Performance Tested Comfort Systems/Climate Crafters

Market Progress Evaluation Report, No. 2

prepared by

Gary Smith

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PERFORMANCE TESTED COMFORT SYSTEMS / CLIMATE CRAFTERS

MARKET PROGRESS EVALUATION REPORT #2

Funded By:

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This report is the second of two Market Progress Evaluation Reports on the Northwest Energy Efficiency Alliance's Performance Tested Comfort Systems/Climate Crafters Project prepared by Gary Smith under contract to the Alliance.

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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.

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

The Northwest Energy Efficiency Alliance (the Alliance) is a non-profit corporation supported by electric utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives. These entities work together to make affordable, energy-efficient products and services available in the marketplace.

This is the second of two Market Progress Evaluation Reports (MPERs) assessing the Alliance's *Performance Tested Comfort Systems (PTCS)/ Climate Crafters* project, a region-wide duct sealing and system tune-up training and certification program for contractors that the Alliance supported from January 2001 through December 2003. To complete this evaluation, the following activities were conducted:

+ **Data Analysis**: Program data from Climate Crafters was reviewed, along with manufactured home project data from the Energy Trust of Oregon, Inc. and Conservation & Renewables Discount program data from Bonneville.

+ **Stakeholder Interviews:** Interviews were completed with representatives from the Oregon and Washington Energy Offices, Bonneville Power Administration, the Northwest Power and Conservation Council, the Energy Trust of Oregon, Delta-T, CEE, Climate Crafters Board members and its Executive Director, and Alliance staff.

The *PTCS/Climate Crafters* project *is* an Alliance-funded project established to develop performance testing, retrofitting, and certification of HVAC systems as a viable on-going business for Northwest contractors, and to create a sustained demand for efficient HVAC systems in new and existing homes in Idaho, Montana, Oregon, and Washington. The PTCS/Climate Crafters project received $600,000 over this three-year period for PTCS development and marketing. The market transformation strategy included establishing an independent nonprofit organization, Climate Crafters, that would train and certify contractors to provide and promote residential HVAC services according to the regional PTCS specification. Thus, market transformation by building a self-sustaining PTCS training and certification organization was the original goal of the project.

This report focuses on developments from May 2003, when the first *Market Progress Report* was drafted, through the end of 2003, when the *PTCS/Climate Crafters* project concluded. The report also presents an overview and background of the project as a whole.

A. Program Background

At the end of 2000, when the PTCS project moved from an initial assessment phase to development and implementation, the program theory was established.[1] The program theory was based on creating a non-profit organization to train and certify contractors to provide and promote residential HVAC services according to the PTCS specification, which was developed/agreed to by regional planners. A goal of the project was to encourage homeowners to obtain and procure efficiency services directly from private sector actors without reliance on utility incentives as a market intervention. Increased consumer demand for private sector efficiency services would create the need for more trained and certified contractors and encourage new entrants into the market (contractors who would be trained and certified by Climate Crafters). In the long term, increased consumer demand would lead to greater competition among service providers, reductions in the cost of services, and improved contractor marketing and sales practices. The long-term goal of the project was to create a self-sustaining market for all energy–efficiency HVAC, duct, and weatherization products and services.

Based on the program theory, the following progress indicators were developed:[2]

- Completion of HP/AC diagnostic service specifications, procedures and training curriculum

[1] Taken from: *Market Baseline Evaluation Report No. 2.* Xenergy, December 2000.

[2] Taken from: *First amendment to the Contract between the Alliance and PTCS Inc.* (dba Climate Crafters), December 12, 2001.

- Revision and effective implementation of the business plan for a self-sustaining, self-supporting contractor training and certification program
- A 20% increase (over baseline) in consumer and contractor awareness of the impact of poorly functioning HVAC systems on energy use, comfort, health and safety, and how design, installation and maintenance practices can improve performance
- Market demand among residential customers resulting in certified contractor jobs
- Satisfaction among customers with energy and non-energy benefits of improvements and system certification
- At least 30 contractor firms participating and at least 200 new trained and certified technicians and 50 renewals from the Northwest
- At least 8 new utilities participating
- At least 40% of total revenues for PTCS services from non-Alliance sources
- At least 3000 homes treated (tested and certified/labeled) in 2002

By the end of 2001, an Alliance internal review of PTCS progress made clear the fact that the project was not on track to meet its goals due to significant organizational problems. The lack of progress meant that outside sources of revenue were not coming in. Moreover, much of the Alliance budget had already been spent. It was at this point that the Alliance Board agreed to a revised course of action that restructured the program to include a utility-based resource acquisition component that leveraged Bonneville C&RD funding. Although utility incentives were not part of the original program theory, this new revenue stream allowed Climate Crafters to have another chance to succeed in the market.

After this restructuring, it was agreed that the progress indicators pertaining to consumer demand—the foundation of the market transformation theory—were unrealistic and would be dropped. The

project focus at this point was to deliver results on the remaining progress indicators.

The restructured project was successful in achieving its business plan goals for certified technicians, renewals, participating contractors, participating utilities, homes certified, and revenue, but a market for PTCS services outside of utility contracts for manufactured homes never developed. Because of this, Climate Crafters was not able to develop a sustainable source of revenue to fund its contractor training, certification, and quality assurance operations. The revenue generated from Climate Crafters' utility contracts is proving to be "one-time" revenue, and not sustainable. The end result is that the goal of a self-supporting, self-sustaining organization was not achieved, and the market was not transformed.

B. Restructured Program

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 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. The Alliance, working through Climate Crafters, funded the marketing services along with the development of new marketing materials.

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 *contract approach*, and Climate Crafters found considerable utility interest in it. Under contract, utilities hired Climate Crafters to project-manage duct-sealing pilot projects on manufactured homes. 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 – the original goal of the project.

The Alliance, wanting a check-in and review of the project's progress, commissioned a review of the business model used by Climate Crafters. Results of the review and recommendations were presented to the Climate Crafters Board in December 2002. Key findings from the review included:

- Climate Crafters needs to develop new markets, new business models, and new partnerships for growth into the future;
- Climate Crafters needs to develop and implement a comprehensive marketing plan;
- Climate Crafters needs to hire and better focus its resources; and
- The collection mechanism and process for collection of the $25 home inspection fee is a problem for all parties.

In short, the 2002 Business Model Review concluded that Climate Crafters would need to make major changes in order to become a self-sustaining organization.

A market progress report was prepared for the Alliance in May 2003. Among its findings, that report concluded that several critical market barriers still stood in the way of market acceptance of PTCS services, including:

- Consumers never became aware of PTCS services or its value to them. Thus, they didn't demand these services and had little-to-no willingness to pay for services;
- Contractors knew that there was no consumer demand and equally important, PTCS services were not lucrative for them given the high equipment costs and low potential margin; and
- Utility involvement was of limited value to building consumer market demand because consumers rarely seek utility advice when making decisions about their HVAC systems.[3]

[3] Additional detail pertaining to market barriers is provided at length in *PTCS/CC Market Progress Evaluation Report #1*, September, 2003.

A 2003 update to the Business Model Review (the Update) concluded that although Climate Crafters had dramatically changed its business model to focus on utility energy services contracts, this model was not the sustainable model the Alliance was trying to develop and did not fulfill the vision of a market transformation approach. Key findings included:

- With no homeowner awareness, Climate Crafters appears to have concluded that the market-driven approach will not work and has moved resources away from market-driven efforts. This approach may lead to long-term negative impacts on the program's credibility with the utilities, contractors, and technicians;

- Climate Crafters needs to update its business and financial plans, objectives, and work plans to reflect its revised business model; and

- The Alliance provided a financial crutch, and this dependency kept Climate Crafters from being forced to look for other sources of revenue or new markets. This pattern is repeated with the current business model, which does not appear to be sustainable given it lacks a variety of revenue sources.

Since then, Climate Crafters has continued to provide contractor training, certification, and quality assurance services to utilities and contractors for PTCS duct sealing and heat pump programs. However, there were no broad-based efforts to expand utility and contractor outreach and training services in support of PTCS, as these efforts were suspended to focus instead on delivering results under Climate Crafters' contracting business. In essence, Climate Crafters continued to develop the market for PTCS through utility contracts for turnkey implementation services, where certified contractors were promised a specified number of jobs. All of the contract work is targeted at the existing manufactured home market, while the site-built market remains largely unattended.

C. Climate Crafters 2002-2003 Results

The restructured project was successful in achieving its business plan goals for certified technicians, renewals, participating contractors, participating utilities, homes certified, and revenue over the final two years of the contract (2002-2003). All but one of these goals was achieved in the first year (2002).

However, Climate Crafters failed to achieve what was perhaps the most critical remaining market progress indicator: revision and effective implementation of a business plan for a self-sustaining, self-supporting contractor training and certification program. And the original market progress indicators for increased consumer and contractor awareness, market demand, and customer satisfaction with benefits of PTCS services were never achieved.

The progress indicators and actual performance results for the 2002-2003 period are as follows:

+ PTCS heat pump/air conditioning diagnostic service specifications, procedures, and training curriculum were completed, and later revised per the 2004 RTF regional standards

+ 163 certified contractor firms participating exceeded the goal of 30

+ 255 certified technicians firms participating exceeded the goal of 200

+ 67 contractor certification renewals in 2002, and 195 renewals in 2003 exceeded the annual goal of 50

+ 22 utilities actively participating exceeded the goal of 8

+ 1,988 homes certified in 2002, and 4,462 certified in 2003 exceeded the annual goal of 3,000 over the two-year period

+ 43% of revenues from non-Alliance sources exceeded the goal of 40%

+ Although Climate Crafters did revise its business plan such that it was able to achieve its revised 2002-2003 goals, the new business model was not the sustainable model that the Alliance originally sought.

D. Key Findings

The following are the key findings from the MPER:

1. **Since MPER #1 in May 2003, little progress was made in developing the hoped for self-supporting, self-sustaining contractor training, certification, and quality assurance organization.** The original sources of revenue for Climate Crafters appear to be stagnating. By the end of 2003, there was no year-over-year growth in the number of utilities participating, even during a period that included heavy utility outreach and marketing. Contractor PTCS renewals, and renewal income, are declining year-over-year on a percentage basis as contractors drop out due to the lack of a market for work. Training revenue also dropped as Climate Crafters completed only about half as many classes as in 2002.

   The main problem appears to be that a market for Climate Crafters services, outside of utility contracts for manufactured homes, never developed. Because of this, Climate Crafters was not able to develop a sustainable source of revenue to fund its contractor training, certification, and quality assurance operations. The revenue generated from Climate Crafters' utility contracts is proving to be "one-time" revenue, and not sustainable. The end result is that the hoped for self-supporting, self-sustaining organization was not achieved, and the market not transformed.

2. **Climate Crafters has lost momentum.** Setbacks in its business operation and the loss of potential contract work stemming from increased competition caused the firm to lose momentum, and placed Climate Crafters at a cross-roads once again. Indecision over which business model to pursue, contractor certification organization or energy services contractor, seems to have held Climate Crafters back from aggressively seeking new work.

3. **The revised Alliance progress indicators, though achieved, did not steer Climate Crafters toward its goal of market transformation and sustainability.** Although Climate Crafters met its revised goals for 2002-2003, it was unable to effectively address the original progress indicators pertaining

to homeowner awareness and demand for PTCS services. When the Alliance decided to drop these market progress indicators and focus on short-term performance goals, it effectively relieved Climate Crafters of its responsibility to develop a real market for PTCS services.

4. After most of the two-year progress indicators were achieved in the first year (2002), it may have been beneficial for them to be reformulated for 2003. Because they were not, they proved little use in guiding Climate Crafters to develop the self-supporting, self-sustaining model the Alliance wanted. However, as a practical matter, it was probably too late anyway, as nearly 90% of the contract budget had already been spent.

5. **As of the writing of this report, Climate Crafters has been weak on Quality Assurance.** While doing a better job of supporting QA on its utility contracts, Climate Crafters has somehow avoided this work on behalf of its utility customers, all under the market-driven program where the certification fee of $25 is not enough to cover the cost of QA. Thirteen utilities have received no QA services, eight of them with substantial numbers of PTCS certifications. For the QA work completed, the results were reported to be fairly positive, but timely feedback to utilities and contractors was a concern. On a related matter, Bonneville voiced concerns over conflicts of interest arising out of Climate Crafters or utilities performing QA inspections on their own work. Because of concerns over this issue, the RTF has established a sub-committee to draft a new regional guideline to ensure independent third-party QA inspections.

6. **Recent changes by the RTF have opened up the market to other PTCS providers, challenging Climate Crafters' role as the primary certification organization in the region.** Although the RTF reaffirmed that Climate Crafters PTCS certification was still required, it opened the door to other providers if they were deemed "equivalent." As a result, new competitors for these services are now entering the market, appear to be having success winning new work, and are increasing the chances PTCS standards will take root in the market.

7. **National efforts to improve the quality of HVAC installations, though still in the early stages, appear to be gathering momentum.** Two different national groups, the EPA (with its industry partners) and the Consortium for Energy Efficiency (CEE; with utility partners), are now working with other stakeholders and appear to be drawing closer together to offer a national coordinated solution to the problem of building consumer demand for quality installations. The Alliance and Climate Crafters sit on both committees to provide the Northwest perspective, and stay abreast of new market developments, but it is too early to predict what impact, if any, these efforts will have on the regional marketplace.

E. Conclusions

The following conclusions are based on the discussions with those interviewed, a review of various program-related documentation, and the key findings from this MPER:

1. **A market for PTCS never developed.** There is no true functioning market for PTCS duct sealing services, outside of utility contracts for manufactured homes, due to the Climate Crafters' organizational issues and critical market barriers discussed above. Climate Crafters was not able to develop a sufficient and sustainable source of revenue to fund its contractor training, certification, and quality assurance operations. The result is that the hoped for self-supporting, self-sustaining organization was not achieved, and the market not transformed.

2. **Climate Crafters future appears uncertain**. Unless a market develops for its services, or Climate Crafters is plugged into more utility programs, the future of the organization is uncertain. With its contract work, Climate Crafters is only fulfilling a very specific need in the market, but it is not clear if that business model can be sustained.

F. Recommendations

The Alliance should:

1. **Continue to focus on development of the new regional ENERGY STAR® new construction program to drive the energy efficient HVAC market**. It may take some time, but progress made in developing this market may have a side benefit of raising awareness and interest in energy efficient ductwork on the part of consumers and HVAC contractors, which could cross-over to the existing/retro home market.

2. **Continue to stay abreast of and participate in national efforts to promote quality HVAC installations** spearheaded by EPA's ENERGY STAR® HVAC Partners and CEE's Residential HVAC committee.

Climate Crafters should:

1. **Work through its business planning process to resolve indecision over which business model to pursue**, energy services company or training, certification and quality assurance organization. Related to this, Climate Crafters should update its business and marketing plans to reflect the changes to its business model, and fully utilize the business consultant to assist in this process.

2. **Work more aggressively at developing other sustainable sources of revenue**. It appears the utility contract channel targeting manufactured home duct sealing has slowed somewhat, and replacement revenue must be found. Potential business opportunities may exist in partnering with entities taking the lead on the new regional ENERGY STAR® new construction program, such as the PMC or the states. Also, Climate Crafters has a significant base of certified contractors. It should seek ways to leverage that base to develop new revenue streams.

3. **Continue to support the national efforts and organizations working to improve the quality of HVAC installations, and look for the business opportunities presented**.

4. **Consider changes to resolve conflicts of interest at the board level that have hindered development of the organization**. The board could benefit from HVAC industry representation.

5. **Commit to regular and more frequent customer communications to utility and contractor allies to add value for fees collected**.

1. INTRODUCTION AND BACKGROUND

The Northwest Energy Efficiency Alliance (the Alliance) is a non-profit corporation supported by electric utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives. These entities work together to make affordable, energy-efficient products and services available in the marketplace.

This is the second of two Market Progress Evaluation Reports (MPERs) assessing the Alliance's *Performance Tested Comfort Systems (PTCS)/Climate Crafters* project, a region-wide duct sealing and system tune-up training and certification program for contractors.

The report is divided into six 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 program's progress. *Chapter 3* updates the market for PTCS. *Chapter 4* presents an update on the Climate Crafters business model. *Chapter 5* discusses recommended changes to the Alliance's ACE cost effectiveness model assumptions for PTCS. And finally, *Chapter 6* presents key findings, conclusions, and recommendations.

A. Program Background

Following several years of developmental research in the late 1990s,[4] the Alliance established and funded 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:

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

+ Independent third-party certification of contractors

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

+ Regional coordinated quality assurance and quality control

+ A market-supported PTCS organization

+ Independent delivery of services by contractors

The program theory was based on creating a non-profit organization, Climate Crafters, to train and certify contractors to provide and promote residential HVAC services according to the PTCS specification, which was developed/agreed to by regional planners. A goal of the project was to encourage customers to obtain and procure efficiency services directly from private sector actors without reliance on utility incentives as a market intervention. Increased consumer demand for private sector efficiency services would create the need for more trained and certified contractors and encourage new entrants into the market (contractors who would be trained and certified by Climate Crafters). In the long term, increased consumer demand would lead to greater competition among service providers, reductions in the cost of services, and improved contractor marketing and sales practices. The long-term goal of the project was to create a self-sustaining market for all energy–efficiency HVAC, duct, and weatherization products and services.

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 market and deliver PTCS services to residential homeowners. To fund the organization, contractors would be charged fees for training, certification, renewals, and home certifications. Market transformation and building a self-sustaining PTCS organization were the original core goals of the PTCS project.

The following progress indicators were developed:[5]

[5] Taken from: *First amendment to the Contract between the Alliance and PTCS Inc.* (dba Climate Crafters), December 12, 2001.

- Completion of HP/AC diagnostic service specifications, procedures and training curriculum
- Revision and effective implementation of the business plan for a self-sustaining, self-supporting contractor training and certification program
- A 20% increase (over baseline) in consumer and contractor awareness of the impact of poorly functioning HVAC systems on energy use, comfort, health and safety, and how design, installation and maintenance practices can improve performance
- Market demand among residential customers resulting in certified contractor jobs
- Satisfaction among customers with energy and non-energy benefits of improvements and system certification
- At least 30 contractor firms participating and at least 200 new trained and certified technicians and 50 renewals from the Northwest
- At least 8 new utilities participating
- At least 40% of total revenues for PTCS services from non-Alliance sources
- At least 3000 homes treated (tested and certified/labeled) in 2002

By the end of 2001, an Alliance internal review of PTCS progress made clear the fact that the project was not on track to meet its goals due to significant organizational problems. The lack of progress meant that outside sources of revenue were not coming in. Moreover, much of the Alliance budget had already been spent. It was at this point that the Alliance Board agreed to a revised course of action that restructured the program to include a utility-based resource acquisition component that leveraged Bonneville C&RD funding. Although utility incentives were not part of the original program theory, this new revenue stream allowed Climate Crafters to have another chance to succeed in the market.

After this restructuring, it was agreed that the progress indicators pertaining to consumer demand—the foundation of the market

transformation theory—were unrealistic and would be dropped. Although Climate Crafters management wanted to continue efforts to build consumer demand, the Program focus at this point was to deliver results on the remaining progress indicators.

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.

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 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. The Alliance funded these marketing services along with the development of new marketing materials.

Climate Crafters training included a 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). A third training session, *Heat Pump System Design* (Manuals D, J, and S) was added later.

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

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 *contract approach*, and Climate Crafters found considerable utility interest in it. Under contract, utilities hired Climate Crafters to project-manage duct-sealing pilot projects on manufactured homes. The work and contract revenue was very important to Climate Crafters because it came at a time when start-up funding from the Alliance was nearly exhausted.

Climate Crafters was successful at meeting its performance measures for numbers of homes and numbers of contractors' certified. However, 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 – the original goal of the project. The utility contract approach was insufficient for market development 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.

B. Business Planning and Market Progress Report

Climate Crafters developed a second business and marketing plan in 2002, later adopted in 2003. The Alliance, wanting a check-in and assessment of the project's progress, commissioned a review of the business model used by Climate Crafters. Results of the review and recommendations were presented to the Climate Crafters Board in December 2002. A market progress report was prepared for the Alliance in May 2003, which included consumer, manufacturer, utility, and contractor research, as well as an update to the business model review.

This MPER updates the results from May 2003, when MPER#1 was drafted, until the end of 2003, when the contract between the Alliance and Climate Crafters ended.

1. INTRODUCTION AND BACKGROUND

2. EVALUATION APPROACH AND PROGRESS INDICATORS

A. Evaluation Approach

The scope of this evaluation is to document what happened in the market for PTCS and Climate Crafters over the last half of 2003 by examining pertinent program and market data, and discussing program accomplishments and challenges with regional stakeholders. The following activities were conducted:

+ **Data Analysis**: Program data from Climate Crafters was reviewed, along with manufactured home project data from the Energy Trust, and *Conservation and Renewables Discount* program data from Bonneville.

+ **Stakeholder Interviews:** Interviews were completed with representatives from the Oregon and Washington Energy Offices, the Bonneville Power Administration, the Northwest Power and Conservation Council, the Energy Trust of Oregon, Delta-T, Climate Crafters Board members and its Executive Director, and Alliance staff.

B. Progress Indicators

The Alliance's amended 2002-2003 contract with Climate Crafters for PTCS development and marketing established criteria to determine program progress. Six two-year and two annual progress indicators were established. Climate Crafters' program data was used to compare actual performance against these indicators. The following were examined:

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

+ Revision and effective implementation of a business plan for a self-sustaining, self-supporting contractor training and certification program

+ 30 certified contractor firms participating

+ 200 certified technicians
+ 50 contractor certification renewals annually
+ 8 utilities actively participating
+ 3,000 homes certified annually
+ 40% of total revenues from non-alliance sources

C. Results of Performance – Actual vs. Goal

The restructured project was successful in achieving its business plan goals for certified technicians, renewals, participating contractors, participating utilities, homes certified, and revenue over the final two years of the contract (2002-2003). All but one of these goals was achieved in the first year (2002).

However, Climate Crafters was unable to achieve what was perhaps the most critical remaining market progress indicator: revision and effective implementation of a business plan for a self-sustaining, self-supporting contractor training and certification program. And the original market progress indicators for increased consumer and contractor awareness, market demand, and customer satisfaction with benefits of PTCS services were never achieved.

Progress indicators and actual performance results are described below.

Development of Specifications, Procedures and Curriculum

Climate Crafters successfully developed and completed its heat pump diagnostic service specifications, procedures, and training curriculum. As changes were made to the FY-2004 regional standards for PTCS at the RTF, Climate Crafters reported it revised and updated its specifications, procedures, and training materials and curriculum. – ***Goal Achieved***.

Revision and Effective Implementation of Business Plan for a Self-Sustaining, Self-Supporting Contractor Training and Certification Program

A revised business plan for Climate Crafters was developed in late-2002. Updates, primarily incorporating changes to the financial plan, were made the first half of 2003, and the document finally approved by the Board in June 2003. Although the business plan was revised, it did not adequately address market development or provide a path to a sustainable, self-supporting organization. ***–Goal Not Achieved***

Number of Certified Contractors and Technicians Participating

Table 1: Number of Certified Contractors and Technicians Participating – *Goal Achieved*

CRITERIA	ACTUAL	TWO-YEAR GOAL
CONTRACTOR FIRMS	163	30
TECHNICIANS	255	200

With 163 total contractor firms (50 heat pump, 113 residential air distribution system – RADS) participating as of end-of-year 2003, Climate Crafters met this goal, successfully in adding 12 new firms in 2003 (off a base of 151 firms at year-end 2002). Climate Crafters certified 60 new technicians in 2003 (22 heat pump, 38 RADS), and when combined with the 195 existing technicians (62 heat pump, 133 RADS), the number totaled 255 certified technicians, and the goal was met. Climate Crafters also certified 15 PTCS utility technicians not included in the totals.

Climate Crafters *2003 Business Plan* budget goal calling for 300 new and renewal techs was not met.

Number of Contractor Certification (Technician) Renewals

Table 2: Number of Contractor Certification (Technician) Renewals – *Goal Achieved*

CRITERIA	ACTUAL	TWO-YEAR GOAL
RENEWALS IN 2002	67	50
RENEWALS IN 2003	195	50

Climate Crafters reported renewal rates of 75% for 2002, and 60% for 2003, exceeding the company's expectations. The annual goal was achieved each year. The situation is that technicians without work are not renewing, while others seem to be waiting to see what develops with Climate Crafters certifications for the new construction program.

Number of Utilities Actively Participating in Program

Table 3: Number of Utilities Actively Participating in 2002 – *Goal Achieved*

CRITERIA	ACTUAL	TWO-YEAR GOAL
UTILITIES PARTICIPATING	22	8

Of the 60 utilities Climate Crafters reported on its contact list of those eligible, 26 participated during the 2002-2003 period, thus achieving this goal. For 2003 activity, 10 were new participants, 4 carried over from 2002, and 8 were under a contracting relationship with Climate Crafters for manufactured homes duct sealing services. Four utilities from the 2002 list did not process any certifications through Climate Crafters in 2003.

Number of Homes Certified

Table 4: Number of Homes Certified – *Goal Achieved*

CRITERIA	ACTUAL	TWO-YEAR GOAL
HOMES CERTIFIED IN 2002	1,988	3,000
HOMES CERTIFIED IN 2003	4,462	3,000

After missing its goal in 2002, Climate Crafters achieved the annual goal in 2003, and effectively made up for the 2002 shortfall.

When Climate Crafters adjusted its *2003 Business Plan* budget projections to be more in-line with its growing contract business, it planned for 4,068 contract certifications, and 1,000 non-contract certifications (combination of RADS, and HP certifications). Actual results were 3,529 contract units and 933 non-contract units. Climate Crafters certified 4,037 RADS

homes, and 425 heat pumps in 2003. Nearly all the heat pumps were located within the greater Spokane area.

Percent of Non-Alliance Revenue

Table 5: Percent of Total Revenue that is Non Alliance – *Goal Achieved*

CRITERIA	ACTUAL	TWO-YEAR GOAL
NON-ALLIANCE REVENUE	43%	Must Exceed 40%

Climate Crafters reported this financial result in its final monthly progress report to the Alliance (December 2003). It achieved this goal.

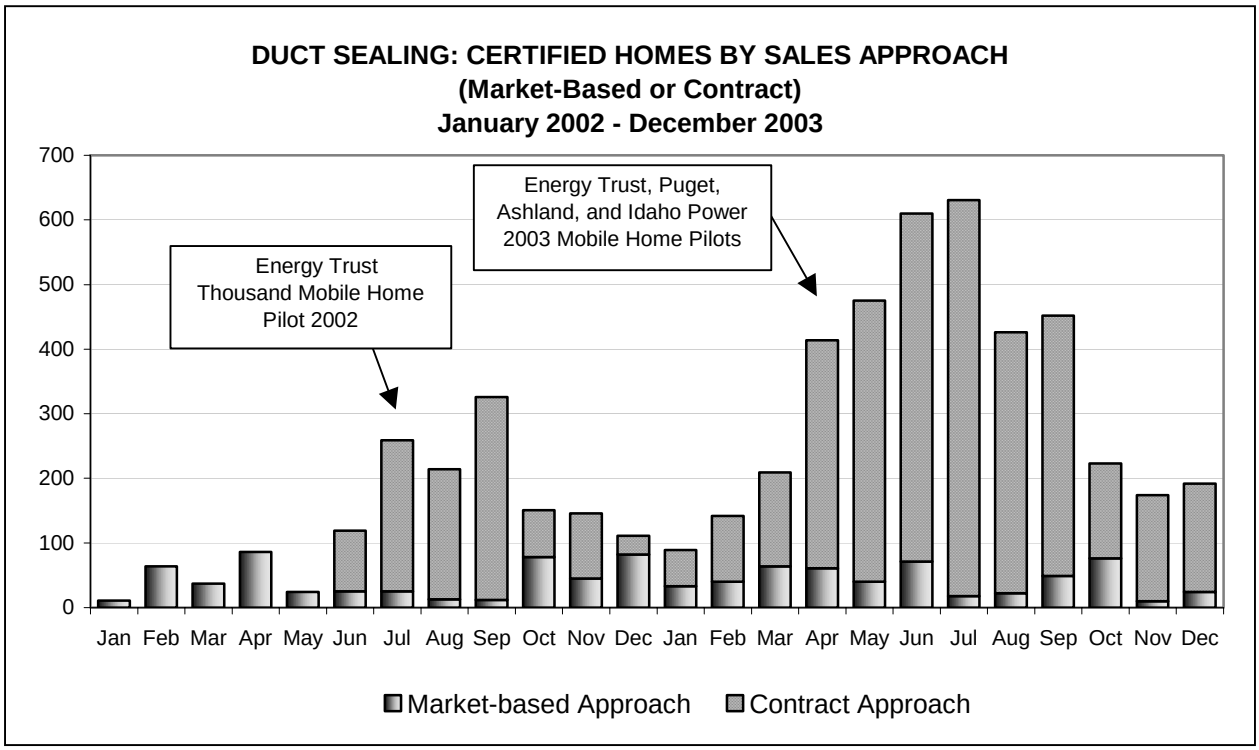
Other Indicators of Progress

While Climate Crafters was successful at achieving the goals listed above, other indicators of progress reveal a stagnant market.

D. 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 manufactured home services. *Figure 1* shows the results of these approaches over the entire span of the program. Program volume has been very dependent on the utility contract work, especially the manufactured home duct sealing projects sponsored by the Energy Trust of Oregon, which represented nearly half of all certifications to date. Work performed by other PTCS-trained contractors, outside of utility contract programs, has not grown, reflecting stagnation of the channel as Climate Crafters moved on to support other more lucrative contract work.

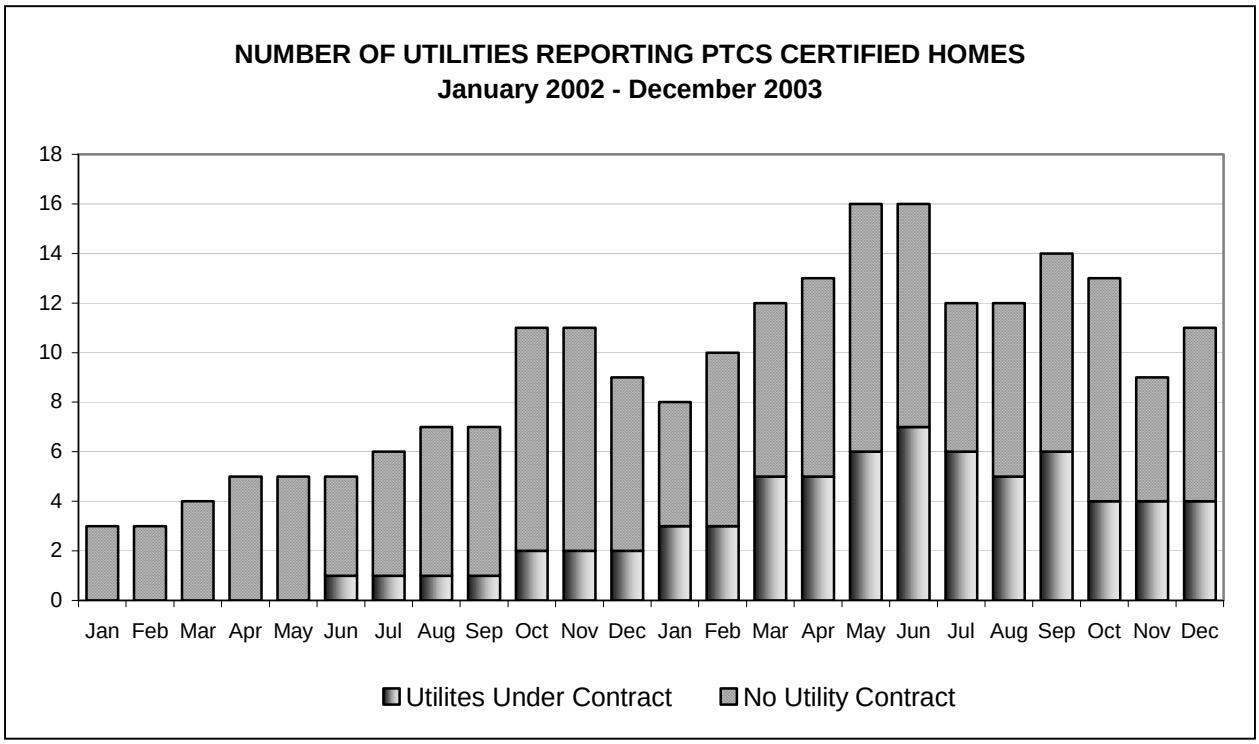
Figure 1: Number of Certified Homes by Sales Approach, 2002-2003



E. Number of Utilities Reporting PTCS Certified Homes

Figure 2 shows illustrates the emergence of Climate Crafters utility contract work, and stagnation of the overall market for PTCS, as the number of utilities reporting PTCS certified homes was about the same at the end of 2003, as it was at the end of 2002.

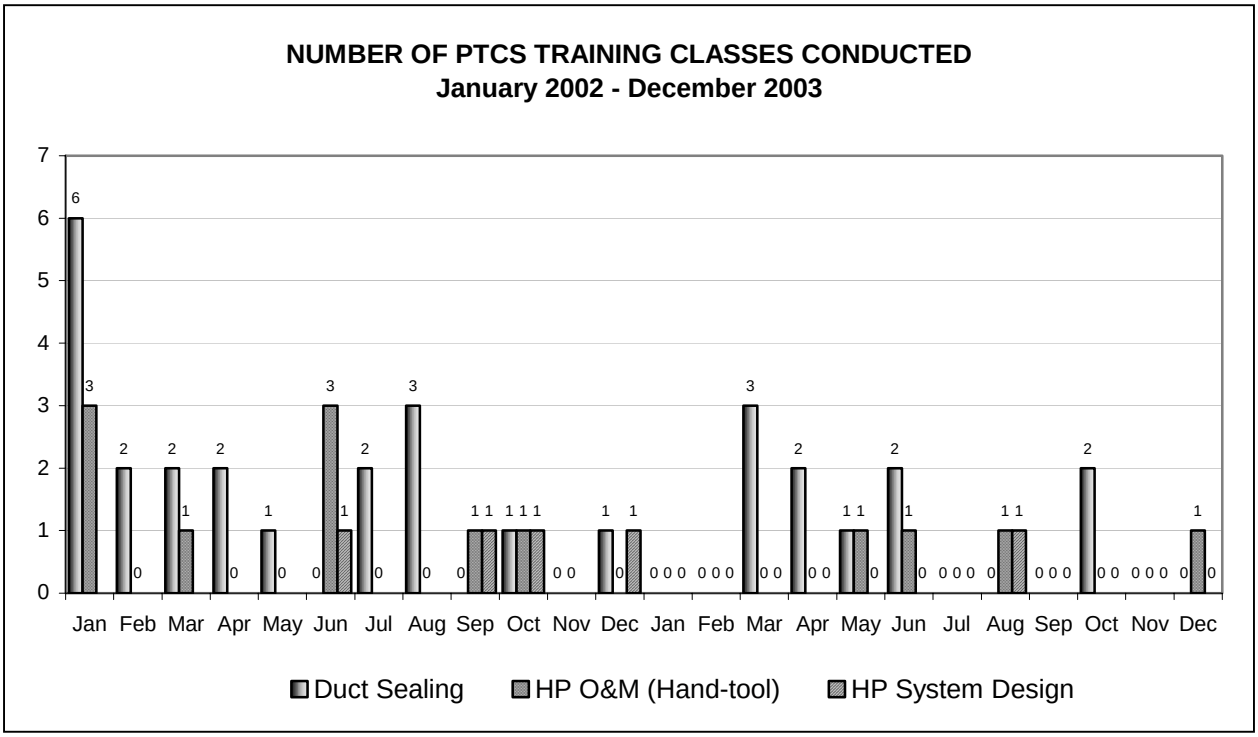
Figure 2: Number of Utilities Reporting PTCS Certified Homes, 2002-2003



F. Number of Training Classes Conducted

Climate Crafters continued to sponsor training sessions in 2003, but completed only about half as many classes as in 2002. The *2003 Business Plan* budget projections called for 30 classes (15 RADS, 15 heat pump). In 2003, Climate Crafters actually completed 10 RADS classes, four heat pump commissioning classes, and one Air Conditioning Contractors of America (ACCA) Manuals D, J & S class. Six classes were conducted in the last half of 2003. The drop-off was primarily due to the change in business model to pursue utility contract work. *(See Figure 3.)*

Figure 3: Number of PTCS Training Classes Conducted, 2002-2003



G. Summary

To Climate Crafters credit, it was successful in achieving its business plan goals for certified technicians, renewals, participating contractors, participating utilities, homes certified, and revenue set out in its two-year contract with the Alliance. However, this success masked difficulties in a number of areas. Development of the market-driven channel slowed to a halt, as Climate Crafters shifted resources away from contractor and utility outreach and training to address the demands of its contracting business, focused on manufactured homes. The number of utilities participating is the same now as it was one year ago, reflecting a stagnating market. Renewals, though exceeding expectations, are declining year-over-year, on a percentage basis, as contractors drop out due to the lack of a market for work.

3. UPDATE ON THE MARKET FOR PTCS

This chapter provides an update on the status of the market for PTCS. The primary focus is on the period following the draft of MPER #1 in May 2003, through year-end 2003.

A. Market Structure and Role of Climate Crafters

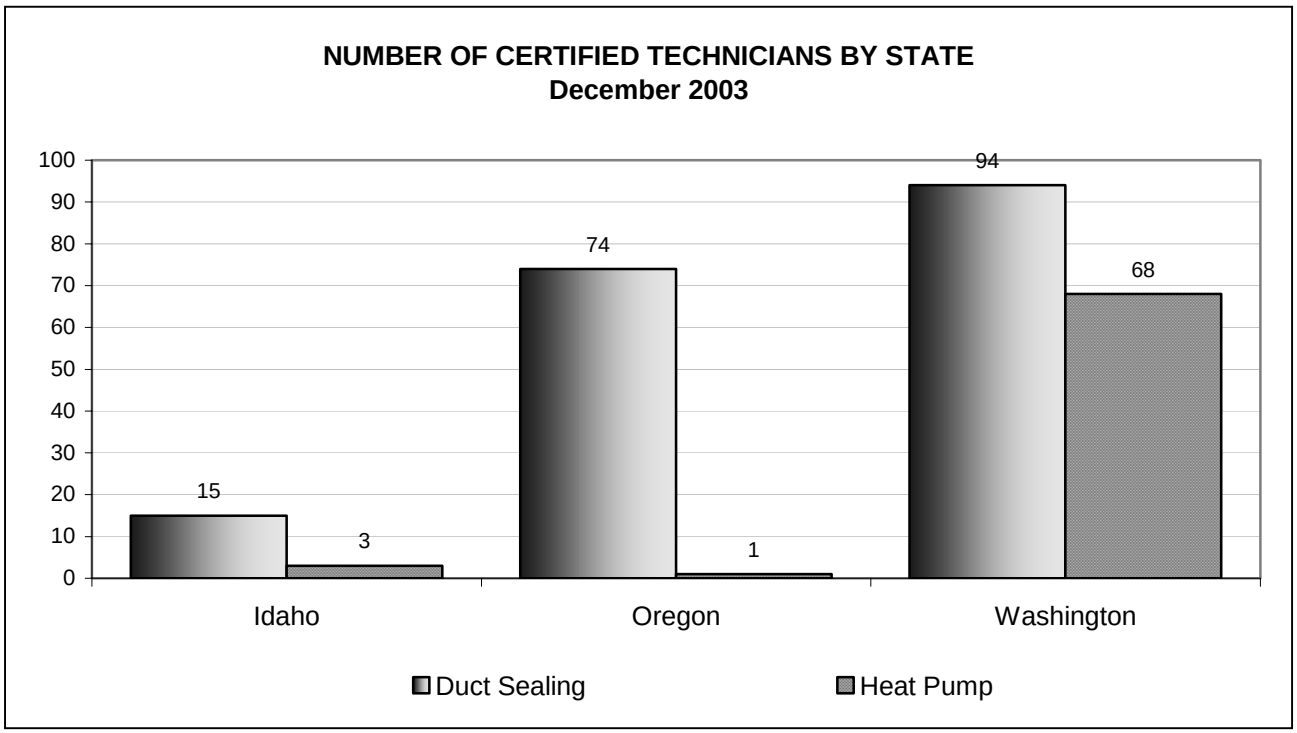
Climate Crafters, under contract to the Alliance for PTCS development and marketing through 2003, continued to provide contractor training, certification, and quality assurance services to utilities and contractors for PTCS duct sealing and heat pump programs during the latter half of 2003. However, there were no broad-based efforts to expand utility and contractor outreach and training services in support of PTCS, as these efforts were suspended to instead focus on delivering results under Climate Crafters contracting business. As noted in MPER #1, Climate Crafters abandoned development of the market-driven channel because of the absence of consumer demand and real work for certified contractors. Instead, Climate Crafters continued to develop the market for PTCS through utility contracts for turnkey implementation services, where certified contractors were promised a specified number of jobs. All of the contract work is targeted at the existing manufactured home market, while the site-built market remains largely unattended.

For the past year, the market for PTCS consisted of 22 utilities promoting the service. However, only 13 utilities processed PTCS certifications in the fourth quarter of 2003, reflecting a decrease in program momentum. About 90% of PTCS certification volume originated from eight utility contracts, reflecting Climate Crafters shift to that business model. Much of the work is localized to IOU territory in Oregon, Washington, and Idaho. The other 10% of certifications come from 14 public utilities operating programs that are more market-based. Utility incentives for PTCS duct sealing range from $200 to $500 per home, but several utilities in Oregon offer the service for free, as does the Energy Trust program. PTCS heat pump commissioning incentives run about $200 per home.

Climate Crafters counted 255 certified and trained PTCS technicians at the end of 2003. Seventy-six technicians from the prior year dropped out, as they quit their jobs, or otherwise failed to renew. *Figure 4* shows the regional distribution of the PTCS technicians. About one-third (57 of 183) of duct sealing technicians are located east of the Cascades, as are the

bulk of the heat pump technicians (>90%), with most residing near the greater Spokane area.

Figure 4: Number of Certified Technicians by State, 2003



The Climate Crafters/PTCS role and presence in Oregon diminished when its involvement as a contractor in the Energy Trust manufactured home duct-sealing program in Oregon was terminated in the fourth quarter of 2003. Services for that contract are now provided entirely by Ecos Consulting. Duct sealing in Oregon extends beyond the Trust's program for manufactured homes, as services reach the site-built market as well, supported by other utilities, the Oregon Department of Energy (ODOE), and Oregon's Residential Energy Tax Credit program.[6]

[6] The ODOE website lists about 70 duct sealing contractors, and 60 heat pump contractors it has certified as either premium efficiency duct system technicians, or certified diagnostic technicians. With some exceptions, certifications generally do not flow through Climate Crafters and are not reported in Climate Crafters tallies.

B. Quality Assurance

Quality assurance inspections, originally designed to be the feedback loop for ensuring the quality of PTCS in the marketplace, were one aspect of Climate Crafters services that received considerable attention during the period. Climate Crafters reported a total of 333 inspections completed program-to-date through 2003, but 197 of these were completed this past summer in support of the Energy Trust program. Originally, the PTCS QA protocol called for 15% inspections of all certified homes to provide sufficient feedback to program planners and contractors. However, several Climate Crafters contracts required fewer QA inspections (5%, or 10%). Through 2003, Climate Crafters completed QA inspections on only 5.9% of certified homes (333 of 5,061). Inspections were conducted for 12 of 25 utilities (although only 19 of these had 10 or more PTCS certified homes). Seven of the 12 utilities receiving inspections were under utility manufactured home contracts. Thirteen utilities received no QA services at all, even though they represented over 780 PTCS certifications. Climate Crafters indicated it working to eliminate this backlog.

Climate Crafters also relied heavily on contract employees to perform the QA inspections. These contractors generally found results to be positive, but indicated more timely communication of the QA inspection results back to the utilities and contractors was important and needed addressing in order to strengthen the overall program.

Regional energy planners at the RTF and Climate Crafters have struggled over the issue of what constitutes independent third-party QA inspections, arguing that Climate Crafters is not at-arms-length if it hires and pays for QA under its own contract work. Although internal procedures were changed at Climate Crafters to address this, the RTF has established a subcommittee to draft a new regional guideline.

The ODOE reported tax credit applications on 500-600 duct sealing jobs, and roughly 200 heat pump commissioning jobs, and noted a considerable number of these were in site built housing.

C. Competition Encouraged by the RTF

Recent changes at the RTF opened up the market for PTCS training and certifications to other service providers, beyond Climate Crafters.[7] This new competition is now entering the market, and several organizations appear set to become PTCS training and certifying organizations in their respective market areas. Ecos was successful at winning the Idaho Power manufactured home contract, and PECI/CSG was awarded the new construction PMC contract for the Energy Trust and the Alliance. Neither organization is presently teaming with Climate Crafters.

D. C&RD Reported Market Activity

Bonneville's C&RD data contains significant details about the market for PTCS.

For FY-2003, Bonneville tallied 1,181 PTCS duct-sealing installations reported by utilities under the program. Of these, 399 were on site-built homes upgrading to a heat pump, while 206 were on manufactured homes upgrading to a heat pump; 54 were on site-built homes with forced-air furnaces, and 522 were on manufactured homes with forced-air furnaces. Overall, PTCS duct sealing certifications were about evenly split between homes with forced-air furnaces (576) and those with heat pumps (605).

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[7] The Alliance turned over ownership of the PTCS trademark to the RTF in March 2003, with the understanding that anyone could become a PTCS provider, as long as they were approved by the RTF. When the RTF changed some policies on PTCS for FY-2004, it reaffirmed that Climate Crafters Certification, or the equivalent, was required, and all PTCS RADS jobs claimed under the C&RD must be certified by Climate Crafters, or an RTF-determined equivalent. Third-party QA certification was also reaffirmed as part of the PTCS specification to qualify jobs for a larger C&RD credit. The RTF also redefined its technical specifications on heat pumps to designate the "PTCS Specification" as including PTCS duct sealing, PTCS commissioning and higher level controls than the lower level "RTF specification," which is the minimum specification allowed for the C&RD. The RTF specification requires mastic on accessible ductwork, but no pressure test. It merely recommends PTCS commissioning, not requires it, and no QC or QA is required, as it is for the PTCS Specification. According to BPA C&RD records, no contractors appear to be installing heat pumps at the higher level PTCS Specification, which would enable utilities to claim the slightly higher C&RD credit (6-9% higher), than the lower level RTF specification. As a practical matter, it does not appear that the PTCS heat pump specification will make an impact on the existing home market, although it is possible that it may be required as an element of the new Northwest ENERGY STAR® new construction program.

About two-thirds of duct sealing jobs (728) were reported completed on manufactured homes, and one-third (453) on site-built. Nearly one-third of heat pumps (605 of 1967) were reported installed with PTCS duct sealing in FY-2003 (an improvement over the 14% in FY-2002).

E. National Efforts

EPA's ENERGY STAR® HVAC Partners and Consortium for Energy Efficiency's (CEE) Residential HVAC Committee are both working on a national coordinated solution to the problem of building consumer demand for quality HVAC installations. The EPA working group, comprised primarily of industry partners – manufacturers, Building Performance Institute (BPI), North American Technician Excellence (NATE),[8] ACCA, and Refrigeration Service Engineers Society (RSES) –is presently clarifying its objectives and charter. The working group appears intent on leveraging its brand and messaging to encourage HVAC technicians to use good practices to make quality installations, but without certifying contractors or installations as ENERGY STAR®.

The CEE working group, with primarily utility members, state energy offices and regional and national energy efficiency organizations, is working to set a quality installation specification for HVAC that its

[8] Until recently there was no single, industry accepted technician testing and certification organization. However, North American Technician Excellence (NATE), has emerged as a leading technician certification organization and receives broad industry and efficiency program support. NATE, begun in 1997, is the result of an industry-wide effort to create an independent, voluntary, technician certification program. NATE is now working with the efficiency community to develop an *Energy Efficiency Specialty Test* that will allow technicians to demonstrate expertise in the design and installation of high-efficiency HVAC systems.

members would support in their programs. Working closely with ENERGY STAR®, CEE plans to begin developing a draft working model that details market knowledge and identifies opportunities for stakeholders to impact quality installations. Alliance staff and Climate Crafters continue to represent the Northwest at the national meetings of both EPA and CEE to stay abreast of recent developments.

4. CLIMATE CRAFTERS REVIEW

The Alliance commissioned a *Business Model Review* as part of the evaluation of Climate Crafters/PTCS. A small business consultant conducted this review and presented results to the Climate Crafters Board in December 2002. This work was updated in May 2003, for MPER #1, when the consultant was asked to check-in and report on the progress made.

A. Findings from the May 2003 Update to the Business Model Review

Following are the key findings from the second review:

1. **Climate Crafters dramatically changed its business model in late 2002. T**he new model focused more on pursuing new contract revenue from utilities rather than market-driven revenue from contractor training, certification, and quality assurance. The change in business models appeared to be related to the deteriorating market-driven business model, and market-driven barriers to success (e.g., no consumer demand, and therefore no work for trained contractors), but was also related to the exhaustion of seed money from the Alliance. Although the contract approach appeared lucrative, it was not the sustainable model the Alliance was trying to develop, and it did not fulfill the vision of a market transformation approach.

2. **With no homeowner awareness, Climate Crafters appeared to have concluded that the market-driven approach would not work.** Climate Crafters had to shift resources away from the market-driven approach to satisfy demands of its growing contract commitments. This was reflected in the diminished number of training sessions, reduced projections for non-contract home certifications, and failure to hire or maintain resources in this area. The new approach may have negatively impacted the program's creditability with the utilities, contractors, and technicians.

3. **Climate Crafters needed to update its business and financial plans, objectives, and work plans to reflect the changes to its business**. The change in the business model

may have successes, but making major, strategic changes such as this should have been done with a business planning process that included a situation analysis, a SWOT (Strengths-Weaknesses-Opportunities-and-Threats) exercise, objectives developed, 3+ year financial planning, and documentation of a new business plan. Through the first half of 2003, there was only a limited financial plan developed.

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 was repeated with the current business model, which does not appear to be sustainable, given it lacks multiple sources of revenue.

B. Review of Climate Crafters Business Model for the Second Half of 2003

As part of this MPER, evaluation staff was asked to check-in with Climate Crafters for an update on its business model. Following are key findings from this review:

1. **A market for PTCS duct sealing and heat pump commissioning services never developed, outside of utility contracts for manufactured homes.** As a result, the hoped for self-supporting, self-sustaining training and certification organization was not achieved. However, the contract business was lucrative and allowed Climate Crafters to continue to support a handful of utilities in its original function as the region's primary PTCS certification and quality assurance organization for the existing home market.

2. **After a strong 2003, a rapidly changing energy efficiency marketplace found Climate Crafters at a crossroads once again, and considering another major change to its business model.** Climate Crafters certified over 4,000 homes in 2003, and met its goal. But a series of setbacks arose late in the year which were troubling, such as the loss of key board members,

staff, utility contracts, and RFPs. So far, in 2004 Climate Crafters appears on the verge of being left out of the new regional efforts to launch a Northwest ENERGY STAR® new construction program, although Climate Crafters did assist the Alliance with its pre-launch Quick-Start pilots.

The setbacks have caused Climate Crafters and its board to seriously re-examine the role it is best suited to play in the rapidly changing Northwest energy efficiency marketplace. To accomplish this, some of the business planning processes recommended in last year's Business Model Review, such as performing a SWOT analysis have been performed. But, the organization has had difficulty revising its business plan and has struggled with the decision on whether to remain a PTCS certifying organization or continue to pursue the more lucrative ESCO contract market. To assist the Executive Director and Board with organizational development and business planning, the Alliance funded another business consultant in 2003 and 2004.

3. **Climate Crafters' contract work, representing nearly 90% of its program volume from duct sealing, has significantly diminished over the past few months, and the organization appears to have lost momentum.** Several contracts concluded at the end of 2003, and did not renew. RFPs for new work were bid on, but not awarded to Climate Crafters, and the Energy Trust contract was severed prior to the fourth quarter 2003. Indecision about its role in the region going-forward appears to be holding Climate Crafters back from aggressively pursuing new utility contract work.

4. **For the first time, Climate Crafters has competition, which has adversely impacted the company's ability to win new work.** Where Climate Crafters was once the sole provider of PTCS services, it now has competition. New and larger organizations, with considerable resources, are entering the market to compete with Climate Crafters for the remaining work. Some utilities also appear to want a role in which they compete with Climate Crafters. So far, these organizations appear to be having success.

5. **Climate Crafters suffered under conflicts of interest at the board level, and these conflicts made navigating the new, more competitive business environment in the region more difficult.** These conflicts were pointed out in the first Business Model Review, but were never resolved, as recommended. Ultimately, Climate Crafters ended up competing with organizations who had employees sitting on its very own board. Climate Crafters was not served well by these conflicts, and should have moved to resolve them back in 2002.

5. COST EFFECTIVENESS OF THE PTCS/ CLIMATE CRAFTERS PROGRAM

This chapter of the report presents a brief review of the latest Alliance cost-effectiveness analysis for the *PTCS/Climate Crafters Program*, and includes summary pages from the analysis.

A. Review of Changes Made to the Old Model by the Alliance

The most recent review of the Alliance PTCS cost-effectiveness analysis ACE model was documented in MPER #1 (September 2003). In the report, it was suggested the Alliance consider improvements to a number of assumptions in the model to better reflect program results. Since then, the Alliance updated its model to reflect some suggested changes, which included:

+ Incorporating the actual units completed in 2002, and Climate Crafters contract commitments for 2003.

+ Weighting manufactured homes more heavily in the model to reflect actual market activity and ramp to 75%.

Several changes that were recommended to the model, but which were not made, included:

+ **Updating the model to correct for heat pump commissioning projections.** Upon further review, it appears the model already incorporates commissioning savings into 100% of heat pump replacements. As this component of PTCS has been slower to fully develop, the model may overstate savings on projections of heat pump units installed prior to the October 2003 RTF requirement for commissioning. For example, for 2003, Climate Crafters reported 425 PTCS heat pump installs (per Manuals D, J & S), but only 26 were commissioned.

+ **Adding PTCS projections for new construction**. The model was not designed or intended to account for growth in the market, and therefore new construction projections need not be

incorporated. The model is based on the existing market (1998 housing stock), and reflects a 5% annual replacement rate of equipment, which translates into 38,028 market units per year.

+ **Using RTF assumptions for costs and savings for PTCS**. Alliance staff considered this recommendation, but decided against the update. The original cost and savings assumptions, developed by the Tom Eckman, still appear reasonable.

The key results from the model are presented at the end of this chapter and include the following projections:

+ $2.1 million in Alliance funding will leverage nearly $40 million in efficiency investments in the region.

+ By 2010, over 15 aMW of electrical energy savings will be realized annually within the region because of these investments.

B. Review of the New Model

The cost effectiveness assumptions and inputs contained in the new model *Cost Effectiveness Summary for Ducts/PTCS (MPER#1 9/2003) Lower Growth* were reviewed as part of this MPER. The following are main points for the Alliance to consider for the next update of the ACE model:

1. **Actual program results from 2002 and 2003 should be incorporated into the model**. Reconciled data from 2002 showed 1,912 PTCS certifications, including 1,482 PTCS duct sealing jobs and 430 heat pumps. For 2003, 425 heat pumps were reported (399 installs per Manual D, J & S), and 26 O&M commissioning. Also, 4,037 PTCS duct jobs were reported, of which 3,211 were standard seals, 524 test only, 54 complex, and 247 were test only-fails.

2. **Oregon data is incomplete, and should be added to the model**. Energy Trust manufactured home duct sealing program results are missing beginning October 2003, but should be available from the Energy Trust. Other Oregon PTCS duct sealing, heat pump and O&M commissioning were

never reported to Climate Crafters, and are not included in the Alliance ACE model results. From its residential tax credit program, ODOE estimated this activity at 500-600 PTCS duct dealing jobs (primarily retrofits in site built), and about 200 heat pump O&M commissioning jobs.

3. Projections for 2004 through 2010 propose significant ramping of PTCS completions compared to previous output. The Alliance should consider verifying these estimates against Climate Crafters updated business plan, and check-in with ODOE to determine its projections for the market.

C. 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:	MAR-2003

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	$646,009	$0	$1,037,926
1999	Venture	$562,009	$350,127	$0	$912,136
2000	Venture	$700,426	$424,322	$195,000	$1,319,748
2001	Venture	$253,000	$802,916	$195,000	$1,250,916
2002	Venture	$154,000	$1,158,647	$195,000	$1,507,647
2003	Post-venture	$20,000	$1,354,333	$300,000	$1,674,333
2004	Post-venture	$0	$1,554,725	$370,000	$1,924,725
2005	Post-venture	$0	$2,067,785	$370,000	$2,437,785
2006	Post-venture	$0	$2,750,154	$345,000	$3,095,154
2007	Post-venture	$0	$3,657,704	$320,000	$3,977,704
2008	Post-venture	$0	$4,864,747	$270,000	$5,134,747
2009	Post-venture	$0	$6,470,113	$220,000	$6,690,113
2010	Post-venture	$0	$8,605,251	$195,000	$8,800,251
Totals		$2,122,000	$34,706,832	$2,975,000	$39,803,832

Continued

5. COST EFFECTIVENESS OF THE PTCS/CLIMATE CRAFTERS PROGRAM

Assumptions:

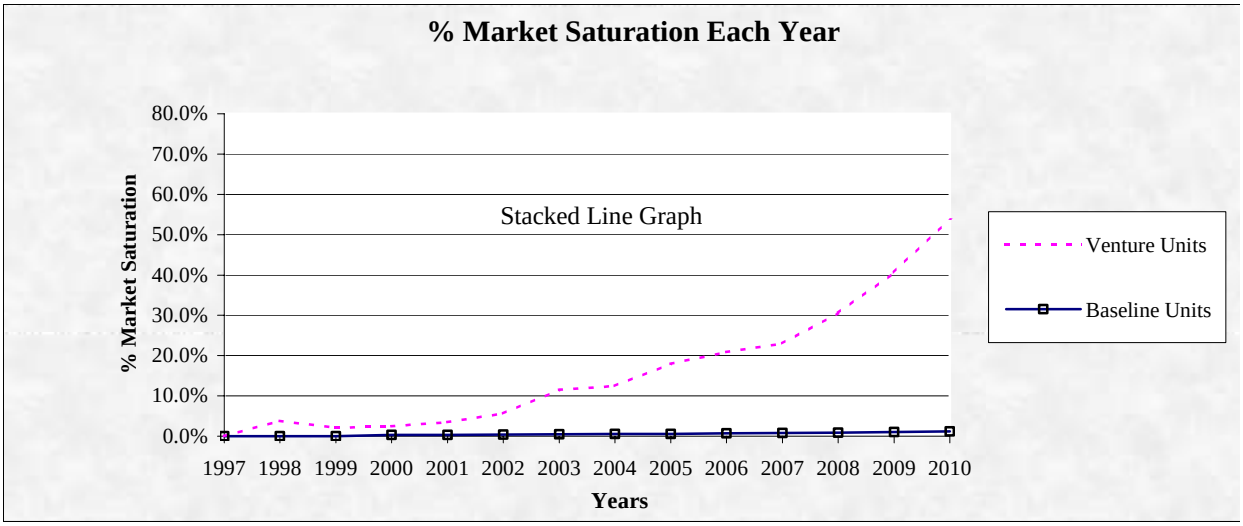
MAR2003 MPER1 September 2003. Update the actuals and shift from 69% to 75% of PTCS in manufactured homes by 2010. Reduced growth of units adopting PTCS in 2004 to 2010 to keep the total cumulative units at about 84,000 homes by 2010.

Weighting revised to have 75% manufactured homes. Twelve 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.

Total dollars are $1,642,000-Contract, $140,000-Alliance admin; $340,000-Evaluation; $2,790,000-Local utility admin 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:** **61,434**

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	834	-	0.6
2001	38,028	129	1,200	-	0.8
2002	38,028	149	1,988	-	1.1
2003	38,028	171	4,200	-	1.9
2004	38,028	197	-	4,553	2.7
2005	38,028	226	-	6,613	3.9
2006	38,028	260	-	7,700	5.3
2007	38,028	299	-	8,459	6.9
2008	38,028	344	-	11,292	8.9
2009	38,028	396	-	15,066	11.7
2010	38,028	455	-	20,094	15.3
	532,385	2,740	10,444	73,777	

Continued

5. COST EFFECTIVENESS OF THE PTCS/CLIMATE CRAFTERS PROGRAM

Total Resource Perspective	Unit First Cost	Annual Unit Savings (kWh)	Levelized Cost (Cents/kWh)	CE Index* (Benefit/Cost Ratio)
Venture + Post-Venture Period	$472.61	1,592.7	1.66	**1.3**
Venture Period Only	$644.67	1,592.7	2.45	1.0
Alliance Perspective	**Unit First Cost**	**Annual Unit Savings (kWh)**	**Levelized Cost (Cents/kWh)**	**CE Index* (Benefit/Cost Ratio)**
Venture + Post-Venture Period	$25.20	1,597.7	-0.39	24.5
Venture Period Only	$141.50	1,597.7	0.14	4.4

*** 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	1,593	$448.31	$0	$79.63	$47.78
Payback (Yrs) Electricity plus Non-electric Benefits less O&M Costs			$0	5.630	9.383
Simple Payback (Yrs) Electricity Savings Only				**5.630**	**9.383**

Key Changes From MAR-2002 added to manufactured housing and reduced other homes for 2004 to 2010 to get 75% of PTCS in manufactured homes by 2010. Updated the actuals for 2001, 2002 and 2003. The new mix of manufactured homes and single family homes are much cheaper but only a little less energy efficient than the other homes, so the cost effectiveness improved.

Breakeven: 0.432564 kWh/unit January peak demand reduction

Maximum Added Alliance Dollars	$ 14,500,000	
Minimum Number of Units	63,500	73%
Proposed units	86,961	

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4/23/2004

5. COST EFFECTIVENESS OF THE PTCS/CLIMATE CRAFTERS PROGRAM

6. FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

In Chapters 2 and 3, some of the program and market-specific findings pertaining to PTCS/Climate Crafters were presented. In this chapter, key findings, conclusions, and recommendations are offered that may have value to the Alliance as it considers similar programs.

A. Key Findings

The following are the key findings from the MPER:

1. **Since MPER #1 in May 2003, little progress was made in developing the hoped for self-supporting, self-sustaining contractor training, certification, and quality assurance organization.** The original sources of revenue for Climate Crafters appear to be stagnating. By the end of 2003, there was no year-over-year growth in the number of utilities participating, even during a period that included heavy utility outreach and marketing. Contractor PTCS renewals, and renewal income, are declining year-over-year on a percentage basis as contractors drop out due to the lack of a market for work. Training revenue also dropped as Climate Crafters completed only about half as many classes as in 2002.

   The main problem appears to be that a market for Climate Crafters services, outside of utility contracts for manufactured homes, never developed. Because of this, Climate Crafters was not able to develop a sustainable source of revenue to fund its contractor training, certification, and quality assurance operations. The revenue generated from Climate Crafters' utility contracts is proving to be "one-time" revenue, and not sustainable. The end result is that the hoped for self-supporting, self-sustaining organization was not achieved, and the market not transformed.

2. **Climate Crafters has lost momentum.** Setbacks in its business operation and the loss of potential contract work stemming from increased competition caused the firm to lose momentum, and placed Climate Crafters at a cross-roads once

again. Indecision over which business model to pursue, contractor certification organization or energy services contractor, seems to have held Climate Crafters back from aggressively seeking new work.

3. **The revised Alliance progress indicators, though achieved, did not steer Climate Crafters toward its goal of market transformation and sustainability.** Although Climate Crafters met its revised goals for 2002-2003, it was unable to effectively address the original progress indicators pertaining to homeowner awareness and demand for PTCS services. When the Alliance decided to drop these market progress indicators and focus on short-term performance goals, it effectively relieved Climate Crafters of its responsibility to develop a real market for PTCS services.

4. After most of the two-year progress indicators were achieved in the first year (2002), it may have been beneficial for them to be reformulated for 2003. Because they were not, they proved little use in guiding Climate Crafters to develop the self-supporting, self-sustaining model the Alliance wanted. However, as a practical matter, it was probably too late anyway, as nearly 90% of the contract budget had already been spent.

5. **Climate Crafters has been weak on Quality Assurance.** While doing a better job of supporting QA on its utility contracts, Climate Crafters has somehow avoided this work on behalf of its utility customers, all under the market-driven program where the certification fee of $25 is not enough to cover the cost of QA. Thirteen utilities have received no QA services, eight of them with substantial numbers of PTCS certifications. For the QA work completed, the results were reported to be fairly positive, but timely feedback to utilities and contractors was a concern. On a related matter, Bonneville voiced concerns over conflicts of interest arising out of Climate Crafters or utilities performing QA inspections on their own work. Because of concerns over this issue, the RTF has established a sub-committee to draft a new regional guideline to ensure independent third-party QA inspections.

6. **Recent changes by the RTF have opened up the market to other PTCS providers, challenging Climate Crafters' role as the primary certification organization in the region.** Although the RTF reaffirmed that Climate Crafters PTCS certification was still required, it opened the door to other providers if they were deemed "equivalent." As a result, new competitors for these services are now entering the market, appear to be having success winning new work, and are increasing the chances PTCS standards will take root in the market.

7. **National efforts to improve the quality of HVAC installations, though still in the early stages, appear to be gathering momentum.** Two different national groups, the EPA (with its industry partners) and the Consortium for Energy Efficiency (CEE; with utility partners), are now working with other stakeholders and appear to be drawing closer together to offer a national coordinated solution to the problem of building consumer demand for quality installations. The Alliance and Climate Crafters sit on both committees to provide the Northwest perspective, and stay abreast of new market developments, but it is too early to predict what impact, if any, these efforts will have on the regional marketplace.

B. Conclusions

The following conclusions are based on the discussions with those interviewed, a review of various program-related documentation, and the key findings from this MPER:

1. **A market for PTCS never developed.** There is no true functioning market for PTCS duct sealing services, outside of utility contracts for manufactured homes, due to the Climate Crafters' organizational issues and critical market barriers discussed above. Climate Crafters was not able to develop a sufficient and sustainable source of revenue to fund its contractor training, certification, and quality assurance operations. The result is that the hoped for self-supporting, self-sustaining organization was not achieved, and the market not transformed.

2. **Climate Crafters future appears uncertain**. Unless a market develops for its services, or Climate Crafters is plugged into more utility programs, the future of the organization is uncertain. With its contract work, Climate Crafters is only fulfilling a very specific need in the market, but it is not clear if that business model can be sustained.

C. Recommendations

The Alliance should:

1. **Continue to focus on development of the new regional ENERGY STAR® new construction program to drive the energy efficient HVAC market**. It may take some time, but progress made in developing this market may have a side benefit of raising awareness and interest in energy efficient ductwork on the part of consumers and HVAC contractors, which could cross-over to the existing/retro home market.

2. **Continue to stay abreast of and participate in national efforts to promote quality HVAC installations** spearheaded by EPA's ENERGY STAR® HVAC Partners and CEE's Residential HVAC committee.

Climate Crafters should:

1. **Work through its business planning process to resolve indecision over which business model to pursue**, energy services company or training, certification and quality assurance organization. Related to this, Climate Crafters should update its business and marketing plans to reflect the changes to its business model, and fully utilize the business consultant to assist in this process.

2. **Work more aggressively at developing other sustainable sources of revenue**. It appears the utility contract channel targeting manufactured home duct sealing has slowed somewhat, and replacement revenue must be found. Potential business opportunities may exist in partnering with entities taking the lead on the new regional ENERGY STAR® new

construction program, such as the PMC or the states. Also, Climate Crafters has a significant base of certified contractors. It should seek ways to leverage that base to develop new revenue streams.

3. **Continue to support the national efforts and organizations working to improve the quality of HVAC installations, and look for the business opportunities presented**.

4. **Consider changes to resolve conflicts of interest at the board level that have hindered development of the organization.** The board could benefit from HVAC industry representation.

5. **Commit to regular and more frequent customer communications to utility and contractor allies to add value for fees collected.**

6. FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS