissatisfaction with the device, while a minority of contractors indicated their solid support.

D. Recommendations

With the dramatic changes to the Climate Crafters business model, and the stagnation of the market-driven channel, the Alliance has been left without a clear mechanism to address the residential HVAC market. However, the Alliance still has several potential opportunities available to consider.

The Alliance should:

1. Continue to address the residential HVAC market. One option would be to target new home construction. It is an important market in terms of its resource size and may prove a better fit from a market transformation perspective because it is market-driven and works more directly with a different contractor group (homebuilders).

2. Consider an "Energy-Efficient" new home construction program and shift the focus from existing homes to new homes to drive the energy-efficient HVAC market. Since the market-driven approach was not embraced by consumers or contractors, and the utility contract is resource acquisition based, it is important to attempt a different method to transform this market. The Alliance could leverage off the existing base of PTCS certified contractors and reward that expertise with a role in the field helping to develop the energy-efficient new home market.

3. Consider linking the energy-efficient new home construction program to ENERGY STAR® to take advantage of that powerful branding.

4. Identify and work with willing "upstream" partners in the HVAC distribution channel to develop and build new working relationships. The Alliance should operate from inside the industry channel, as it has done in other market transformation programs (e.g., lighting). With the interest received from the few equipment distributors contacted, we are inclined to believe they are very open to working together with the Alliance. Both have similar goals. Distributors want to move more energy-efficient product, have better trained dealers, and they are interested in more energy-efficient installations. They also have a highly established industry mechanism for certification and training (NATE) that is heavily supported by the large manufacturers and it is a top priority for them right now.

5. Establish a market development fund (MDF) in conjunction with industry partners for the purpose of funding future marketing activities tied to the development of the energy efficient new construction market.

6. Develop a plan to work for codes or licenses at the state level to move the industry toward PTCS-level installations, similar to what was recently accomplished in the State of California.

1. INTRODUCTION AND BACKGROUND

The Northwest Energy Efficiency Alliance (the Alliance) is a non-profit group of electric utilities, state governments, public interest groups and industry representatives committed to bringing affordable energy efficiency products and services to the marketplace. This is the first Market Progress Evaluation Report (MPER) assessing the Alliance's *Performance Tested Comfort Systems (PTCS)/Climate Crafters Venture*, a region-wide duct sealing and system tune-up training and certification program for contractors.

The report is divided into eight sections. This chapter presents a brief background and description of the program. *Chapter 2* discusses the evaluation approach and presents the Alliance's performance indicators and other facts about the progress made by the program. *Chapter 3* summarizes results from the Utility Interview. *Chapter 4* discusses contractor views about PTCS. *Chapter 5* discusses consumer interest in PTCS services. *Chapter 6* summarizes the results of interviews with the factory-distribution network. *Chapter 7* discusses recommended changes to the Alliance's ACE cost effectiveness model assumptions for PTCS. *Chapter 8* summarizes results of the Business Model Review. Finally, *Chapter 9* presents key findings, conclusions, and recommendations.

The main body of the report is followed by the Appendices, which include the four survey instruments and Business Model Review.

A. Program Background

Following several years of developmental research in the late 1990's,[1] the Alliance set up an independent non-profit organization, named *Climate Crafters*, to develop the market for a residential energy-efficient air distribution system specification, otherwise known as *Performance Tested Comfort Systems* (PTCS). The core concepts differentiating PTCS in the market included:

[1] See the *Market Baseline Evaluation Report: Performance Tested Comfort Systems, No. 2* (Report #E00-071), prepared by Xenergy, Inc., December 2000.

+ HVAC system diagnostics, tune-ups, and performance testing according to PTCS specifications

+ Independent third-party certification of contractors

+ Regional coordinated quality assurance and quality control

+ A market-supported PTCS organization

+ Independent delivery of services by contractors

Contractors were to be trained and certified by Climate Crafters in PTCS duct performance testing and duct sealing efficiency specifications. Climate Crafters was to rely exclusively on these certified contractors to deliver PTCS services to residential homeowners. To fund the organization, contractors would be charged fees for training, certifications, renewals, and home certifications. Market transformation and building a self-sustaining PTCS organization were the original core goals of the PTCS venture.

Following a period of transition, Climate Crafters was able to take advantage of the energy crisis in the West and reposition itself with utilities by offering them services which leveraged Bonneville Power's *Conservation and Renewable Discount* (C&RD) credits. The availability of this funding enabled utilities to offer homeowners incentives for duct testing and sealing to Climate Crafters' PTCS specifications. As Bonneville developed incentives for PTCS, the Regional Technical Forum (RTF), an area body charged with establishing the energy efficiency standards for BPA programs, adopted Climate Crafters' PTCS specifications, and made "PTCS" the regional standard.[2]

Climate Crafters spent most of 2002 in a utility outreach and training mode, working closely with interested utility partners, to prospect and encourage HVAC and insulation contractors to attend training sessions to become certified

[2] As the only organization meeting the new regional PTCS standard, Climate Crafters had a corner on the market. This position resulted in a close working relationship for Climate Crafters with the utilities and Bonneville. These organizations came to rely heavily on Climate Crafters as an important cog in the record keeping, processing, and reporting of utility C&RD incentives concerning PTCS.

in PTCS. Several regional experts were identified and placed under contract to develop and provide these training services. Evergreen Consulting Group, LLC was hired to facilitate the training sessions around the region, and provide Climate Crafters with additional marketing and utility outreach assistance. Climate Crafters training included curriculum to certify contractors in *Performance Testing And Duct Sealing* and *Heat Pump O&M Diagnostics* (later renamed *Heat Pump Commissioning*). Heat pump O&M training and certification relied on the use of the Honeywell *ACRX Service Assistant* (hand-tool).[3] A third training session, *Heat Pump System Design* (Manuals D, J, and S) was added later.

After initially working to sign up utilities and contractors for PTCS training, using a market-based, cast-a-wide-net approach, Climate Crafters began to evolve its offering to one that was easier to sell. The new approach became known as the *turnkey*, or *targeted contract approach*, and Climate Crafters found considerable utility interest in it. Under the contract, utilities hired Climate Crafters to project-manage duct-sealing pilot projects on mobile homes. Since some of the elements of the market-based approach still existed, Climate Crafters was successful at meeting its performance measures for numbers of homes and numbers of contractors' certified.

Another important activity for Climate Crafters in 2002 included the development of the second business plan and a marketing plan. The Alliance, wanting a check-in and review of the venture's progress compared to plan, commissioned a review of the business model used by Climate Crafters. A business consultant, expert in non-profit start-ups was hired to conduct the assessment. The business model review was the initial work undertaken in this evaluation of the PTCS/Climate Crafters Program. The review was completed

[3] Climate Crafters ran a test pilot for a Heat Pump Diagnostics program in the greater Spokane area in support of higher Bonneville C&RD incentives for heat pumps. This pilot trained contractors in the use of the hand-tool. Before launching the unit regionally, Climate Crafters attempted to create interest by offering contractors and utility reps a teaser through the sponsorship of eight training primers conducted around the region. When the training primers were completed at the end of summer 2002, Climate Crafters ran out of the hot weather necessary to operate the tool and conduct the full training required for PTCS heat pump certification.

and results and recommendations presented to the Climate Crafters Board in December 2002.

The Alliance expanded the scope of the evaluation in early 2003 to include consumer and manufacturer research to augment already scheduled utility and contractor research.

This MPER presents the results from the first year of the program since it was rolled out region-wide beginning in 2002, and an update of developments since the December 2002 Board meeting.

2. EVALUATION APPROACH AND PROGRESS INDICATORS

A. Evaluation Approach

The original scope and approach of the evaluation relied heavily on a business model review and primary survey research conducted with contractors and utilities. The business model review consisted of an analysis of Climate Crafters' recently completed business and marketing plans to answer questions about the sustainability of the business. Survey research was to be conducted with contractors and utilities to determine interest in, and satisfaction with Climate Crafters' services.

The scope of the evaluation expanded in 2003, following completion of the business model review, to include additional primary research with consumers and manufacturers. It included:

+ **Utility Research:** Fifty surveys were completed – 24 with utilities participating in PTCS and 26 with non-participating.

+ **Contractor Research:** Thirty-nine surveys were conducted – 23 with certified contractors and 16 with non-certified.

+ **Consumer Research.** Five hundred surveys were completed of NW consumers.

+ **Factory-Distributor Interviews:** Two of six primary heating equipment suppliers in the Northwest were interviewed.

B. Progress Indicators

Progress of the PTCS/Climate Crafter Venture was also evaluated. To accomplish this, data from program activity in 2002 was used to compare actual performance against progress indicators (per the Alliance contract) or Climate Crafters' Business Plan goals. The following were examined:

+ Completion of heat pump/air conditioning diagnostic service specifications, procedures, and training curriculum

+ Number of Training Sessions Conducted
+ Number of Certified Contractor Firms Participating in Program
+ Number of Certified Technicians
+ Number of Contractor Certification Renewals
+ Number of Utilities Actively Participating in Program
+ Number of Homes Certified
+ Total Revenues for Services From Non-Alliance Sources

C. 2002 Results of Performance – Actual vs. Goal

For 2002, Climate Crafters succeeded in achieving every one of its Business Plan goals and all but one Alliance Progress Indicator (3,000 homes certified) – a remarkable achievement. Individual performance measure results from 2002 are as described below.

Development of Specifications, Procedures and Curriculum

Climate Crafters successfully developed and completed its heat pump diagnostic service specifications, procedures, and training curriculum – ***Goal Achieved***.

Number of Training Sessions Conducted

Table 1: Number of Training Sessions Conducted in 2002 – *Goal Achieved*

CRITERIA	NUMBER CONDUCTED 2002 GOAL	NUMBER CONDUCTED 2002 ACTUAL
TRAINING SESSIONS	15	37

Note: The 2002 goal was a Business Plan goal.

Number of Certified Contractors Participating in Program

Table 2: Number of Certified Contractors Participating in 2002 – *Goal Achieved*

CRITERIA	NUMBER PARTICIPATING 2002 GOAL	NUMBER PARTICIPATING 2002 ACTUAL
CONTRACTOR FIRMS	30	130
TECHNICIANS	200	201

Note: The 'Contractor firms' goal was an Alliance Progress Indicator. The 'Technicians' goal was also an Alliance Progress Indicator. The Business Plan goal of 182 was also met.

Number of Contractor Certification Renewals

Table 3: Number of Annual Contractor Certification Renewals in 2002 – *Goal Achieved*

CRITERIA	NUMBER RENEWED 2002 GOAL	NUMBER RENEWED 2002 ACTUAL
CONTRACTOR CERTIFICATION	50	67

Note: The 2002 goal was an Alliance Progress Indicator.

Number of Utilities Actively Participating in Program

Table 4: Number of Utilities Actively Participating in 2002 – *Goal Achieved*

CRITERIA	NUMBER PARTICIPATING 2002 GOAL	NUMBER PARTICIPATING 2002 ACTUAL
UTILITIES NEW IN 2002	8	13
TOTAL UTILITIES	14	16

Note: The 'New in 2002' goal was an Alliance Progress Indicator; the 'Total' was a Business Plan goal.

Number of Homes Certified

Table 5: Number of Homes Certified in 2002 – *Goal Partially Achieved*

CRITERIA	NUMBER CERTIFIED 2002 GOAL	NUMBER CERTIFIED 2002 ACTUAL
HOMES CERTIFIED	1,800	1,988

Note: The Alliance Progress Indicator for 2002 was 3,000 homes certified. The 1,800 homes reflected above, was the goal established in the Business Plan.

Percent of Non-Alliance Revenue

Table 6: Percent of Total Revenue in 2002 That Is Non Alliance – *Goal Achieved*

CRITERIA	PERCENT OF TOTAL 2002 GOAL	PERCENT OF TOTAL 2002 ACTUAL
NON-ALLIANCE REVENUE IN 2002	Must Exceed 40%	49%

Note: The 2002 goal was an Alliance Progress Indicator.

Other Indicators of Progress

While Climate Crafters appeared highly successful at achieving the goals listed above, a review of other indicators of progress provide additional clarity, but tell a different story and reveal a market more difficult to crack.

D. Contractor Acceptance of PTCS

Contractors' acceptance of PTCS appears weak and narrow. For participating firms, only 30% of duct contractors had certified at least one home, the percent for heat pump contractors was 60%.[4] Also, a review of the 2002 data showed

[4] The term heat pump (PTCS) certification is not exactly correct as it is used here, as explained by Climate Crafters. Although these heat pumps were actually installed (2002) and reported to Climate Crafters, they have not yet been PTCS

the top-four contractors performed 60% of the PTCS duct certifications in the region, and 40% of heat pumps (*Table 7.)*

Table 7: Number of PTCS Contractors Certifying at Least One Home

TYPE OF CONTRACTOR	NUMBER OF PTCS CONTRACTORS CERTIFIED	NUMBER OF PTCS CONTRACTORS CERTIFYING AT LEAST ONE HOME
DUCT SEALING CONTRACTORS	94	29
HEAT PUMP CONTRACTORS	46	26

Note: Thirteen contractor firms do both duct sealing and heat pump diagnostics. Of these thirteen, seven have completed at least one duct and one heat pump certification.

E. Purchase of Equipment by Contractors

Climate Crafters staff was queried about the number of certified contractors purchasing the needed equipment to perform the certifications. The latest list of certified duct and heat pump contractors was reviewed, and staff made its best estimate about which firms had, and had not, purchased equipment (blower doors, duct blasters or hand-tools).

Table 8: Number of Contractors who Have Purchased Necessary Equipment

TYPE OF CONTRACTOR	PURCHASED THE EQUIPMENT	DID NOT PURCHASE EQUIPMENT	PURCHASE NOT KNOWN/ UNLIKELY
DUCT CONTRACTORS	44	28	20
HP CONTRACTORS	23	20	5

Note: Fourteen of heat pump contractors were trained in system design only, and not certified in heat pump O&M (hand-tool); they would have no need to purchase the unit until they became O&M certified.

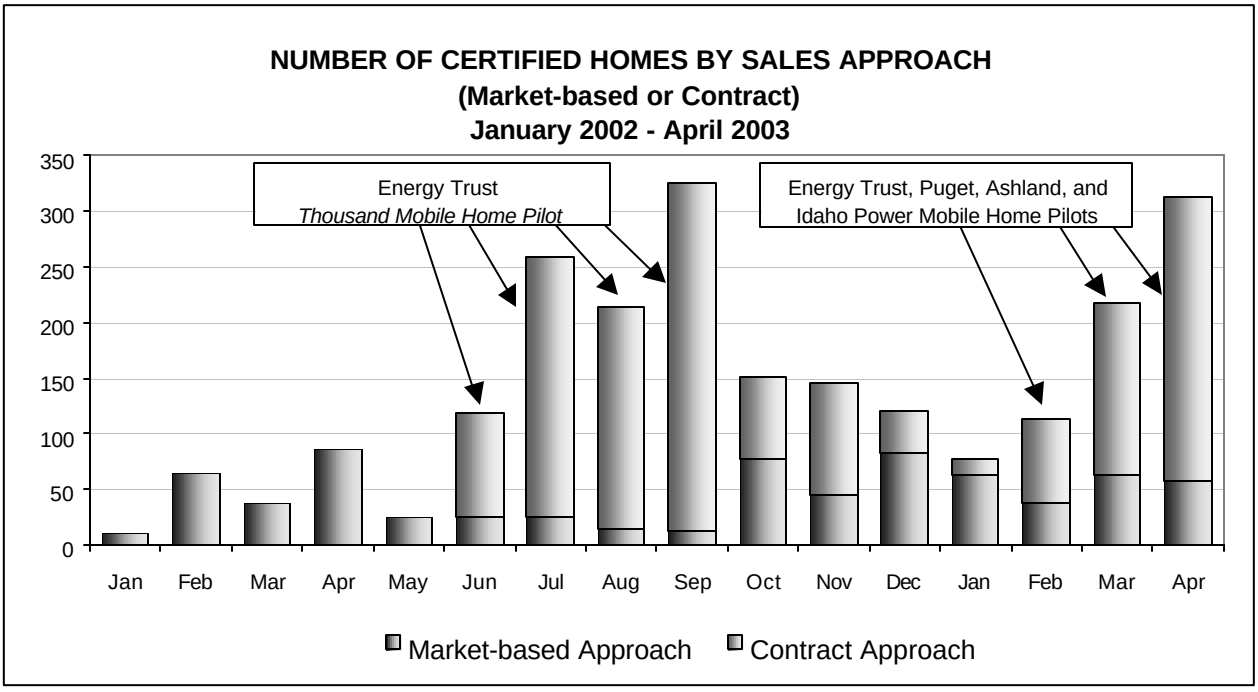
certified with the Hand-tool. Contractors are waiting until summer 2003 to revisit homeowners on callbacks to run the Hand-tool diagnostics when it gets warm enough for the unit to function properly (over 65° F needed).

Results appear weak, as only half to two-thirds of certified contractors appear to have purchased the required equipment to certify homes to PTCS. This is a major finding of this study.

F. Number of Certified Homes by Sales Approach

Homes get PTCS certified through one of two sales delivery channels: the market-driven contractor or the utility contract for mobile home services. To understand the impact of the latter on the number of certified homes, a comparison was made between the two approaches based on monthly data. *Figure 1* shows this impact as substantial and growing.

Figure 1: Number of Certified Homes by Sales Approach



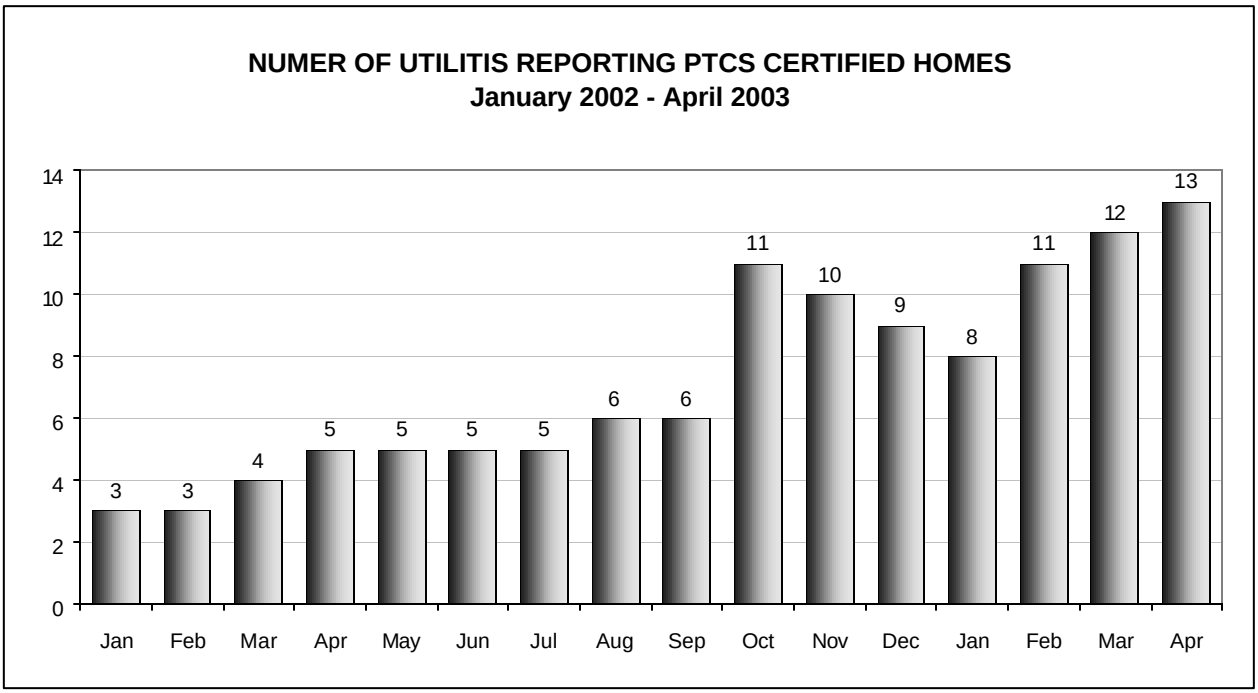
This should be expected, as Climate Crafters has focused heavily on the more saleable (and lucrative) contract approach, and less on the market-driven channel. In effect, Climate Crafters is getting more "bang-for-the-buck" selling utilities duct sealing mobile home pilots, than it would trying to convince

individual HVAC contractors about the merits of PTCS. This reality was brought home with the Energy Trust of Oregon mobile home contract, and the trend has continued with other utility contracts. One result is the market-driven channel has stagnated, and it does not appear it will be further developed.

G. Number of Utilities Reporting PTCS Certified Homes

Although the total number of utilities that have reported PTCS certified homes to Climate Crafters stands at twenty (program-to-date), and could reach 25 in 2003, the total actually processing jobs each month is increasing slowly, but steadily. This may continue as more contract mobile home pilots kick-in during 2003, but their contribution may be only temporary.

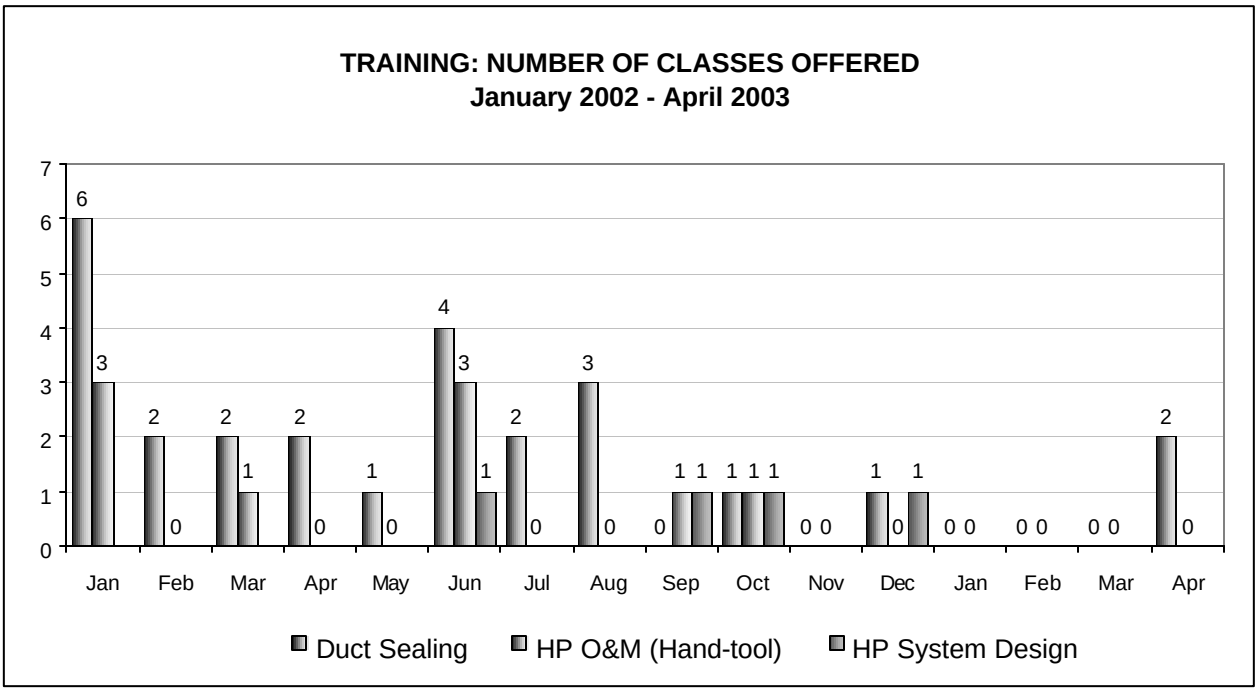
Figure 2: Number of Utilities Reporting PTCS Certified Homes



H. Training: Number of Classes Offered

Most of Climate Crafters training sessions were offered during the first half of 2002. Since then, the pace of training appears to have slowed down quite a bit, with more emphasis placed on heat pump training, and less on duct sealing. Climate Crafters explained the drop-off as seasonal, suggesting the summer months are the busiest training months, and that training typically slows in the fall at the startup of the heating season and remains slow into spring. *(See Figure 3.)*

Figure 3: Number of Training Classes Offered

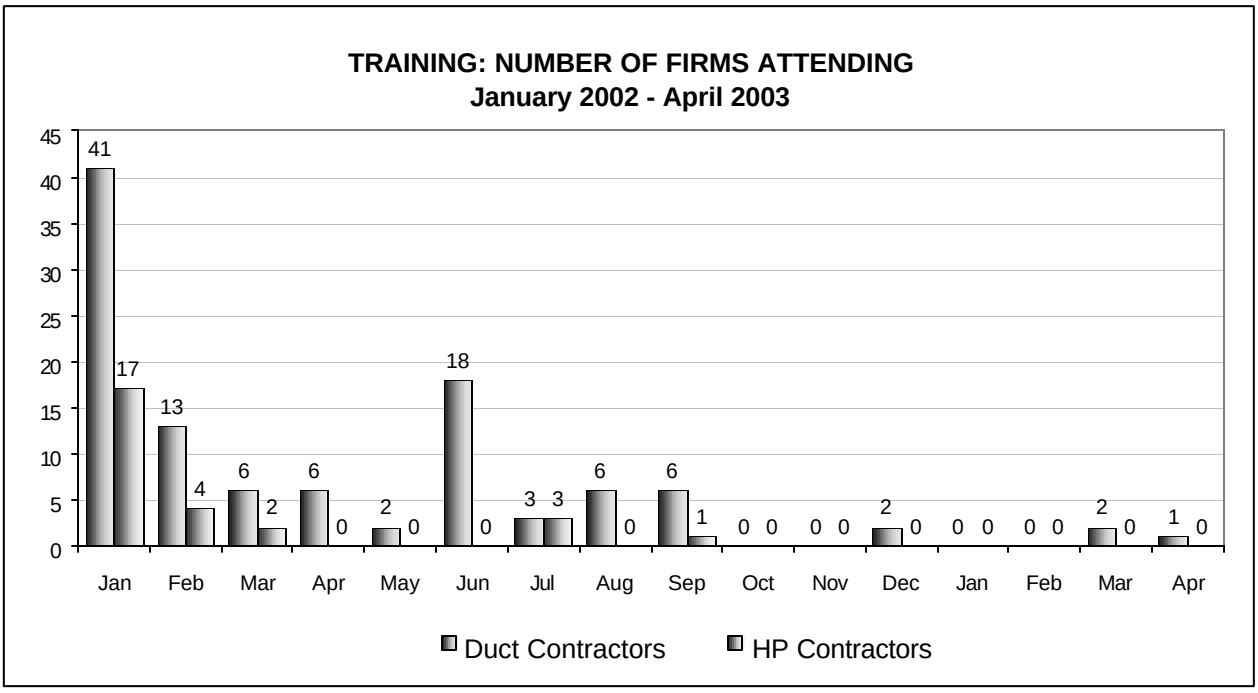


I. Training: Number of Firms Attending

Most of the contractor firms now certified in PTCS were trained during the first half of 2002. After the initial training burst, classes became sparser, and attendance thin. However, suggesting no lack of contractor interest, Climate Crafters recently changed its focus to concentrate on targeted training. Instead of an approach where Climate Crafters provided outreach, held classes and

hoped contractors could find work, Climate Crafters now targets and selects contractors for training and guarantees work under a utility contract. Climate Crafters reported instructors noted difficulties when class sizes exceeded ten. The new targeted approach allows for better control of class size. Climate Crafters also noted training is again gearing up as six classes were held in late spring (not shown on chart). *(See Figure 4.)*

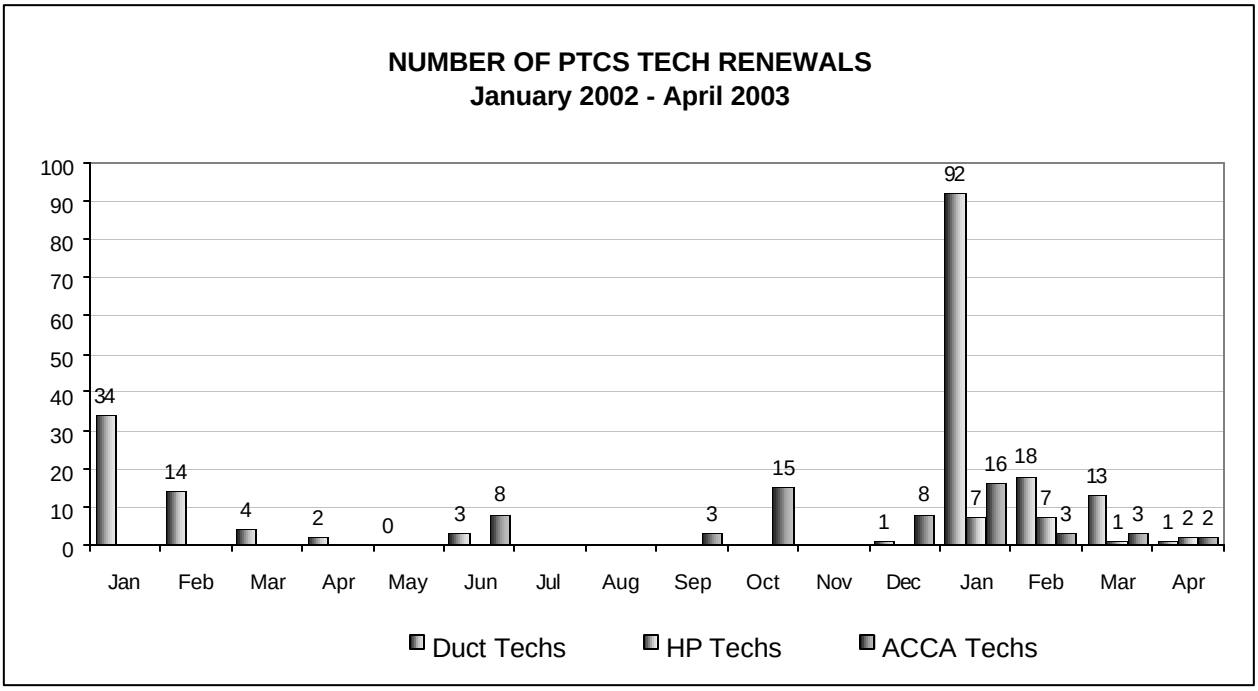
Figure 4: Number of Firms Attending



J. Number of PTCS Tech Renewals

Climate Crafters reported in early-2003 that annual renewals were coming in at 75%, an impressive number. The number of annual renewals in January 2003 was off-the-charts. *(See Figure 5.)*

Figure 5: Number of Tech Renewals



K. Summary

To Climate Crafters credit, they achieved all the goals set out for them in 2002. But, this success masked difficulties in a number of areas. Many of the certified contractors are not doing much, and a significant portion of contractors never purchased the equipment (a major finding of this research). Development of the market-driven channel has slowed to a halt, while the targeted utility contract channel has exploded. This was primarily driven by the availability of The Oregon Energy Trust and investor-owned utility funding. These contributions to Climate Crafters financials are impressive, but may not be sustainable. Renewals for PTCS certification were impressive as well. Training slowed considerably the second half of 2002, reflecting the seasonality of that service, but appears to be picking up again as of late spring 2003.

3. UTILITY INTERVIEW

To gain a greater understanding of utility interest, satisfaction, and support for the services provided by Climate Crafters on PTCS, fifty telephone interviews were completed in January 2003 on a sample of utilities. All 24 utilities offering PTCS duct or heat pump diagnostic incentives were interviewed. Another 26 interviews were conducted with non-participating utilities selected from a list prepared by Alliance staff. In all, interviews were completed with utilities in Washington (19), Oregon, (21), Idaho (6), and Montana (4).

Awareness of PTCS was very high for participating and non-participating utilities. Forty-three of 47 utilities indicated PTCS or Climate Crafters when queried if they could name a duct sealing training program for contractors.

A. Interest in PTCS Duct Sealing

Utilities reported they have a high level of interest in PTCS, but admitted few homeowners or contractors are inquiring about their PTCS programs. They reported a strong need for PTCS, because of a high level of awareness in the field of problems with leaky ductwork. *(See Table 9.)*

Table 9: Company Interest in Duct Sealing (n=50)

UTILITY INTEREST IN PTCS DUCT SEALING	1 NOT INTERESTED	2	3 NEUTRAL	4	5 VERY INTERESTED
PARTICIPATING UTILITIES	0	2	5	9	8
NON-PARTICIPATING UTILITIES	1	6	5	8	6
TOTAL	1	8	10	17	14

Utilities without duct-sealing programs (non-participants) showed a modest interest in PTCS, however, their awareness of PTCS was very high. Nearly one-third reported having sent staff to training sessions. About one-third saw a

real need for PTCS duct sealing. Over half reported they were interested in the PTCS services.

B. Satisfaction with Climate Crafters Support

As shown in *Table 10,* overall satisfaction with Climate Crafters' support for PTCS was rated very high by the participating utilities (21 of 24). Satisfaction with training was very high among the group as well (20 of 24). The individual elements of training rated high in satisfaction, including the availability of training (21), logistics (17), quality of training (15), and contractor feedback (18). Cost was the lowest rated element of training (14 satisfied).

Table 10: Satisfaction with Climate Crafters Support for Training (n=24)*

TRAINING ELEMENT	VERY SATISFIED	SOMEWHAT SATISFIED	NOT SATISFIED	DON'T KNOW
AVAILABILITY OF TRAINING	15	5	2	2
LOGISTICS OF TRAINING	10	7	2	5
QUALITY OF TRAINING	11	4	1	7
COST OF TRAINING	5	9	5	4
CONTRACTOR FEEDBACK	9	9	2	3
OVERALL SATISFACTION WITH TRAINING	10	10	1	3

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

As shown in *Table 11*, satisfaction with marketing among participants rated high (20 of 24). Individual elements of marketing rating high in satisfaction, included program communications (22), availability of materials (21), and access to marketing support (20). Some marketing elements rated lower, including usefulness of the marketing materials (15), the Dysfunctional House brochure (14), and the referral list of contractors (13). Respondents reported almost no familiarity with the website.

Table 11: Satisfaction with Climate Crafters Support for Marketing*

SUPPORT ELEMENT	VERY SATISFIED	SOMEWHAT SATISFIED	NOT SATISFIED	DON'T KNOW
AVAILABILITY OF MARKETING MATERIALS	9	12	1	1
USEFULNESS OF MARKETING MATERIALS	7	8	5	2
USEFULNESS – DYSFUNCTIONAL HOUSE BROCHURE	9	5	3	6
USEFULNESS OF UTILITY MARKETING PACKET	2	6	3	11
REFERRAL LIST OF CONTRACTORS	7	6	3	6
PROGRAM COMMUNICATIONS	10	12	2	0
WEBSITE	4	7	1	10
ACCESS TO MARKETING SUPPORT	5	15	0	2
OVERALL SATISFACTION WITH MARKETING	8	12	3	0

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

Overall, satisfaction with tracking and reporting rated high (16 of 19). Several individual elements of tracking also rated high in satisfaction, including ease of implementation (16) and the invoicing process (14). Third-party quality assurance inspections had almost no awareness by the utilities. *(See Table 12.)*

According to utilities, Climate Crafters' biggest value to *them* is the training to improve contractor capability and knowledge of PTCS. But, the utilities agreed that Climate Crafters' biggest value to the *region* is helping the utilities get information out about duct sealing.

Table 12: Satisfaction with Climate Crafters Support for Tracking and Reporting*

SUPPORT ELEMENT	VERY SATISFIED	SOMEWHAT SATISFIED	NOT SATISFIED	DON'T KNOW
TRACKING & REPORTING	9	4	4	2
INVOICING PROCESS	10	4	2	1
THIRD PARTY QA	3	2	0	10
EASE OF IMPLEMENTATION	4	12	2	0
OVERALL SATISFACTION WITH TRACKING	4	12	1	1

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

C. Utility and Contractor Support for PTCS

Utilities reported support for PTCS. Those participating indicated they have staffed the program adequately to handle program volume; personnel are trained, pre- and post- tests are provided to customers, and financial incentives are offered. *(See Table 13.)*

Table 13: Utility Support for PTCS*

SUPPORT ELEMENTS	1 VERY WEAK	2	3 NEUTRAL	4	5 VERY STRONG
HOW STRONGLY YOUR UTILITY PROMOTES PTCS TO HOME OWNERS	4	5	5	6	4
HOW STRONGLY UTILITY PROMOTES PTCS TO CONTRACTORS	0	4	5	7	6
RATE OVERALL SUPPORT FOR PTCS	0	3	8	11	2

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

Utilities say they promote the program, but admit they market it more to contractors than homeowners. They believe in the need for PTCS, and are convinced of the importance of having a PTCS-certified tech in their service territory *(Table 14)*.

Table 14: Importance to Utility of Having A PTCS Certified Tech In Service Territory

KEY ELEMENT	1 NOT IMPORTANT	2	3 NEUTRAL	4	5 VERY IMPORTANT
HAVING A PTCS CERTIFIED TECH IN SERVICE TERRITORY	0	0	0	6	18

Most plan to continue PTCS in the future and promote it more. Utilities reported they are not satisfied with customer participation *(Table 15)*.

Table 15: Utility Satisfaction with Customer Participation

PROGRAM CATEGORY	1 NOT SATISFIED	2	3 NEUTRAL	4	5 VERY SATISFIED
SATISFIED WITH HOMEOWNER PARTICIPATION	5	7	3	6	3

To improve the program, participants want Climate Crafters circuit riders on-board to work closely with contractors in the field. Homeowner education is a missing element, and utilities report it impeding progress in the market. Refreshed marketing materials were requested because the original material is out-of-date. Lower contractor training and equipment costs are deemed very important to improve contractor buy-in.

The utilities are concerned about Bonneville audits, and note the importance of the strong certification procedures and record keeping provided by Climate Crafters. They are very interested in the quality assurance it provides on certified homes, although most were not aware of any inspections.

Utilities report they have tried to bring contractors on board, but contractor support remains weak. They contend that awareness is high with contractors, but interest is low, citing significant hurdles contractors must overcome (low consumer demand and lack of profitability). Utilities noted that few contractors are inquiring about PTCS, and that frequency is diminishing.

D. Utility Heat Pump Programs and PTCS

Nearly all utilities surveyed that participate in PTCS offer heat pump incentives under Bonneville's Conservation and Renewable Discount (C&RD) program. However, only one-third required the ductwork be certified to PTCS standards to qualify for their incentives, a major finding of this research. Utilities appear to resist PTCS interference in their heat pump programs, and are concerned about contractor backlash if PTCS is required. Several utilities not currently requiring PTCS on their heat pump program, reported they were leaning toward adopting the standard in 2003. The litmus test on utility support for PTCS may be their reaction to Bonneville's changes in C&RD heat pump incentives for FY2004.

With utilities commenting about how rapidly they are consuming their five-year C&RD budgets, many realize that adopting a PTCS duct sealing requirement for their heat pump incentive program would actually burn through these dollars even faster, a potential negative for their support of PTCS.

Utilities perceive little homeowner or contractor interest in heat pump diagnostics; but, for themselves, they see a strong need and interest in the service to ensure better installations in the field. Most reported they were aware of the heat pump diagnostic training primers offered throughout the region in late summer 2002. Twenty-three utilities reported sending reps to these courses.

Two-thirds of utilities surveyed that do not participate in PTCS see a real need for the heat pump diagnostic service, and about half reported being interested in it. Nearly two-thirds of non-participating utilities were aware of the heat pump

diagnostic primers, with about one-third sending staff to be trained. *(See Table 16.)*

Table 16: Utility interest in PTCS HP/AC Diagnostics and Tune-up

TYPE OF UTILITY	1 NOT INTERESTED	2	3 NEUTRAL	4	5 VERY INTERESTED
PARTICIPATING UTILITIES	3	4	9	5	3
NON-PARTICIPATING UTILITIES	1	5	8	9	3
TOTAL	4	9	17	14	6

E. Acceptance of PTCS in Oregon

Oregon utilities cited on-going confusion with the different program requirements for PTCS and Oregon's *Residential Tax Credit* (RTC). This confusion included requirements for both duct sealing and heat pump diagnostics. Utility managers were clearly upset about this, and reported the failure to resolve this issue created persistent negative feelings about PTCS and Climate Crafters. They suggested Climate Crafters should begin to work more closely with them to help resolve these issues.

The Energy Trust's *Thousand Mobile Home Pilot Project* did not create much awareness for PTCS. Due to the short timeline on the project, PTCS stickers were not included as part of the effort, although the main program requirements were verified as being in compliance with PTCS standards.

F. Why Utilities Are Not Participating

The following are the most common reasons utilities mentioned for not participating in PTCS (by number of utility responses):

+ No contractors are on board, or contractors are not interested (9)

+ No funding is available, either utility funding or C&RD budget (6)
+ Few duct systems require it (predominance of basements & zonal heat) (4)
+ BPA bureaucracy and specifications are too stringent (3)
+ No management support or priority (2)
+ No staff available to implement a program (2)
+ Previous duct sealing specifications are working fine (2)
+ PTCS is onerous, and needs to be avoided (2)

G. The Big Challenge for Climate Crafters and PTCS

Utilities reported the biggest challenge for Climate Crafters is to prove the value of PTCS to contractors, who are concerned that there may not be enough money in it for them. Utilities have concluded that contractors do not know how to sell the program, and speculated that PTCS may not fit most contractors' business model (equipment installs). A half-day sales training for all contractor marketing staffs, with a focus on teaching them how to up-sell PTCS services, was recommended by program developers to overcome these barriers.

H. Summary

Utilities report they have a high level of interest in PTCS, but acknowledge few homeowners and contractors inquire about their programs. This is due to a lack of consumer demand and homeowner education. But, while utilities appear to be the most aware of the problem and best positioned to resolve it, they have not succeeded. Utility satisfaction with Climate Crafters support for PTCS is high. But Climate Crafters has been unable to crack the Oregon market, where there are issues, particularly with its compatibility with the State's *Residential Tax Credit Program*. Utility C&RD heat pump programs are widespread, but do not include the requirement that ducts be sealed to PTCS standards. While

there appears to be some utility movement to require PTCS, the litmus test will be utility reaction to Bonneville's changes in C&RD heat pump incentives. Utilities not participating in PTCS see a need for it and indicated a modest interest.

4. CONTRACTOR INTERVIEW

Utilities reported that contractor support for PTCS was weak. To determine more about contractors' level of awareness, interest in, satisfaction with, and support for PTCS, thirty-nine interviews were completed in April 2003 with Northwest contractors. Twenty-three surveys were conducted with contractor firms listed as PTCS certified. They were selected from Climate Crafters lists and included firms active and inactive in the market. These contractors are separated by type of PTCS certification and state. Results are shown in *Table 17*.

Table 17: PTCS Certified Contractors Surveyed (n=23)

STATE	TYPE OF PTCS CERTIFICATION		
	DUCT SEALING ONLY	DUCT & HEAT PUMP	HEAT PUMP ONLY
WASHINGTON	4	5	6
OREGON	5	2	0
IDAHO	0	1	0

Sixteen surveys were also conducted with contractors who were not certified. Eight of these were chosen because they had attended a Climate Crafters duct or heat pump training primer in 2002. The other eight were chosen from searches on the *Big Yellow* website. Efforts were made to ensure geographic coverage of Climate Crafters services.[5]

[5] Survey coverage included 17 of 94 RADS contractors (18%), representing 35% of PTCS duct certifications to date. Coverage also included 14 of 38 heat pump contractors (37%), representing 30% of PTCS heat pump certifications to date.

A. Awareness

Fifteen of 39 contractors named Climate Crafters or PTCS when asked to name an organization offering residential duct testing and sealing training, or heat pump diagnostic training.

For contractors that could not name Climate Crafters or PTCS in the initial "unprompted" question when asked if they had heard of Climate Crafters or PTCS, awareness was much higher, as 17 of 19 indicated they had, including 9 of 11 not certified.

B. Satisfaction

As shown in *Table 18*, certified contractors were very satisfied with support provided by Climate Crafters. Responses were "positive" to seven different program categories of satisfaction by a factor of at least 2 to 1. "Overall satisfaction" also rated high, with nine contractors indicating "satisfied," eight were "neutral," and two "not satisfied."

Table 18: Satisfaction with Climate Crafters Support (n=23)*

PROGRAM CATEGORY	1 NOT SATISFIED	2	3 NEUTRAL	4	5 VERY SATISFIED
CONTRACTOR TRAINING	0	1	4	8	5
COST OF TRAINING	1	3	4	4	5
COST OF EQUIPMENT	5	4	3	3	2
MARKETING MATERIALS	4	4	1	5	5
TECHNICAL SUPPORT TO CONTRACTORS	1	1	6	5	2
QUALITY ASSURANCE INSPECTIONS	0	0	1	2	3
CLIMATE CRAFTERS WEBSITE	0	1	1	0	1

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

Note: The table is based on a one-to-five point rating scale, where a one was explained as 'not satisfied', a three was explained as 'neutral', and a five was 'very satisfied.' This five-point scale was used throughout the survey, and also appears in the tabulated results throughout this chapter.

Training was the highest rated element of Climate Crafters' support, followed by *technical support provided to contractors*. Satisfaction with *marketing materials* was evenly split, with *Heat Pump-Only* certified contractors strongly negative. *Cost of the equipment* was the largest element of dissatisfaction. Contractors were largely unaware of the Quality Assurance inspections and the Climate Crafters website.

Heat pump-only certified contractors rated their satisfaction significantly lower in every category compared to contractors certified in duct-sealing, indicating concerns by this group over that Climate Crafters service.

C. How the Program Could Be Improved

When asked how Climate Crafters or the utilities could improve the program, the contractor response was clear. More promotion is needed to educate the public and raise public awareness. This element is listed as the single biggest weakness of the program, and is the primary reason contractors are struggling in their support of the program.

Another concern related to the annual renewal fee of $150 for each certified technician in a contractor firm.[6] Contractors questioned the value received for this yearly fee, noting the absence of continuing education or program updates from Climate Crafters.

[6] The $150/year tech fee was described as excessive. By comparison, two other licenses absolutely critical to an HVAC business, a gas license and a low-voltage license, require fees of only $35/year and $35 for two years, respectively.

D. Interest in Duct Sealing

As shown in *Table 19*, most contractors think homeowners are currently not interested in PTCS duct sealing (8 said interested, 21 said not interested). The majority of certified and non-certified contractors noted that homeowners do not believe there is a problem, are not concerned about it, don't understand, and don't care. Several contractors mentioned homeowners would never do duct sealing unless it was free. Contractors not certified noted that homeowners would not be interested unless the costs and savings were compelling, but thought it impossible to quantify these.

Table 19: Contractor Perception of Homeowner Interest in Duct Sealing (n=39)*

CONTRACTOR CATEGORY	1 NOT INTERESTED	2	3 NEUTRAL	4	5 VERY INTERESTED
CERTIFIED CONTRACTORS	5	8	3	4	2
NOT CERTIFIED	3	5	5	2	0

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

It is noteworthy that contractors were consistent in their belief that "if educated," homeowners would be very interested in duct sealing. This belief was the basis for their interest in the service, which was mixed overall, but leaned positive (16 said interested, 12 said not interested; *see Table 20*).

Table 20: Company Interest in Duct Sealing (n=39)

CONTRACTOR CATEGORY	1 NOT INTERESTED	2	3 NEUTRAL	4	5 VERY INTERESTED
CERTIFIED CONTRACTORS	2	4	4	4	9
NOT CERTIFIED	4	2	7	1	2

The strongest interest was by firms who admitted it was a big part of their business, or that it filled in the holes in the duct-cleaning schedule. They seem to have little competition.

Contractors lack interest in PTCS duct sealing for a number of reasons. Most indicated that they were not interested in labor-only work, citing the absence of profit. Others mentioned the price of the equipment contributed to a poor payback because of the volume of work needed to regain the initial cost. One contractor cited a difficulty in marketing PTCS, due to the lack of contractor credibility in the eyes of homeowners. Several firms noted the difficulty in finding manpower to do a difficult job. Others noted they were simply too busy with their main line of work – equipment installs.

Contractors said there was no way to compete with it, noting they had to give the incentive away to the customer. Several agreed it was a "hard sell" for contractors. At $350 for a test, one indicated he couldn't even complete his spiel to the homeowner.

E. Importance of Duct Sealing to Certified Contractors' Business

Results were split when certified contractors were asked to rate the importance of duct sealing to their business. About half (11) see it as important, and half (10) not important (*see Table 21*).

Table 21: Importance of Duct Sealing to Contractors' Business (n=23)

CONTRACTOR CATEGORY	1 NOT IMPORTANT	2	3 NEUTRAL	4	5 VERY IMPORTANT
CERTIFIED CONTRACTORS	9	1	2	5	6

Only a few contractors mentioned duct sealing makes money. They view it as a necessity, and part of their basic business, and take pride in it. Others noted that, while it fails to provide meaningful revenue generation, it is important to

their operation to get installs done correctly. Some see it in their future, but because there is not enough money in it, they do not fully rely on it for survival. The fact that it is required by utilities appears to be the main impetus for support by contractors.

Contractors cite "absence of demand" by homeowners as the main reason duct sealing is not important. Because of this, only half of PTCS certified contractors surveyed indicate they purchased the equipment (blower door, or Duct Blaster).[7] This is a major finding of this research. Subcontracting to a third-party specialist appears to be the method of choice for contractors working with utility programs. The *Heat Pump Only* contractors rated the importance of duct sealing significantly lower than the other two groups.

Contractors were somewhat positive in their view of whether duct sealing would become a more important part of their business in the future (14 said yes, 8 said no). To become more important, contractors indicated it would require an educated consumer, and more utility support and referrals. Clearly, the *Heat Pump Only* group answered it would not become more important.

F. Promotion of Duct Sealing

Contractors rated the strength of utility promotion of duct sealing as somewhat weak, about the same rating given to their own. Not surprisingly, *Heat Pump Only* contractors rated utility promotion and their own promotion as very weak (*Table 22*).

[7] A follow-up call to Climate Crafters to determine how many contractors on their list of certified duct sealing contractors had actually purchased the equipment confirmed the results from this Contractor Interview. Only one-half to two-thirds of all certified contractors have purchased the equipment.

Table 22: Rate How Strongly You Think Duct Sealing Is Promoted (n=23)*

PROMOTION CATEGORY	1 VERY WEAK	2	3 NEUTRAL	4	5 VERY STRONG
PROMOTION BY UTILITY	5	4	5	4	3
PROMOTION BY CONTRACTOR	8	2	5	3	4

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

Contractors bid duct sealing only when it is required by utilities. Almost no one knocks on doors, or cold-calls to attempt to sell duct sealing. Subcontracting to a specialist is commonplace. Contractors sell duct sealing on equipment replacement change-outs by discussing it with homeowners, including it as an option on the bid proposal, or embedding the price within the bid. Some include Climate Crafters brochures in the bid. Only eight contractors indicated they were using duct sealing as a sell-up service.

Responses were evenly split between "easy" and "difficult," when asked how easy it was to sell duct sealing (6 said easy, 6 said difficult). Responses were slightly positive when contractors were asked if homeowners seemed willing to pay for it (9 yes, 6 no).

G. Importance of a Climate Crafters Field Rep

Results were split when asked how important it was to have a Climate Crafters field rep available to assist in the field (7 said interested, 6 said not interested). Several contractors indicated it would be nice to have more contact and support from Climate Crafters to help get-the-word-out, noting this would lead to better-educated customers. Climate Crafters would have to follow a straight business approach (focus on making money). However, even more contractors cautioned that, while technical help was acceptable, sales help was not needed. They worried Climate Crafters would get in the way and cause them problems. Others noted it would help their competitors and hurt them, so they did not favor of the field rep.

H. Heat Pump Diagnostics

Results were negative when contractors were asked how interested homeowners would be in PTCS heat pump diagnostic services (7 said interested, 20 said not interested; *see Table 23*). While some noted that homeowners would be interested due to high electric bills, more contractors indicated homeowners would not care because they do not understand or relate to the technical side of the business.

Table 23: Contractor Perception of Homeowner Level of Interest In Heat Pump Diagnostics (n=39)*

CONTRACTOR CATEGORY	1 NOT INTERESTED	2	3 NEUTRAL	4	5 VERY INTERESTED
CERTIFIED CONTRACTORS	6	5	4	2	2
NOT CERTIFIED	5	4	4	2	1

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

As shown in *Table* 24, results were split, but leaned negative, when contractors were asked about their company's level of interest in PTCS Heat Pump diagnostics (13 said interested, 18 said not interested).[8] *PTCS Certified* contractors were evenly split in their level of interest in heat pump diagnostics for their firms (8 said interested, 8 said not interested), while non-certified contractors' interest was negative (5 said interested, 10 said not interested).

[8] Twenty-four of the 39 contractors surveyed were aware of the training primers on heat pump diagnostics, and 22 attended.

Table 24: Company's Level of Interest In PTCS Heat Pump Diagnostics*

CONTRACTOR CATEGORY	1 NOT INTERESTED	2	3 NEUTRAL	4	5 VERY INTERESTED
CERTIFIED CONTRACTORS	6	2	4	6	2
NOT CERTIFIED	5	5	1	3	2

* Where responses do not equal the sample size (n), respondents refused to answer or found "not applicable."

Interested contractors reported the unit works well and "sells." It is viewed as another tool to use and charge for. Some contractors want their tech's to have it, since their goal is to offer the best service possible. Some find it very informative, and are big believers that it can be used to learn a lot about a house. Apparently, the tool creates more consistency among Tech's with different capabilities, a prime benefit for larger HVAC firms interested in a consistent level of service. The best use of the tool is on a service call on existing equipment – it shows the *Efficiency Index* percentage improvement. It was also seen as a tool used to compensate for poor training and installation practices.

Contractors not interested in PTCS heat pump diagnostics noted that the failure of the unit to work below 65° F. rendered the unit nearly worthless from a business perspective. This deficiency necessitates expensive callbacks, and prompted some to label it a "service nightmare." Contractors said they see little value in the tool in Zone-1.

Contractors have issues with the accuracy of the hand-tool. They suggested it makes mistakes, needs verification, and the results can be manipulated. Several contractors said they saw problems and questionable readings glossed over in the primer. Some indicated they do not believe in the "expert system" concept.

Contractors also view the tool as "overkill." They said they are not convinced of its value and indicate the same information can be provided with existing tools. They described the hand-tool as so expensive, for so little benefit, it does not make sense. They noted it had no payback based on the short duration of use, and there appeared to be no way to charge the homeowner for it.

Contractors said they would not buy the tool if it was not required by utilities for their heat pump programs and consistently indicated they would not use it outside of the programs. Contractors also indicated they were skeptical that BPA and the utility programs would run out of money, and therefore they would not recapture their investment.

While addressing over and undercharging of refrigerant, contractors noted the tool does not fully address an even larger problem, that of inadequate airflow due to undersized ducts. In effect, Honeywell developed a large hammer (hand-tool) for a small problem (undercharging), while somewhat ignoring a larger issue – airflow restrictions.

I. Support for Regional Standards and Specifications

As shown in *Table 25*, results were positive when contractors were asked if a regional electric utility conservation standard like PTCS had their support (22 yes, 6 no), but there were some caveats.

Table 25: Does A Regional Electric Utility Conservation Standard Have Your Support? (n=39)

CONTRACTOR CATEGORY	YES	NO	NOT SURE
CERTIFIED CONTRACTORS	16	3	4
NOT CERTIFIED	6	3	7
TOTAL	22	6	11

Approximately three-quarters of certified contractors, and one-quarter of non-certified, indicated they were familiar with PTCS standards and specifications. Many noted a regional standard helps with consistency, especially when a contractor works with multiple utilities – the contractor knows they meet the specification and it gets the states and utilities on the same page. Several contractors said that standards benefit the homeowner, but they were also good

for the industry, noting that, "quality is fleeting in this business," and that "half the industry is not up to standards."

If demanded by utilities, contractors indicated they would support the regional standard, but they consider the cost hurdle to be high (thousands per tech). They note that standards only put a burden on them, which they will not support without utility incentives. Some would support standards required of everyone, but noted that they would also make it harder to compete. Some embrace standards, but are leery of over-regulation, a major concern.

Arguments against regional utility standards pointed to a failure to successfully implement them for the heat pump program. Here, several contractors cited confusion over inconsistent utility standards on heat pumps between BPA, the Oregon Office of Energy, and their utility. They noted that the one advantage the utilities had (a consistent regional standard) was "blown." One contractor had a problem with how the standard was developed; suggesting the utilities made the Northwest a guinea pig, and noted that these standards were not evident nationally in the industry. Another called the standards "utterly ridiculous," and said to, "Keep out of our business, it's legislated (duct sealing) with the new code change, anyway."[9] *(See Table 26.)*

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[9] New energy-conservation requirements in the Oregon One- and Two-Family Dwelling Specialty Code (OTFDC) became effective April 1, 2003.

All joints in duct systems shall be sealed by means of tapes, mastics, aerosol sealant, gasketing, or other approved closure systems. Cloth-back rubber adhesive duct tape IS NOT allowed by code. Sealing is not required for the adjustable portion of metal gores. (Section M1601.3.1). Source: State of Oregon Building Codes Division

The Washington State Building Code Council has adopted revisions to the WSEC and the VIAQ went into effect July 1, 2001.

Duct sealing requirements have become more specific. Mastic will be required on all sheet metal connections. Tape will only be allowed for duct board and flex duct connections. The tape used must meet UL 181A (ductboard) or 181-B(flex) test standards. Duct tape is prohibited. Building cavities used as ductwork must also be sealed to a high standard. Source: State of Washington, State Building Codes web site.

Table 26: Does An Electric Utility Conservation Program, That Requires Specific Standards Like PTCS, Have Your Support? (n=39)

CONTRACTOR CATEGORY	YES	NO	NOT SURE
CERTIFIED CONTRACTORS	20	3	0
NOT CERTIFIED	10	3	3
TOTAL	30	6	3

Contractors are even more supportive of local utility conservation programs, revealing a perceived flexibility from the "hard rules" of a regional standard (30 support, 6 do not). Contractors noted if standards were required, they would comply, but the only way to get widespread contractor buy-in would be for utilities to educate homeowners and provide incentives.

J. Summary

High start-up costs and "excessive" annual fees combined with little profitability from services that lack consumer demand, and are just too-difficult-to-sell to homeowners due to long paybacks, is hurting contractor buy-in of PTCS.

Contractors reported they were very satisfied with Climate Crafters' support. Training and technical support rated highest, and cost of equipment, the lowest. They question the value of PTCS renewal fees, and consider them excessive compared to the cost of other licenses. Contractors strongly pointed out the need for more utility promotion to raise public awareness of PTCS duct sealing and educate the consumer. This was considered the single biggest weakness of the program.

Contractors think homeowners are not interested in duct sealing, but if educated, they could be. This belief seems to be the basis of contractor interest in PTCS duct sealing, which was positive for certified contractors, but negative for contractors not certified. Indicating it was a "hard sell," contractors said they had little interest in labor-only work, citing the "absence of profit." The price of equipment is a barrier, considering the volume of work necessary to regain the initial investment. "Absence of demand" was the reason certified contractors rated PTCS duct sealing as not important to their business.

Because of this, only half the certified duct contractors purchased the equipment, preferring instead to subcontract work to a third-party specialist. Contractors were slightly positive as to whether PTCS duct sealing would become more important to their business in the future.

The importance of a Climate Crafters field rep was also mixed. Supportive contractors would require a strong business approach and emphasis on making profits. Technical help was considered to be acceptable, but sales help not needed.

Contractors think homeowners are not interested in PTCS heat pump diagnostic services because they do not relate to the tech side of the business. Certified contractors were evenly split in their interest in heat pump diagnostics, while those not certified were negative. The main concern is the failure of the unit to work below 65°. This renders the unit useless for most of the year, necessitating expensive callbacks during the summer. Contractors also had issues over the accuracy of the unit, and their poor return-on-investment. Contractors would not buy the tool if it were not required for utility programs. They consider it an expensive item for such a small problem (undercharge of refrigerant).

Heat Pump Only certified contractors consistently gave negative responses to the questions asked in the survey. They will not consider duct sealing, but to appease the utilities they have established relationships to sub-contract the work to third party specialists.

Most contractors interviewed said they would support utility standards, like PTCS, but not without significant support from the utilities, such as incentives and promotion. Absent this support, they will not participate.

In spite of all this, PTCS duct sealing and heat pump diagnostics still have the support of some contractors, and overall, the contractors as a group indicated satisfaction with Climate Crafters support.

5. CONSUMER SURVEY

To better understand consumer awareness and interest in duct performance testing, duct sealing, and heat pump diagnostic services, a telephone survey was conducted among homeowners in Idaho, Montana, Oregon, and Washington. Gilmore Research Group assisted in the development of the questionnaire, and Gilmore conducted the survey with 500 consumers in April 2003. Households in the four states were sampled randomly according to their regional population distribution, consistent with the *2000 Baseline Study*.[10] The sample was limited to owners of homes with forced-air heating systems, heat pumps, or central cooling systems.

A. Characteristics of the Sample

Forty-one percent of respondents were classified suburban, 35% rural, and 24% urban. Seventy-nine percent lived in single-family detached (site-built)

[10] Responses were received from homeowners from over 50 utility companies, representing over one-third of the region's electric utilities. The top-ten utilities surveyed represented over two-thirds of respondents.

UTILITY	NUMBER OF SURVEY RESPONDENTS	PERCENT OF SURVEY RESPONDENTS	DUCT SEALING PROGRAM/ PILOT
PUGET SOUND ENERGY	102	20%	Yes- pilot
PORTLAND GENERAL ELECTRIC	58	12%	Yes – ETO
AVISTA	37	7%	No
PACIFICORP	40	8%	Yes – ETO
IDAHO POWER CO.	34	7%	Yes – Pilot
NORTHWESTERN ENERGY	26	5%	No
SNOHOMISH COUNTY PUD	19	4%	No
SEATTLE CITY LIGHT	19	4%	No
CLARK PUBLIC UTILITIES	17	3%	Yes – Program
TACOMA POWER	13	3%	No

dwellings, while 17% were in manufactured homes. Fifty-seven percent of respondents indicated their primary fuel was natural gas, while 32% used electric, 5% propane, and 5% oil heat. Fourteen percent reported having a heat pump, and 21% had central-air conditioning. Sixty percent of the homes were built over unheated crawl spaces, with an additional 5% having unheated basements or mobile home blocking. Thirty-three percent were built over a conditioned space, such as a heated basement, or over a slab. Fifty-seven percent of respondents indicated their ducts were wrapped or insulated, 27% said they were not, and 16% did not know.

B. Duct Performance Testing and Sealing

Slightly less than half (44%) of respondents indicated they had heard of ducts leaking air into attics or crawlspaces, but based on their knowledge of their home's construction, only 17% guessed their ducts had leaks. Over half (54%) believed their ducts did not leak, with a large proportion (28%) not sure.

Impressively, a modest portion of the sample reported they had heard of duct performance testing (21%) and duct sealing services (22%), but few (4%) indicated they had purchased them. Respondents said average costs for these services ranged from about $100 for duct performance testing,[11] to nearly $350 for duct sealing, as shown in *Table 27*.

There appears to be relatively slight interest by homeowners in duct performance testing and sealing at this time. At a price of $600 ($300 for manufactured homes), and savings of $50 to $75 per year, only 14% were interested (7% very interested) and 64% were not interested. Without a price mentioned, a similar question on consumer interest in duct sealing from the *2000 Baseline Survey* scored somewhat higher, with 26% "interested," and 54% "not interested." Homeowners who expressed an interest in the service were equally likely to consider it for current equipment or at the time of equipment replacement.

[11] From the *2000 Baseline Survey*, consumers indicated a "willingness to pay," at an average price of $105 (n=163) for a duct test and certification (note this did not include duct sealing).

Table 27: Homeowners' Knowledge of Duct Services

DUCT SERVICE	HEARD OF SERVICE	PURCHASED DUCT SERVICE	AVERAGE COST OF DUCT SERVICE
DUCT CLEANING	65%	25%	$160
DUCT REPAIR	32%	4%	$292
DUCT SEALING	22%	4%	$341
DUCT TESTING	21%	4%	$108

Note: The average costs for duct repair, sealing and testing were based on a small sample of respondents, about nine to eleven responses. The duct cleaning average cost was based on a sample of 66 respondents. Many respondents could not remember the cost of the service.

Only 9% of the entire sample was aware of any utility-sponsored programs that promoted duct performance testing, a percentage roughly matching results from the *2000 Baseline Survey*.[12] However, 5% reported that they had heard of the name "PTCS," and 1% said they had heard of "Climate Crafters."

C. Contractor Certification and Third Party Quality Control

The importance of certification when choosing a contractor scored very high in this survey, even showing a slight improvement over the strong positive response from the *2000 Baseline Survey (see Table 28).*

The importance of a third-party quality control checkup on duct sealing was mixed. While 37% indicated it was "important," 38% said "not important" and 25% were neutral/didn't know.

ENERGY STAR® name recognition was at 30%. Additionally, 47% of respondents indicated they would be "more likely" to hire a contractor if they heard the contractor was ENERGY STAR® certified, although 43% indicated it would make "no difference."

[12] By contrast, nearly half the survey respondents reside in areas where the utility company currently offers a duct sealing pilot or program.

Table 28: Importance of Certification

IMPORTANCE	CURRENT SURVEY 4/2003	BASELINE SURVEY 8/2000
VERY IMPORTANT	73%	51%
SOMEWHAT IMPORTANT	11%	25%
TOTAL	84%	76%

D. Heat Pump Testing, Tune-up and Quality Control

Nearly half (48%) of those with heat pumps or central air conditioning recalled that the manufacturer of their heating system recommended it be serviced annually. Two-thirds recalled that servicing was recommended within five years. One-third did not know. Thirty-one percent of heat pump and central air owners pay for annual maintenance checks, although only 5% are on an annual maintenance contract. Homeowners who pay for maintenance typically spend between $50 and $100.

Consumers generally have confidence in the contractors who perform the maintenance, as 83% were confidant their last equipment maintenance was performed properly, *one of the highest readings of any question in this study*. Because of this, interest was modest in an HVAC tune-up service that included a third-party quality control check. Still, 32% percent were interested in the service (9% very interested), and half of those said they were willing to pay an average of $40 for it. Nearly half of those interested in the service were not willing to pay extra for it.

Only a fraction of homeowners with heat pumps or central air conditioning appear to be interested in having their systems tested for performance and tuned-up. Twenty-seven percent indicated interest in this service (15% very interested), but 47% were not interested (41% not at all interested). At a cost of $250 for the heat pump test, and with the expectation it would save $50 per year, only 13% indicated they were "likely" to have the test and tune-up. Some thought it sounded like a good idea, but most cited cost and payback as reasons they were not likely to have it done. Only 8% of heat pump or air

conditioning owners said they were aware of a utility-sponsored program that promoted heat pump or air conditioning testing and tune-ups.[13] One person named the program, correctly mentioning PTCS.

E. Maintenance and Referrals

Sixty-five percent indicated their home's heating or cooling system had been serviced at some time. Of these, 60% noted the reason as "annual maintenance or tune-up," 34% said it was "to repair or replace broken equipment," 9% indicated "a safety inspection," and 5% said it was for "an equipment upgrade" (multiple responses were allowed).

Prior to having the work done, 16% requested advice from their utility company, with only 7% getting a referral from the utility for a contractor to do the work.[14] However, most (86%) of those who received a utility referral followed up and requested a bid or service.

F. Credibility of Information Sources

Respondents were also asked about the credibility of several information sources. *Table 29* shows a comparison of current responses to the *2000 Baseline Survey* for homeowners answering "very credible," or "credible." Electric utilities' credibility rating, already extremely high, improved somewhat in the *2003 Survey*. Credibility of "a government agency" also noted a modest improvement compared to the *2000 Baseline Survey*.

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[13] While nearly all utilities offer heat pump purchase incentives, only Spokane area contractors are certified in PTCS HP diagnostics, while Oregon contractors are certified via Proctor. So, it seemed odd that this percentage was so high.

[14] When homeowners consider hiring a contractor to perform services on their heating or cooling equipment, only 6% noted they specifically contact their utility for a referral. Recommendations from friends or neighbors, and *The Yellow Pages* ranked higher than utilities. Sixty-two percent of the sample of homeowners indicated they had not hired an HVAC contractor in the past.

Table 29: Credibility of Information By Source (Very Credible And Credible)

SOURCE	CURRENT SURVEY 4/2003	BASELINE SURVEY 8/2000
ELECTRIC UTILITY	76%	72%
FAMILY, FRIENDS, NEIGHBORS	46%	51%
INDUSTRY ASSOCIATION (2000) INDEPENDENT CERT. ORGN. (2003)	46%	38%
A GOVERNMENT AGENCY	44%	38%
CONTRACTOR	34%	34%
RETAIL STORE	10%	14%

G. Summary

According to the survey, the market potential for duct sealing may be quite large, as 60% of forced-air systems are installed over unheated crawl spaces. But, the survey also indicated the large majority of these are likely natural gas heat (57%), compared to 29% electric heat. Heat pumps and central air conditioning are much smaller markets by comparison, making up 14% and 21% of the overall market respectively.

About 22% of consumers say they have heard of duct performance testing and sealing, but only 17% think they may have a problem. Fourteen percent are "interested" in the service, with half (7%) of those "very interested" in buying at the regional average price of $600 ($300 for manufactured homes). There were a small number of consumers who reported they had purchased duct testing or sealing services. On average, these consumers paid about $100 for a test, and $350 for a duct-sealing job. The importance of certification when choosing a contractor for duct sealing rated very high (84%), but the importance of a third-party quality control check was mixed (37% said important, 38% not important).

Interest in a heat pump diagnostic test and tune-up was modest (15% interested), and only 13% of consumers indicated they would be likely to purchase the service at a price of $250 when saving only $50 per year.

Consumers expressed confidence that service work performed by contractors is already done properly. Because of this, there is only modest interest in an HVAC test and tune up that includes a third-party quality control check (32% interested, 9% very interested), and half of those said they were willing to pay $40 extra for it.

Utilities scored the highest credibility rating of any other group (76% said credible). But the irony is they still do not appear to be effective at getting the word out to change the market (only 9% were aware of a utility program promoting duct sealing, when nearly half of respondents live in territories where utilities offer programs or pilots). One reason for this, according to the survey, is because consumers rarely seek out utility company advice, or request referrals, when making decisions on their heating and cooling systems.

ENERGY STAR® name recognition is substantially greater than the brand awareness of PTCS, or Climate Crafters. About half (47%) of consumers said they would be more likely to hire a contractor if they heard the contractor was ENERGY STAR® certified.

6. FACTORY-DISTRIBUTOR INTERVIEWS

To learn more about the role of the factory distribution network on energy-efficient equipment and installations, telephone interviews were conducted with residential sales managers from the regional offices of two of the six major northwest wholesale HVAC equipment distributors/brokers.[15]

A. Survey Findings

Following are the key findings.

1. Distributors have never heard of Climate Crafters, PTCS, or Checkme!. While they are familiar with ENERGY STAR®, they had little awareness of the Northwest Energy Efficiency Alliance.

2. Distributors are very interested in working with Climate Crafters. In the retrofit/replacement market, they see their role as a go-between, helping to bring together their dealers and Climate Crafters, to inform dealers of important training opportunities concerning energy-efficient installations. They offered to make their dealer network available and work together to make sales calls in the field to promote PTCS training. Their main concern was that it would take a heavy sell-job at two levels in the channel, both internally with management, and externally with dealers.

3. Distributors' believe that consumer education is the best way to sell more energy efficient equipment, and get better installations. Homeowners appear to be at the mercy of contractors as to what is, and what is not, energy efficient. Distributors suggest utilities work to inform the public and get them to ask for more efficient equipment. They noted it was important that someone make the sale to the homeowner, before the homeowner will push the contractor for it. Either homeowners need to be educated to ask contractors to bid it, or the contractor has to become aware, and

[15] Numerous attempts over a three-week period were made to contact sales managers at all six wholesalers. Four of the wholesalers could not be reached, and did not return repeated attempts at contact.

want to bid it. Distributors suggested only A-level dealers[16] would do this, not 'B and C' dealers.

4. NATE appears to be an established industry certification and training mechanism that could be used to reach more contractors.[17] Manufacturers are currently getting behind NATE and other national HVAC certification and training organizations to shore up training deficiencies in their dealer force.[18] This is having a ripple effect throughout the sales channel, and extends down to the individual dealer/contractors. These manufacturers are known for their reluctance about getting into the training business, preferring to focus on selling equipment and making money. Local distributors are now under pressure from them to train dealers, but turn that investment into sales.

   Distributors consider NATE to be an opportunity for Climate Crafters, but caution it has a lengthy and time consuming process, and dealers do not always get certified. "A-dealers" usually have a percentage of staff that is NATE-certified. The higher brand names

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[16] Distributors describe dealers as falling into one of three categories, either A, B, or C. 'A' dealers, those making over one-quarter to a half-million per year, are the most reachable and approachable on new ideas. Thus, they are the dealers that distributors work most closely with. 'B' and 'C' level dealers are 'the other 50% of the market', tend to be more poorly trained, and install the equipment that is best for their bottom-line. They are often struggling to stay in business, and were described as unreachable. Nevertheless, distributors are working very hard to attempt to train these dealers, offering free classes on *How to Stay in Business*. So far, results have frustrated distributors.

[17] NATE (North American Technician Excellence) is a contractor certification organization providing testing services for the HVAC industry. While NATE does not specifically provide training, education and training services are available from NATE-approved individuals and organizations that also provide NATE testing services.

[18] Distributors acknowledged they have the worst trained industry in business. As a result, training is a major focus for the industry this year. The major manufacturers are funding support for NATE. In turn, NATE is pushing distributors to get their dealers NATE certified. Another distributor is working with the Excellence Alliance, a national training organization for the HVAC industry that their manufacturer recently joined. They offer a host of training opportunities to help dealers to run their businesses.

require it. Distributors believe all contractors will be driven to it eventually.

5. Distributors suggest utilities take a long-term approach to develop and promote code upgrades in duct design and performance testing in new construction. They note the State of California now requires a pressure test on ducts, and distributors are beginning to pressure manufacturers to build furnaces test-ready (no leaks).

6. Dealers don't push high efficiency equipment, preferring code-minimum to win the bid. Distributors indicated there are more energy savings to be had in residential systems because efficient equipment is available, and cost effective.[19] Although contractors tend to put in whatever equipment is best for their bottom line, sales usually come down to the last cent, with the lowest bid winning. With this extreme level of competition, anything that adds to the cost of a job, such as performance-testing or sealing ducts, is a long shot. New construction may be even tougher than the replacement market.

B. Summary

Climate Crafters and the utilities are clearly operating outside of the distributor's channel.

Distributors had never heard of Climate Crafters, but would welcome the opportunity to work closely with an organization representing the electric utilities. They also pointed out the natural opportunities to reach more contractors by working through established industry certification organizations, such as NATE.

The new industry-wide push to shore up training deficiencies in the dealer force could present new opportunities for Climate Crafters.

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[19] But, distributors also indicated they do not do much high SEER business in the Northwest because it is such a hard sell at ROI's of ten years. They indicate rebates are needed, but believe higher efficiency equipment is inevitable, as consumers will eventually be driven to it through increased regulation.

While distributors say they push high-efficiency equipment, their dealers generally do not, instead preferring code-minimum to win the bid. "A"-level dealers would be the only allies of utilities in the high efficiency market. Consumer education is the best way for utilities to promote energy-efficient equipment and get better installations. Longer-term, utilities need to work through the code upgrade process to develop and promote PTCS duct design and performance testing, similar to what was successfully done in California.

7. COST EFFECTIVENESS OF THE CLIMATE CRAFTERS/PTCS PROGRAM

A. Suggested Improvements to Model Assumptions

As part of the evaluation of the Climate Crafters/PTCS program, a review was made of the Alliance's ACE cost effectiveness model and assumptions. This review found that a number of assumptions in the model could be improved and should be considered to better reflect program results. They are:

1. **The ACE model should be modified to reflect actual PTCS duct-sealing units completed in 2002.** A total of 1,558 duct sealing completions were PTCS certified by Climate Crafters in 2002.[20] All of the completions appeared to be from utilities offering full or partial incentives for PTCS, so these certifications should be reflected as baseline units. There appears to be a very small number of PTCS certified homes (Venture units) completed where no utility incentive is available (e.g., Tillamook PUD), but there is no mechanism for capturing this data.

2. **Heat pump commissioning projections should be updated in the ACE model.** In addition to the duct-sealing completions, 430 heat pumps from the Spokane pilot were reported receiving O&M commissioning services in 2002. This number can be expected to increase as BPA has made commissioning a system-wide requirement for higher C&RD heat pump incentives beginning October 2003. The ACE model should incorporate this data and also include regional projections for heat pump commissioning services.

[20] Additionally, BPA C&RD data indicated PTCS duct sealing services were performed on 300 of the 2,135 heat pumps installed in 2002. These 300 units should be a subset of the 1,558 homes PTCS certified, but this has not been verified.

3. **Climate Crafters PTCS contract commitments for 2003, as well as projections for new regional programs should be incorporated into the ACE model.** At its June 2003 Board meeting, Climate Crafters reported contract commitments of 4,200 (mobile home) units for 2003, of which 1,300 were reported already completed through May 2003. These contract commitments for 2003 are much higher than the planning assumptions included in the ACE model, and should be used instead.

   Although still in planning stages, an Alliance-sponsored region-wide new construction program would likely include a duct sealing option. Projections for the new construction program should be reflected in the model. Additionally, the Energy Trust of Oregon will launch its new construction program in Fall 2003. This program would likely include a duct sealing option and should also be reflected in the model.

4. **Mobile homes should be weighted more heavily in the ACE model.** About 75% of PTCS certifications in the past year were for mobile homes completed under contracts to utilities. This trend is expected to continue, if not accelerate, in 2003, considering the level of mobile home contract work pending. The ACE model should reflect this heavier weighting of mobile homes.

5. **New RTF assumptions concerning costs and savings for PTCS duct sealing should be reviewed and considered for the ACE model for both retrofit, and new construction.** RTF assumptions reflect the cost and savings for the "retrofit" of existing homes. However, a brief check with regional energy planners revealed the RTF cost and savings estimates could be used for new construction as well.

   Savings estimates for new construction are similar to retrofit because overall per home heating kWh has remained about the same. Even though houses have become more energy efficient, the benefits of decreased energy use have been offset by increases in the size of the dwellings.

RTF cost assumptions for retrofit may also apply to new construction. Typically, costs for new construction should be less, reflecting easier access to the air distribution system. However, proposed requirements for the new construction program appear to call for contractors to make two trips to test and commission the HVAC system, instead of one. The added cost of the second trip tends to bring overall costs for new construction up to the level of the RTF retrofit costs, thus enabling planners to use the RTF values for PTCS in both existing and new construction.

The ACE model should also reflect RTF assumptions for weighting costs and savings by climate zone, home and heat type.

B. Cost Effectiveness Summary for Ducts/PTCS

Cost Effectiveness Summary for Ducts/Performance Tested Comfort Systems

Creation Date	February 26, 2000
ProCost Ver.	4.1
Run Date	February 24, 2002
Analyst	Ken Anderson

Project Number:	C97-011
Sector:	Residential
Stage:	MPER2 (AAA2001)

Key Assumptions — Analysis Unit: Weighted Home

Duration: Venture Period: 6 years — Project Start: 1997

Ann Non-Electric Benefits: $0.00 — Ann. Net O&M Cost: $0.00 Per Unit

Venture Cost Summary	Period	Venture Costs	Consumer Costs	Other Costs	Total Costs
1997	Venture	$40,648	$0	$0	$40,648
1998	Venture	$391,917	$689,506	$0	$1,081,423
1999	Venture	$562,009	$373,702	$0	$935,711
2000	Venture	$700,426	$452,892	$195,000	$1,348,318
2001	Venture	$253,000	$856,978	$195,000	$1,304,978
2002	Venture	$154,000	$1,236,661	$195,000	$1,585,661
2003	Post-venture	$0	$1,445,522	$300,000	$1,745,522
2004	Post-venture	$0	$1,659,408	$370,000	$2,029,408
2005	Post-venture	$0	$2,207,013	$370,000	$2,577,013
2006	Post-venture	$0	$2,935,327	$345,000	$3,280,327
2007	Post-venture	$0	$3,903,985	$320,000	$4,223,985
2008	Post-venture	$0	$5,192,300	$270,000	$5,462,300
2009	Post-venture	$0	$6,905,758	$220,000	$7,125,758
2010	Post-venture	$0	$9,184,659	$195,000	$9,379,659

Totals	$2,102,000	$37,043,710	$2,975,000	$42,120,710

Assumptions:

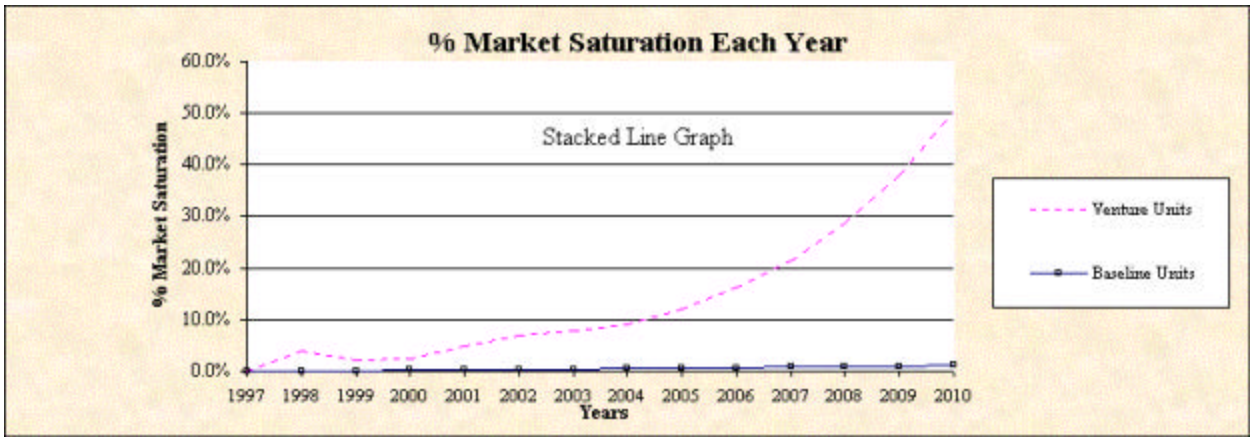
AAA2001 MPER2 and Cycle 2 extension to end of year 2002.

Weighting was based on numbers of existing electric homes with 12 combinations of four ECMs, i.e duct sealing, service or replacement of FAF and HP, etc for two existing home types (SF and Manf Homes). New baseline added from MPER2, Central Air Conditioner 31%,. Heat pump 32% and weatherization 19% of 1999 savings and grow baseline at 15% per year.

"Other Costs" in the table above include $2,790,000 in local utility costs and $185,000 in government and agency grants. Certification and training fees and other contractor's costs are recovered from consumer costs.

Non-electric Benefits and Net O&M Cost Assumptions:

No non-electric or O&M benefits or costs are assumed.



Year 2010 Market Size (Units): **38,028** **Tons of CO2 Saved by 2010:** **54,939**

Estimated Cumulative Electrical Energy Savings from Venture Units

Year	Market Units	Baseline Units	Venture Contract Units	Venture Market Effects Units	Venture Cum. aMW Savings
1997	38,028	-	-	-	-
1998	38,028	-	1,441	-	0.3
1999	38,028	-	781	-	0.4
2000	38,028	113	417	417	0.56
2001	38,028	129	831	831	0.87
2002	38,028	149	1,218	1,218	1.31
2003	38,028	171	-	2,850	1.8
2004	38,028	197	-	3,271	2.4
2005	38,028	226	-	4,386	3.2
2006	38,028	260	-	5,874	4.3
2007	38,028	299	-	7,860	5.8
2008	38,028	344	-	10,507	7.7
2009	38,028	396	-	14,036	10.3

2010	38,028	455	-	18,740	13.7
	532,385	2,740	4,688	69,990	

Total Resource Perspective	**Unit First Cost**	**Annual Unit Savings (kWh)**	**Levelized Cost (Cents/kWh)**	**CE Index* (Benefit/Cost Ratio)**
Venture + Post-Venture Period	$564.04	1,606.3	2.06	**1.1**
Venture Period Only	$803.98	1,606.3	3.15	0.8
Alliance Perspective	**Unit First Cost**	**Annual Unit Savings (kWh)**	**Levelized Cost (Cents/kWh)**	**CE Index* (Benefit/Cost Ratio)**
Venture + Post-Venture Period	$28.15	1,606.3	-0.38	22.1
Venture Period Only	$210.14	1,606.3	0.45	3.0

*** If CE Index for Total Resource Perspective and Venture + Post-venture Period is greater than 1.0, then project is deemed cost effective.**

Consumer Perspective

Scenario	Electric Savings	First Cost	Ann. O&M cost & Non-electric Benf	**Simple Payback in Years** @ 5.0 cents/kWh	@ 3.0 cents/kWh
Savings and Benefits	1,606	$478.49	$0	$80.32	$48.19
Payback (Yrs) Electricity plus Non-electric Benefits less O&M Costs			$0	5.958	9.929
Simple Payback (Yrs) Electricity Savings Only				**5.958**	**9.929**

Key Changes Same as AAA2000 (Local utility already larer than Alliance total)

Breakeven: 0.436272 kWh/unit January peak demand reduction

Maximum Added Alliance Dollars $	6,500,000	
Minimum Number of Units	64,864	87%
Proposed units	74,678	

D:\Data\Gary Smith\CE Chapter\[CE-C97-011-PTCS-MPER2-AAA2001-LC-Summary.xls]Input Assumptions
7/4/2003

7. COST EFFECTIVENESS OF THE CLIMATE CRAFTERS/PTCS PROGRAM

8. SUMMARY OF THE BUSINESS MODEL REVIEW

The Alliance commissioned a *Business Model Review* as part of the evaluation of Climate Crafters/PTCS. A small business consultant, with experience in non-profit start-ups and business planning, was hired to conduct this review and complete a thorough examination of Climate Crafters new Business and Marketing Plans, and strategies. The work was completed in late 2002, and results presented to the Climate Crafters Board at its December 2002 meeting.

A. Summary of Original Findings from the Business Model Review

The following were key findings from the Business Model Review:

1. **Climate Crafters needs to develop new markets, new business models, and new partnerships for growth into the future.** Long-term success will require Climate Crafters to seek out new business models, new revenue sources, new partnerships, and even new areas, beyond the Northwest, to do business. Climate Crafters should have multi-sources of sustainable revenue.

2. **Climate Crafters needs to develop and implement a comprehensive marketing plan.** Climate Crafters developed a marketing plan in 2002 and it appears this plan was not implemented. Updated Climate Crafters marketing and sales collateral is needed.

3. **Climate Crafters needs to have quarterly strategic business planning meetings.** During its market creation and development phase, a business needs to be very fluid and open to change. These changes need to be carefully planned. A quarterly meeting to discuss results, plans, and goals would help with keeping focused and on track.

4. **Climate Crafters needs to hire and better focus its resources.** Climate Crafters at times has not staffed to their business needs, such as a Field Representative and Marketing Staff. Climate

Crafters needs to determine proper staffing needs and stay focused to that plan. The much needed business consultant, funded by the Alliance, is not yet staffed.

5. **The $25 home inspection fee is an issue to contractors.** Climate Crafters, contractors, and utilities have all mentioned that the process and collection of the $25 fee for inspections is difficult and may result in costing more to collect than the actual fee itself. Climate Crafters should investigate a process to streamline, or develop other options in collecting this $25.

B. Findings from the 2003 Update to the Business Model Review

To help prepare this MPER, the small business consultant was asked to check-in again to provide an update on progress since the original findings were presented to the Climate Crafters board. Following are the key findings from this second review:

1. **Climate Crafters dramatically changed its business model in late 2002.** Climate Crafters instinctively made a strategic decision to change its business model to ensure its survival. The new model is more focused on contract revenue from utilities rather than market-driven revenue from contractors. Acceptance and interest in the contract approach has been a pleasant surprise for Climate Crafters, who should be given real credit for developing the approach.

   The change in business models seems to be related to the deteriorating market-driven business model, and market-driven barriers to success, but was also related to the exhaustion of seed money from the Alliance. Although the contract approach appears to be an easier solution for Climate Crafters to keep a positive cash flow, it is not the sustainable model the Alliance was trying to develop, and it does not fulfill the vision of a market transformation approach.

2. **With no homeowner awareness, Climate Crafters appears to have concluded that the market-driven approach will not**

work. Climate Crafters is moving resources away from the market-driven approach. This is reflected in the drop in home inspections, training, contractor certifications, and eventually renewals. They are greatly reducing the projections for non-contract home certifications, decreasing the number of training classes, and failing to hire or maintain resources in this area. This approach may lead to long-term negative impacts on the program's creditability with the utilities, contractors, and technicians.

3. **Climate Crafters needs to update its business and financial plans, objectives, and work plans to reflect these changes to its business**. The change in the business model may be the right direction and approach, but making major, strategic changes such as this should be done with a business planning process that includes situation analysis, Strengths-Weaknesses- Opportunities-and-Threats (SWOT) exercise, objectives developed, 3+ year financial planning, and documentation of a new business plan. Currently, there is only a limited 2003 financial plan.

4. **The Alliance provided too much of a financial crutch, and this dependency did not force Climate Crafters to look for other sources of revenue or new markets, or fail.** Because Climate Crafters was not forced to fine-tune its business model and look for other sustainable sources of revenue, when seed funding ran out, a drastic business change occurred. This pattern is repeated with the current business model, which does not appear to be sustainable given it lacks multiple sources of revenue.

C. Summary

With the abandonment of the market-driven channel, and dramatic changes to the Climate Crafters business model, the Alliance has been left without a clear market transformation strategy and plan to address the residential HVAC market. However, the Alliance still has several potential opportunities available to consider (see Recommendations).

8. SUMMARY OF THE BUSINESS MODEL REVIEW

9. KEY FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

A. Key Findings

The following are key findings from the study.

1. **Climate Crafters dramatically changed its business model in late 2002, from a market-driven approach to relying on utility contracts.** The change in business models seems to be related to the deteriorating market-driven business model, and market-driven barriers to success, but was also related to the exhaustion of seed money from the Alliance. Although the contract approach appears to be an easier solution for Climate Crafters to keep a positive cash flow, it is not the sustainable model the Alliance was trying to develop, and it does not fulfill the vision of a market transformation approach.

2. **With no homeowner awareness, Climate Crafters appears to have concluded that the market-driven approach will not work.** Climate Crafters is moving resources away from the market-driven approach. This is reflected in the drop in home inspections, training, contractor certifications, and eventually renewals. They are greatly reducing projections for non-contract home certifications, decreasing the number of training classes, and failing to hire or maintain resources in this area. There may be long-term negative impacts on the program's credibility with the utilities, contractors, and technicians.

3. **The value of PTCS duct sealing has yet to be proven in the marketplace.** It is neither sought out by consumers, nor pushed by contractors. The survey of consumers indicated little interest, as only 7% of consumers were "very interested" at a price of $600. Most certified contractors have never certified a home. Few of the contractors indicated they were making money on it, or had broken even. The track record shows it is either given away for "free" in utility mobile home pilots, or heavily subsidized by utilities in market-driven programs.

4. **The consumer economics of PTCS duct sealing are not compelling to consumers or contractors without utility subsidies, which raises serious questions about its viability and future in the marketplace.** Paybacks are beyond the one-to-two years required by consumers, and realistically extend beyond the average period of home ownership of seven years. Contractors charge anywhere from $350 to $1,200 for PTCS duct sealing, with an average of $600 for site-built homes and $300 for mobile homes. Savings in heating costs range from 10% to 15%, so an average household using 10,000 kWh/year would save 1,000 to 1,500 kWh. In Chelan County PUD, with rates of 2.5 cents per kWh, annual dollar savings range from $25 to $37, and paybacks exceed fifteen years. With some investor-owned utilities charging closer to eight cents per kWh, annual savings range from $80 to $120, but even then paybacks exceed five years.

5. **The highly competitive nature of the HVAC industry works to keep prices low, hurting contractors, but also pressuring quality and the marketability of add-on sales like PTCS duct sealing.** Contractors in numerous areas of the Northwest commented how local-area cutthroat pricing made it difficult for them to compete using PTCS. Because of the extreme competition, they describe their industry as having the second highest occupation to experience bankruptcies, after restaurants. A-level contractors, tired of putting up with low-bid operations that give the industry a bad reputation, openly commented they would support licensing at the state level to clean up their industry, even admitting they see this in the not-to-distant future.

6. **Contractor support for PTCS duct sealing appears weak.** A prime indicator of contractor acceptance of PTCS is that only half to two-thirds of trained and certified contractors purchased the necessary equipment. The reason is twofold. Contractors said the startup costs are too high for the equipment, training, and certification fees, and the return is too low based on the expectation of low program volume due to the absence of homeowner demand. As a result, contractors have taken a wait-and-see attitude, preferring instead to sub-out utility work to a third-party specialist, rather than integrate duct sealing into their own business models.

This leaves duct sealing as a third-level business opportunity for contractors, ranking it behind equipment installs, and duct cleaning. The service does have some support from firms that chase utility incentives, but even these certified contractors do not offer it to homeowners when outside of utility incentive program areas.

7. **Most contractors believe that "if educated," homeowners would be interested in PTCS duct sealing.** Contractors and utilities alike agreed the single element that is most needed to turn this market around is the development of a comprehensive marketing strategy and public awareness campaign to educate homeowners. But, it was interesting to learn from consumers that they don't seek utility advice on HVAC matters, so utilities may not be best positioned to get-the-word-out, despite the fact that consumers rate utilities as having the highest credibility.

8. **So far, contractors have not really gotten much for their support of PTCS.** For all their expense to gear-up for utility programs, most contractors were met with low consumer demand and referrals that have slowed to a trickle. "Once burned is twice shy."

9. **Utility support for PTCS appears weak.** Climate Crafters records show only thirteen utilities process PTCS certifications each month (20 utilities overall have processed incentives program-to-date). This is out of 35 utilities in the region that offer incentives. In the survey, utilities appeared to indicate a much higher level of support. Additionally, two-thirds of utilities surveyed did not require PTCS duct sealing on their heat pump programs, and for 2002, Bonneville's C&RD records show 86% of the 2,135 heat pumps installed in the region, were installed without PTCS duct sealing.

10. **Utility and Contractor Satisfaction with Climate Crafters support is high.** The majority of those surveyed are pleased with the job done by Climate Crafters. Many noted a lot had been accomplished, with little resources. Training provided by Climate Crafters rated the highest marks, followed by technical support. In 2002, Climate Crafters achieved every one of its performance

targets established by the Alliance, and Climate Crafters is on track to meet business plan goals for 2003.

11. **Climate Crafters is very much a utility invention, operating largely outside the industry mainstream.** The lack of industry partners has limited Climate Crafters' reach and presence in the market. Several large regional equipment suppliers surveyed had never heard of Climate Crafters or PTCS, and were completely unaware it was training and certifying contractors. Non-participant contractors had no recognition of Climate Crafters as a training organization, although most had heard of it or PTCS. Climate Crafters has yet to explore opportunities to integrate its training into normal industry channels with equipment suppliers and community colleges. *Note: Climate Crafters pointed out that as long as it has to create its own sustainable funding, a dichotomy exists between getting more training accomplished and giving it to the community colleges, as this act encourages Climate Crafters to lose a source of revenue.*

12. **Climate Crafters needs to nail down multiple funding sources to secure its future viability.** Too much reliance on one funding source is risky. At least Climate Crafters now has three sources of funding (BPA C&RD, Investor-Owned Utilities (IOUs), and The Energy Trust of Oregon), but all three are dependent upon electric utility conservation budgets, and two are of a temporary, non-sustainable nature (contracts).

13. **The revenue model for Climate Crafters, which relies partially on fees for annual certification renewal, will be severely tested in the future.** Even though Climate Crafters has estimated renewals at 75%, the fees required for continuing PTCS certification may become a significant barrier for contractors. Larger firms labeled the cost of this certification, at $150 per year per technician, as outrageous. By contrast, the renewal fee for a comparable gas license is only $35 per year, and a low-voltage license is $35 for two years. Both licenses are absolutely critical to an HVAC business, whereas PTCS certification is not. Contractors were further agitated because they see Climate Crafters doing nothing for this renewal money. Should Climate

Crafters offer to provide some continuing education for these fees, they would be more palatable, but since this is not the case, this 'free revenue' is causing some contractor resentment and backlash. Ultimately, the issue is low program volume, due to the absence of consumer demand. At low program volume (the current scenario), contractors fear they cannot recover the renewal fees.

14. **Awareness by consumers of Climate Crafters and PTCS is low.** Few know who Climate Crafters is, or what Climate Crafters certification means. A regional initiative would do better to link to ENERGY STAR®, and use that name if possible.

15. **Drawbacks in Honeywell's ACRX hand-tool are impacting contractor acceptance of the device.** The Honeywell tool used by contractors helps ensure specific readings are taken for refrigerant charging and the system is properly commissioned. Unfortunately, the unit has failed to demonstrate it saves money or time, a requirement for contractors. In fact, the unit increases time and costs since wintertime installations require a callback in the summer. Contractors have labeled the unit a "service nightmare." The high cost of the unit is a barrier at low program volumes. Consumers have only modest interest in heat pump diagnostics at $250 for a test and tune-up. Despite these drawbacks, a minority of contractors did indicate solid support for the unit.

16. **The upstream equipment channel, notably factory-distributors, would welcome an opportunity to work closely with an organization representing the electric utilities.** This group prides itself on daily face-to-face contact with its dealers, so they are well connected in the channel. They are central to the current industry-wide push to train dealers, and are active in that role. They are encouraging NATE certification.

B. Conclusions

After nearly one and a half years of Climate Crafters working hard to promote PTCS standards and certification to utilities and contractors, a lot has been learned. PTCS duct sealing has been demonstrated as a successful utility

resource acquisition program. This has proven especially true when targeting mobile home parks with PTCS services that are given away for free. As a market transformation approach, PTCS has demonstrated it does not offer enough benefits to homeowners or contractors to overcome the poor economics associated with either group. The market for PTCS continues to be totally supported by utility C&RD incentives, and other utility, or Energy Trust of Oregon funding.

Specifically, we conclude:

1. **There is little consumer demand for PTCS duct sealing**. All agree PTCS duct sealing is still in market creation mode, and desperately needs the help of a sustained public awareness campaign to educate homeowners about its benefits. To date, none of the region's stakeholders, or contractors, has been willing to step up to address this critical and costly barrier.

2. **Contractors have taken a wait-and-see attitude on PTCS duct sealing.** Only half to two-thirds of our top supporters (PTCS certified contractors), willing to pay to be trained and certified, have purchased the equipment to perform the service. This is due to their concerns about return-on-investment, given low utility program volumes. Instead, they are content to subcontract the required work to third party specialists. They also have made clear, that without incentives, they will not support utility PTCS standards.

3. **The utilities, despite their claims of support for PTCS, curiously have not required it on their heat pump incentive programs**. For 2002, C&RD records show that only 14% of heat pumps were installed with PTCS duct sealing.

The program reached a critical turning point in 2002 when Climate Crafters had nearly exhausted its start-up funding from the Alliance. To ensure survival, Climate Crafters made significant changes to its business model, and morphed into an ESCO, providing part-time project management services to utilities and the Energy Trust of Oregon on their mobile home duct sealing programs. This transition has slowed further development of the market-driven channel.

So, what is the answer?

1. **Are more contractors needed?** In the absence of a significant increase in consumer demand, probably not. Many communities in the region, where there is utility interest, have several certified contractors to do the work, and these contractors have established business relationships with third-party subcontractors sufficient to meet current demand. The contractors that are on board do not need more competition, they need more referrals from utilities and more duct sealing jobs.

   More contractors who are trained and certified in PTCS would potentially be needed should the Alliance launch an energy-efficient new construction program. If utility interest in a new construction program was significant, and exceeded interest in PTCS duct sealing, Climate Crafters would stand to benefit from the additional training and certification business.

2. **Is more training needed?** Yes. But, this contractor training needs to focus more on how to sell PTCS duct sealing, rather than the technical aspects of the service.

3. **Is a consumer public awareness and homeowner education campaign needed?** It would surely help stimulate consumer demand. This was the single-most common recommendation made by utilities and contractors on how to improve the program. But, it is questionable whether consumer education alone could stimulate enough consumer demand to change this market, and overcome hurdles of long consumer paybacks and little profitability for contractors. For utilities offering PTCS incentives, more demand would translate into greater pressure on shrinking C&RD budgets.

4. **Is a certification and marketing program that is more strongly linked to ENERGY STAR® needed?** It would obviously help out a lot. Name recognition for ENERGY STAR® is significantly higher than either Climate Crafters, or PTCS. Additionally, nearly half of respondents to the consumer survey indicated they would be more likely to hire a contractor for HVAC services work if they had heard the contractor was ENERGY STAR® certified.

Ultimately, the Alliance needs to decide what it wants to do, based on its goals going forward. A sufficient capability and infrastructure has already been developed by utilities in parts of the region to handle low volume programs. Should the Alliance's goals call for a substantial increase in regional contractor capability, such as in a new construction market transformation program, then obviously a lot more work needs to be done.

C. Recommendations

With the abandonment of the market-driven channel, and dramatic changes to the Climate Crafters business model, the Alliance has been left without a clear market transformation strategy and plan to address the residential HVAC market. However, the Alliance still has several potential opportunities available to consider.

The Alliance should:

1. **Continue to address the residential HVAC market.** One option would be to target the new construction market for residential HVAC. It is an important market in terms of its resource size, and it may prove a better fit from a market transformation perspective, because it is market-driven and works more directly with a different contractor group (homebuilders).

2. **Consider an "Energy Efficient" new home construction program and shift the focus from existing homes to new homes to drive the energy efficient HVAC market.** Since the market-driven approach was not embraced by consumers or contractors, and the utility contract is a resource acquisition approach, it is important for the Alliance to attempt a different approach to transform this market. The Alliance could leverage off the existing base of PTCS certified contractors, and reward that expertise with a role in the field helping to develop the Energy Efficient new home market.

3. **Consider linking the energy efficient new home construction program to ENERGY STAR® to take advantage of that powerful branding**.

4. **Identify and work with willing "upstream" partners in the HVAC distribution channel to develop and build new working relationships.** The Alliance should operate from inside the industry channel, as it has done in other market transformation programs (e.g., lighting). With the interest received from the few equipment distributors contacted, we are inclined to believe they are very open to working together with the Alliance. Both have similar goals. Distributors want to move more energy-efficient product, have better trained dealers, and are interested in more energy-efficient installations. They also have a highly established industry mechanism for training and certification (NATE) that is heavily supported by the large manufacturers, and it is a top priority for them right now.

5. **Establish a market development fund (MDF) in conjunction with industry partners** for the purpose of funding future marketing activities tied to the development of the energy-efficient new construction market.

6. **Develop plans to work for codes or licenses at the state level to move the industry toward PTCS-level installations**, similar to what was recently accomplished in the State of California.

Climate Crafters should:

1. **Update its business and financial plans, objectives, and work plans to reflect the changes to its business model**. Its change in business model may be the right direction and approach, but making major strategic changes such as this should be done with a business planning process that includes situation analysis, Strengths-Weaknesses-Opportunities-and-Threats (SWOT) exercise, objectives developed, 3+ year financial planning, and documentation of a new business plan. Currently, there is only a limited 2003 financial plan.

2. **Work to help stakeholders develop and implement market approaches to ensure PTCS standards are adopted in the new home construction market.** An opportunity appears to be

emerging for Climate Crafters to assist the Alliance in this strategy, and Climate Crafters should work to follow-through with it.

APPENDICES

Climate Crafters – Utility Interview Instrument

Contact Name: _____ Date: _____

Utility: _____ State: _____ Phone: _____

Introduction

Hello. Identify myself. May I speak to name: _____.

Identify myself. I am doing some research for the Northwest Energy Efficiency Alliance concerning energy efficiency standards and services available to utilities in the Pacific Northwest. Would you have about 20 minutes available to answer some questions about these topics. Yes-continue, no-reschedule to another time. _____

SECTION 1: Awareness of PTCS or Climate Crafters

The first few questions are necessary to help determine your familiarity with certain HVAC-related energy efficiency services.

Check for Awareness - Unprompted

1. Are you aware of any training programs for contractors who are interested in becoming certified in duct testing & sealing? **Yes-skip to 3**, No

2. Do you know of any organizations offering training services to contractors interested in duct sealing certifications? Yes, **No-skip to 4**

3. **[If yes]** Can you name them? Yes, No. Name: _____

   How do you know about them? _____

   [If name PTCS or Climate Crafters-skip to 9]

Check for Awareness – Prompted

4. Have you heard of Performance Tested Comfort Systems-PTCS? Yes, **No-skip to 6**

5. How do you know about it? _____

6. Have you heard of Climate Crafters? Yes, **No-skip to 8**

7. How do you know about them? _____

[skip to 9]

8. **[Completely Unaware]** Are you doing anything on your own to promote duct sealing or heat pump & air conditioning diagnostic services? Yes, No.

Please explain: _____

_____

[END OF SURVEY for UNAWARE] That concludes our survey today. Thank you very much for taking the time to answer our questions. Good-bye.

AWARE OF PTCS OR CLIMATE CRAFTERS

9. What do you know about […Climate Crafters…or, PTCS…]? _____

_____

_____

Read ***Climate Crafters is a company that trains and certifies contractors to promote PTCS standards for sealing residential air-ducts, and diagnosing inefficiencies in heat pumps & air conditioning systems. PTCS certification enables utilities to claim the***

largest C&RD credits available from BPA. Climate Crafters is funded by revenues from training sessions, home certification fees, and other sources.

Did you know that Climate Crafters is also sponsored by, and receives funding from the Northwest Energy Efficiency Alliance? Yes, No

10. Is your utility partnering with Climate Crafters on PTCS?

Yes = Participant - Continue

No = Non Participant, skip to SECTION 4-Interest in PTCS

SECTION 2: Satisfaction with Climate Crafters Support

11. Now I have some questions concerning your satisfaction with Climate Crafters support for contractor training and certifications.

[Responses: Very satisfied, somewhat satisfied, not satisfied, don't know, NA]

How satisfied are you with the…?

a) Availability of training sessions for your contractors VS, SS, NS DK, NA

b) Logistics of organizing & conducting the training sessions VS, SS, NS, DK, NA

c) Quality of the training VS, SS, NS, DK,NA

d) Cost of the training & certification VS, SS, NS, DK,NA

e) Contractor feedback following the training session VS, SS, NS DK, NA

12. Overall, how satisfied are you with Climate Crafters support for **contractor training & certification**? VS, SS, NS, DK,NA

13. What could Climate Crafters do to better support contractor training and certification?

_____

14. Now I have some questions concerning your satisfaction with Climate Crafters support for marketing. How satisfied are you with the…?

a) Availability of marketing materials VS, SS, NS, DK, NA

b) Usefulness of marketing materials VS, SS, NS, DK, NA

c) Usefulness of the brochure "Dysfunctional House" VS, SS, NS, DK, NA

d) Usefulness of the Utility Marketing Packet VS, SS, NS, DK, NA

e) Referral list of certified techs. & registered contractors VS, SS, NS, DK, NA

f) Program communications VS, SS, NS, DK, NA

g) Climate Crafters website VS, SS, NS, DK, NA

h) Access to PTCS marketing support VS, SS, NS, DK, NA

15. Overall, how satisfied are you with Climate Crafters support for **marketing?**
VS, SS, NS, DK, NA

16. What could Climate Crafters do to better support marketing? _____

17. Has your utility submitted any homes to Climate Crafters for PTCS certification?
Yes-continue, **No-skip to 21**

18. Now I have some questions concerning your satisfaction with Climate Crafters support for **PTCS certifications and QA inspections.** How satisfied are you with the…?

a) Tracking & reporting of certified homes VS, SS, NS, DK, NA

b) Invoicing process for certified homes VS, SS, NS, DK, NA

c) Third-party quality assurance inspections VS, SS, NS, DK, NA

d) Ease of program implementation VS, SS, NS, DK, NA

19. Overall, how satisfied are you with Climate Crafters support for **PTCS certifications and QA?** VS, SS, NS, DK, NA

20. What could Climate Crafters do to better support **PTCS certifications and QA inspections**?

_____

_____

21. So, overall, how satisfied are you w/ Climate Crafters support?

VS, SS, NS, DK,NA

22. How do you think Climate Crafters could better serve its utility customers?

_____

_____

23. What is Climate Crafters biggest value to your utility? _____

_____

_____

24. What is Climate Crafters biggest value to the region? _____

_____

_____

25. Is Climate Crafters value to your utility more as a training and certification organization, or as a contractor providing turnkey services?

a) Training and certification organization

b) Contractor providing turn-key services

c) Both

d) Neither

e) Other _____

f) Don't know

SECTION 3: Utility Support

This next set of questions concerns actions taken by your utility to support PTCS.

26. On a scale of 1 to 5, (with 1 = very weak, 5 = very strong) rate 'how strongly' you think your utility promotes PTCS to homeowners? 1 2 3 4 5

27. Which of the following promotional approaches has your utility used to promote PTCS to homeowners? (Circle all that apply)

a) Conversations with homeowners

b) Incentives

c) Bill messages

d) Bill stuffers

e) Direct mail

f) Newsletters

g) Web link

h) Referrals to contractors

i) Co-op advertising

j) Community energy booth

k) Other: _____

28. On a scale of 1 to 5, (with 1 = very weak, 5 = very strong) rate 'how strongly' you think your utility promotes PTCS to contractors? 1 2 3 4 5

29. Which of the following promotional approaches has your utility used to promote PTCS to contractors? (Circle all that apply)

a) Training incentives

b) Coop advertising

c) Sponsored training

d) Referral of leads to contractors

e) Other: _____

30. On a scale of 1 to 5, (with 1 = very low, 5 = very high), how would you rate your utility's overall support for PTCS? 1 2 3 4 5

31. Why do you give it that rating? _____

_____

32. What is your utility hoping to accomplish with PTCS? _____

_____

_____

33. **Now just a few questions about the results to-date of your utility's efforts.** On a scale of 1 to 5, (with 1 = not satisfied, 5 = very satisfied), how satisfied is your utility with the number of homeowners participating in PTCS? 1 2 3 4 5

34. And what are your utility's plans for PTCS for the future? _____

_____

35. On a scale of 1 to 5 (with 1 = not at all important, and 5 = very important), how do you rate the importance of having PTCS certified technicians in your service territory?

1 2 3 4 5

36. On a scale of 1 to 5, (1 = very low, and 5 = very high) for the PTCS services in your utility territory, how would you rate…?

a) Level of homeowner awareness 1 2 3 4 5

b) Level of contractor awareness 1 2 3 4 5

c) Level of homeowner interest 1 2 3 4 5

d) Level of contractor interest 1 2 3 4 5

e) Availability of resources at your utility 1 2 3 4 5

f) Promotion & support by your utility 1 2 3 4 5

g) Cost to administer this service 1 2 3 4 5

h) Complexity of the program 1 2 3 4 5

i) Other _____ 1 2 3 4 5

37. What do you feel you need for staffing to run the PTCS program? _____

Now I have just a few questions about heat pumps…

38. Does your utility have a heat pump incentive program?

Yes, N**o-skip to SECTION 4**

39. Do you require the ductwork be certified by PTCS to qualify for HP incentives?

Yes, No

40. Why is that? ? _____

_____

PARTICIPANTS CONTINUE - NON PARTICIPANTS RESUME

SECTION 4: Interest in PTCS duct sealing & heat pump and air conditioning diagnostics

Now I have a series of questions about interest in PTCS duct sealing and PTCS heat pump and air conditioning diagnostics. Let's discuss interest in PTCS duct sealing first.

41. Are homeowners inquiring about this service? Yes / No / DK

42. Are contractors inquiring about this service? Yes / No / DK

43. Has your utility been interested enough in this service to either send your staff, or contractors, to a training session sponsored by Climate Crafters? Yes / No / DK

44. Does your utility see a need for this service? Yes / No / DK

45. Why, or why not? _____

_____

46. On a scale of 1 to 5, (1 = not interested, and 5 = very interested), what would you say is your utility's level of interest in this service? 1 2 3 4 5

This past summer, Climate Crafters came out with a new energy efficiency service for heat pumps and air-conditioning systems that uses a diagnostic hand-tool to measure and adjust refrigeration temperatures and air-flows. To kick-off this new service, Climate Crafters sponsored a series of training primers around the region for utility company reps and contractors.

47. Were you aware of this training? Yes / No / DK

Now, I have a few questions about interest in this service.

48. Are homeowners inquiring about this type of service? Yes / No / DK

49. Are contractors inquiring about this type of service? Yes / No / DK

50. Has your utility been interested enough in this service to either send your staff, or contractors, to a training session sponsored by Climate Crafters? Yes / No / DK

51. Does your utility see a need for this service? Yes / No / DK

52. Why, or why not? _____

53. On a scale of 1 to 5, (1 = not interested, and 5 = very interested), what would you say is your utility's level of interest in this service? 1 2 3 4 5

54. Climate Crafters offers its services to utilities in two different ways, through a **market-based approach**, or a **turnkey contract**.

    1) The **Market-based approach** is where Climate Crafters offers fee-based training and certification to contractors, and charges a per-home certification fee for quality assurance and data tracking.

    2) The **Turnkey contract** is where Climate Crafters agrees to train a specified number of contractors and improve a specified number of homes for a flat price including QA.

    Based on these descriptions, would your utility be more interested in:

    a) Market-based approach?

    b) Turnkey contract?

    c) or Neither?

    d) Other? _____

55. **[If 'A or B']** Why would you be more interested in [a, or b]? _____

_____

_____

56. **[If 'C-Neither']** What would it take, in terms of **restructuring** these services, to get your utility interested in offering them to customers? _____

_____

_____

_____

_____

57. **[If 'D-Other']** Could you describe the kind of services that would be of most interest to your utility? _____

_____

_____

_____

[That concludes the survey. Thank you for taking the time to answer our questions about these programs. Your answers will help us to perform a complete evaluation of the program.]

[End]

Climate Crafters – Contractor Interview Instrument

Contact Name: _____ Date: _____

Contractor: _____ State: _____ Phone: _____

Introduction

Hello. Identify myself. May I speak to name: _____.

Identify myself. I am doing some research for the Northwest Energy Efficiency Alliance concerning energy efficiency services that contractors provide to homeowners in the Pacific Northwest. Would you have about 10 minutes available to answer several questions about energy efficiency. Yes-continue, no-reschedule to another time.

SECTION 1: Awareness of PTCS or Climate Crafters

The first few questions I have relate to training of your firm's field installers.

Check for Awareness

1. Can you name any organizations offering residential duct testing & sealing training, or heat pump diagnostic training to contractors? Y, **No-skip to 2**

   Names: _____

   _____

   How do you know about them? _____

[If named Climate Crafters or PTCS – skip to "Read' – Description]

2. Have you heard of Climate Crafters, or Performance Tested Comfort Systems (PTCS)?
   Yes, No

Read *Climate Crafters is a company that trains and certifies contractors to promote PTCS standards for sealing residential ductwork, and diagnose inefficiencies in heat pumps & air conditioning systems. The PTCS standard is supported by BPA and many of the region's electric utilities. Contractors' receive PTCS certification by completing a training program offered by Climate Crafters.*

3. Are you familiar with PTCS standards and specifications? Yes, No

4. a) As a contractor, does a regional electric utility conservation standard, like PTCS, have your support? Yes, No

   Explain _____

4. a) Does an electric utility conservation program, that requires specific standards like PTCS, have your support? Yes, No

   Explain _____

   _____

5. Are you doing anything at your business to promote duct sealing or heat pump & air conditioning diagnostic services? Yes, No

   Explain how promoted (logos, patches MM, yellow pages, print ads) _____

   _____

6. Who are your sources for training…

   a) for HVAC equipment installations? _____

   Where located? _____ Have all of your crews had this training? Yes, No

   Is it usually: 1) initial training, 2) on-going training, or 3) both?

b) for HVAC service work (e.g. O&M) _____

Where located? _____ Have all of your crews had this training? Yes, No

Is it usually: 1) initial training, 2) on-going training, or 3) both?

c) for heating duct installations _____

Where located? _____ Have all of your crews had this training? Yes, No

Is it usually: 1) initial training, 2) on-going training, or 3) both?

7. Has anyone from your company attended a training session sponsored by Climate Crafters? Yes, No

8. Is anyone from your company PTCS certified by Climate Crafters in duct performance testing, or HP diagnostics (paid the certification fee)?

Duct certified_____, HP/AC certified _____, Both _____

Yes = Participant - Continue

No = Non Participant, skip to SECTION 5-Interest in PTCS

9. About how many homes have you certified within the past year? _____

SECTION 2: Satisfaction with Climate Crafters Support

Now I have some questions concerning your satisfaction with Climate Crafters support.

10. On a scale of 1 to 5 (with 1 = not at all satisfied, and 5 = very satisfied, and 3 = neutral (neither satisfied, nor dissatisfied)) rate how satisfied you are with the following elements of Climate Crafters support:

a) Contractor training? 1 2 3 4 5

b) Cost of the training? 1 2 3 4 5

c) Cost of the equipment? 1 2 3 4 5

d) Climate Crafters overall efforts to market PTCS? 1 2 3 4 5

e) Climate Crafters PTCS marketing materials? 1 2 3 4 5

f) Technical support provided to contractors? 1 2 3 4 5

g) Quality assurance inspections? 1 2 3 4 5

h) Climate Crafters website 1 2 3 4 5

11. Overall, how satisfied are you with Climate Crafters support? 1 2 3 4 5

12. How could Climate Crafters improve the program? _____

_____

13. How could utility companies improve the program? _____

_____

SECTION 3: Importance of Duct-Sealing Services

14. On a scale of 1 to 5, (with 1 = not at all important, 5 = very important) rate how important duct-sealing is to your business? 1 2 3 4 5

15. And why that rating? _____

_____

_____

16. In the future, do you see duct sealing becoming a more important part of your business? Yes, No

17. What would have to change for it to become more important? _____

_____

_____

18. Did you buy the equipment? Yes, No If not, why not? _____

If not, any interest in leasing? Yes, No

SECTION 4: Promotion and Sales of PTCS Services

19. On a scale of 1 to 5, (with 1 = very weak, 5 = very strong) rate 'how strongly' you think utilities in your area promote PTCS duct-sealing? 1 2 3 4 5

20. On a scale of 1 to 5, (with 1 = very weak, 5 = very strong) rate 'how strongly' you promote PTCS duct-sealing to homeowners? 1 2 3 4 5

21. How do you sell it? _____

Do you use it as a sell-up service? Yes, No

22. On a scale of 1 to 5, (with 1 = very difficult, 5 = very easy) rate how easy it is to sell this service? 1 2 3 4 5

23. Do homeowners seem willing to pay for it? Yes, No

24. What percent of the time do you recommend, or bid PTCS duct-sealing, on…

a) New construction installations? _____%

b) Equipment replacement jobs? _____%

25. Please explain. _____

_____

_____

26. On a scale of 1 to 5, (with 1 = not at all important, and 5 = very important), how important is it to have a Climate Crafters field rep available to assist you in the field with sales and technical training to help you more fully develop your duct sealing or HP diagnostic business? 1 2 3 4 5 And why that rating? _____

PARTICIPANTS CONTINUE – NON PARTICIPANTS RESUME

SECTION 5: Interest in PTCS duct sealing, and HP/AC diagnostics

Now I have a few questions about interest in PTCS duct sealing and heat pump and air conditioning diagnostics. Let's discuss interest in PTCS duct sealing first.

27. On a scale of 1 to 5, (1 = not interested, and 5 = very interested), what would you say is the level of interest in this service by homeowners? 1 2 3 4 5

28. And why that rating? _____

_____

29. On a scale of 1 to 5, (1 = not interested, and 5 = very interested), what would you say is your company's level of interest in this service? 1 2 3 4 5

30. And why that rating? _____

_____

HP/AC Diagnostics

This past summer, Climate Crafters came out with a new energy efficiency service for heat pumps and air-conditioning systems that uses a diagnostic hand-tool to measure and adjust refrigeration temperatures and air-flows. To kick-off this new service, Climate Crafters sponsored a series of training primers around the region for utility company reps and contractors.

31. Were you aware of this training? Yes / No / DK

32. Did you attend the training? Yes / No / DK

Now, I have a few questions about interest in this service.

33. On a scale of 1 to 5, (1 = not interested, and 5 = very interested), what would you say is the level of interest in this service by homeowners? 1 2 3 4 5

34. And why that rating? _____

_____

35. On a scale of 1 to 5, (1 = not interested, and 5 = very interested), what would you say is your company's level of interest in this service? 1 2 3 4 5

36. And why that rating? _____

_____

Final Questions

37. What would you say is the most important industry Trade Assn. for your firm?

_____

38. Do you consider your firm to be active in participating in that group? Yes, No

[That concludes the survey. Thank you for taking the time to answer our questions. Your answers will help us to perform a complete evaluation of the program.]

[End]

Climate Crafters – Distributor Survey Instrument

Introduction

Describe who we are, and that we represent the Northwest Energy Efficiency Alliance.

1. Are you familiar with them?

2. Could you help us by explaining how you fit in to the residential heating marketplace, like your relationship to the manufacturers, dealers, and installers?

Last few years we have been doing a lot work on energy efficiency to go after the energy savings in residential heating systems

- Somewhat in high efficiency equipment
- More so on installations

We are wondering if you familiar with our efforts:

3. Have you heard of Climate Crafters?
   - PTCS?
   - Checkme!?
   - Familiar w/ ENERGY STAR®? Is it the vehicle we should ride?

4. Do you think there are any energy savings to be had in residential heating systems?

5. What do you think would be the best way to sell more energy efficient equipment?

6. What is the best way to get more energy efficient installations? Will PT make it????

7. Do you see any role for you or your manufacturers to help installers do a better job at energy efficient installations?

8. Do you see a role for us in this, or is our best chance - NATE?

9. We would like to get your thoughts on new hi-efficiency equipment…

   – Do you push it?

   – Is it inevitable, or so price driven it's a non starter (its all first cost)?

   – ECM motors in new construction, replacement

Climate Crafters – Consumer Duct, Heat Pump and AC Survey (by Gilmore Research Group)

STATE:

STATE FROM SAMPLE

N =		500	100%
Idaho	ID	56	11%
Montana	MT	41	8%
Oregon	OR	154	31%
Washington	WA	249	50%

SUR:

N =		500	100%
URBAN	U	120	24%
SUBURBAN	S	205	41%
RURAL	R	175	35%

INTRO:

IF NOT AVAILABLE, ARRANGE CALL-BACK

Hello, my name is ___ calling for the Northwest Energy Efficiency Alliance. We are calling to find out about people's interest in different energy savings options for heating and cooling systems as part of a study for Northwest electric utilities. This is not a sales call. May I please speak with the person in the house who is most familiar with your heating and air conditioning systems? IF DIFFERENT PERSON, REINTRODUCE. IF NEEDED: This will take about 10 minutes. IF NEEDED: All information is confidential and is being used for research purposes only. IF NEEDED: We will be asking questions about your home's characteristics relating to heating, cooling, ducts and some other general information. IF NEEDED: The Northwest Energy Efficiency Alliance is a non-profit organization working with electric utilities on energy efficiency in the Northwest. IF NEEDED: We are just interested in your opinions.

Q1:

DO NOT READ. PROBE TO FIT.

First, do you own or rent your home?

N =			500	100%
Own (or in the process of buying)	1		500	100%
Rent (or lease)	2	=> TERM	0	0%
Don't know	3	=> TERM	0	0%
Refused	4	=> TERM	0	0%

Q2:

What is the primary fuel used to heat your home? IF MULTIPLE: Which do you rely on, or use most?

N =			500	100%
Natural gas	01		288	57%
Electricity	02		144	29%
Oil	03		24	5%
Propane	04		27	5%
Electric heat pump	05		17	3%
Cord/wood pellets	06	=> TERM	0	0%
Other (SPECIFY):	97	=> TERM	0	0%
Don't know	98	=> TERM	0	0%
Refused	99	=> TERM	0	0%

Q3:

Is that a central forced air furnace, heat pump, or something else?

N =			500	100%
Central forced air	1		439	88%
Heat pump	2		61	12%
Something else (wall units, baseboard, portable heaters, etc.)	3	=> TERM	0	0%
NONE	0	=> TERM	0	0%
Don't know	5	=> TERM	0	0%
Refused	6	=> TERM	0	0%

Q4:

Is your home a . . .

N =			500	100%
Manufactured or Mobile home	1		85	17%
Single family detached house	2		395	79%
Duplex or triplex	3		8	1%
Townhouse or row house	4		9	2%
Or condominium?	5		3	1%
Don't know - DO NOT READ	6		0	0%
Refused - DO NOT READ	7		0	0%
Other (specify:)	8		0	0%

Q5:

Is your home built over an unheated crawl space? INTERVIEWERS... PLEASE CAPTURE ANY SPECIFIC MENTIONS OF OTHER TYPES OF UNDER SPACES.

N =		500	100%
Yes	01	301	60%
No, unspecified	02	107	21%
No, unheated basement	03	18	4%
No, mobile home blocking	04	3	1%
No, slab	05	7	1%
No, heated basement	06	56	11%
No, Other mention of basement type (SPECIFY:)	97	0	0%
Don't know	98	8	1%
Refused	99	0	0%

HEATPUMP:

=> * IF IF((Q2=05 OR Q3=2),1,0)

N =		500	100%
Has a heat pump	1	69	14%
No heat pump	0	431	86%

Q6:

Do you have any type of cooling or air conditioning system in your home besides fans? NOTE: FANS INCLUDE BOTH CEILING AND PORTABLE FANS

=> +2 IF HEATPUMP=1

N =		431	100%
Yes	1	144	33%
No	2	284	66%
Don't know	3	3	1%
Refused	4	0	0%

Q7:

Which of the following types of cooling do you have?

=> +1 IF NOT Q6=1

N =		144	100%
Central air conditioning unit	01	103	72%
Heat pump	02	18	13%
Swamp cooler	03	6	4%
Room air conditioner	04	20	14%
Whole house fan	05	5	3%
Or something else? (SPECIFY):	97	0	0%
Don't know - DO NOT READ	98	0	0%
Refused - DO NOT READ	99	0	0%

AC:

=> * IF IF((Q7=01),1,0)

N =		500	100%
Has central air conditioning	1	103	21%
No central air conditioning	0	397	79%

SET:

=> * IF IF((AC=1),1,IF((HEATP=1),2,IF((Q7=98-99),4,3))))

N =		500	100%
Air conditioner	1	103	21%
Heat pump	2	69	14%
Neither	3	328	66%
Don't know/Refused	4	0	0%

Q8:

Have you ever had your heating<or cooling>system serviced? IF NEEDED: Beyond just changing the filter.

N =			500	100%
Yes, heating	1		230	46%
Yes, cooling	2		5	1%
Yes, both	3		89	18%
No, neither	4	=> Q12	172	34%
Don't know	5	=> Q12	4	1%
Refused	6	=> Q12	0	0%

Q9:

READ 1-7. MULTIPLE RESPONSES OKAY.

For which of the following reasons did you have your <heating/cooling>system last serviced?

N =		324	100%
To repair or replace broken equipment	01	110	34%
To upgrade equipment	02	17	5%
For a safety inspection	03	30	9%
For annual maintenance or tune-up	04	194	60%
Or something else? (SPECIFY):	97	0	2%
Don't know - DO NOT READ	98	4	1%
Refused - DO NOT READ	99	3	1%
Performance testing for energy efficiency - DO NOT READ	08	0	0%

Q10:

Before having the work done, did you get information or advice from your utility company or did you check into programs they offer to assist customers with these services?

N =			324	100%
Yes	1		52	16%
No	2		255	79%
Don't know	3	=> Q12	16	5%
Refused	4	=> Q12	1	0%

Q11:

Did you get a referral from your utility for a contractor to do the service work?

N =			307	100%
Yes	1		21	7%
No	2	=> Q12	280	91%
Don't know	3	=> Q12	6	2%
Refused	4	=> Q12	0	0%

Q11A:

Did you follow-up on the referral and request a bid or service?

N =			21	100%
Yes	1		18	86%
No	2		2	10%
Don't know	3		1	5%
Refused	4		0	0%

Q12:

READ 1-3

From what you have heard, do you think that most<air conditioning / heat pump>manufacturers recommend their equipment be serviced ...

=> Q24 IF NOT AC=1 AND NOT HEATP=1

N =			172	100%
Every year	1		82	48%
Every two years	2		15	9%
Or every three to five years?	3		15	9%
Only when something goes wrong - DO NOT READ	4		5	3%
Don't know/haven't heard of recommendations - DO NOT READ	5		55	32%
Refused - DO NOT READ	6		0	0%

Q13:

How much do you usually spend on maintenance for your <air conditioning / heat pump>?

N =			172	100%
NONE/ZERO	00	=> Q14	67	39%
$1.00 - $25.00	02		7	4%
$26.00 - $50.00	03		12	7%
$51.00 - $75.00	04		18	10%
$76.00 - $100.00	05		17	10%
$101.00 - $125.00	06		1	1%
$126.00 - $150.00	07		6	3%
$151.00 - $175.00	08		1	1%
$176.00 - $200.00	09		1	1%
$201.00 - $225.00	10		0	0%
$226.00 - $250.00	11		1	1%
$251.00 +	12		1	1%
Don't know	98		39	23%
Refused	99		1	1%

Q13A:

Do you get your <air conditioning / heat pump> Checked annually or less often?

N =			105	100%
Annually	1		54	51%
Less often	2	=> Q14	46	44%
Don't know/Not sure	3	=> Q14	5	5%
Refused	4	=> Q14	0	0%

Q13B:

Do you have a maintenance contract for that?

N =			54	100%
Yes	1		9	17%
No	2		45	83%
Don't know/Not sure	3		0	0%
Refused	4		0	0%

Q14:

The last time you had your <air conditioning / heat pump>checked for maintenance, how confident were you that the work was performed properly and completely?

=> +1 IF NOT Q8=1-3

N =			117	100%
Very confident	1		84	72%
Somewhat confident	2		13	11%
Not confident	3		4	3%
Don't know/Not sure	4		16	14%
Refused	5		0	0%

Q15:

READ 1-3

Now I have some hypothetical questions about your interest in different services. This information is for research on energy saving options for heating and cooling systems. This is not a sales call and you will not be contacted in any way after this call. Thinking of your last<air conditioning / heat pump> service, how interested would you have been in a tune-up service that included a third-party quality control check. Would you have been ...

N =			172	100%
Very interested	1		15	9%
Somewhat interested	2		40	23%
Or not interested?	3	=> Q18	98	57%
Don't know - DO NOT READ	4	=> Q18	19	11%
Refused - DO NOT READ	5	=> Q18	0	0%

Q16:

Would you be willing to pay extra for that?

N =			55	100%
Yes	1		29	53%
No	2	=> Q18	23	42%
Don't know	3	=> Q18	3	5%
Refused	4	=> Q18	0	0%

Q17:

How much extra would you pay?

N =		29	100%
	15	1	3%
	20	3	10%
	25	4	14%
	40	1	3%
	50	4	13%
	100	3	10%
	150	2	7%
	250	1	3%
Don't know	9998	9	30%
Refused	9999	1	3%

Q18:

How interested would you be in having your home's<air conditioning / heat pump>tested for performance and tuned up? Use a scale of 1 to 5, where "5" means you are Very Interested and "1" means you are Not At All Interested.

N =		172	100%
1 - Not at all interested	1	71	41%
Two	2	10	6%
Three	3	37	22%
Four	4	21	12%
5 - Very interested	5	25	15%
Don't know - DO NOT READ	6	6	3%
Refused - DO NOT READ	7	2	1%

Q19:

Performance testing is a new type of service provided by contractors to check the proper functioning of your<air conditioning system / heat pump>. If the cost of a performance test and tune-up were $250, but it saved you on average $50 per year in energy savings, how likely would you be to have a test and tune-up? Use a scale of 1 to 5, where "5" means you are Very Likely and "1" means you are Not At All Likely.

N =			172	100%
1 - Not at all likely	1		81	47%
Two	2		30	17%
Three	3		36	21%
Four	4		9	5%
5 - Very likely	5		13	8%
Don't know - DO NOT READ	6	=> Q22	2	1%
Refused - DO NOT READ	7	=> Q22	1	1%

Q21:

Why do you say that?

N =		169	100%
Sounds like a good idea	02	4	2%
Saves us money/ Cost effective	03	6	4%
Not needed/ Never had a problem	04	5	3%
Newer appliances/ Working fine/ All energy efficient	05	18	11%
Trust my service man to keep it serviced yearly	06	16	9%
Don't have the money to spend now/ Not a high priority at this time	07	15	9%
Can get the same thing done somewhere else cheaper	08	3	2%
Have someone else (friend/ relative) to repair things	09	4	2%
Do it myself for free	10	7	4%
Depends how often it's checked/ Tuned up	11	3	2%
Might be interested/ Need more information	12	2	1%
Selling my home/ Not sure how long we will live here	13	3	2%
Cost/ Versus Benefits	14	10	6%
Too expensive	15	15	9%
Waste of money	16	5	3%
Value not worth the cost/ Takes years to recover my savings	17	21	12%
If I needed to have it checked or repaired I would do it	18	11	7%
Wait till it breaks down/ Then I'll have it fixed	19	4	2%
Later if I was already replacing it anyway I might consider it	20	2	1%
Gone most of the year/ Don't use it that often	24	4	2%
Don't know	98	19	11%
Refused	99	1	1%

Q22:

Are you aware of any utility-sponsored program that promotes air conditioning or heat pump performance testing and tune-ups?

N =			172	100%
Yes	1		14	8%
No	2	=> Q24	156	91%
Don't know	3	=> Q24	1	1%
Refused	4	=> Q24	1	1%

Q23:

Do you know the name of the program?

N =		14	100%
Yes (SPECIFY):	01	0	0%
No	00	10	71%
PTCS (Performance Tested Comfort Systems) - DO NOT READ	03	1	7%
Don't know	04	3	21%
Refused	05	0	0%

Q24:

Now I have a few questions about your house's duct system. Ducts are round or rectangular tubes that deliver heated air to the rest of the home. Are your ducts wrapped or insulated? IF NEEDED: The air from the ducts enters the home through the registers in the walls, ceiling or floor.

N =		500	100%
Yes	1	286	57%
No	2	133	27%
Don't know	3	80	16%
Refused	4	1	0%

Q25:

READ 1-5 IN ORDER SHOWN. ENTER ALL THAT APPLY.

While most people don't think about their ductwork, it can be serviced just like other household systems. Have you ever HEARD of any of the following services?

ROTATE -> 5

N =			500	100%
Duct cleaning	1		323	65%
Duct performance testing	2		103	21%
Duct sealing	3		108	22%
Duct Repair	5		158	32%
NO - HAVEN'T HEARD OF ANY OF THESE SERVICES	6	=> Q28	142	28%
Don't know - DO NOT READ	7	=> Q28	11	2%
Refused - DO NOT READ	8	=> Q28	1	0%

Q26:

READ 1-5 IN ORDER SHOWN. ENTER ALL THAT APPLY.

Have you ever had any of these services done?

ROTATE -> 5

N =			346	100%
Duct cleaning	1		123	36%
Duct performance testing	2		20	6%
Duct sealing	3		18	5%
Duct Repair	5		22	6%
NO - HAVEN'T HAD OF ANY OF THESE SERVICES	6	=> Q28	204	59%
Don't know - DO NOT READ	7	=> Q28	8	2%
Refused - DO NOT READ	8	=> Q28	0	0%

Q27A:

Approximately how much did it cost to have your ducts cleaned?

=> +1 IF NOT Q26=1

N =		123	100%
Don't know	9998	57	46%
	0	9	7%
	30	1	1%
	40	1	1%
	50	4	3%
	59	1	1%
	60	1	1%
	72	1	1%
	75	4	3%
	80	2	2%
	98	4	3%
	100	10	8%
	110	1	1%
	120	1	1%
	125	4	3%
	150	7	6%
	200	3	2%
	250	2	2%
	300	5	4%
	350	2	2%
	400	2	2%
	1000	1	1%

Q27B:

Approximately how much did it cost to have your ducts performance tested?

=> +1 IF NOT Q26=2

N =		20	100%
Don't know	9998	10	50%
Refused	9999	0	0%
	0	7	35%
	60	1	5%
	125	1	5%
	140	1	5%

Q27C:

Approximately how much did it cost to have your ducts sealed?

=> +1 IF NOT Q26=3

N =		18	100%
Don't know	9998	7	39%
Refused	9999	0	0%
	0	5	28%
	50	1	6%
	150	1	6%
	200	1	6%
	300	1	6%
	350	1	6%
	1000	1	6%

Q27E:

Approximately how much did it cost to have your ducts repaired?

=> +1 IF NOT Q26=5

N =		22	100%
Don't know	9998	13	59%
Refused	9999	0	0%
	0	2	9%
	50	2	9%
	150	2	9%
	200	1	5%
	450	1	5%
	1000	1	5%

Q28:

Have you ever heard of a home's duct system leaking air into attics or crawl spaces?

N =		500	100%
Yes	1	221	44%
No	2	266	53%
Don't know	3	11	2%
Refused	4	2	0%

Q29:

Based on what you know about your house and its construction, would you guess that your duct system probably has air leaks, probably doesn't have air leaks, or you have no idea if it does or not?

N =		500	100%
Probably does	1	85	17%
Probably does not	2	270	54%
No idea/Don't know	3	142	28%
Refused	4	3	1%

Q30:

This survey is to find out about people's interest in different energy savings options for heating and cooling systems as part of a study for Northwest electric utilities. I'd like to remind you that this is not a sales call. We're just interested in your opinions. When the time comes to replace your heating<OR COOLING>equipment, how interested would you be in having your home's duct system tested and sealed if this service cost <$300/ $600>, but saved you $50-$75 a year? Use a scale of 1 to 5, where "5" means you are Very Interested and "1" means you are Not At All Interested.

N =			500	100%
1 - Not at all interested	1	=> Q34	258	52%
Two	2		60	12%
Three	3		92	18%
Four	4		37	7%
5 - Very interested	5		37	7%
Don't know - DO NOT READ	6		15	3%
Refused - DO NOT READ	7		1	0%

Q31:

Why do you say that?

N =		227	100%
Sounds like a good idea	02	6	3%
Saves us money/Cost effective	03	26	11%
Not needed/ Never had a problem	04	7	3%
Newer appliances/ Working fine/ All energy efficient	05	18	8%
Trust my service man to keep it serviced yearly	06	4	2%
Don't have the money to spend now/ Not a high priority at this time	07	7	3%
Can get the same thing done somewhere else cheaper	08	0	0%
Have someone else (friend/relative) to repair things	09	2	1%
Do it myself for free	10	12	5%
Depends how often it's checked/Turned up	11	0	0%
Might be interested/ Need more information	12	11	5%
Selling my home/ Not sure how long we will live here	13	6	3%
Cost/ Versus Benefits	14	9	4%
Too expensive/initial cost/don't have the money	15	16	7%
Waste of money	16	3	1%
Value not worth the cost/ Takes years to recover your savings	17	12	5%
If I needed to have it checked or repaired I would do it	18	9	4%
Wait till it breaks down/ Than I'll have it fixed	19	2	1%
Later if I was already replacing it anyway I might consider it	20	17	7%
Like knowing the ducts would be sealed/ No leaks	21	8	4%
Don't have a lot of duct work/ No duct work	22	6	3%
No need for that type of service in our area	23	1	0%
Gone for most of the year/ Don't use it that often	24	2	1%
Other (miscellaneous)	97	3	1%
Don't know/Not sure	98	42	19%
Refused	99	9	4%

Q32:

If you were to consider having your ducts tested and sealed, would you prefer to do it on your current equipment, or would you wait to do it when your current equipment is replaced?

N =		242	100%
At time of replacement	1	111	46%
While existing equipment is in use	2	98	40%
Not interested	3	10	4%
Don't know	4	21	9%
Refused	5	2	1%

Q34:

Are you aware of any utility sponsored programs that promote testing ductwork for air leaks?

N =			500	100%
Yes	1		44	9%
No	2	=> Q36	444	89%
Don't know	3	=> Q36	9	2%
Refused	4	=> Q36	3	1%

Q35:

Please describe what you know about these programs. BRIEFLY RECORD COMMENTS SUCH AS NAME OF UTILITY WHO SPONSORED PROGRAM, NAME OF PROGRAM AND/OR TYPE OF PROGRAM (REBATE, LOAN, ETC.)

N =		44	100%
Come out to evaluate your home/ Energy Check	02	2	5%
Programs to test them for free (Local Power Company)	03	2	5%
Check for leaks, Insulation (offer windows - thermostats -etc.)	04	8	18%
Come to your home and clean the ducts	05	4	9%
Offer Rebates	06	2	5%
Utility name only	07	7	16%
Not interested in them	08	1	2%
Other (miscellaneous)	97	17	39%
Don't know	98	6	14%
Refused	99	4	9%

Q36:

Have you heard of any of the following names?
ROTATE 1- 3

N =		500	100%
Climate Crafters?	1	7	1%
Performance Tested Comfort Systems or PTCS?	2	23	5%
Energy Star?	3	149	30%
NONE OF THE ABOVE - DO NOT READ	4	334	67%
Don't know - DO NOT READ	5	3	1%
Refused - DO NOT READ	6	1	0%

Q37:

READ 1-97 IN ORDER SHOWN. ENTER ALL THAT APPLY.

Have you hired a contractor in the past to perform any heating, air conditioning or weatherization services? IF YES: Which of the following did you do to find the contractor you used?

ROTATE -> 3

N =		500	100%
Got a recommendation from a friend or neighbor	01	87	17%
Contacted your utility for a referral	02	29	6%
Looked in the Yellow Pages	03	37	7%
Already knew them / worked for us in the past	04	28	6%
Newspaper/local advertising	05	4	1%
Or something else? (SPECIFY):	97	2	0%
NOT HIRED A CONTRACTOR IN PAST	00	309	62%
Don't know	98	12	2%
Refused	99	1	0%

Q39:

If you were choosing a contractor for duct testing, how important would it be to know they are certified? Please use a scale from 1 to 5, with 1 being Not At All Important to you and 5 being Very Important to you. IF NEEDED: Certification is like a license in that it requires a specified level of experience and competency.

N =		500	100%
1 - Not at all important	1	25	5%
Two	2	8	2%
Three	3	28	6%
Four	4	55	11%
5 - Very important	5	366	73%
Don't know - DO NOT READ	6	16	3%
Refused - DO NOT READ	7	2	0%

Q40:

How important do you think it would be to have a follow-up visit from a third-party to check for quality control? Use a scale from 1 to 5, with 1 being Not At All Important and 5 being Very Important.

N =		500	100%
1 - Not at all important	1	136	27%
Two	2	55	11%
Three	3	95	19%
Four	4	69	14%
5 - Very important	5	115	23%
Don't know - DO NOT READ	6	28	6%
Refused - DO NOT READ	7	2	0%

Q41:

If you heard that a duct testing contractor was Energy Star certified, would that make you more or less likely to hire the contractor or would it make no difference?

N =		500	100%
More	1	236	47%
Less	2	10	2%
Make no difference	3	217	43%
Don't know	4	36	7%
Refused	5	1	0%

Q42:

I have a few questions about how you make home energy decisions. I'd like you to rate some possible sources of information about servicing your heating, cooling or duct system. Think about how credible each source of information is and rate it on a scale of 1 to 5, with 1 being Not At All Credible and 5 being Very Credible. How credible would information be if you received it from ...

N =		500	100%
Continue	1	500	100%

Q42A:

Your Electric Utility?

IF NEEDED: Please rate this source of information on a scale of 1 to 5, with 1 being Not At All Credible and 5 being Very Credible.

N =		500	100%
1 - Not at all credible	1	23	5%
Two	2	21	4%
Three	3	69	14%
Four	4	120	24%
5 - Very credible	5	258	52%
Don't know - DO NOT READ	6	7	1%
Refused - DO NOT READ	7	2	0%

Q42B:

A Contractor?

IF NEEDED: Please rate this source of information on a scale of 1 to 5, with 1 being Not At All Credible and 5 being Very Credible.

N =		500	100%
1 - Not at all credible	1	47	9%
Two	2	84	17%
Three	3	182	36%
Four	4	83	17%
5 - Very credible	5	87	17%
Don't know - DO NOT READ	6	15	3%
Refused - DO NOT READ	7	2	0%

Q42C:

A Government agency?

IF NEEDED: Please rate this source of information on a scale of 1 to 5, with 1 being Not At All Credible and 5 being Very Credible.

N =		500	100%
1 - Not at all credible	1	90	18%
Two	2	43	9%
Three	3	131	26%
Four	4	128	26%
5 - Very credible	5	91	18%
Don't know - DO NOT READ	6	17	3%
Refused - DO NOT READ	7	0	0%

Q42D:

Independent Certification Organization?

IF NEEDED: Please rate this source of information on a scale of 1 to 5, with 1 being Not At All Credible and 5 being Very Credible.

N =		500	100%
1 - Not at all credible	1	54	11%
Two	2	50	10%
Three	3	138	28%
Four	4	143	29%
5 - Very credible	5	85	17%
Don't know - DO NOT READ	6	30	6%
Refused - DO NOT READ	7	0	0%

Q42E:

A retail store?

IF NEEDED: Please rate this source of information on a scale of 1 to 5, with 1 being Not At All Credible and 5 being Very Credible.

N =		500	100%
1 - Not at all credible	1	143	29%
Two	2	134	27%
Three	3	160	32%
Four	4	32	6%
5 - Very credible	5	21	4%
Don't know - DO NOT READ	6	8	2%
Refused - DO NOT READ	7	2	0%

Q42F:

Family, Friends and Neighbors?

IF NEEDED: Please rate this source of information on a scale of 1 to 5, with 1 being Not At All Credible and 5 being Very Credible.

N =		500	100%
1 - Not at all credible	1	60	12%
Two	2	61	12%
Three	3	140	28%
Four	4	140	28%
5 - Very credible	5	90	18%
Don't know - DO NOT READ	6	9	2%
Refused - DO NOT READ	7	0	0%

Q43:

What was your typical monthly <Q2> bill last winter? IF NEEDED: Your best estimate is fine.

N =	500	100%
$997 or more 997	4	1%
Don't know 998	81	16%
Refused 999	5	1%
0	4	1%
20	4	1%
28	1	0%
30	10	2%
35	2	0%
40	13	3%
45	10	2%
50	22	4%
53	1	0%
55	8	2%
57	1	0%
58	1	0%
60	30	6%
62	2	0%
64	1	0%
65	8	2%
66	1	0%
68	2	0%
70	12	2%
75	16	3%
76	1	0%
78	2	0%
80	22	4%
82	1	0%
85	7	1%
88	1	0%
89	1	0%
90	15	3%
92	2	0%
95	1	0%
98	3	1%
99	1	0%
100	43	9%
102	1	0%
105	1	0%
110	7	1%
118	1	0%
120	25	5%
125	7	1%
130	11	2%
140	7	1%

.....148	1	0%
.....150	34	7%
.....153	1	0%
.....160	4	1%
.....165	3	1%
.....166	1	0%
.....169	1	0%
.....170	1	0%
.....175	2	0%
.....180	5	1%
.....185	1	0%
.....190	2	0%
.....200	15	3%
.....203	1	0%
.....210	1	0%
.....216	1	0%
.....225	1	0%
.....250	6	1%
.....275	1	0%
.....300	6	1%
.....325	1	0%
.....350	6	1%
.....399	1	0%
.....400	2	0%
.....600	1	0%
.....700	1	0%
.....950	1	0%

Q44:

What is the name of your electric utility?

N =		500	100%
Ashland	01	0	0%
Avista	02	37	7%
Benton PUD	03	2	0%
Benton REA	04	0	0%
Big Bend Electric Cooperative	05	1	0%
Blachly-Lane Electric Cooperative	06	1	0%
Canby Utility	07	0	0%
Cascade Locks	08	2	0%
Central Electric Coop	09	2	0%
Central Lincoln PUD	10	2	0%
Chelan PUD	11	6	1%
Cheney Energy Services	12	1	0%
Clallam County PUD	13	0	0%
Clark Public Utilities	14	17	3%
Clatskanie PUD	15	1	0%
Clearwater Power Company	16	1	0%
Columbia River PUD	17	1	0%
Consumers Power	18	4	1%
Coos-Curry Electric Cooperative	19	2	0%
Cowlitz County PUD	20	2	0%
Declo	21	0	0%
Douglas Electric Cooperative	22	7	1%
Ellensburg	23	2	0%
Emerald PUD	24	3	1%
Eugene Water & Electric Board (EWEB)	25	2	0%
Farmers Electric Company	26	0	0%
Flathead Electric Cooperative, Inc.	27	6	1%
Forest Grove	28	0	0%
Franklin PUD	29	0	0%
Glacier Electric Coop	30	0	0%
Grant County PUD	31	2	0%
Grays Harbor	32	1	0%
Heyburn	33	0	0%
Hood River Electric Cooperative	34	0	0%
Idaho Falls Power	35	3	1%
Idaho Power Company	36	34	7%
Idaho Water Resources	37	0	0%
Inland Power & Light	38	0	0%
Klickitat PUD	39	0	0%
Kootenai Electric	40	1	0%
Lakeview Light and Power	41	0	0%
Lane Electric Coop	42	2	0%
Lewis County PUD	43	2	0%
Lost River Electric Cooperative	44	0	0%
Lower Valley Energy	45	0	0%

Mason #3	46	3	1%
Mason County PUD No. 1	47	0	0%
McMinnville Water and Light	48	0	0%
Midstate Electric Cooperative	49	1	0%
Milton Freewater City Light	50	2	0%
Modern Electric	51	1	0%
Northern Lights	52	0	0%
Northern Wasco PUD	53	2	0%
NorthWestern Energy	54	26	5%
NW Natural Gas	55	14	3%
Oregon Trail Electric Cooperative	56	2	0%
PacifiCorp (PP&L)	57	40	8%
Pacific County PUD No. 2	58	4	1%
Pend Oreille PUD	59	2	0%
Port Angeles	60	1	0%
Portland General Electric (PGE)	61	58	12%
Puget Sound Energy	62	102	20%
Ravalli County Electric Cooperative	63	2	0%
Richland Energy Services	64	1	0%
Rupert	65	0	0%
Salem Electric	66	1	0%
Salmon River Electric Cooperative	67	0	0%
Seattle City Light	68	19	4%
Snohomish County PUD	69	19	4%
Springfield Utility Board	70	3	1%
Tacoma Power	71	13	3%
Tillamook PUD	72	1	0%
Umatilla Electric Cooperative	73	4	1%
United Electric Cooperative, Inc.	74	1	0%
Vera Water & Power	75	3	1%
Wasco Electric Cooperative	76	1	0%
West Oregon Electric Cooperative	77	0	0%
Sunriver	78	3	1%
Other (SPECIFY:)	97	20	4%
Don't know/Not sure	98	3	1%
Refused	99	1	0%

Q45:

Approximately, how old is your home? IF NEEDED: Just your best estimate is fine.

N =	500	100%
Less than 1 year.....000	12	2%
Don't know.....998	12	2%
Refused.....999	1	0%
.....1	8	2%
.....2	8	2%
.....3	12	2%
.....4	14	3%
.....5	15	3%
.....6	17	3%
.....7	8	2%
.....8	11	2%
.....9	12	2%
.....10	22	4%
.....11	9	2%
.....12	11	2%
.....13	7	1%
.....15	13	3%
.....16	4	1%
.....17	2	0%
.....18	7	1%
.....19	2	0%
.....20	23	5%
.....21	3	1%
.....22	3	1%
.....23	5	1%
.....24	7	1%
.....25	21	4%
.....26	9	2%
.....27	6	1%
.....28	5	1%
.....29	2	0%
.....30	32	6%
.....31	2	0%
.....32	3	1%
.....33	2	0%
.....34	2	0%
.....35	13	3%
.....36	1	0%
.....37	1	0%
.....38	1	0%
.....40	19	4%
.....41	1	0%
.....42	2	0%
.....43	1	0%
.....44	3	1%

.....45	9	2%
.....46	2	0%
.....49	2	0%
.....50	19	4%
.....51	3	1%
.....52	2	0%
.....53	4	1%
.....54	1	0%
.....55	4	1%
.....56	2	0%
.....57	1	0%
.....58	2	0%
.....60	13	3%
.....62	1	0%
.....63	1	0%
.....64	1	0%
.....65	1	0%
.....68	1	0%
.....70	9	2%
.....73	2	0%
.....74	1	0%
.....75	8	2%
.....78	1	0%
.....79	2	0%
.....80	10	2%
.....81	2	0%
.....83	1	0%
.....89	1	0%
.....90	6	1%
.....94	2	0%
.....95	3	1%
.....98	1	0%
.....99	1	0%
.....100	3	1%
.....102	1	0%
.....104	1	0%
.....105	1	0%
.....200	1	0%

Q46:

Which of the following best describes the square footage of the living space in your home?
IF NEEDED: Not including any unheated garage or unfinished basement areas.

N =		500	100%
Less than 1000 square feet	1	38	8%
1000 up to 2000	2	258	52%
2000 up to 3000	3	137	27%
3000 square feet or more	4	52	10%
Don't know - DO NOT READ	5	14	3%
Refused - DO NOT READ	6	1	0%

Q47:

What is your home zip code?

N =		500	100%
Don't know	99998	6	1%
Refused	99999	13	3%

Q48:

Was your household income before taxes last year ...

N =		500	100%
Less than $40,000	1	126	25%
$40,000 to $80,000	2	166	33%
Over $80,000?	3	89	18%
Don't know - DO NOT READ	4	31	6%
Refused - DO NOT READ	5	88	18%

GENDR:

DO NOT ASK!

RECORD GENDER

N =		500	100%
Male	1	249	50%
Female	2	251	50%

Climate Crafters MPER
Business Model Review

Introduction

The business model review was done from October 2002 through December 2002.[21]

On December 18, 2002, preliminary findings were shared with the Climate Crafter's board in their quarterly meeting at the Northwest Energy Efficiency Alliance's offices in Portland, Oregon.

Conclusions

In late 2002, Climate Crafters dramatically changed their business model; they need to update their business and financial plans. Making drastic changes as seen with Climate Crafters needs to be carefully planned. This may be the right direction and approach but an updated business plan, financial model, objectives, and work plan must be developed. Currently, there is a very limited financial budget for 2003.

Climate Crafters needs to develop new markets, new business models, and new partnerships for growth into the future. Long-term success will require Climate Crafters to seek out new business models, new revenue sources, new partnerships, and even new areas, beyond the NW, to do business. Climate Crafters should have multi-sources of sustainable revenue. Partnerships with organizations such as NATE are worth investigating. Climate Crafters could also offer Proctor CheckMe! and Delta-T trained technicians renewal through the Climate Crafters program.

[21] Information was gathered by review of the Climate Crafter (CC) business plan dated September 10, 2002, Climate Crafters Strategic Marketing Plan dated September 13, 2002, Climate Crafters projections for FY2000-FY2006, Climate Crafters Work Plan for 2003 dated October 3, 2002, Climate Crafters 2002 financial report, Climate Crafters 2003 Projected Budget, and the Climate Crafters 2003 Utility Contract Report. Meetings, phone calls, and discussions were held with Climate Crafters staff and board, NW Power Planning Staff, Oregon Office of Energy, and NW Energy Efficiency Alliance members. Additional research included meetings with contractors, realtors, and loan officers.

Climate Crafters needs to develop and implement a comprehensive marketing plan. Climate Crafters developed a marketing plan in 2002 and it appears this plan was not updated nor implemented. There is no branding or homeowner-awareness program for Climate Crafters. KATU commercial was good, but lack of program for Portland customers lost a potential opportunity. Updated Climate Crafters marketing and sales collateral is needed

The Alliance provided too much of a financial crutch, this dependency did not force Climate Crafters to look for other sources of revenue, markets, or fail. Climate Crafters was not forced to fine tune their business model and look for other sustainable sources of revenue. Thus, when this money was removed a drastic business change occurred. This is looking to be repeated with the current business model.

Climate Crafters needs to have quarterly strategic business planning meeting. In a market creation and development time of a business the business needs to be very fluid and open to change. But these changes need to be carefully planned. A quarterly meeting to discuss results, plans and goals would help with keeping focused and on track.

Climate Crafters needs to hire and better focus their resources. Climate Crafters at times has not staffed to their business needs, such as a Field Representative and Marketing Staff. It appeared that Climate Crafters goals and objectives were in a constant change. Climate Crafters needs to determine proper staffing needs and stay focused to that plan. The much needed business consultant funded by the Alliance has not yet staffed.

Climate Crafters trained contractors and technicians, but with no homeowner awareness, the market driven program has not been successful. Climate Crafters appears to have concluded that the market driven approach will not work by greatly reducing the projections for non-contract home certifications, decreasing the training classes and failing to hire or maintain resources in this area. This could have a long-term impact on the creditability with the utilities, contractors, and technicians.

The $25 home inspection fee is an issue to contractors. Climate Crafters, contractors and utilities have all mentioned that the process and collection of the $25 fee for inspections is difficult and may result in costing more to collect then the actual fee itself. Climate Crafters should investigate a process to streamline or other options in collecting this $25. In 2002, 10% of the total non-contact homes inspected monies were not collected.

Market Opportunity

Studies show that 75% of homes with heat pumps or air conditioners have improperly or maintained equipment and leaky air ducts. Manufactured homes and mobile homes, because of construction and

movement, create the large portion of the need for duct sealing. But that does not limit the need to just those markets. New homes with lower construction quality may have leaky ducts and improperly installed equipment.

Market Driven

In 2002, Climate Crafters' business plan was to work with utilities to develop a local market driven certification program that includes training contractors to do duct sealing and HP/AC testing. Climate Crafters charges for contractor certification classes and yearly renewals. Climate Crafters receives $25 per house for the home certification and quality assurance. A number of utilities offer incentives to their customers for testing and servicing ducts and HP. Several areas also offer homeowner tax credits based on the service performed.

Contract

At the end of 2002, Climate Crafters began a contract utility program. This program works with area utilities using their C&RD funds to train and pay contractors to do testing and duct sealing in their areas, thus no cost to the homeowner. This program focuses primarily on duct sealing in the mobile home market.

The program is a contract between the utility and Climate Crafters, in return Climate Crafters trains contractors, implements the program, provides the home certification, and conducts quality assurance. Each contract is set up with different terms and payments.

Competition and Partnerships

There were no competitors listed in the business plan, further research uncovered several direct and non-direct competitors. Competitors can also be potential partners and Climate Crafters should investigate ways for growth through partnerships.

North American Technician Excellence or NATE

North American Technician Excellence, Inc. (NATE) is the leading certification program for technicians in the heating, ventilation, air-conditioning, and refrigeration (HVAC/R) industry and is the only national certification program supported by the entire industry.[22]

NATE is the industry leading training and certification in HVAC/R that has partnerships and relationships with the top manufacturers in the business such as Trane, Rheem, Lennox, and York. There are 17 trainers in the NW area.

Climate Crafters could partner with by providing NATE training through Climate Crafters or getting PCTS training into the NATE program.

HVACReducation.net

A comprehensive HVAC training program for heating, ventilation, air conditioning, and refrigeration technicians that is available online. Classes are focused on entry-level technicians into the HVACR trade, continuing education for upgrading skills, and help in becoming certifiable (NATE, RSES, CM status, etc.)[23]

Proctor's CheckMe!™

Proctor Engineering has developed a program to train and certify air conditioning technicians to perform testing on air condition systems. The cost of initial test is approximately $50. Currently, there are CheckMe! certified technicians in California, Idaho (1), Montana (2), Oregon (27), and Washington (3)[24]. Cost for the contractor for the Proctor CheckMe! solution is $3300, includes $2000 training and a $1300 contractor fee. Proctor Engineering is one of the leading companies that does research and testing in duct sealing and consults with many U.S. utilities.

[22] Source: NATE website www.natex.org

[23] Source: HVACReducation.net web site

[24] Source: Proctor Engineering web site

Energy Outlet

Energy Outlet has contracted Bruce Manclark and Delta-T to provide a duct-sealing program that includes training to contractors.

Conservation and Renewal Discount

Most of the money being used by the utilities as incentives and program costs for duct sealing and heat pump inspections comes from C&RD budgets. This money can be used for many other energy efficiency programs and Climate Crafters competes with these other programs for C&RD revenue.

Other Solutions

Competition can also come from finding other methods or procedures for doing duct sealing and heat pump/AC testing. Contractors and utilities can also provide this service without using the Climate Crafters solution.

Financials

For 2002, Climate Crafters ended the year with a positive cash flow of $106K. The total income was $532K (including $125K from the Energy Trust contract) and total expenses were $426K. Plan for 2002 was income of $415K and expenses of $350K with net income of $65K.

	2002	2002 PLAN
REVENUE W/O CONTRACTS	$407	$415
EXPENSES	$342	$350
CONTRACT REVENUE	$125	
CONTRACT EXPENSES	$125	
NET INCOME	$106	$65

All numbers in thousands

In 2002, the NW Energy Efficiency Alliance provided $274K of Climate Crafters' $532K of income, that is over half of Climate Crafters total 2002 income. That is a large one-source dependency for any company.

Contractor Training

Climate Crafters trained technicians receive a one-year certification that can be renewed annually for $150. Training classes cost $400 for Residential Air Duct System and $150 for Heat Pump classes and Air Conditioning Contractors of America classes. Contractors pay an additional $2200 for the Honeywell ACRX Handtool to be able to perform the HP and AC testing. Currently, the Honeywell handtool is not certified for the Oregon Residential Tax Credit, although it is expected soon. Today, the only solution for C&RD and RTC is the Proctor CheckMe! solution.

In 2002, Climate Crafters conducted 37 training classes that included 9 HP classes, 20 RADS classes, 4 RADS classes for the Oregon Energy Trust contract and 4 ACCA classes. Of these 37 classes 225 technicians (44 HP, 107 RADS, 16 Energy Trust, 34 ACCA and 24 Utility techs) were trained from 130 contractors. This generated Climate Crafter revenue of $76,777 or $2075 per class.

$25 Certification Charge

Climate Crafters collects a $25 fee per house inspected to provide record keeping and quality assurance.

Home Inspections and Certifications

For 2002, Climate Crafters projected to certify 300 RADS homes, 300 HP/AC homes and 1200 contract homes. By the end of 2002 Climate Crafters had certified 593 RADS homes, 430 HP/AC homes and 965 contract homes. RADS and HP/AC market driven certifications exceeded projections but the contract homes missed by 235 homes. Non-contract home certifications income was $22,800, that is 912 homes at $25 each, that indicates that 111 homes certifications were collected or $2775.

	2002 ACT	2002 PLAN	2003 ACT Q1	2003 PLAN
CONTRACTS	965	1,200	274	4068
RADS	593	300	133	1000[25]
HP/AC	430	300	81	
AI	0	0	0	

[25] 1000 is the total number of RADS, HP/AC and AI certifications for 2003, this has not been broken out in the 2003 Climate Crafter budget.

TOTALS	1,988	1,800	488	5068

Northwest Energy Efficiency Alliance Performance Indicators

The Alliance provided $274K of funding to Climate Crafters in 2002. Performance indicators were a required part of the funding. The Alliance's performance indicators required 30 contractor firms in the program, 200 technicians trained, 50 technicians renewed their certification, and at least 40% of total revenue comes from non-Alliance sources. Climate Crafters trained 123 contractor firms, 201 technicians were trained, and 67 technicians renewed their certifications, exceeding the performance indicators. In 2002, Climate Crafters revenue from the non-Alliance sources was 49% of their total revenue.

Barriers to Success

In the meeting with the Climate Crafters board in December 2002 the evaluation team identified several key "Barriers to Success" items.

Barriers for Utilities

With revenues declining and resources stretched, utilities have mentioned that they do not have the resources to run a market driven duct sealing and HP/AC program. Climate Crafters has addressed this through their contract turnkey program but this is still an issue with the market driven programs.

Thirty utilities have signed up for the Climate Crafters programs but only ten are actually performing. This is due to lack of Climate Crafters staff to follow up with the utilities once they were part of the program.

Climate Crafters is competing with other services and products for a limited amount of C&RD dollars for the utilities.

The utilities have not been successful in creating homeowner demand in their areas. Homeowners are not aware of the problem, or it's not a priority to the homeowner that is aware.

Barriers for Contractors

In the market driven program, cost of the training and the equipment is prohibitive. Almost half of the contractors have taken the HP training but do not spend the money on the required equipment; they do

not see the demand for the service. The Honeywell product for HP/AC testing is not certified for Oregon Tax Credit.

The contractors have been reluctant to market and sell the Climate Crafters market driven programs. These services could be sold during yearly cleaning and service, new installations, or as special program.

Barriers for Homeowners

Homeowners are not aware of the problem or it is not a priority for the homeowner. Cost of $300-$600 for the Climate Crafters service with up to a twelve year return on investment make the service unlikely[26].

Recommendations

During the initial review of Climate Crafters the evaluation team made several internal and external recommendations to the Climate Crafters management and board.

Resources

After reviewing the statement of work and business plan it is recommended that Climate Crafters have the appropriate staff for their business. As of December 2002, Climate Crafters had three full-time paid positions, Lavelle (Executive Director) and Marla (Finance/Data Management), Beth (Executive Assistant) and two contract positions, Roger works one-day per work (Business Development) and Bruce and David (Training, RD, QA) are contracted for needed training.

During our research we heard repeatedly that Climate Crafters needs a Field Representative to follow up after a utility has been signed up and the contractors have been trained.

Hiring a Marketing Manager will help to update collateral, develop a branding program, and start a program for a much needed homeowner awareness program. This person would work on projects such as the Clark County commercials that also aired in Portland Oregon. The Portland area utilities

[26] The average cost of a typical duct sealing for a homeowner is $600. Duct sealing will save about 10-15% of the homes heating costs or $50-$75/year for a home using 10,000 kwh, at $.05/kwh, a eight to twelve year payback. The cost of a HP/AC service is approximately $300 with a savings of about 10%, a six-year payback.

were not prepared for requests for information and Clark PUD only certified 45 homes during the commercial run.

Hire a business consultant to help with business planning, objectives, pricing models, setting strategy, and keeping Climate Crafters resources focused on activities. The Alliance has offered to provide funding for a temporary Business Consultant to work with Climate Crafters.

Single Source of Income

Climate Crafters is to develop sustainable revenue from multiple sources. Climate Crafters' 2002 dependency on Alliance and C&RD funding caused a major change to their business plans when a major source of projected Alliance revenue did not materialize. Climate Crafters dependency on one source of revenue can jeopardize long-term survivability.

Business Planning

Climate Crafters should hold monthly or quarterly meetings to discuss strategic planning and help focus resources. Climate Crafters is going through growth and changes and it is important to have frequent strategic planning meetings to discuss changes and new opportunities. An example of a strategic business-planning meeting would be reviewing current plan, situation analysis, SWOT (Strengths, Weaknesses, Opportunities, and Threats) and setting clear objectives for the next period. On several occasions Climate Crafters has changed their strategic direction and not re-aligned their quarterly objectives, plans, and financial models. This change also makes it difficult in determining business success.

Marketing Strategy

In the Market Driven model, Climate Crafters depends heavily, and maybe solely, on the utilities and the contractors to develop homeowner awareness programs. Climate Crafters has developed marketing material to help utilities and contractors marketing their solution but the materials are not being used and should be updated.

In late 2002, Climate Crafters and Clark PUD did a commercial on the local KATU television station. This commercial was played 70+ times and generated few leads for home inspections. By not planning properly for the greater Portland market hurt the overall results of this commercial.

Homeowner Education and Awareness

We heard from contractors that homeowners were not asking for duct sealing and HP/AC testing and repair. Homeowners were not aware of the problem of duct sealing and improperly maintained HP/AC systems.

Portland realtors, when asked, mentioned that this is not a high issue on homeowners concerns when buying a home. Bigger issues were mold and dry rot, siding, window replacement, efficient furnaces and appliances.

Climate Crafters would need to develop a homeowner market awareness campaign that would educate the homeowner of the need and the solution. Climate Crafters can also look for matching contributions for these programs from C&RD, utilities, contractors, manufacturers, and trade groups. Programs could include:

- Branding program such as Climate Crafters or ENERGY STAR®
- Marketing campaigns by local utilities
- Press releases to the local media
- Writing articles for homeowner magazines
- Utility, contractor and homeowner testimonials
- Create handouts for homeowners
- Create marketing materials that can be incorporated and used by utilities and contractors to market to homeowners

Collecting Data

Collected data can be a key component of selling these programs to utilities, contractors, and homeowners. Collection of data before and after the Climate Crafters service and trending information is needed. Climate Crafters should review their current data to determine that proper collection is taking place. After testing and service there should be an analysis about the actual kwh savings in the home. This data can be used in marketing and sales material.

Trade Schools

Work with the trade schools to get Climate Crafters practices curriculum into the trade schools. Technicians can then be certified during their traditional education program.

Board Recommendations

Advisory Council

Climate Crafters could set up an "Advisory Council" made up of industry experts, manufacturers, contractors, and homeowners. The Advisory Council would not be an official part of Climate Crafters. The Advisory Council can provide invaluable information as well as it becomes a marketing tool for Climate Crafters to reach a broader audience.

2003 Updates

During late 2002, Climate Crafters made a strategic decision to change their business model to be more focused on contract revenue rather than market driven revenue. Although, this was not part of the evaluation, the evaluation team felt there are some key areas that should be highlighted.

Making major strategic business changes such as this should be done with a business planning process that includes situation analysis, SWOT exercise, objectives being developed, 3+year financial planning and documenting a new business plan. Currently, there is only a limited 2003 financial plan.

This change seems to be related to the deteriorating market driven business model, market driven barriers to success, and a "follow the money" plan. The contract approach appears to be an easier solution for Climate Crafters to keep a positive cash flow, but it does not appear to be a sustainable model that offers multi-sources of revenue.

2003 Plan vs. New 2003 Plan

In 2003, Climate Crafters changed their focus on market driven home certifications to contract home certifications. The original 2003 plan called for 5,100 RADS certifications, 2,880 HP/AC certifications, 960 AI certifications, and 2,400 contract certifications. The "new" 2003 calls for 1,000 total non-contract certifications and 4,218 contract certifications.

HOME CERTIFICATIONS	2003 OLD PLAN	2003 NEW PLAN
RADS	5100	1000*
HP/AC	2880	
AI	960	
CONTRACT RADS	2400	4218
TOTAL CERTIFICATIONS	11340	5218

* Total RADS, HP/AC and AI home certifications

As of April 2003, Climate Crafters has 8-signed contracts that will inspect 4218 homes with revenue of $1,689,850 and income to Climate Crafters of $266,875. 2003 plan is for revenue of $262,500 for contract and home certifications revenue.

Climate Crafter has scheduled 14 RADS classes and 6 HP classes with a goal of at least 4 people per class that would create revenue of $26,000. In Q1, 2003 Climate Crafters has already renewed 172 technicians for $25,800. The 2003 budget calls for 30 classes @ $3000/per class and a total of 300 new and renewal technicians at $150 each for revenue of $135,000.

For 2003, Climate Crafters has changed their 2003 budget to be more in-line with their changing business of contract work. This reflects a more realistic 1000 market driven home certifications for 2003 and 4068 contract homes. For HP/AC certifications it's only Inland Power that is providing measurable numbers.

With the signed contracts and the current trend on the market driven certifications Climate Crafters appears on track to meet their new 2003 budget projections.

In 2003, Climate Crafters hired Brad (Training and QA for turn-key contract work) and Josh (Contract Field Rep/Marketing)

2003 Concerns

Climate Crafters' revenue has moved from being almost solely dependent on Alliance and C&RD money to be dependent on just C&RD money. Climate Crafters is moving resources away from the market driven approach, this is reflected in the drop of home inspections, training, contractor certifications, and eventually renewals. There may be negative impacts from the already trained contractors and utilities.

Recommendations for New Markets and Business

Most manufacturers use Market Development Funds (MDF) to develop their market and channels. How it works -- a percent of money a company gets in sales goes into a fund, this could be 1% to 5%. This money is then used for MDF programs such as education, ads, incentives, and making the industry better. Carmakers use MDF to pay dealers to sell and promote their cars; computer makers provide incentives for stores to sell their computers and for users to buy them. Climate Crafters could develop an MDF-funded program with key industry manufacturers.

Climate Crafters could run a program of education, training, testing, data collection, certifications, and QA that helps their industry. Climate Crafters would partner and get support from equipment manufacturers and trade organizations

The benefits of this program can help Climate Crafters develop additional revenue sources, grow the programs nationwide, bring the manufacturers into the program, and provide another source for education and marketing.

Energy Efficient New Homes

Climate Crafter and the Alliance can develop new home programs to make develop energy efficiency. Energy Star or similar branding can make this program a sales and marketing tool for new home sellers. Realtors have suggested they are interested in ways to better sell and market homes. Washington and Oregon have recently updated their duct sealing requirements for new homes. Additional branding and certifications could create the "Energy Efficient" home.