

Final Report

---

# Ohio Home Weatherization Assistance Program Training Evaluation

---

***Prepared for:***

Ohio Department of Development  
Office of Energy Efficiency

***June 2, 2006***



*Raising the bar in analytics™*

***Prepared by:***  
Rick Karg  
R.J. Karg Associates

Allen Lee, Ph.D.  
M. Sami Khawaja, Ph.D.  
Quantec, LLC

K:\2004 Projects\2004-63 (OH DOEE) HWAP, Res Training\Training\Report\Training Eval Report Final 060206.doc

**Quantec Offices**

720 SW Washington, Suite 400  
Portland, OR 97205  
(503) 228-2992; (503) 228-3696 fax  
www.quantecllc.com

1722 14th St., Suite 210  
Boulder, CO 80302  
(303) 998-0102; (303) 998-1007 fax

3445 Grant St.  
Eugene, OR 97405  
(541) 484-2992; (541) 683-3683 fax

28 E. Main St., Suite A  
Reedsburg, WI 53959  
(608) 524-4844; (608) 524-6361 fax

20022 Cove Circle  
Huntington Beach, CA 92646  
(714) 287-6521



Printed on  
recycled paper

# Table of Contents

---

- Executive Summary ..... 1**
  - Overview of Ohio HWAP Training .....1
  - Evaluation Approach .....2
  - Major Findings .....2
  - Major Recommendations .....5
  - Program Status .....9
  
- 1. Introduction ..... 11**
  - Program Overview .....11
  - Overview of Ohio HWAP Training .....12
  - Evaluation Overview .....13
  - Report Contents .....13
  
- 2. Evaluation Methods ..... 15**
  - Overview .....15
  - Interviews .....15
  
- 3. Training Program Findings ..... 19**
  - Goals .....19
  - HWAP Training Requirements .....19
  - Office of Energy Efficiency .....21
  - Ohio Weatherization Training Center (OWTC) .....25
  - Agencies .....38
  - Secondary Sources of Training and Education .....40
  - Weatherization Program Standards (WPS) .....43
  - Survey of Other Training Centers .....43
  
- 4. Conclusions and Recommendations ..... 47**
  - Conclusions .....47
  - Recommendations .....49
  
- Appendix A: Training Interview Instrument ..... 59**
  
- Appendix B: Other Training Center Interview Instrument ..... 75**



# Executive Summary

---

The Ohio HWAP (the Program) training program is the successful result of work and collaboration by the Program managers at the Office of Energy Efficiency (OEE) in the Ohio Department of Development (ODOD), managers and staff at the Ohio Weatherization Training Center (OWTC) run by the Corporation for Ohio Appalachian Development (COAD), the managers at the HWAP Agencies, and the field staff trainees. The HWAP training certainly does not suffer from a lack of courses, skilled instructors (both at OWTC and OEE), or well-trained field personnel. Because of the evolved nature of the training program in Ohio, this evaluation does not deal with the fundamentals of recommending basic training or suggesting curricula. All of the important building blocks of a solid, ongoing training program are already in place. Rather, this evaluation examines specific aspects of the existing training that lead to recommendations for fine tuning and improving an already mature and effective program.

During the preparation of this report (starting in late 2004), a number of HWAP personnel made us aware of tension that existed in the relationship between OEE and OWTC, driven in part by apparent increases in training costs per student, budget constraints, increases in OWTC course cancellations, and COAD funding initiatives for the OWTC. Several interviewees at OWTC, Agencies, and OEE specifically highlighted this issue and the impacts it was having on the program. Since we began collecting this information, both OEE and OWTC have begun working constructively on resolving these issues and we believe that these efforts are now moving the program in a positive direction. It is important to stress that, in general, the information presented in this report reflects conditions and feedback received more than one year before publication of this report and, in our view, strides have been made since then in many areas to improve the program; given the timing, however, it was not possible to document the progress that has occurred.

This executive summary includes the prominent findings and recommendations. For more details and supporting information, please refer to the body of this report.

## Overview of Ohio HWAP Training

Training is a vital Program component because HWAP requires skilled staff to implement weatherization measures effectively and safely. The OWTC provides training to Agency weatherization staff. COAD runs the center and receives Program funds to provide HWAP training. The OEE staff also provides training through their monitoring and Training and Technical Assistance (T&TA) activities. Agencies often host training sessions provided through the OWTC or the OEE. In addition, qualified Agency trainers may teach a limited number of courses at their Agencies. The Agencies have the sole responsibility for hiring staff with the aptitude for successfully completing the rigorous OWTC menu of required training. Agency managers also have the responsibility of preparing their staff adequately for formal and field training events.

Training responsibilities are shared:

- OEE plays the central role in planning and guiding program implementation

- OWTC delivers the majority of the formal training
- Agencies are the key implementers, with day-to-day responsibility for delivering services to clients

To determine methods for making the training components of the HWAP as effective and efficient as possible, our training evaluation closely examined the roles of these organizations and the perceptions and ideas of their staff.

## **Evaluation Approach**

To perform this training evaluation, we completed the following five steps (Figure 1, below):

- Defined the components of the HWAP training program
- Collected and reviewed the necessary documents related to the training program
- Developed interview instruments
- Conducted interviews with OEE, OWTC, Agencies, and other training organizations
- Analyzed the relevant collected data and composed the written training evaluation report

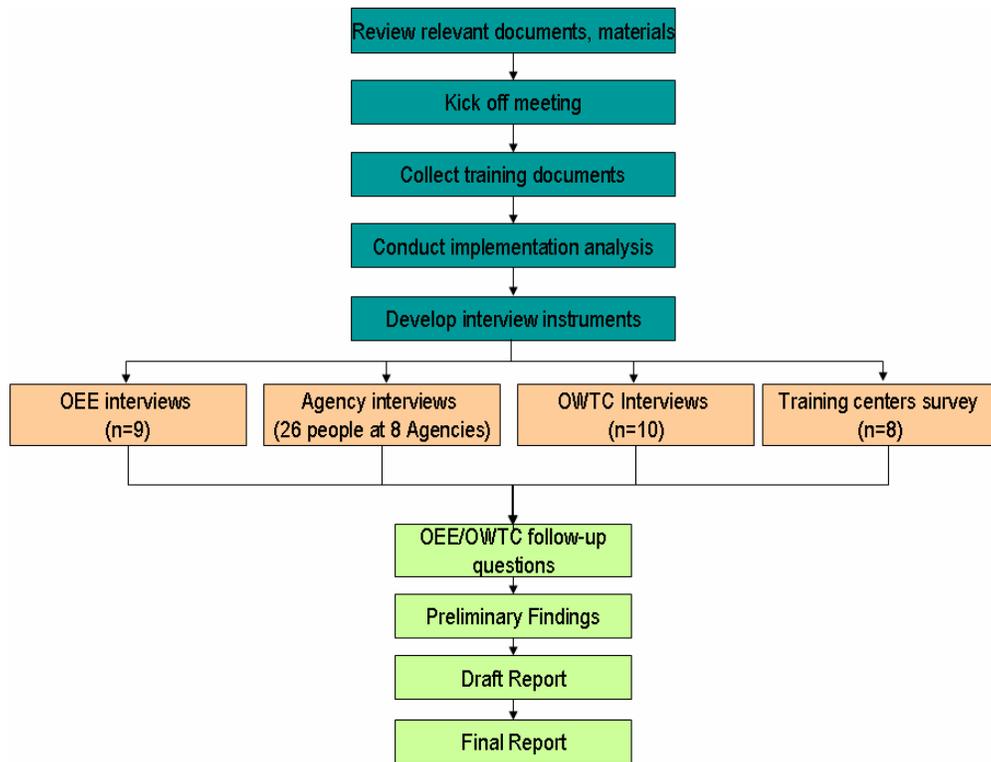
## **Major Findings**

### **Office of Energy Efficiency**

In addition to overseeing the HWAP training activities, OEE staff play an active part in the training program by presenting regular and occasional formal training and conducting T&TA events in the field.

The primary way OEE interacts with Agency personnel is through the Program field representatives. Workers at Agencies generally rated field representative-provided training high, but wanted more of it. They also had thoughtful suggestions for improving the field representative training and the relationship between field representatives and Agency staff.

**Figure 1. Training Evaluation Overview**



## Ohio Weatherization Training Center

In the early 1990s, COAD was awarded a contract from OEE to train weatherization personnel across the entire state. According to the HWAP Policy and Procedures Manual (Vol. II):

*The role of the OWTC is primarily to provide standardized training to HWAP employees in skills necessary to perform/complete the major operations outlined in the WPS.*

*Another broad responsibility includes providing technical assistance in conjunction with the OEE to grantees in an overall effort to keep the HWAP up-to-date and technically correct.*

The OWTC is intended to provide the majority of the HWAP training for the Program. Quantec’s interviews with OEE, OWTC, and Agency staff, visit to the OWTC, overview of OWTC curricula, and survey of other training centers found:

- At least one-half of the Agency personnel interviewed wanted another training center location further north.
- The majority of the Agency staff (75%) rated the OWTC Athens facility as “good” or “very good.”
- Agency staff rated the OWTC instructors as “very good” on average and OEE staff rated them as “good” to “average.” Agency staff gave the OWTC instructors’ presentations ratings from “good” to “very good” while OEE staff rated them as “average.” These

ratings were provided by the respondents and did not represent an independent assessment by Quantec.

- Most of the Agency staff interviewed stated the overall OWTC course offerings were “very effective.” The OEE staff ratings were typically somewhat lower. As above, these responses did not represent independent analysis by Quantec.
- On average, Agency personnel rated the primary training documents used at the OWTC as “good” to “very good,” while OEE staff rated them as “average.” From our review, we found these training documents to be visually uninteresting and difficult to navigate.
- Agency staff generally thought highly of regional training presented throughout the state by the OWTC instructors. They liked the hands-on character of this training and appreciated learning close to or within their service territory.
- Quantec found some dissatisfaction with the marketing and scheduling methods used by OWTC. Some Agency managers wanted more frequent scheduling information and often were upset by course cancellations.
- The OWTC cost-per-student-day reported by COAD is within the range of other training facilities, but there is disagreement between COAD and OEE regarding the proper calculation of this important value.
- OEE and some Agencies have raised concerns about the high number of OWTC course cancellations over the last few years. Quantec believes this is because of the maturing of the training curricula and the lack of new course introductions during these years.

## **HWAP Agencies**

Agencies are the primary benefactors of OEE and OWTC training, but they also have a responsibility to make the HWAP training effective. Of course, Agency management often gets caught between production needs and the need to train weatherization staff. Quantec’s main finding from interviews was:

- Most OWTC staff (five of nine) and several OEE and Agency personnel mentioned that students were often not prepared for OWTC courses, either because they had not been in the field enough or because they had not done any preparatory study for the class.

## **Secondary Sources of Education**

Quantec also examined secondary sources of training and education available to Agency personnel. Findings included:

- Respondents stated that attending conferences was generally a positive experience. The national Affordable Comfort Conference was mentioned most often.
- Training provided by utilities did not appear to be a significant part of the overall HWAP training program.
- *Residential Update* is a well written and effective newsletter published by OEE, but it could be used to greater advantage as part of the HWAP training program.

- The Comprehensive Home Energy Curriculum (CHEC), a computer-aided training tool, is being underutilized at the OWTC and by Agencies.
- Although the Weatherization Program Standards (WPS) is the basis for most of the HWAP training, it is also an educational resource. Some Agency staff mentioned the WPS was difficult to navigate, too complex, and redundant.

Using the Home Energy magazine and Residential Energy Services Network's (RESNET) Web sites, Quantec identified training organizations similar to the OWTC and contacted them via e-mail or telephone. The eight selected programs were comparable because they were non-profit and performed training at a central location. Based on the information we collected, we found that the OWTC could improve some of its training related activities by modeling some of these other organizations.

## Major Recommendations

The training program has the primary objective of transferring the needed knowledge and skills to the field staff so that they are able to professionally fulfill the mission of HWAP. The major components of this training program are the OEE, the OWTC, the Agencies, and, of course, the trainees. All of these players have a vital part to play in an effective program to educate HWAP staff.

### Office of Energy Efficiency

Our most important recommendation is for OEE to bring together representatives from the key organizations – OEE, COAD, and the Agencies – for the purpose of defining or redefining HWAP training responsibilities and commensurate authority. Responsibilities should be stated clearly. The tensions between OEE and COAD at the time we started our study could have been a cause or an effect of the uncertain perception of organizational responsibility.

Another major recommendation is that OEE conduct a comprehensive needs assessment within the next three years and that this process be repeated thereafter at reasonable intervals. For a number of years OEE and/or OWTC have conducted a class-needs survey for the purpose of scheduling classes. This recommendation goes far beyond the determination of scheduling needs by including:

- Identification of the knowledge and skills required to complete a particular weatherization job.
- Determination of the knowledge and skills the staff conducting a particular job possesses.
- Recognizing the gap between what the weatherization staff does know and what they should know to successfully complete their work, and then determining the ways to bridge the gap.

Other recommendations for OEE include:

- OEE should plan and promote events that foster better communication within the Program.

- Field representatives should provide more positive reinforcement as part of the monitoring process.
- All monitoring reports should include page references to the WPS for all recommendations and requirements.
- Simplification should be the primary objective of future WPS updates; simplification is likely to enhance its effectiveness. Agency personnel, including inspectors, crew leaders, crew technicians, and contractors should regularly be invited to become involved in this process.
- OEE, in cooperation with the OWTC and Agency representatives, should develop a statewide method for allowing related work experience and any equivalent out-of-program training to count as credits toward the completion of a series track at the OWTC.
- OEE should work with OWTC and Agencies to create a program to assist energy coordinators in creating learning plans for their weatherization field staff.
- OEE should assist Agencies in developing mentoring programs.
- OEE should engage in discussions with utilities to explore opportunities for joint funding of weatherization training.

## **Ohio Weatherization Training Center and COAD**

The fact that OWTC has been the primary statewide training venue for the last 15 years has solidified its core role in the Program; however, to ensure HWAP success, OWTC needs to continuously improve its operations and maximize the effectiveness of its relationships with OEE and Agencies. Our major recommendations for the OWTC include:

- COAD should continue to engage in efforts with OEE to move beyond the difficult relationship the two organizations had experienced in the past. As noted earlier, significant steps were already taken in this direction by the time this report was published.
- OWTC should continue the more detailed class-needs survey that it has started conducting. This more enhanced effort includes identifying job titles and staff duties at each agency to help identify needed training and telephoning Agency energy coordinators to ask about the training needs of their staff.
- The schedule should be published at least three months in advance and reflect any changes since the previous schedule was released. OWTC should rely on e-mail less and telephoning more for scheduling. The training schedule should be updated and posted on the OEE and OWTC Web sites.
- The OWTC should enhance its marketing of classes by posting the latest schedule in *Residential Update*; mailing the schedule quarterly to other parties; regularly contacting Ohio energy coordinators by telephone (this process has begun); and publishing a color brochure of the course offerings.

- COAD and OWTC should work together to improve tracking and analysis of student records, evaluations, cancellations, and other information by enhancing current electronic databases or by purchasing new software for this purpose.
- OWTC, in conjunction with OEE, should adopt a standard process and metric for measuring and tracking training efficiency, such as cost-per-student-day, calculated in a consistent way. Calculation methods should include consideration for cancelled classes, T&TA events, and regional training. Cost-per-student-day results should be reported to OEE semiannually.
- OWTC should begin networking with other training organizations and learn about methods others use for marketing, scheduling, grading, applying databases, enhancing instructor knowledge and skills, utilizing demonstrations, and integrating audio-visual techniques and technologies.

Based on our interviews and observations, we offer several recommendations for ways OWTC trainers can improve their instructional skills:

- The OWTC should work with OEE to improve the instructor certification process.
- An outside training professional should be hired to critique each trainer and assist in improving their presentation methods.
- Each trainer should have a digital camera with which to build an OWTC library of digital photographs for PowerPoint presentations, and two video cameras should be made available for the trainers to share. All instructors should receive training in the use of PowerPoint.
- The OWTC should require each trainer to deliver at least one presentation every two years at a work-related national or regional conference.
- OWTC instructors should be sent regularly to other training centers as “ambassadors” and should exchange knowledge with other trainers and learn new ways of enhancing the educational experience at the OWTC.

In addition to adjusting the course offerings after the comprehensive training assessment, we recommend the following:

- Update the training curricula more frequently; we suggest every other year. Updates should be coordinated with the WPS revisions.
- Design the companion training documents so that they are useful resources after the training, as well as during it, by adding illustrations, sequentially numbering the pages, reducing the use of copy-and-paste, using a uniform format, including a narrative to serve as a continuum among topics, and adding introductory language for sections that require explanation.

To diversify and improve accessibility to the training, we recommend the following:

- Continue with the recent trend to offer more T&TA events.
- Attempt to increase the number of regional training sessions.

- In close cooperation with OEE, explore the possibility of a second training center location in the northern part of Ohio. This will involve significant additional funding.
- Work with OEE and Agencies to create a program to assist energy coordinators in creating learning plans for their weatherization field staff.
- Assist Agencies in developing mentoring programs.

## **HWAP Agencies**

The important Agency task of delivering services to a population of diverse clients is complicated by limited financial resources, the need for staff training, a demand for high job throughput, and the requirement of increased productivity. To enhance the role that Agencies play in training, we offer the following recommendations:

- Agencies should give training and education the importance it deserves and not view it as an obstruction.
- Agency management should ensure that their staff are prepared for training sessions at the OWTC by using the information provided on course preparation and arranging outside training for employees and/or provide work time for necessary course preparation, if necessary.
- Agencies should increase wage rates in proportion to experience in the field and the HWAP training completed.
- Energy coordinators should be responsible for helping each weatherization field employee develop an individual learning plan.
- Agencies should initiate mentoring programs.
- Although Agencies did not adopt peer training in the past, it should be tried again after establishment of a statewide Agency mentoring program.
- OEE, the OWTC, and Agency representatives should write model employee qualifications for each of the significant HWAP field positions. It would also be helpful to develop qualifications for contractors. This effort should be coordinated with the national initiative by DOE to develop core competencies for weatherization staff.
- Within three to six weeks after an employee attends a formal OWTC training session, the Agency energy coordinator should interview the trainee for 15 minutes to assess the value the training had to their work.
- Agency managers should determine the training their contractors need to increase the quality of their work and it should be included in the agreements Agencies have with their contractors. OEE, OWTC, and Agencies should work together to identify and deal with the special needs of contractors and contractor training issues.

## **Program Status**

The review draft of this report was finalized in December 2005. As noted earlier, the authors have observed that, since the draft was issued, OEE, OWTC, and others have already made strides in addressing several of the issues identified in the report and are beginning to implement some of the recommendations. We were unable to update this report to reflect all the progress that has occurred since the end of 2005; consequently, the reader should note that our report presents a snapshot of conditions as they were in the third and fourth quarters of 2005. We find the efforts and the commitment exhibited by all parties in early-2006 to be very positive and encourage all participants to continue to work together to enhance the training program.



# 1. Introduction

---

This report presents an evaluation of the training component of the Ohio Home Weatherization Assistance Program (HWAP, the Program). This chapter presents a brief overview of HWAP and the comprehensive training program, discusses the purpose of the evaluation, and defines the evaluation scope and context.

## Program Overview

HWAP is implemented in accordance with regulations promulgated by the U.S. Department of Energy (DOE) in 10CFR Part 440. According to the purpose and scope of the Program, it is designed to accomplish three objectives:

- Increase the energy efficiency of dwellings owned or occupied by low-income persons
- Reduce participants' total residential energy expenditures
- Improve participants' health and safety

DOE regulations (10 CFR Part 440, Section 440.16(b)) further provide that efforts to accomplish these objectives shall ensure that priority is given to five specific populations of low-income energy users that have been defined as being “particularly vulnerable”:

- The elderly
- Persons with disabilities
- Families with children
- High residential energy users
- Households with high energy burdens

The Program has provided weatherization services to low-income households in Ohio since 1977. Since 1991, HWAP has been implemented at the state level by the Office of Energy Efficiency (OEE) in the Ohio Department of Development (ODOD).

OEE is the central HWAP organization in Ohio. It provides overall guidance, requirements (for example, through the Weatherization Program Standards, WPS), policy, and oversight; secures and distributes federal funds; and provides the interface with the federal funding agencies.

HWAP is delivered through a network of community and local government organizations. These include Community Action Organizations (CAOs), local government entities and community-based non-profit organizations (CBOs). OEE disburses the funds to these groups (hereafter, Agencies), which then have the responsibility of delivering the weatherization services. Some Agencies (“grantees”) contract with OEE and, in turn, subcontract to other Agencies (“delegates”) that implement weatherization. The actual services are delivered by implementing Agency staff and, in some cases, private contractors hired by the Agency.

The Agencies are responsible for meeting specific targets in delivering the HWAP services. These targets include production (number of housing units weatherized) and average cost per weatherized unit.

## Overview of Ohio HWAP Training

Training structure and the related responsibilities of various parties, OEE, Ohio Weatherization Training Center (OWTC), Agencies, and contractors for the Ohio HWAP, are clearly defined in the HWAP Policy and Procedures Manual, Volume II, Section E.4. The recognition of the importance of training is stated at the beginning of Section E:

*Skilled and knowledgeable people working in your program are the best asset an organization can have. People who know how (and why) to do things are more efficient and effective than people who do not. While experience may still be the best teacher, a good training program is the best way to ensure that those experiences will be positive for the employee, the customer and the agency.*



**Home of the Ohio Weatherization Training Center, Athens, Ohio**

HWAP requires skilled staff to implement weatherization effectively and safely, so training is a vital Program component. OWTC provides training to Agency weatherization staff. The Corporation for Ohio Appalachian Development (COAD) runs the center and receives Program funds to provide HWAP training. The OEE staff also provides training through their Training and Technical Assistance (T&TA) activities. Agencies often host training sessions provided through the OWTC or the OEE. In addition, qualified Agency trainers may teach a limited number of courses at their Agencies. The Agencies have the sole responsibility for hiring staff with the aptitude for successfully completing the rigorous OWTC menu of required training.

The OEE plays the central role in planning and guiding Program implementation; the OWTC delivers the majority of the formal training; and the Agencies are the key implementers, with day-to-day responsibility for delivering services to clients. To determine methods for making the training components of the HWAP as effective and efficient as possible, our training evaluation closely examined the roles of these organizations and the perceptions and ideas of their staff.

The training requirements for the Ohio HWAP are probably more rigorous than for any other weatherization program in the country.<sup>1</sup> This comprehensive program is a compliment to the

---

<sup>1</sup> This informal assessment is based on the perceptions of the primary author of this training evaluation document. He worked with a number of northern-climate low-income weatherization programs, including those in the six New England states, New York, Indiana, Wisconsin, Michigan, Iowa, North Dakota, Utah, and Wyoming.

program managers at OEE, to the managers and staff at the OWTC, to the managers at the Agencies, and to the field staff trainees. The HWAP training certainly does not suffer from a lack of courses, skilled instructors (both at OWTC and OEE), or well-trained field personnel. Because of the evolved nature of the training program in Ohio, this evaluation need not deal with the fundamentals of recommending basic training, finding funding for a training center, or suggesting curricula. All of the important building blocks of a solid, ongoing training program are already in place. Rather, this evaluation offers the opportunity to fine tune and improve an already mature and effective program.

## Evaluation Overview

Quantec, LLC, conducted this training evaluation under contract to the OEE. It was conducted as part of a comprehensive evaluation of the Program that included an impact evaluation and Program process evaluation.<sup>2</sup>

The last evaluation of Ohio's HWAP addressed the 1994 Program Year (PY94). The Program Year extends from April 1 to March 31 of the following year. This evaluation specifically covers PY03; however, since the evaluation was conducted in 2005-'06, the information collected (primarily through interviews and surveys) for the training evaluation is not restricted to information for just PY03.

The purpose of this training evaluation is two-fold:

- To assess how well the training components are functioning
- To assess the effectiveness of the training components in fulfilling the Program's goals and objectives

The training program components we identified and examined include:

- The roles and responsibilities of the training program players, in particular OEE, local Agencies, and OWTC
- Activities and processes implemented at all levels of the training program
- Flows of information (communications) and resources, and linkages among the training program players

## Report Contents

Chapter 2 describes the methodologies we used for this evaluation. Chapter 3 presents findings on all aspects of the Program training.

The final chapter, Chapter 4, presents our conclusions and recommendations. The recommendations are intended to be actionable items that OEE and other parties could implement to make the training even more effective.

---

<sup>2</sup> These evaluations are being published in separate reports.



## 2. Evaluation Methods

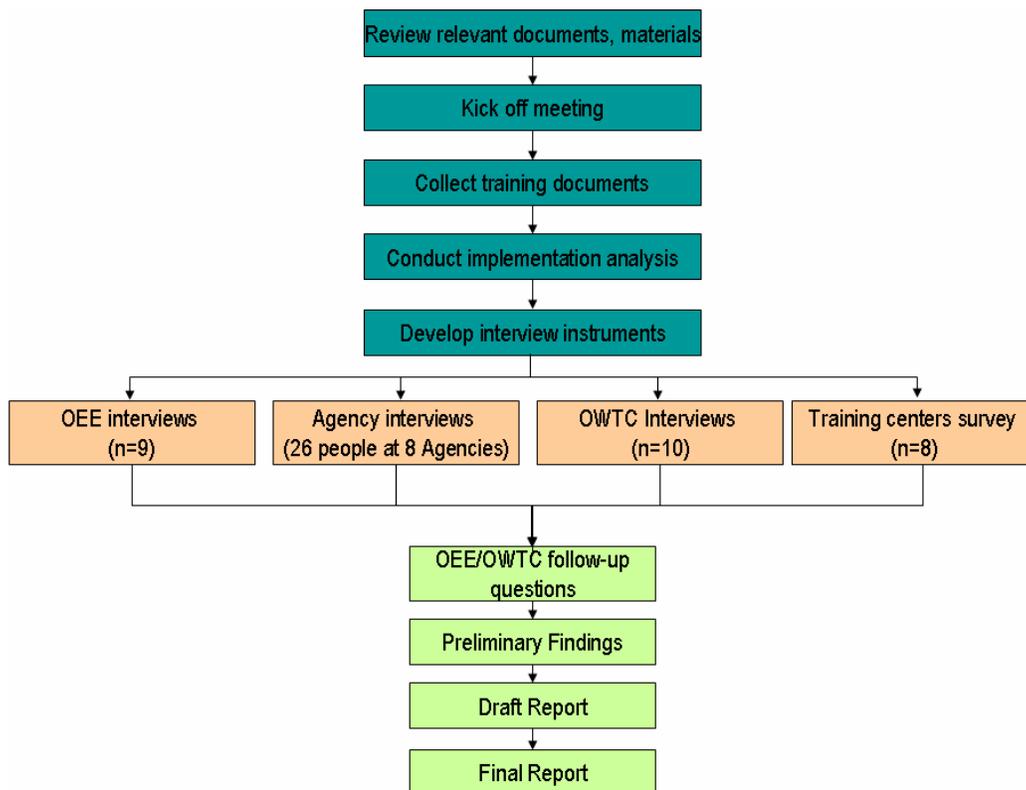
---

### Overview

To perform this training evaluation, we completed the following five steps (Figure 2):

- Defined the components of the HWAP training program
- Collected and reviewed the necessary documents related to the training program
- Developed interview instruments
- Conducted interviews with OEE, OWTC, Agencies, and other training organizations
- Analyzed the relevant collected data and composed the written training evaluation report

**Figure 2. Training Evaluation Overview**



### Interviews

One interview questionnaire was developed to serve as the instrument for the three groups queried – OEE, OWTC, and Agencies. This training evaluation interview instrument included

specifically selected questions for each of these three groups, so no one was asked all of the questions.<sup>3</sup>

Some of the 102 questions were taken directly from the RFP for this project where 22 questions were listed that related to residential training and monitoring. The interview instrument went through a number of drafts before it was sent to OEE for approval. After the OEE comments were integrated into the instrument, it was finalized just before the first series of interviews at OEE and the OWTC in early February 2005.

## OEE Interviews

Quantec personnel conducted training interviews with the OEE staff on the last day of January 2005. Before individual interviews were conducted, a group interview was conducted at the end of a staff meeting. After the group interview, in-person individual interviews were conducted using a semi-structured interview guide and were conducted with the following:

- Residential Program Manager
- Low-income Programs Manager
- Residential Customer Education Specialist
- HWAP field representatives (6)

## Agency Interviews

Over the course of one and a-half weeks (early February and mid-March 2005), Quantec conducted formal on-site interviews with personnel at nine Agencies (Table 1) that implement HWAP.

**Table 1. Agencies Selected for Training Interviews**

Agency	No. Interviewed	Type	Geographic Location	Delivery Strategy
Ashtabula County CAA	4	Rural	NE	Crew
Columbus Metropolitan Area CA	2	Urban	Central	Contractor/Crew
Community Action - Wayne / Medina	3	Rural	NE	Contractor/Crew
East Akron Neighborhood Development Corp.	1	Urban	NE	Contractor
Mid-Ohio Regional Planning Commission	3	Urban	Central	Contractor/Crew
Hancock-Hardin-Wyandot-Putnam CAC	4	Rural	NW	Contractor/Crew
Lorain County CAA	3	Urban	NE	Contractor
Stark County CAA	3	Urban	NE	Contractor
Summit County Dept. of Comm. & Econ. Develop.	3	Urban	NE	Contractor

---

<sup>3</sup> The training evaluation interview instrument is included in Appendix A.

In choosing the Agencies for interviews, we sought a mix of geographic locations, type (urban or rural), size, and delivery approach (crew or contractor). Of the 26 agency personnel interviewed, most were inspectors. See Table 2 for the frequency of Agency positions interviewed.

**Table 2. Frequency of Agency Positions Interviewed**

Position at Agency	No. Interviewed
Chief operating officer	1
Energy coordinator	9
Inspector	11
Production supervisor/warehouse manager	1
Field supervisor	1
Crew leader	2
Furnace technician	1

While at one agency in northwestern Ohio, Quantec was able to visit a weatherization job in process to discuss diagnostic procedures and weatherization measures installation with the crew leader and installers.

This sample of interviews at Agencies gave us a broad spectrum of opinions, with the core of our interviews conducted with those in positions closest to the HWAP training program – energy coordinators and inspectors. Initially, Quantec personnel were scheduled to interview the staff at some of the COAD delegate Agencies in the Athens area. However, because of the importance of interviewing all the OWTC training staff and schedule constraints, these Agency interviews did not take place. This choice resulted in all the Agency staff interviews taking place at locations in Columbus and northward. Had personnel from these southern Agencies been interviewed, some of the reported percentages of respondents that felt one way or another might have changed. Overall, the Agencies in our sample were more likely than the population to be located in urban areas and in the central or northern part of the state. They also tended to be somewhat larger and to use contractors more often than the population as a whole. One possible effect was that respondents were more likely to express a desire for a training center location closer to Agencies in the northern part of the state. Other probable effects of the makeup of our sample on their views about training are not as predictable and obvious. Because of these limitations to our Agency sample, the results reported herein should be considered indicative of overall perceptions and views, but with the caution that reported percentages may not be completely accurate if extrapolated to the population of Agencies as a whole.<sup>4</sup>

### **OWTC Interviews, Facility Inspection, and Course Evaluation**

Interviews at the OWTC took place over a two-day period in early February 2005 at the Athens facility. Seven instructors and three managers were interviewed. Two Quantec analysts also had the opportunity to inspect the training facility, including the two classrooms and the large and

---

<sup>4</sup> It is important to note that the findings from this evaluation are very consistent with those presented in our process evaluation report, *Ohio Home Weatherization Assistance Program Year 2003 Process Evaluation*, April 2006, which was based on interviews with a statistically representative sample of Agencies.

well equipped laboratory and demonstration area. While there, we also sat in on an Inspector Refresher course with eight participants and two instructors.

### **Survey of Other Training Centers**

Other training centers in the country were screened to determine if they were similar to the OWTC. The eight that were selected for contact were non-profit and performed training at a central location. When contact was made, a brief survey was sent to the appropriate contact by e-mail or the survey was performed over the telephone.

### **Data Analysis**

All interviews were entered into a database after the interviews were conducted. All interviews but three were recorded for documentation purposes. We interviewed three groups (OEE, 9 respondents; OWTC, 10 respondents; Agencies, 26 respondents) for a total of 45 interviews. Because of the distinctly different perspectives of these three groups, most of the interview data were analyzed within each group rather than across groups.

### 3. Training Program Findings

---

This chapter presents our findings based on our review of primary training materials, training-related materials, and interviews. Program and training goals are described first. The training requirements are then described.

The roles of key training implementers – OEE, OWTC, and the Agencies – are then discussed and assessed. Next, other sources of training and education are described. The relationship of the training to the WPS is described next. Finally, this chapter concludes with information gathered from our review of other weatherization training centers.

#### Goals

Key to the successful implementation of a comprehensive HWAP training program is a clear understanding of the overall Program goals. OEE has adopted the national program mission statement: “To reduce energy costs for low-income families, particularly for the elderly, people with disabilities, and children, by improving the energy efficiency of their homes while ensuring their health and safety.”<sup>5</sup> Of course, the Program training should help achieve this mission as effectively as possible for the lowest feasible cost.

The OWTC’s goal for its training activities is to “provide affordable and effective training that enables community action agencies to provide quality services to serve the low-income residents of Ohio, and serve as a resource for technical consultation and trouble-shooting.”<sup>6</sup>

We incorporated these goals into our analysis and basis for recommendations to improve the HWAP training program in Ohio.

#### HWAP Training Requirements

OEE is responsible for oversight of the HWAP, including the training requirements and functions.

The Ohio HWAP requires weatherization personnel that inspect dwelling units, repair or replace heating units, or install weatherization measures to successfully complete a number of formal training sessions. Staff performing these important activities may also need to successfully complete a refresher class and/or examination every three years. Upon completion of the required series of classes, attendees receive a certification. In some cases, it is necessary to complete training before performing certain tasks in the field.

The required training courses for specific jobs tasks are outlined in the following tables.<sup>7</sup>

---

<sup>5</sup> Source: [www.waptac.org](http://www.waptac.org).

<sup>6</sup> Source: <http://www.coadinc.org/Main.php?page=programs-cdds-training>.

<sup>7</sup> Source: HWAP Policy and Procedures Manual, Volume II, page 1 - 2.

**Table 3. Inspector Series**

	Notes
Initial Inspection Orientation (IO)	These courses must be completed prior to performing initial inspections.
Math course, if needed (MATH)	
National Energy Audit Tool (NEAT)	
Manual J – Short Form (MANJ)	
Blower Door Use (BDU)	
Heating Unit Inspection (HUI)	
Initial Inspection (IINS)	
Within 6 months of completing (IINS):	These courses must be completed prior to performing final, quality control inspections.
<ul style="list-style-type: none"> <li>• Electric Baseload Measurement (EBM)</li> <li>• Consumer Education (CEE)</li> </ul>	
Within 1 year of completing (IINS)	
<ul style="list-style-type: none"> <li>• House Diagnostics (HD)</li> <li>• Duct Testing and Sealing (DTS)</li> <li>• Lead Safe Weatherization (LSW)</li> </ul>	
Final Inspection (FINS)	
Every 3 years	
<ul style="list-style-type: none"> <li>• Inspection Series Refresher (INSR), or</li> <li>• Inspection Series Certification Test (ISCT)</li> </ul>	

**Table 4. Heating Technician Series**

	Notes
Heating Unit Inspection (HUI)	These courses must be completed prior to performing repairs or replacements of heating units.
Manual J – Short Form (MANJ)	
House & Heating System Electricity (HHSE)	
Gas Furnace Maintenance and Repair (GFMR)	
Lead Safe Weatherization (LSW)	
Every 3 years	
<ul style="list-style-type: none"> <li>• Heating Technician Series Refresher (HTR), or</li> <li>• Heating Technician Series Certification Test (HTCT)</li> </ul>	

**Table 5. Weatherization Technician Series**

	Notes
Weatherization Skills and Theory (WXST)	
Lead Safe Weatherization (LSW)	
Blower Door Use (BDU)	
Mobile Home Weatherization (MHWX)	

There are also recommended courses for personnel performing specific tasks. For example, OEE recommends that staff performing inspections of dwellings attend:

- Sidewall Tubing and Siding Removal (STSR)
- Weatherization Skills and Theory (WXST)
- Boiler Heating System Inspection (BHUI)
- Oil Furnace Maintenance and Repair (OFMR)
- Heat Pump/Air Conditioning (HPAC)

Specific training courses can also be mandated for an individual or an Agency if, through the monitoring process, the OEE finds serious deficiencies in technique or noncompliance with program requirements that training may help correct.

In addition:

- 1) Five of ten staff interviewed at the OWTC said the number of courses offered is adequate and four stated that a better job should be done deciding which courses to include in the training schedule each year.
- 2) Four of the nine OEE interviewees thought the number of training sessions offered in early 2005 was about right; three said that a better job could be done deciding what to add and delete.
- 3) Ten of 26 of those interviewed at Agencies said the course offerings were adequate; the others felt some of the sessions were either too advanced or not advanced enough.
- 4) A significant majority of all interviewed (37 of 45) said that the right topics are being taught.

## **Office of Energy Efficiency**

In addition to its overall oversight of the training program and HWAP skill requirements, the OEE delivers training through several channels. This training includes both formal and informal activities.

### **Formal Training**

The OEE technical staff shares in the presentation of Inspector Orientation (one-day course), which is scheduled four times each year. Once each year, the Low Income Programs Manager presents Energy Coordinator training (a three-day course) for those new to the job.

### **As-Needed Training**

In the past, the OEE has presented scheduled training sessions on an as-needed basis. The “Pressure Road Show” was a formal session presented by OEE staff. This wholistic training covered pressure measurement and related testing procedures and was presented about ten times between PY00 to PY03.

Other less formal, as-needed training initiated and delivered by the OEE included sidewall tubing methods and mobile home attic insulation.

## **T&TA Events**

The OEE invites Agencies to request informal, on-demand training from the OEE technical field representatives. The field representatives interviewed estimated that they spent 20 to 25 percent of their time in PY04 performing this type of training in the field.

The field representatives reported that some of this training time is spent with contractors. Training delivered by field representatives is state-sponsored, so funds are not taken from the Agencies' T&TA budget.

## **OEE Monitoring Process and Reports**

The primary way the Agency field staff interacts with the OEE is through field monitoring, rather than contact with OEE management. Each Agency is monitored annually for an average of two days by one of the six OEE field representatives. Each field representative has assigned Agencies, but these assignments change over time for various reasons.

We reviewed one monitoring report written by each of the six program field representatives. Each report begins with a cover letter written by the Residential Programs Manager to the Agency management. Following the cover letter is a detailed monitor appraisal of usually five completed jobs with recommended and required actions. Additionally, some reports comment on Agency staffing, warehouse condition, equipment, inventory, quality assurance, and air leakage reduction. Field representatives might also include details on recurring problems or trends. All but one of the six sample reports included WPS references with each of the required actions. This is important for the Agency management and field staff.

The monitoring reports we reviewed were similar in style and tone. During our Agency interviews, we found overall comments about the monitoring reports to be positive. Field representatives and Agency staff stated that monitoring visits increased the awareness of best practices and increased their use. One inspector mentioned that the monitoring reports have a "good impact" and they "help [us] evaluate [our] contractor and [ourselves] better."

A few Agencies reported that they felt the reports were too negative in tone. Some Agency staff also expressed concerns about the negative attitude exhibited by a few field representatives. One Agency interviewee suggested that the field representatives work with local staff as partners, not as adversaries.

We believe that some tension is inherent in the relationship between the field representatives and Agencies. The field representative's mission is to critique the work of the Agency for the good of the Program and clients. It is only natural that this monitoring process would cause Agency field personnel to feel anxious and Agency management to feel attacked. Although this may be somewhat inherent in the monitoring process, OEE should be aware of this situation and attempt to minimize the inherent adversarial nature of the process.

More than half of Agency and OEE interviewees thought a standardized scoring system would be useful as part of the monitoring reports. The OEE staff has been discussing such a system for the last two years, but is not close to finalizing one. One Agency representative said a scoring system would provide an incentive for improvement. A handful of Agency field personnel stated they would like to see how they compare with other Agencies, but one mentioned that, “politics would get involved, so leave the monitoring reports as they are now.”

When asked what information would be most useful to include on monitoring reports, most of the Agency personnel stated they thought the reports were fine as they are. Of 22 local staff responding to this question, two said they would like the monitoring reports to have a more positive tone.

The field representatives’ time at each Agency and their monitoring reports are the closest the HWAP comes to a true needs assessment of the field staff. Job deficiencies listed in reports identify knowledge deficiencies, although they can also indicate lack of proper tools, a faulty energy audit, or improper prioritization of job measures.

Two other OEE personnel mentioned that OWTC should do a more formal job of analyzing the monitoring reports and integrating the data into the training. One energy coordinator mentioned that she would like to, “get field representatives, contractors, and inspectors together to talk about the Program.”

### **Interview Responses Regarding Training Provided by Field Representatives**

Field representatives provide training through the T&TA events described earlier and in the course of the standard technical monitoring visits. All of the Agency personnel interviewed thought the field representative training (most often provided through the T&TA events) was a positive experience. Responses included:

- “It shows us what to expect.”
- “Our contractors could see from the monitor what they will look for.”
- “It is one-on-one and very specific. They are coming to us.”
- “It helps us with major problems that we wouldn’t be able to address.”
- “Crews see that a ‘big shot’ will get his hands dirty.”
- “It builds better working relationships and builds partnership.”
- “It’s a good way to find out about very recent changes between refresher courses.”

When asked what improvements could be made to the OEE field representative training, Agency staff gave a broad range of responses. About one-half of the Agency personnel had no suggestions and said that the training they were receiving from the field representatives was “thorough,” “good,” or “OK.” Three of the respondents thought the monitor/training visits should be increased to twice per year. Consistent with the themes identified above, some of the responses to this question were critical:

- “Monitors need to be more open to our ideas, the way we are to theirs.”

- “Monitors should be less clinical and less critical.”
- “There should be more non-adversarial visits.”

Useful suggestions about the field representative training included:

- “Monitors should ask what training might be needed before they arrive so they could plan more time.”
- “Monitors should work some jobs with us.”
- “Let inspectors attend the debriefing after the monitoring visit; now only supervisors attend.”
- Two stated that, “an occasional house diagnostics refresher session would be useful.”

### **Peer Training Initiative**

From PY99 through PY01, OEE funded a peer training initiative for Agency training and technical assistance – an innovation of a manager at the OEE. Each year, \$25,000 was made available statewide to offset the salary of local service providers who were willing to conduct trainings for their peers. Individual Agencies were allowed to draw up to 25% of the qualified peer trainer’s salary. Weatherization personnel at Agencies could qualify as peer trainers by successfully completing the OWTC train-the-trainer course. An OWTC instructor was available to supervise each course they taught in the field for the first time. Any training presented by a peer trainer would be considered a course certified by the OWTC. The peer trainers were to teach at Agencies other than their own, but personnel from their Agency were allowed to attend. However, this “offset of salary” fund for peer trainers was discontinued in 2002 because no Agency ever drew from the \$25,000 fund.

This failed initiative could have lifted some of the training load from the OWTC and increased the breadth of the training and technical instructors’ pool within the state by tapping into the knowledge and experience of local staff. The OWTC supported this initiative by assigning an instructor to oversee it. We did not directly query Agency personnel about this initiative; we suspect it failed because Agency executive directors and energy coordinators thought it would cut into short-run productivity. Even if it did, the initiative might very well have increased long-run productivity.

### **Training Needs Assessment**

OEE has conducted routine training needs assessments annually, and OWTC has conducted informal assessments of training needs. Based on our interviews, these “needs assessments” have been more of a review of expected class attendance than a formal needs assessment linked to the requirements of the weatherization services. For the most recent Program year, the OWTC

conducted a more thorough assessment for the scheduling of classes. This more rigorous assessment should help reduce the number of class cancellations.<sup>8</sup>

The Program training could benefit from a more systematic and comprehensive training needs assessment. This will be discussed in more detail in the final chapter of this report.

## Ohio Weatherization Training Center (OWTC)

The OWTC opened in Athens in 1981 and is operated by COAD. In addition, COAD serves as an umbrella Agency for a number of delegate Agencies, and it operates programs for seniors, early childcare, and leadership with public and non-profit organizations. According to the HWAP Policy and Procedures Manual:

*The role of the OWTC is primarily to provide standardized training to HWAP employees in skills necessary to perform/complete the major operations outlined in the WPS.*

*Another broad responsibility includes providing technical assistance in conjunction with the OEE to grantees in an overall effort to keep the HWAP up-to-date and technically correct.<sup>9</sup>*

For approximately ten years, the Athens organization trained only its delegate Agencies in southern Ohio. Then, in the early 1990s, COAD was awarded a contract from OEE to train weatherization personnel across the entire state.

### Training Center Access

The OWTC is in the southeastern corner of Ohio just twenty-five miles from the West Virginia border. It is approximately 200 miles from Cleveland and Toledo, 150 miles from Cincinnati, and 70 miles from Columbus.

One-half of the Agency interviewees stated that there were not enough training center locations to serve the Agencies. Six of the nine interviewees at OEE agreed. Our process evaluation found that, “For organizations in the northern part of the state, traveling to training is costly and time consuming. Fifty percent of the Agencies felt that the distance, time, and cost to get to Athens were a barrier.” Almost all respondents who wanted more training centers said that an additional location in the central or northern part of the state would serve their needs. Nevertheless, eight of the ten interviewees at the OWTC said that one training center in Athens was adequate.

In 2002, OEE initiated an effort to establish a second OWTC location in northern Ohio. A group of managers from COAD visited Agencies in the area to discuss suggestions for a northern training center location. A request for proposals (RFP) for sites was written and distributed to interested property owners. Two COAD managers visited the proposed sites and selected one in

---

<sup>8</sup> As of April 2005 the OWTC sent an electronic spreadsheet to each Agency with a request that Agency personnel supply information on this spreadsheet, including who is on staff, job titles, and duties. With this information the OWTC is attempting to schedule the appropriate number of classes. Additionally, the OWTC has reported that its management is calling Agency energy coordinators to discuss staff training needs.

<sup>9</sup> Source: *HWAP Policy and Procedures Manual*, Volume II, page 4.

Lakewood, a west-side suburb of Cleveland. Before this process was finalized, however, it was brought to a stop because the PVE funding, used for years to fund training center activity, was diverted to another initiative. This resulted in reduction in the budget for the OWTC and the second training center initiative was dropped.

## **Training Facility**

The OWTC utilizes approximately two-thirds of the COAD facility floor space – approximately one-half of the office space and all of the laboratory/demonstration space.

The Athens facility has two classrooms and a large laboratory/demonstration area. The laboratory area is very well equipped with:

- a heating system area
- a full-size, two-story house (indoors) with a working heat pump
- an insulation dense-pack demonstration area
- a roofing area
- an electrical controls laboratory

It also contains a well-stocked inventory of older heating units, water heaters, insulation types, tools and instruments, and other weatherization related materials. The laboratory/demonstration area has ample floor space to accommodate at least 10 students and instructors. It is well lit, safe and organized to enhance the educational experience. A pressure house demonstration is also in the demonstration area to enhance trainees’ understanding of house pressure dynamics and the importance of worst-case draft testing.

The two classrooms are large enough for the typical classroom size (usually 10 or fewer students). Small demonstrations and posters line the walls in the classroom, making it possible for students to enjoy learning even during break times. Each classroom is equipped with a large television and a companion VCR player, an overhead projector, and a projection screen.

Instructor’s offices are close to the classroom and laboratory/demonstration area, making them easily accessible to the students.

Three-quarters of the Agency personnel interviewed said the training facilities in Athens were “very good” or “good.” Close to the same proportion of the OEE staff agreed. Three of the OEE/Agency interviewees mentioned that the prop house at the training center needs updating.



**Heating laboratory at the Ohio Weatherization Training Center**

## Instructors

There are eight full-time instructors at the OWTC and each must become certified by the OWTC management to teach any class. This process involves attending the complete training session twice, passing any associated exams, teaching the class three or four times as a secondary instructor (teacher trainee), receiving approval for solo instruction of the class by the primary instructor, and, finally, receiving approval to instruct the class from the management at the OWTC.

In addition, all OWTC instructors must be certified by the Building Performance Institute (BPI) and must receive certification from the National Environmental Training Association (NETA) after attending a 40-hour Train-the-Trainer course, or an equivalent.<sup>10</sup>

The eight trainers at the OWTC reported during interviews that they upgrade their skills as trainers by:

- Researching on the Internet (6)
- Attending conferences (4)
- Cross-training at the OWTC (3)
- Reading trade journals (2)
- Taking manufacturer's training, getting out in the field, and operating related business on weekends (1 person mentioned all three)

A manager at COAD mentioned that he and other managers within the organization encourage outside training for the OWTC trainers. Responses from the OWTC instructors regarding the frequency with which they upgrade their skills varied widely. Answers ranged from “constantly” and “daily” to “one or two times each year.”

Regarding the instructors' overall knowledge level, the interview responses from the Agency staff were more positive than those from the OEE staff. Agency staff rated the instructors “very good” on the average, while OEE staff rated them between “good” and “average.” Similarly, Agency staff rated OWTC instructors' overall presentations better than OEE staff did. Agency staff thought they were “very good” to “good,” while OEE staff thought they were “average.”

## OWTC Curricula

The courses offered by the Training Center were listed earlier in this section. These courses fall into seven broad categories:

1. Inspector Series
2. Heating Technician Series

---

<sup>10</sup> As of September 2005, seven of the eight instructors are BPI certified. Three of the instructors have successfully completed the NETA Train-the-Trainer course and four have completed an equivalent course.

3. Weatherization Technician Series
4. Energy Coordinator Series
5. Continuing Education Series
6. Special Courses Series
7. Program Update Courses Series

According to the Training and Technical Services Manager at the OWTC, most of the courses now offered were developed between 1990 and 1995. The topics were initially selected to satisfy the skills required for successful compliance with the WPS.

The course list seems complete, and it appears that the process for adding and dropping classes is reasonable. Reasons for adding courses include alterations in the WPS, dictates by DOE (e.g., lead training and mold training), and findings by OEE field representatives while in the field. OEE and the OWTC work together to decide which courses to add and drop.

One of the regularly offered courses, Inspection Series Refresher (INSR), must be attended and passed every three years by Agency inspectors. The OWTC offers the option of the one-day Building Performance Institute (BPI) certification test rather than sitting for the normal four-day session. This option saves time for the inspector and gives those attending and passing the BPI test a nationally recognized certification. This option also allows recognition of day-to-day work experience.

When courses are developed, OWTC assigns a point person to coordinate the development of the curriculum. Sometimes OEE or Agency personnel are involved with the development early on. Many of the staff and management at the OWTC are part of the editing of a curriculum. Once OWTC approves a new course, it is supposed to receive final approval from OEE, but in practice it does not always work this way.

The OWTC staff told us the courses are updated as needed, usually every two to three years. When we questioned Agency and OEE staff about how current the curricula at the OWTC are, their average responses were, respectively, “reasonably current” and between “reasonably current” and “somewhat out of date.”

Feedback on the classes is gathered in different ways. Students are asked to fill out an evaluation during the final minutes of each course. This type of evaluation is not as effective as a short follow-up interview done within three to six weeks after the class is completed, but it is easy to fill out, does not require much effort by the trainer, and occasionally yields useful information. This practice should be continued.

All of the OWTC staff interviewed indicated that follow-up is done with trainees at some later time to determine the effectiveness of the training. The instructors at the training center said that a follow-up evaluation is sent out to trainees from two to four weeks after the session. However, a majority of both OEE and Agency staff interviewed either said no follow-up was done or they could not remember it.

Trainers and trainees had many ideas regarding the best follow-up method for evaluating OWTC training. The most common suggestion was that instructors should visit the trainees after the training to evaluate the impact of the training. Other suggestions included:

- Send a stamped, self-addressed questionnaire to each trainee
- Send a questionnaire to student's supervisor to fill out
- Have the OEE field representatives evaluate trainees' performance during visits
- Have trainees leave feedback on the OWTC Web site
- OEE should call trainees to ask about enhancement of performance as a result of training
- There should be a third-party evaluation because there is too much baggage between OEE and OWTC

### **Effectiveness of OWTC Training**

Of 18 Agency staff responding during our interviews, 10 said that overall the training sessions at the OWTC were "very effective," and the remaining eight felt they were "effective." Those interviewed at the OEE were slightly less positive in their ratings of the general curricula.

Agency personnel said the most effective courses offered by the OWTC included House Diagnostics, Heating Unit Inspection, Skills and Theory, and the Inspector Series. The reasons they gave for rating these courses as effective included "good basic knowledge," "gives good overall picture right up front," "gives my contractors new ideas," "lots of hands-on," and "covered the basics of how a house works." They felt the least effective courses included NEAT, Consumer Education, and Blower Door Use. Reasons given for poor ratings for these courses included, "didn't have any hands-on segment – too much talking," "too elementary, people should have these skills when hired," "already knew most of it from other classes," and "don't use the knowledge."

Quantec did not measure the effectiveness of training by OWTC instructors. As mentioned above, we found that most of the trainees felt they were receiving "very effective" training during OWTC classes. Of course, perceptions and measured results can differ. In the Conclusions and Recommendations section of this report, we discuss the need for a comprehensive training needs assessment. This assessment should be designed to measure the effectiveness of the existing training program.

### **OWTC Companion Training Documents and Educational Aids**

We reviewed the handouts for 25 of the 30 courses offered at the OWTC. The positive features found with the companion documents included:

- Almost all the companion documents include course objectives and expected outcomes.
- For the most part, the content is based on primary sources, such as, many references to *Residential Load Calculation* (Manual J) by ACCA, *National Fuel Gas Code* (NFPA 54) by NFPA, and the Weatherization Program Standards (WPS).

When asked to rate the OWTC training materials overall, the average Agency personnel response was “good” to “very good.” The average response from the staff at OEE to the same question was “average.” For a related question about how current the OWTC training materials were, the average response for Agency personnel was “reasonably current,” while the OEE respondents felt the materials were “reasonably current” to “somewhat out of date.”

Based on our review, these documents are not visually interesting and are difficult to navigate. It is probable that some trainees find them intimidating and of little use after the training is completed. We believe there is value in making these documents more appealing to trainees so that they would be used and useful after the training. In addition, this would add interest, enhance understanding, and enrich the educational experience during the training.

OWTC staff said they use many other documents for training sessions including code books, the WPS, various manuals published by the Air Conditioning Contractors of America, manufacturers’ documents, and various energy-related text books.

The instructors reported that they use white boards, overhead and 35 mm slide projectors, manufacturers’ videos, and three-dimensional demonstrations in the laboratory area of the building. Two of the ten OWTC interviewees mentioned that they sometimes use data projectors. One stated that they do not use PowerPoint very much. Another said that he would like to do, “flashier and more professional presentations.”

Although PowerPoint presentations should not be overused, it seems that increased use of this medium at the OWTC would enhance many of the presentations. It is always best to use a hands-on demonstration when possible; the OWTC is well-equipped for such opportunities with its richly furnished laboratory. But when a demonstration is not possible, second best is a photograph or video. PowerPoint presentations offer this possibility with low cost, fast turnaround time, and ease of use.

## **Regional Training**

Approximately two-thirds of the formal, state-sponsored, instruction by the OWTC occurs in Athens. The remainder is regional training, occurring at other locations. For these regional trainings, a host Agency coordinates the training preparation with staff from the OWTC, helps promote the training with other Agencies, and assists with the training, if appropriate.

These regional trainings are usually:

- Duct Testing and Sealing
- House Diagnostics
- Blower Door
- Mobile Home Weatherization
- Consumer Education
- Electric Baseload Measurement

- Sidewall Tubing and Siding Removal
- Lead Safe Weatherization

Training sessions that require a well-equipped laboratory always take place in Athens. These include

- Initial and Final Inspection
- Heating Inspection
- House and Heating System Electricity
- Heating Unit Maintenance and Repair

Agency staff typically said that local training offerings were effective. Many local personnel liked the hands-on character of regional training and appreciated learning close to or within their service territory. The local interviewees said that the most effective regional training sessions included

- House Diagnostics
- Blower Door

## **T&TA Events**

In addition to formal training courses, the OWTC offers state-sponsored individualized Training and Technical Assistance (T&TA) site visits to Agencies at jobs in process. These T&TA events are designed to give small groups of Agencies, individual Agencies, or even individual crews, informal training and assistance for diagnostic or installation procedures.

The OWTC keeps a list of Agencies desiring T&TA assistance. Between formal course events, or when formal courses are cancelled, the OWTC responds to these T&TA requests. As a result of the increase in formal course cancellations, OEE and OWTC have agreed to put more focus on the number of state-sponsored T&TA visits by the OWTC.

## **Follow-Up Certification**

Two of the formal training sessions offered by the OWTC require on-site follow-up by the course instructors before student certification is granted. After attending House Diagnostics, students must be tested on site for worst-case draft testing, blower door testing, and zone pressure diagnostics before receiving certification.

Likewise, after attending Gas Furnace Maintenance and Repair, students must demonstrate their skills to instructors on site while performing efficiency tests, gas range testing, and furnace trouble-shooting.

## **Marketing the OWTC Courses**

Agencies are notified of upcoming trainings via an annual calendar developed at the beginning of the Program Year. The Training Center also sends out class schedule changes by broadcast e-mail approximately every two months.

As an important first step in this scheduling process, OEE or OWTC have conducted routine class-need surveys annually. However, staff at the OWTC mentioned that scheduling is a difficult process and that they are making attempts to make it more effective. There are many courses to schedule and the needs of the Agencies' personnel change as the year progresses. Updates are sent out by e-mail, and the course instructors try to inform students of changes.

Records are kept in an OWTC database about each person employed in HWAP. These data include completed courses and courses each person is still required to take, including refresher sessions. Rather than having free access to these data, OEE requests the data from the OWTC and keeps a separate database. It has been reported that it is not unusual for the OWTC student database and the separate OEE student database to contain different information. This situation should be corrected as soon as possible. Quantec was told that on their routine visits, field representatives inform weatherization personnel of the courses they are required to successfully complete. Energy coordinators or other management at Agencies can call the OWTC to learn what training each of their employees requires.

There is no evidence that the OWTC is marketing its training services outside of Ohio except with its Web site and with the use of an exhibition booth at some national conferences. OEE management feels that if the OWTC were able to broaden its economic base beyond Ohio's boundaries, the cost-per-student within the Ohio Program would fall. This may be only partly true, though, because much of the training for HWAP is based on the WPS, an Ohio-specific standard. On the other hand, some OWTC classes are based on DOE guidelines, such as Lead Safe Weatherization, and students from outside Ohio who paid for such classes would help lower the Ohio per-student cost.

The OWTC and Agencies staff rated the effectiveness of OWTC marketing between "effective" and "somewhat effective." OEE staff rated it between "somewhat effective" and "not very effective."

It appears that the OWTC can do a more effective job of marketing its training services, both inside and outside of Ohio. It is likely that enhanced marketing would hold down, to some degree, training costs paid for with Ohio Program funds.

## **Appraisal of Inspector Refresher Class at OWTC**

On February 1 and 2, 2005, two Quantec staff observed about three hours of Inspection Series Refresher training at the OWTC. Inspectors are required to attend this four-day session class once every three years or pass the corresponding Building Performance Institute exam, which requires one day. The eight students attending this four-day class included two OEE field representatives and six inspectors from as many Agencies.

During the introduction for the course, two instructors handed the instruction back and forth. Questions were encouraged during a preview of the class. The printed resources for the class were discussed, and provisions were made for students who did not bring the necessary code books. The classroom had a video player/television monitor, a projection screen, and an overhead projector near the instructors. At least a half dozen instructive, well-designed posters hung on the walls. The room was well illuminated with natural and artificial lighting.

The tone in the classroom was very restrained. This could have been a result of intimidation caused by our observation and/or because two OEE field representatives were in attendance.

The two instructors got right to the curriculum rather than starting off by helping to make the students comfortable and feel welcome. Additionally, the instructors did not take the responsibility for infusing energy into the training experience. Yes, the printed materials were provided for those who needed them, the classroom was clean, the usual audio-visual equipment was on hand, and the trainers were very knowledgeable. All the right components were there for a successful learning experience – except the energy. This made the training segment observed by the Quantec staff very flat and lacking in dynamism. Although it is risky to generalize our findings because of the short time the Quantec staff were able to observe this class, we believe that trainers at the OWTC should always be aware that, in the classroom and laboratory, *they have the primary responsibility* for bringing energy and dynamism to the learning experience. Based on our observations and responses from some agency staff we interviewed, we believe that the instructors are generally technically knowledgeable, but are not as skilled in their teaching methods.

Later during our visit, we were able to observe a demonstration segment of the training in the well equipped and spacious laboratory. The demonstration/ laboratory area of the training center is organized into stations for heating equipment, insulation blowing, roofing, and other activities. It also includes a full-size house for performing diagnostic procedures such as blower door operation and worst-case draft testing. We noticed that the interaction among the instructors and students was more relaxed in the laboratory than it had been in the classroom.

## **Costs and Funding**

During our interviews conducted through early 2005 for this study, we became aware of recent tensions in the relationship between OEE and OWTC, driven in part by apparent increases in training costs during the past few years. Several interviewees at OWTC, Agencies, and OEE specifically highlighted this issue and the impacts it was having. Consequently, we explored this issue and some of the information related to it.

During the past four years, the budget allocated to OWTC has varied by as much as 20%, primarily because of the State's loss of Petroleum Violation Escrow (PVE) funds. In early 2005, memoranda from both OEE and OWTC were distributed discussing the training budget and OWTC's performance. The documents provided different estimates of the training budgets and costs, based on different calculation methods.

These memos were symptomatic of a difficult relationship between the two organizations at the time. OEE felt that the return on training dollars was going down and it had lost some control of

the training program, for which it is ultimately responsible. Of special concern to OEE was that COAD had initiated an amendment in the State budget bill to guaranteed the OWTC a funding set-aside in the 2003-2005 State biennium budget. This line item budget limited OEE's control over the funding for the biggest share of the comprehensive HWAP training program.

This contentious situation had caused serious communication difficulties between OEE and COAD that had repercussions extending beyond these organizations. During our Agency interviews, just over a month after the memos from OEE and COAD were distributed, Agency management reacted strongly to the OEE/COAD controversy. The Agencies expressed a range of opinions supporting one organization over the other and generally noting that this situation was having negative effects on the training Program overall.

There is no question that damage was caused to the training Program and overall HWAP implementation by this controversy. Since our data collection began, constructive steps have been taken to remedy these problems.

### Cost per Student Day

One of the significant factors causing problems between the two organizations is lack of agreement on methods for calculating training costs, for example, the cost-per-student day. The basis for such calculations should be mutually determined by OEE and COAD as soon as possible.

OEE raised concerns about the per-student cost of training. OEE estimated that the PY04 cost per student had increased 93% over the 2002 program year. These estimates are shown as the fourth column in Table 6.

COAD estimated the PY04 costs to be significantly lower than OEE's because they included the T&TA visits in their calculations. OEE did not have access to these T&TA data so could not include this activity in their calculations. COAD's values, in terms of both cost per student and cost-per-student-day, are shown in the last two columns in Table 6. Using the cost-per-student-day values, the cost increased from PY02 to PY04 by only 24%. Using COAD's figures, the cost-per-student for each year is shown in the next to last column of Table 6. These values increased by only 20% between PY02 and PY04, compared to the 93% increase estimated by OEE.

**Table 6. Cost per Student, February 2005**

Program Year	Cost per Course	Cost per Day	OEE Cost per Student*	Cost per Student	Cost per Student Day
PY 2002	\$5,528.62	\$2,089.30	\$539.50	\$765.41	\$298.47
PY 2003	\$6,216.67	\$2,404.10	\$935.10	\$1,059.29	\$411.95
PY 2004	\$5,081.97	\$2,046.20	\$1039.86 (projected)	\$918.52	\$369.71
The source of this information is COAD, except for the fourth column, which is based on OEE information.					

These differences in the values presented by OEE and COAD illustrate that not only the average values for a Program Year differ, but the trends are not consistent. This confirms that the methodologies used by the two organizations are not the same, and probably even the inputs used in the calculations differ.

We believe that cost-per-student-day is a more precise way of measuring training costs than cost per student. For comparison purposes, we conducted an Internet search of nine training companies offering software and vocational training and found a cost-per-student-day range of \$300 to \$750.<sup>11</sup> The comparable figures calculated by COAD and including the T&TA activities fall at the low end of this range.

The simplified equation for the calculation of cost-per-student day is:

$$\text{Cost per Student Day} = \frac{\text{OWTC PY \$ Allocation}}{\text{Number of Actual Student Days for PY}}$$

Because the training performed by the OWTC occurs in various ways – classroom training in Athens, regional training, and T&TA events – agreeing on a method for calculating the cost-per-student day might be complicated. Included among the issues that must be considered are:

- How should T&TA training events be included? We suggest that the field staff served be counted and the number of T&TA events and students served be accounted for.
- How should regional training events be included in the calculation? We recommend that the field staff served be counted and the number of regional trainings and students served be accounted for.
- When OWTC instructors are serving a delegate Agency, how should this time be included in cost-per-student, if at all?
- Should fixed costs for the OWTC be included in the cost-per-student calculation? We suggest that all fixed costs (e.g.; instructor, manager, and support staff salaries and benefits; building rental and insurance, etc.) be included.
- When classes are cancelled, how should students who otherwise would have attended be included in the equation? We recommend that these registered students not be counted.

We believe that implementing a consistent cost tracking method is very important at this juncture and that regularly reporting the cost-per-student-day value for the Ohio HWAP training program is an important metric that will yield many benefits. However, when determining the method for quantifying cost per student day, it is important not to lose focus on the quality of the training. The primary objective should always be to achieve the best educational experience for each dollar spent.

---

<sup>11</sup> We were unable to get reliable cost data from the OWTC interviews we conducted. These interviews are discussed later.

## Course Cancellations and an Aging Curriculum

The OWTC supplied Quantec with both detailed and summary data for PY99 through PY04. Class and student cancellation data in Tables 7 and 8 are for scheduled classes held in Athens and regional training events; T&TA training is not included. Some of these data vary slightly from those reported by OEE, but the variation is not significant and probably resulted from slight differences in reported information.<sup>12</sup>

**Table 7. Class Cancellation Data for the OWTC, PY99 - PY04**

Program Year	Classes Scheduled	Students Initially Registered	Actual Student Attendance (% of Initially Registered)*	Net Classes Cancelled (% of Scheduled)**
1999	100	922	66%	13%
2000	123	1063	56%	15%
2001	188	1883	73%	16%
2002	149	1309	70%	9%
2003	128	855	72%	19%
2004	142	873	74%	20%

\* Indicates the percentage of initially registered students who actually attended the class. Reasons for not attending included late cancellation and not showing up for class.  
 \*\* Indicates the percentage of initially scheduled classes by the OWTC that were cancelled and not replaced by a rescheduled class at the OWTC or a regional training. T&TA events replacing cancelled classes are not included in these data.  
 All data provided by the OWTC, July 2005.  
 All data for scheduled classes at the OWTC in Athens and for regional training.

**Table 8. Student Cancellation Data for the OWTC, 1999 - 2004**

Program Year	Total Student Cancellations (% of total initially registered)	Late Student Cancellations* (% of total initially registered)	Students not Cancelled and not Attending Class** (% of total initially registered)	Average No. Students per Class after Cancellations
1999	318 (34.5%)	23 (2.5%)	65 (7.0%)	6.9
2000	469 (44.1%)	51 (4.8%)	88 (8.3%)	5.7
2001	507 (26.9%)	50 (2.7%)	95 (5.0%)	8.7
2002	393 (30.0%)	91 (7.0%)	70 (5.4%)	7.4
2003	238 (27.8%)	86 (10.0%)	35 (4.0%)	6.7
2004	226 (25.9%)	77 (8.8%)	55 (6.3%)	5.6

\* A student cancellation taking place within five working days of the first day of a scheduled class.  
 \*\* The OWTC refers this category as "no-shows."  
 The difference between "Total Student Cancellations" and the sum of "Late Student Cancellations" and "Students not Cancelled and not Attending Class" is the students who cancelled more than five days before the class began.  
 All data for classes held at the OWTC or Regional training (T&TA events are not included).  
 All data provided by the OWTC, July 2005.

<sup>12</sup> The OWTC submits a monthly report to the OEE, which includes class attendance, cancellations, etc.

These data show that from PY99 through PY04, the percentage of classes cancelled and not replaced by rescheduled classes varied from 9% to 20%. The smallest percent was in PY02.

To minimize course planning problems, the OWTC has a policy that penalizes delinquent Agencies for late cancellations or no-shows. Since PY00 OEE requires OWTC to levy a \$50.00 per-person, per-course, refundable registration fee on Agencies that have a history of five or more last-minute cancellations or no-shows during a six-month period. If a delinquent Agency cancels a student registration within five working days of the class or the student does not show up for the class, the registration fee is deposited in the OWTC account to offset registration costs; otherwise, the fee is refunded. As Table 8 shows, there are no clear trends in the student cancellation numbers. Total cancellations (as a percent) have declined in the most recent years compared to PY99 and PY00. Late cancellations, however, appear to have increased recently, while “no shows” have tended to decline.

Since OEE raised the concern about class cancellations, it is important to note that class cancellations were highest in PY03-04 (see Table 7). We believe that the cancellation percents for these two years are higher for two reasons: the maturing of the training curricula and the lack of new course introductions during these years.

First, as a curriculum ages or matures, the demand for it from a fixed population decreases. When most of the HWAP courses at the OWTC were new, between 1991 and 1995, the demand for each course was high. This made scheduling easier for the OWTC, and course cancellations were lower. As the curricula matured and demand decreased, average class size has gone down and scheduling has become more difficult. As a natural outcome of this maturing supply and dwindling demand, cancellations have increased. This evolution is natural, but is also an indicator of the need to revise the curricula and to become more thoughtful about class scheduling.

Second, no new courses were introduced in PY03 or PY04. When new courses are introduced at the OWTC, average class size will increase, scheduling will become easier, and class cancellations will decrease. For example, “in 2002 there was one new class and one class that had been new in 2001, but not all the provider staff had yet attended.”<sup>13</sup> The percent of net classes cancelled was lower in PY02 than any of the other five years examined.

Of course, demand will always be created by new Agency staff and by experienced staff attending refresher classes, but as a training program and curricula mature, overall demand decreases. This maturing can cause stress to the managers of a training program because it leads to reduced class size and more challenging scheduling. As a program matures, is also likely to be perceived as less and less relevant by the trainees and their managers.

---

<sup>13</sup> Memorandum from Bob Pitts, Deputy Director, COAD, to HWAP Policy Advisory Council, HWAP Executive Directors, Energy Coordinators regarding Response to Sara Ward’s 2/9/05 Correspondence, February 28, 2005, page 5.

# Agencies

## Agency Responsibilities and Challenges

Agencies, along with the OEE and the OWTC, are one of the primary organizations responsible for ensuring that the HWAP training for Agency employees and contractors is working in the best manner possible. OEE's stated guidance for Agency training defined in the HWAP Policy and Procedures Manual includes new employee training, a mechanism for assessing training needs, a listing of training resources available, the importance of continuing education, the advantages of both formal classroom training and on-the-job training, and the recognition that training in ancillary areas (e.g., computer literacy or occupational safety) is important.

Of course, Agency management often gets caught between production needs and the need to train weatherization staff. Our process evaluation noted that, "One-fourth of the Agencies interviewed reported that sending their staff to training created difficulties in meeting their production goals. This can especially impact smaller, rural Agencies with few staff people."

However, one of the important advantages of training staff is to increase productivity in the long-term. Loss of productivity while staff is training is a short-term obstacle. Agency management must understand this tradeoff and do their best to accommodate the training requirements.

For Agency management faced with resource limitations in this competitive job environment, a comprehensive training program can be a mixed blessing. On one hand, it increases worker efficiency, competency, and professionalism, but on the other hand, it makes workers more attractive to employers in parallel fields of employment, such as construction, and more difficult to retain without pay increases.

## Local Training Programs

OEE provides local Agencies with T&TA funding. This local training should not be confused with regional training or T&TA training presented by instructors – and funding – from the OWTC. These local Agency T&TA funds are generally used for:

- Travel and per diem costs for state-sponsored training events
- HWAP related training costs for topics not covered by the state-sponsored training center
- Registration and travel expenses for national and regional conferences
- Purchasing HWAP and OSHA related training materials

Up to 10 percent of the salary for an Agency T&TA trainer is available from OEE. This training salary offset is available after the Agency individual has completed the Train-the-Trainer course through the OWTC. The individual can then provide training on topics in which they are proficient to in-house staff. Any training provided by this individual does not receive certification through the OWTC. It is not necessary for the peer trainer specialist from the OWTC to oversee these local training events.

OEE recognizes the importance of local training programs, defines the components of a successful program as a guide for Agencies, and states, “an effective local training program is the responsibility of the HWAP provider agency.”<sup>14</sup> This is a balanced approach by the OEE, taking responsibility in its leadership role, but delegating responsibility and authority to the Agencies.

## **Training for Weatherization Contractors**

Although the OEE prescribes certain training requirements for some contractors, it makes it clear that Agencies have the primary responsibility for ensuring the contractors and other weatherization employees are adequately trained and skilled. The OEE recognizes that Agencies might have their own requirements for contractor training.<sup>15</sup> Additionally, the OEE believes, “[the] local agency contractor selection process should be rigorous enough to ensure that contractors are adequately skilled and qualified.”<sup>16</sup>

According to OEE requirements, if a heating contractor is not State or locally certified, the contractor must complete the OWTC Combustion for Contractors course or the Gas Furnace Maintenance and Repair course. Weatherization contractors must successfully complete Blower Door training and House Diagnostics training. We heard from a handful of field representatives and inspectors that the quality of contractor work is generally lower than that of crews. Contractors generally receive less training than Agency employed crews. Some Agencies require contractor training beyond the Blower Door Use and House Diagnostics classes required by OEE. One Agency manager we spoke with includes these extra required courses in their agreement with their contractors. This Agency reported that this improved the quality of work and enhanced communications between inspectors and contractors.

If a weatherization contractor bills for job testing procedures, the person overseeing these procedures must successfully complete the appropriate training courses.

Contractor training at the OWTC and at regional trainings is state-sponsored. Contractors attending training in Athens have their registration and lodging paid, but they must pay their own travel expenses and per diem. The OEE and OWTC require an Agency that uses a contractor to register the contractor staff for classes at the OWTC.

## **Personnel Preparation for OWTC Courses**

Five of the nine OWTC staff and several OEE and Agency personnel interviewed mentioned that students were often not prepared for OWTC courses, either because they had not been in the field enough or because they had not done any preparatory study for the class. In recent years, OEE and OWTC have recognized this problem and, as a result, the OWTC has sent out a math

---

<sup>14</sup> See HWAP Policy and Procedures Manual, Volume II, page 3.

<sup>15</sup> One energy coordinator interviewed provided a section of his agencies agreement with contractors. This agreement requires contractor crew leaders to obtain a specified level of training and certification from the OWTC.

<sup>16</sup> Source: HWAP Policy and Procedures Manual, Volume II, page 2.

pre-test for some courses. The OWTC instructs students and their managers that attendees should be able to pass the test before attending. Apparently, however, there was a strong reaction against the math pre-test and other pre-course study from Agencies; as a result, this work is now recommended rather than required. A manager at the OWTC stated that recommended “homework” is sent out to all students before all formal classes.

We believe, in accord with the HWAP Policy and Procedures Manual, that Agencies have the primary responsibility for ensuring the contractors and other weatherization employees are adequately trained and skilled. Before hiring, an Agency manager should ensure that the prospect has the aptitude to learn the necessary knowledge and skills to productively complete the required tasks. Furthermore, if an employee has the aptitude to learn, but needs preparatory training before attending classes at the OWTC, it is incumbent on the Agency to make sure such training is provided. One energy coordinator we interviewed uses the math test sent out by the OWTC to determine if employees are ready for classes in Athens. If they need math training, they are sent to a local college first. If they pass the course, the Agency reimburses them for their registration fee. Additionally, as employees move up the educational ladder of OWTC courses, their wage rate is increased as a reward.<sup>17</sup> This energy coordinator has never blamed the OWTC if an employee has difficulty with an OWTC class; she thinks it is a result of improper preparation and is the fault of the employee or the Agency.

## **Secondary Sources of Training and Education**

### **Conferences**

The most common conference attended by personnel in the three groups interviewed – OWTC, OEE, and Agency staff – was the annual Affordable Comfort Conference. This national conference was mentioned 30 times by interviewees, while regional weatherization conferences were mentioned 16 times and the National Weatherization Conference was mentioned nine times.

The reported cost range for attending a conference was \$600 to \$1,800, with the average being \$1,200. These costs excluded any amount for salary or wages.

Of those responding regarding the number of days each year they attend conferences, the OWTC staff averaged 5.7 days, OEE staff averaged 4.6 days, and Agency staff averaged 3.4 days. Seventeen of the 26 Agency staff interviewed stated they had attended at least one conference related to weatherization. All of the OEE and OWTC staff interviewed had attended related conferences.

Popular advantages of attending conferences for all three groups included:

- Networking

---

<sup>17</sup> We are aware of at least one other Agency that increases employee compensation as they advance through the required OWTC training.

- Learning about new technologies and policies
- Sharing weatherization stories with others

Disadvantages mentioned by Agency personnel included:

- Loss of time on job
- High cost
- Crowded classes
- Travel time

A few respondents mentioned that attending conferences broadened their perspective of weatherization and learning; when compared with other states, they discovered that Ohio had a very good Program, but there were other ways to do many weatherization tasks.

## **Outside Trainers**

Periodically, OEE, an Agency, or an Ohio utility hires a trainer from outside the Ohio HWAP system to deliver needed training. Examples include building inspection training, ZipTest Pro building diagnostics software training, and heating system diagnostics (presented by a manufacturer).

## **Utilities**

A number of utilities in Ohio operate a variety of programs that complement HWAP. Utilities have traditionally utilized the training resources that are part of HWAP. Their staff and contractors have attended training at OWTC and they have contracted with OWTC staff to provide training within their communities.

There was very little response from OWTC instructors, OEE staff, or Agency personnel to interview questions about training specifically for utility programs. For the six (of 35) people responding, utility training was rated “effective” to “very effective.” The only utility program mentioned was WarmChoice. The only training sessions identified were the National Fuel Gas Code, Consumer Education, Electric Baseload, and Columbia Gas Heating Unit Inspection. One of the utilities suggested that a needs assessment be conducted to determine how best to allocate training resources. Utility training does not appear to be a significant part of the overall HWAP training program.

## ***Residential Update Newsletter***

OEE began writing and publishing *Residential Update* in March 1999. This HWAP-related newsletter has been published three times each year, with the exceptions of four times in 1999 and two times in 2001. The length of the 8½ by 11 inch publication varies from three to ten pages.

*Residential Update* is mailed to OEE staff, energy coordinators, PAC members, State HWAP offices, out-of-state training centers, DOE, and others, and is posted on the OEE Web site. For each issue, 400 to 450 copies are printed and distributed. OEE is presently experimenting with broader distribution by e-mail.

This well written and informative publication includes program announcements; relevant news reports; clarifications and discussions of technical weatherization program issues; information about equipment and tools; occasional book reviews; and a calendar of upcoming conferences, OEE training sessions, and program deadlines.

With formatting, content, and delivery changes, *Residential Update* could be used to greater advantage to enhance communication among OEE, OWTC, Agencies, and educate inspectors and weatherization work-site personnel.

## Comprehensive Home Energy Curriculum (CHEC)

<b>TABLE OF CONTENTS</b>	
<p><b>HOME ENERGY PRINCIPLES</b>            Energy Basics            Energy Efficient Buildings            Energy-Efficient Windows            Electrical Safety</p> <p><b>WEATHERIZATION BASICS</b>            Insulation Basics            Densepack Wall Insulation            Air Barrier Repair</p> <p><b>DURABLE HEALTHY HOMES</b>            Moisture Management and IAQ            Mechanical Ventilation Systems</p> <p><b>BASELOAD MEASURES</b>            Domestic Hot Water            Residential Lighting</p> <p><b>HOME HEATING</b>            Gas Furnace Basics            Gas Furnace Evolution            New Gas Furnace Tests            Existing Gas Furnace Tests            Air-Handler Airflow Tests            Combustion Air            Chimneys and Venting            Oil Burner Basics            Hot-Water Heating Basics            Steam Heating Basics</p>	<p><b>HOME COOLING</b>            Low Energy Cooling            AC &amp; Heat Pump Basics            Charging ACs and Heat Pumps            Room Air Conditioners            Evaporative Coolers            Cool Roof Coatings</p> <p><b>DUCT EFFICIENCY</b>            Duct Efficiency Basics            Quality Duct Installation            Blower Door Duct Testing            Duct Blower Duct Testing            Duct Sealing</p> <p><b>SHELL PRESSURE DIAGNOSTICS</b>            Blower Door Basics            Digital Manometers: The DG-3            Basic Pressure Diagnostics            Add-a-Hole Diagnostics            Pressure-Only Diagnostics</p> <p><b>MOBILE HOMES</b>            Mobile Home Construction            Mobile Home Insulation            Mobile Home Air Sealing            Mobile Home Furnaces            Mobile Home Duct Repair</p>

Full Screen Mode On/Off      Go Back      CHEC: Comprehensive Home Energy Curriculum © 2003 Saturn Resource Management, Inc.

OEE has a user license that allows unlimited distribution of CHEC to Agencies and the OWTC for HWAP training purposes. CHEC was authored by Saturn Resource Management, Inc., in 2003 for the Ohio HWAP. This comprehensive computer-aided weatherization training was distributed to all Agencies and the OWTC in 2003. Other copies of the compact disk are available from OEE if needed by an Agency.

The CHEC table of contents shows the comprehensiveness of this training program. Based on our review, each unit is easy to understand because of the logical organization, the effective and efficient use of text, and the inclusion of clear illustrations and photographs.

Although we did not ask directly about CHEC during our interviews, two of the trainers at the OWTC said they use it to enhance their training sessions. One Agency energy coordinator said he was going to start using CHEC with his inspectors and crews (he was not asked directly about CHEC).

## **HWAP Field Guide**

This how-to weatherization field guide was written in 2003 by Saturn Resource Management, Inc. under the direction of the OEE. The 240-page document is well illustrated and clearly written for inspectors, crews, and contractors. The text closely reflects the more technical language of the Weatherization Program Standards (WPS).

This publication is probably very useful to the weatherization staff for which it was written. It is easy to navigate, includes many good illustrations, is easy to carry in one's truck or car, and demystifies many of the items in the WPS.

## **Weatherization Program Standards (WPS)**

One of the primary responsibilities of OEE is the maintenance of the WPS, now in its ninth edition. This 460-page document is written and formatted as a code book for the diagnostic and installation standards for all HWAP testing, installation, and inspection at each job.

This document explains the requirements of the best practice approaches to diagnostic procedures, installation of weatherization measures, and health and safety within HWAP. OEE regularly administers the updating of the WPS (with a process described in Section 105) that includes the stakeholders.

During even numbered years, OEE collects proposed amendments. During odd numbered years, OEE compiles all the proposed amendments along with supporting documentation and makes this compilation available to all interested parties for 30 days. Written challenges to the proposed amendments may be submitted and heard on a date set by OEE. All proposed amendments and challenges are then heard by the PAC. The PAC determines changes and submits the proposed text to OEE for final consideration and approval.

Although we did ask specifically about the WPS in our interviews, some of the Agency personnel interviewed offered comments, including that the WPS was difficult to navigate, too complex, and redundant. Based on our knowledge of similar programs in other states, the WPS has more pages than any other state technical weatherization program document. Material in some sections is repeated a number of times, probably with the intent to enhance understanding and ensure completeness. However, it appears that the complexity and the size of this important document may intimidate many trainees and practitioners.

## **Survey of Other Training Centers**

Using the *Home Energy* magazine and Residential Energy Services Network's (RESNET) Web sites, Quantec identified training organizations similar to the OWTC and contacted them via e-

mail or telephone. The selected programs were generally considered comparable if they were non-profit and performed training at a central location. When contact was made, a brief survey was sent to the appropriate contact by e-mail, or the survey was performed directly over the phone. The instruments is presented in Appendix B.

The training centers we surveyed included:

- Indiana Community Action Association (INCAA), Indianapolis, Indiana: serves Indiana and neighboring states. INCAA has been providing training to members of the building trades and employees and contractors for the Weatherization Assistance Program since 1980. Funding: 80% federal, 20% student.
- California Building Performance Contractors Association, Oakland, California: serves central and northern California. This program trains contractors to become home performance professionals and concentrates on “house as a system” training – the interaction of the HVAC system, building envelope, and the rest of the house. Funding: 100% Public Utilities Commission.
- Sun Power, Inc., Denver, Colorado: serves primarily Colorado, although trainings are also conducted at other state’s weatherization agencies. Beginning and advanced courses include blower door use, carbon monoxide and venting, whole-house weatherization, and heating system operation. Funding: 100% federal.
- DOE Central Region Weatherization Assistance Center, Montana State University Extension Service, Bozeman, Montana: serves DOE central weatherization region (12 states). Funding: 70% federal, 30% state.
- Utah Energy Conservation Coalition, Inc., Orem, Utah: serves mountain and southwestern states. Funding: 100% student.
- CASE of West Virginia Training and Energy Services Center-Princeton, West Virginia: serves primarily West Virginia weatherization personnel. The Center serves private contractors, utility staff, weatherization program personnel, building and code officials and the general public in West Virginia and surrounding states. The training facility has classrooms and laboratories with operating HVAC systems to learn maintenance and repair. Students use state of the art diagnostic equipment during the training and receive training manuals for each topic. Funding: 100% federal.
- Vermont Energy Investment Corporation, Burlington, Vermont: serves primarily Vermont, but also the northeast weatherization region. VEIC provides training toward BPI (Building Performance Institute) certification and is authorized to proctor the testing of candidates for three levels of BPI certification: Building Analyst, Heating Specialist and Shell Specialist. Funding: 75% federal, 25% state.
- Oregon Housing and Community Services, Salem, Oregon: serves weatherization personnel in Oregon. OHCS was created in 1991 when the legislature merged the Oregon Housing Agency with State Community Services. Funding: 40% federal, 60% state.

All of these training organizations get all or most of their funding from the Federal government, except the California Building Contractor Performance Associates, which receives all of its

funding from the state Public Utilities Commission and the Utah Energy Conservation Coalition, which gets all of its funding from students.

A training facility that appears to be quite similar in character to the OWTC is the INCAA. INCAA mails a quarterly course schedule to potential public and private sector, in- and out-of-state students. Although the INCAA courses are primarily geared for the weatherization standards in Indiana, INCAA is able to accommodate outside students in most of their classes. This adds diversity to the student body, enhances the learning experience, and contributes approximately 20 percent of the annual operating budget.

INCAA's marketing efforts are targeted approximately as follows: weatherization staff, 50%; contractors, 35%; utilities, 10%; and 5 % to others. Virtually all students are employed directly or indirectly by a low-income weatherization program. Their marketing includes a Web site, networking, and a quarterly mailing of the class schedule.

The average class size at INCAA sessions is similar to that of OWTC; however, the other seven organizations we surveyed have larger average class sizes – from eight to 30.

All of the surveyed organizations provided class cancellation information and all were significantly lower than the most recent OWTC percentage. INCAA said they cancel about 5% of their classes (they have no cancellation penalty). New INCAA classes are usually full until the class is held from four to eight times; then the enrollment drops off and class cancellations can become a problem. As the attendance drops, INCAA reduces the number of times the class is held. Four students is the INCAA minimum for a class. The other surveyed organizations reported class cancellation rates from 0% to 5%, although, one reported a 10% cancellation rate.

Half of the training organizations plan their training schedule on a quarterly basis, the other half on an annual basis. For most of the organizations, the scheduled courses are determined in the same manner in which it is done at the OWTC. Agency managers are queried regarding the training needs of their staff, and the training organization keeps a record for each weatherization staff in a database. None of the surveyed organizations indicated that they had ever completed a comprehensive training needs assessment. For half of the organizations, monitoring reports are examined for indications of training needs.

None of the organizations are performing math or reading comprehension screening tests, although one mentioned that they should. To its credit, the OWTC started this practice a number of years ago.

The training organizations were asked about the number of students who pass their courses. Two organizations stated that all their students pass. Four had passage rates in the range between 90% and 99%, and two had rates between 80% and 83%.

The student scoring data supplied by the OWTC in Table 9 falls within a similar range. Overall, students scored worst in OWTC courses related to heating units and math.

**Table 9. Student Scoring Data for the OWTC, PY01 - PY05**

Program Year	Number of Students Scored*	Students Passing the Scored Classes, percentage
2001	846	94%
2002	690	90%
2003	429	83%
2004	410	74%
2005	310**	85%**
All data provided by the OWTC, September 2005. * Data includes the majority of students, but not all students. ** Does not include the entire program year.		

## 4. Conclusions and Recommendations

---

### Conclusions

The Ohio HWAP is well managed and staffed by competent and committed people. Through its biennial revisions to the WPS, the Program ensures that its weatherization practices are at the cutting edge of the field and provide the maximum benefits to its clients. Training is an integral component of the Program, and the OWTC probably does more training and has a larger staff than any other central weatherization training facility.

Our thorough examination of the HWAP training program found many strengths and identified some opportunities for improvement. As stated earlier, Ohio's HWAP training requirements are probably more rigorous than those for any other weatherization program in the country. All of the most important building blocks for a solid, ongoing, and effective program are already in place. As a result, this evaluation has addressed methods of fine-tuning an already mature training system.

### General Conclusions

We found many important characteristics and initiatives that create a strong foundation for the training program. These include:

- Advanced HWAP technical standards characterized by a thoughtful concern for the healthy and safe installation of energy-saving weatherization measures
- A significant depth of training and education resources, including the OWTC (formal classes in Athens, regional training, T&TA training), OEE (formal training in Columbus), field representatives (coincident training while monitoring and T&TA training), Agencies (T&TA training presented by Agency staff), utilities, national and regional conferences, and various self-study materials (HWAP Field Guild and CHEC, for example)
- Concerned, knowledgeable, and committed staff at OEE
- Very knowledgeable and committed trainers at OWTC
- The broad menu of formal courses available
- A well equipped training center

Ohio is one of only a few states with its own training center. States without training centers typically send their staff to centers in other states or hire independent trainers. There are advantages and disadvantages to either approach.

Likely advantages of having an in-state training facility include:

- Development of continuity, a history, known values, and familiar staff
- An ongoing and predictable training schedule

- A training budget that is not subject to sudden changes
- Knowledgeable instructors available to conduct regional training and T&TA events, giving a great depth to the training program

Possible disadvantages of a training center include:

- The potential for becoming complacent due to lack of competition and new ideas and new blood
- Students exposed to the same instructors for years
- A curriculum that is slow to change

The alternative of hiring independent trainers through a competitive bidding process also has advantages and disadvantages.

We believe that OEE and the OWTC could improve its formal training by finding ways to combine the advantages of the central training center with the advantages of using independent trainers. For example, independent trainers could be hired for short-term residencies at the OWTC in Athens. This would expose the regular trainers and some students to an outside influence, bringing fresh ideas and methods to the overall training program. Of course, this is not a novel idea; colleges and universities have been retaining resident teachers for decades.

There are three areas we highlight in which relatively recent actions and initiatives are making significant positive contributions to the training function:

- An increased focus on T&TA at OWTC providing custom-tailored training to meet the educational needs of the Agency personnel
- A new effort by OWTC management to contact Agency energy coordinators personally to discuss the training needs of their employees
- A renewed initiative by management at OEE to improve its relationship with COAD and the OWTC and overcome perhaps the greatest existing obstacle to an effective training program

## **Improvement Opportunities**

We found that the staff we talked with from OEE, OWTC, and Agencies realized the great value of the Ohio training program, but also had a sense that it could do a better job fulfilling the HWAP mission.

We believe that at the time we conducted our data collection, the biggest obstacle to the training Program was the tension between OEE and COAD. Since then, efforts have been made by both organizations to develop improved relations and a common understanding about the Program. We believe that our research helped motivate these changes and that both groups are moving in a positive direction.

Another important area for improvement is that of a comprehensive training needs assessment. OEE and OWTC have been questioning Agency management or checking training records to determine the demand for the existing classes at the training center. This is an important function for the thoughtful scheduling of classes and it should continue. We suggest that the current activity be termed a “class-needs survey” rather than a needs assessment.

## **Recommendations**

The training program has the primary objective of transferring the knowledge and skills to the field staff so that they are able to professionally fulfill the mission of the HWAP. The major components of this training program are the OEE, the OWTC, the Agencies, and, of course, the trainees. All of these players have a vital part in an effective program to educate HWAP staff.

### **Clarification of Organizational Responsibilities**

Our most important recommendation is for OEE to bring together representatives from the key organizations – OEE, COAD, and the Agencies – for the purpose of defining or redefining HWAP training responsibilities and commensurate authority. Responsibilities should be stated clearly. Both OEE and COAD have made strides since our study began to address these issues.

We note that, since OEE is ultimately responsible for the training program quality and its outcomes, it must have the authority to make critical program decisions, including those involving overall funding allocations. Of course, with its expectation that the OWTC will deliver an effective training program, OEE must hand over an appropriate amount of operating authority to the OWTC. In turn, OEE has the right to expect and be confident that OWTC will deliver an effective program. These two organizations should be partners, each exercising its appropriate authority and doing its best to fulfill the HWAP mission.

There are other roles and responsibilities that need better definition. It should be made clear by OEE that:

- OWTC must have final approval from OEE for a new course or a revised course before the course is taught. The realities of scheduling will sometimes make timely approval difficult, so OWTC and OEE should decide upon a smooth and expeditious process. OEE approval should always be in writing.
- Trainers are ultimately responsible for providing their trainees an educational, comfortable, and entertaining experience
- Agency management is responsible for providing the pre-training skills and knowledge needed by their employees
- Agency management is responsible for ensuring that their contractors have the requisite knowledge and skills
- Trainees are responsible for fully participating in training events and understanding that learning is an interactive process

All responsibilities of OEE and OWTC should be detailed in the annual contract between the two organizations. Contract terms should be discussed by management from OEE and OWTC with ample lead time for negotiation and adjustment. It is our understanding that OEE has begun efforts to define the responsibilities of each organization more clearly in the PY06 contract.

OEE should consider retaining a third-party facilitator to help in the process of overcoming the difficulties between OWTC and OEE. A facilitator would bring greater objectivity to the discussions between OEE and COAD and ensure that the primary spirit of their relationship focused on the HWAP mission.

## **A Comprehensive Needs Assessment**

Our second major recommendation is that OEE conduct a comprehensive needs assessment within the next three years and that the process is repeated thereafter at reasonable intervals.<sup>18</sup> The Ohio HWAP is one of the most technically sophisticated in the country. The WPS includes hundreds of pages of installation specifications, diagnostic procedures, and performance standards that are sometimes challenging to understand and difficult to expedite properly. Training the weatherization personnel in the state to perform the requirements of the WPS is a significant educational task.

At its foundation, the Ohio HWAP training program is an activity that attempts to alter human behavior. The first step in setting up an educational program is assessing the needs of the target audience. This is the process of defining the learner's current behavior or knowledge (actuals), determining the desired behavior or knowledge (optimals), and identifying factors influencing the learner's motivation and ability to move from their current knowledge level to the desired level.

For a number of years, the needs assessment has been conducted by the OEE and/or OWTC. Energy Coordinators were asked at the beginning of each PY to inform OEE of the training sessions their Agency personnel needed. Recently this survey method has changed and, as a result, is probably yielding more accurate information. Although this process has been called a needs assessment, it is a class-needs survey for the purpose of scheduling classes, not a comprehensive needs assessment.

Key elements of the recommended needs assessment include:

- A planning meeting including representative agencies, OWTC, OEE, and possibly contractors
- An attempt to include every stakeholder in the Program. All should be given the opportunity to contribute face-to-face, by telephone, e-mail, or by mail

---

<sup>18</sup> The HWAP Policy and Procedures Manual, Volume II, page 3 states that a local agency training program should include "A mechanism for assessing the need for training." It goes on to say that this can be accomplished in two ways; either by knowing the courses an individual has completed and still is required to complete, or by receiving feedback from co-workers and the final inspector about the knowledge and skills of a worker. "Knowing this information will benefit your program."

- Measurement of the effectiveness of the existing training program
- Application of the following two steps:
  - Identification of the knowledge and skills required to complete a particular job – the optimal. The basis for this knowledge and skill is the WPS.
  - Determination of the knowledge and skills people conducting a particular job possesses – the actual. This may be done by observation and/or by interviewing. Observation is more accurate, but is more expensive than interviewing.
- Collection of the required information following these practices:
  - Use of standard survey forms to bring thoroughness and consistency to the process
  - Interviews of crew personnel without foreman, inspectors, or energy coordinators
  - Promise that all information will remain confidential and will not be identified with the source
  - Interviews of foremen and inspectors individually
  - Interviews of energy coordinator individually
  - Inclusion of contractors so their special needs for training, financial limitations, and likelihood of leaving HWAP are considered.
- Analysis of the data collected
- Determination of what is required to move the trainees from the actual to the optimal
- Redesign of the comprehensive training program to reflect the results of the needs assessment.

Advantages of a comprehensive needs assessment include:

- A more relevant and effective training curricula
- Enhanced program staff morale
- Less complex and more effective class scheduling
- Fewer individual and course cancellations
- Enhanced credibility of OEE and OWTC

We recommend OEE issue a request for proposals for this comprehensive training needs assessment. The cost of this assessment will depend on the number of Agencies involved with the study and the detail with which it is conducted.

Although we are recommending a comprehensive needs assessment within the next three years, we think it must be recognized that the OEE field representatives are now performing an informal needs assessment each time they monitor an Agency. We suspect that the difference between optimal and actual that they are now discovering in the field are being underutilized within the training program. Consequently, we also recommend that OEE, the OWTC, and Agency representatives formally meet to discuss methods of making this monitoring process and reporting even more useful for the fine-tuning of the training program.

If the training needs assessment information is collected and analyzed thoughtfully during and after monitoring visits, this ongoing process should be effective at keeping the training program on track between more comprehensive needs assessments.

### **Other Recommendations for OEE**

OEE should plan and promote events that foster better communication within the Program. Management and staff of OEE and OWTC should meet regularly to improve organizational and interpersonal relationships. Insufficient communication is probably both a cause and a symptom of a difficult relationship. We recommend:

- The Manager of Low-Income Programs at OEE should meet monthly with the Community Development Division Director at COAD. It is our understanding that regular monthly meetings have now begun; we recommend that they continue.
- Two or three OWTC instructors should meet with two or three OEE field representatives on a quarterly basis to discuss training needs, training procedures, weatherization procedures, and other training and weatherization issues. The spirit underlying these meetings should be the understanding that field representatives and OWTC instructors have much to offer one another. For example, field representatives can discover what weatherization tasks are performed poorly in the field and they can report items and trends to OWTC instructors. Instructors can discover what trainees are having difficulty with in the field and can suggest new courses, course improvements, or adjustment to monitoring methods.
- Management and staff of OWTC and OEE should meet annually for an informal, after-hours event.

A common feeling of our Agency interviewees was the sense of being misunderstood or left out of the communications loop. As recommended in the process evaluation, OEE should conduct a facilitated planning workshop with OWTC that addresses the statewide training needs.

OEE and the OWTC should make a greater effort to communicate regularly with Agency staff. OEE field representatives' relationships with Agency staff are inherently problematic because they are expected to be critics, advisors, and, sometimes, friends:

- Based on our interview data, we think some field representatives could improve the monitoring process by using more positive reinforcement. We are not suggesting that they “spoon feed” the Agency personnel, but we think more is learned and a greater spirit of cooperation and camaraderie is fostered with positive reinforcement.
- OEE should implement mechanisms to follow up monitoring visits to ensure that Agencies transfer the lessons learned to subsequent weatherization jobs.
- All monitoring reports should include page references to the WPS for all recommendations and requirements. For the monitoring reports we reviewed, we found that most, but not all, of the field representatives included page references.
- A new section should be added to monitoring reports listing discovered deficiencies that can be corrected by training or by the use of other educational resources. These

deficiencies should be tallied by OEE, OWTC, or both, as an interim measure between more comprehensive training needs assessments.

Although the WPS are thorough, up-to-date, and incorporate weatherization best practices, the document is complex, difficult to navigate, and very large:

- We recommend simplification as a primary objective of future WPS updates; simplification is likely to enhance its effectiveness. Agency personnel, including inspectors, crew leaders, crew technicians, and contractors should regularly be invited to become involved in this process.

We believe the three interviewed energy coordinators raised a valid point about allowing staff certification by experience:

- We recommend that OEE, in cooperation with the OWTC and Agency representatives, develop a statewide method for allowing related work experience and any equivalent out-of-program training.

In conjunction with recommendations presented later in this chapter, we recommend that OEE do the following:

- Work with OWTC and Agencies to create a program to assist energy coordinators in creating learning plans for their weatherization field staff
- Assist Agencies in developing mentoring programs

There are likely to be opportunities to generate more training resources if OEE works closer with the utilities:

- We recommend that OEE engage in discussions with utilities to explore opportunities for joint funding of weatherization training.

To enhance the educational impact of the *Residential Update* we recommend the following:

- Include regular features that readers can depend on such as an OEE authored article clarifying a section of the WPS; a technical article about diagnostics authored by a trainer at OWTC; and one article for energy coordinators, one for inspectors, one for foremen, one for crew people, and one for contractors
- Include more photographs and illustrations – perhaps a cartoon – to add interest and increase readership
- Include OEE and OWTC schedules in each issue
- Offer an annual prize for best innovation in Ohio HWAP

To make the *Field Guide* more useful:

- The *Field Guide* should be updated as necessary in the future, the OWTC should use it as a training resource when appropriate, and OEE should regularly remind Agency personnel that it is available as an information resource

Although CHEC is a relatively small part of the HWAP training program, it is a valuable learning tool for self-study at Agencies or as a complement to courses at the OWTC:

- OEE should continue to distribute copies of this compact disk to Agencies and remind energy coordinators and in-field staff of its usefulness

## **The Ohio Weatherization Training Center and COAD**

The relationship between COAD and OEE at the time we did our interviews has already been mentioned as the primary obstacle to further enhancements in the HWAP training program. COAD managers understand that OEE has the responsibility to optimize the benefit of each training dollar spent. The fact that OWTC has been the primary statewide training venue for the last 15 years has solidified its core role in the Program; however, to ensure HWAP success, OWTC needs to continuously improve its operations and maximize the effectiveness of its relationships with OEE and Agencies. It is our appraisal that the management and instructors at the training center understand this and are capable of and committed to providing a quality educational experience to the HWAP staff.

- We strongly encourage COAD, to continue working with OEE in efforts to move beyond the difficult relationship the two organizations experienced in the past. The management and instructors at the OWTC must work in partnership with OEE and understand that OEE has the primary responsibility for the quality of the HWAP training.

To improve the effectiveness of OWTC and overcome some of the inefficiencies and problems encountered in recent years, we offer the following recommendations:

- OWTC should continue the more detailed class-needs survey that it is conducting. This more enhanced effort includes identifying job titles and staff duties at each Agency to help identify needed training and telephoning Agency energy coordinators to ask about the training needs of their staff.
- The schedule should be published at least three months in advance and reflect any changes since the previous schedule was released. OWTC should rely on e-mail less and telephoning more for scheduling, ensuring that energy coordinators are fully aware of the training schedule. The training schedule should be updated and posted on the OEE and OWTC Web sites.
- The OWTC should enhance its marketing of classes by posting the latest schedule in *Residential Update*; mailing the schedule quarterly to other parties; regularly contacting Ohio energy coordinators by telephone (this process has begun); and publishing a color brochure of the course offerings.
  - OWTC should give special consideration to marketing training to contractors inside and outside of HWAP. Performance contracting may increase the demand for OWTC courses.
  - When courses have out-of-state appeal, market these courses outside of Ohio.
- Improve tracking and analysis of student records, evaluations, cancellations, and other information by enhancing current electronic databases or by purchasing new software for

this purpose. All of this information should be supplied to OEE on a regular and timely basis so that OEE always has timely access to recent student and course data.

- Adopt a standard process and metric for measuring and tracking training efficiency, such as cost-per-student-day calculated in a consistent way. This will help determine the cost-effectiveness of training, provide early feedback on possible training modifications, and provide consistency.
- The method of determining cost-per-student-day should be determined in cooperation with OEE and calculations and results should be reported to OEE semiannually. Calculation methods should include consideration of cancelled classes, T&TA events, and regional training.
- OWTC should begin networking with other training organizations and learn about methods others use for marketing, scheduling, grading, applying databases, enhancing instructor knowledge and skills, utilizing demonstrations, and integrating audio-visual techniques and technologies.

Based on our interviews and observations, we offer several recommendations for ways OWTC trainers can improve their instructional skills:

- The OWTC should work with OEE to improve the instructor certification process.
  - The BPI certification requirement for instructors represents a nationally-recognized third-party standard; this should be continued.
  - The NETA Train-the-Trainer course completion requirement should be continued also, although it does not include a certification based on performance.
  - OWTC and OEE should cooperate to determine an appropriate continuing-education requirement for each of the OWTC instructors.
  - OWTC and OEE should work with the Department of Energy and/or another appropriate national organization or professionals to develop standards of certification for instructors who train HWAP personnel. A nationally recognized certification would enhance the quality of instruction and professionalism of these important educators.
- An outside training professional should be hired to critique each trainer and assist in improving their presentation methods. This evaluation should include appraisal of each instructor's knowledge of adult education methods. OEE or the OWTC should issue a request for proposals for this appraisal and follow-up training for OWTC instructors, if any is recommended.
- Each trainer should have a digital camera with which to build an OWTC library of digital photographs for PowerPoint presentations, and two video cameras should be made available for the trainers to share. All instructors should receive training in the use of PowerPoint.
- The OWTC should require each trainer to present at least one presentation every two years at a work-related national or regional conference.

- OWTC instructors should be sent regularly to other training centers as “ambassadors” and should exchange knowledge with other trainers and learn new ways of enhancing the educational experience at the OWTC.

In addition to adjusting the course offerings after the comprehensive training assessment, we recommend the following:

- Work with OEE to ensure that all new and revised courses receive written approval from OEE before the course is taught. The realities of scheduling will sometimes make timely approval difficult, so OWTC and OEE should decide upon a smooth and expeditious process.
- Update the training curricula more frequently; we suggest every other year. Updates should be coordinated with the WPS revisions.
- Design the companion training documents so that they are useful resources after the training, as well as during it by adding illustrations, sequentially numbering the pages, reducing the use of copy-and-paste, using a uniform format, including a narrative to serve as a continuum among topics, and adding introductory language for sections that require explanation.

To diversify and improve accessibility to the training, we recommend the following:

- Continue with the recent trend to offer more T&TA events.
- Attempt to increase the number of regional training sessions.
- In close cooperation with OEE, explore the possibility of a second training center location in the northern part of Ohio. This will involve significant additional funding. In cooperation with COAD, OEE should explore the feasibility of obtaining additional funding and the ongoing costs and benefits of a second training center.
- Work with OEE and Agencies to create a program to assist energy coordinators in creating learning plans for their weatherization field staff.
- Assist Agencies in developing mentoring programs.

## **HWAP Agencies**

Agency managers and staff have the task of delivering weatherization services to a population of diverse clients. This task is complicated by limited financial resources, the need for staff training, a demand for high job throughput, and the requirement of increased productivity. This is a challenging mandate. We believe that good training, a supportive work environment, and rewards for good work and accomplishments lead to longer employee retention and increased long-term productivity.

To enhance the role that Agencies play in training, we offer the following recommendations:

- Agencies should give training and education the importance it deserves and not view it as an obstruction. Agency management should help create a positive learning environment

for their personnel by supporting training activities and taking an interest in their employees' learning experiences.

- Agency management should ensure that their staff is prepared for training sessions at the OWTC by using the information provided on course preparation and arranging outside training for employees and/or provide work time for necessary course preparation, if necessary.
- Agencies should increase wage rates in proportion to experience in the field and the HWAP training completed.
- Energy coordinators should be responsible for helping each weatherization field employee develop an individual learning plan. OEE and the OWTC should support this effort by presenting a statewide workshop for energy coordinators. This workshop should instruct energy coordinators how to create learning plans with their employees and/or contractors and inform them of the assistance available from the OWTC.
- Agencies should initiate mentoring programs. Mentoring programs shift more of the responsibility for learning to the Agency and the student.
- Although Agencies did not adopt peer training in the past, it should be tried again after establishment of a statewide Agency mentoring program.
- OEE, the OWTC, and Agency representatives should write model employee qualifications for each of the significant HWAP field positions. It would also be helpful to develop qualifications for contractors. This effort should be coordinated with the national initiative by DOE to develop core competencies for weatherization staff.
- Within three to six weeks after an employee attends a formal OWTC training session, the Agency energy coordinator should interview the trainee for 15 minutes to assess the value the training had to their work. The OWTC should supply an interview form to energy coordinators for this purpose, which includes a place for the energy coordinator's appraisal of the training experience. Copies of these interview forms should be sent to the OWTC and OEE each quarter.
- Agency managers should determine the training their contractors need to increase the quality of their work. This training should be included in the agreements Agencies have with their contractors. OEE, OWTC, and Agencies should work together to identify and deal with the special needs of contractors and contractor training issues.



# Appendix A: Training Interview Instrument

---

## January 2005 Training Evaluation Interview Instrument Ohio HWAP and Residential Training Program Evaluation

### BACKGROUND

Interviewer \_\_\_\_\_ Date \_\_\_\_\_

Interviewee \_\_\_\_\_

Interviewee's Organization \_\_\_\_\_

Interviewee's Title \_\_\_\_\_

#### Q.1 In which of the following ways have you been involved in weatherization training?

- 1 Assisted in developing training materials (documents, videos, visuals, etc.)
  - 2 Reviewed training materials and curricula
  - 3 Conducted training
  - 4 Assessed training
  - 5 Taken Ohio Weatherization Training Center (OWTC) training
  - 6 Taken local agency training
  - 7 Taken utility program training
  - 8 Attended national or regional conferences
  - 9 Other. Describe
- \_\_\_\_\_

### TRAINING ASSESSMENT BY PARTICIPANTS: PEOPLE WHO HAVE TAKEN SPECIFIC TRAINING

#### IF TAKEN OWTC TRAINING

#### Q.2 What OWTC trainings have you taken and when?

Training 1 \_\_\_\_\_ Date \_\_\_\_\_

Training 2 \_\_\_\_\_ Date \_\_\_\_\_

Training 3 \_\_\_\_\_ Date \_\_\_\_\_

Training 4 \_\_\_\_\_ Date \_\_\_\_\_

Training 5 \_\_\_\_\_ Date \_\_\_\_\_

Training 6 \_\_\_\_\_ Date \_\_\_\_\_

#### Q.3 How effective were the OWTC trainings overall?

- 1 Not very effective
- 2 Somewhat effective
- 3 Effective
- 4 Very effective
- 5 Don't know

**Q.4 Why do you say that?**

---

---

---

**Q.5 Which OWTC training would you rate as the most effective and why?**

Training \_\_\_\_\_

Reasons \_\_\_\_\_

---

**Q.6 Which OWTC training would you rate as the least effective and why?**

Training \_\_\_\_\_

Reasons \_\_\_\_\_

---

**Q.7 How would you rate the OWTC training materials (documents, videos, visuals, etc.) overall?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.8 How current are the OWTC training materials (documents, videos, visuals, etc.)?**

- 1 Very current
- 2 Reasonably current
- 3 Somewhat out of date
- 4 Very out of date
- 5 Don't know

**Q.9 How would you rate the OWTC instructors' knowledge level overall?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.10 How would you rate the OWTC instructors' presentations overall?**

- 1 Very good

- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.11 How would you rate the OWTC training facilities?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**IF TAKEN LOCAL AGENCY TRAINING (NOT INCLUDING MONITOR TRAINING)**

**Q.12 What local agency trainings have you taken and when?**

Training 1_____	Date_____
Training 2_____	Date_____
Training 3_____	Date_____
Training 4_____	Date_____
Training 5_____	Date_____
Training 6_____	Date_____

**Q.13 How effective were the local trainings overall?**

- 1 Not very effective
- 2 Somewhat effective
- 3 Effective
- 4 Very effective
- 5 Don't know

**Q.14 Why do you say that?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Q.15 Which local agency training would you rate the most effective and why?**

Training\_\_\_\_\_

Reasons\_\_\_\_\_

\_\_\_\_\_

**Q.16 Which local agency training would you rate the least effective and why?**

Training\_\_\_\_\_

Reasons \_\_\_\_\_

**Q.17 How would you rate the local agency training materials (documents, videos, visuals, etc.) overall?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.18 How would you rate the local agency instructors' knowledge level overall?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.19 How would you rate the local agency instructors' presentations overall?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.20 How would you rate the local agency training facilities?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

## **IF TAKEN UTILITY TRAINING**

**Q.21 What utility trainings have you taken and when? (Record utility name with training description)**

Training 1 _____	Date _____
Training 2 _____	Date _____
Training 3 _____	Date _____
Training 4 _____	Date _____
Training 5 _____	Date _____
Training 6 _____	Date _____

**Q.22 How effective were the utility trainings overall?**

- 1 Not very effective
- 2 Somewhat effective
- 3 Effective
- 4 Very effective
- 5 Don't know

**Q.23 Why do you say that?**

---

---

---

**Q.24 Which utility training would you rate the most effective and why?**

Training \_\_\_\_\_

Reasons \_\_\_\_\_

---

**Q.25 Which utility training would you rate the least effective and why?**

Training \_\_\_\_\_

Reasons \_\_\_\_\_

---

**Q.26 How would you rate the utility training materials (documents, videos, visuals, etc.) overall?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.27 How would you rate the utility instructors' knowledge level overall?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.28 How would you rate the utility instructors' presentations overall?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**Q.29 How would you rate the utility training facilities?**

- 1 Very good
- 2 Good
- 3 Average
- 4 Below average
- 5 Poor
- 6 Don't know

**IF ATTENDED CONFERENCES**

**Q.30 What conferences providing weatherization training and information have you attended in the past three years?**

Conference 1 _____	Date _____
Conference 2 _____	Date _____
Conference 3 _____	Date _____
Conference 4 _____	Date _____
Conference 5 _____	Date _____

**Q.31 On the average, how many days each year do you spend attending conferences involving weatherization?**

\_\_\_\_\_

**Q.32 What are the main benefits of attending these weatherization conferences?**

- 1 Networking with other weatherization experts and practitioners
- 2 Learning about new technologies or techniques
- 3 Learning about new policies, regulations, etc.
- 4 Sharing weatherization information and experiences
- 5 Other 1

\_\_\_\_\_

- 6 Other 2

\_\_\_\_\_

**Q.33 What is the average full cost of attending a weatherization conference (excluding labor hours)?**

- 1 \$ \_\_\_\_\_
- 2 Don't know

**Q.34** Compared to formal training, what are the advantages of the weatherization conferences?

---

---

---

**Q.35** What are the disadvantages of the weatherization conferences?

---

---

---

**OWTC TRAINING MARKETING: OWTC TRAINERS AND STAFF, OWTC TRAINEES, OEE, FIELD AGENCIES**

**Q.36** How is the OWTC training marketed?

---

---

**Q.37** How did you become aware of the OWTC training?

---

---

**Q.38** How effective do you think the OWTC training marketing is?

- 1 Not very effective
- 2 Somewhat effective
- 3 Effective
- 4 Very effective
- 5 Don't know

**Q.39** Why do you say that?

---

---

**Q.40** How could the marketing of OWTC training be improved?

---

---

**OWTC TRAINING DETAILS: OWTC TRAINERS AND STAFF, OWTC TRAINEES, OEE, FIELD AGENCIES**

**Q.41 How effective is the current OWTC training program at adapting materials (documents, videos, visuals, etc.) to fit various learning styles?**

- 1 Not very effective
- 2 Somewhat effective
- 3 Effective
- 4 Very effective
- 5 Don't know

**Q.42 Is the number of OWTC training sessions available about right?**

- 1 Yes **GO TO Q.44**
- 2 No
- 3 Don't know **GO TO Q.44**

**Q.43 How should the number of OWTC sessions be changed?**

- 1 Increased substantially
- 2 Increased somewhat
- 3 Decreased somewhat
- 4 Decreased substantially

**Q.44 Does the OWTC training cover the right topics?**

- 1 Yes **GO TO Q.46**
- 2 No
- 3 Don't know **GO TO Q.46**

**Q.45 What changes should be made in the topics covered?**

---

---

**Q.46 Are there an adequate number of OWTC training centers available?**

- 1 Yes **GO TO Q.48**
- 2 No
- 3 Don't know **GO TO Q.48**

**Q.47 How many do you think should be available? \_\_\_\_\_**

**Q.48 How effective are the OWTC "On-the-Road" training sessions?**

- 1 Not very effective
- 2 Somewhat effective
- 3 Effective
- 4 Very effective
- 5 Don't know

**Q.49 What could be done to improve the “On-the-Road” training?**

---

---

**Q.50 What training and certification do OWTC trainers possess?**

---

---

---

**Q.51 How do OWTC trainers upgrade their skills?**

---

---

---

**Q.52 How often do the trainers upgrade their skills?**

---

---

**Q.53 What research and development do OWTC trainers do on the methods and technologies being taught?**

---

---

---

**Q.54 How are the performance and effectiveness of OWTC training evaluated currently?**

---

---

---

**Q.55 What is the cost range and average cost per student for OWTC training?**

- 1 Low\_\_\_\_\_
- 2 High\_\_\_\_\_
- 3 Average\_\_\_\_\_
- 4 Don't know\_\_\_\_\_

**Q.56 How much do attendees pay to attend the OWTC training?**

- 1 \$\_\_\_\_\_ per \_\_\_\_\_
- 2 Don't know

**Q.57 Is there any follow-up done with trainees on the effectiveness of OWTC training?**

- 1 Yes
- 2 No **GO TO Q.59**
- 3 Don't know **GO TO Q.59**

**Q.58 Please describe what kind of follow-up is done and who does it.**

---

---

---

**Q.59 What type of follow-up with trainees would be useful to assess the OWTC training?**

---

---

---

**OWTC TRAINING: OWTC TRAINERS**

**Q.60 How well do you believe your skills and expertise match the needs of the OWTC training you provide?**

---

---

---

**Q.61 What additional skills and expertise would you like to acquire to do the best training possible?**

---

---

---

**Q.62 What, if any, courses would you like to teach that you are not teaching currently?**

---

---

---

**Q.63 How would you change the courses you are currently teaching to make them better?**

---

---

---

---

---

**OWTC TRAINING PROCESS: OWTC TRAINERS AND STAFF**

**Q.64** Please describe the types of materials (printed, video, visual, etc.) used in the OWTC trainings?

---

---

---

**Q.65** What are the sources of these materials (documents, videos, visuals, etc.)?

---

---

---

**Q.66** How are the OWTC training curricula developed?

---

---

---

---

**Q.67** How are the curricula kept up to date?

---

---

---

---

**Q.68** What approach is used to incorporate “best practices” in the OWTC training?

---

---

---

**Q.69** What training and certification requirements are there for the OWTC trainers?

---

---

---

**Q.70 What are the strengths of the OWTC training?**

---

---

---

**Q.71 How could the OWTC training be improved?**

---

---

---

---

**REFRESHER COURSES: OWTC TRAINERS AND STAFF, OWTC TRAINEES, FIELD AGENCIES**

**Q.72 How effective are refresher courses at improving use of “best practices?”**

- 1 Not very effective
- 2 Somewhat effective
- 3 Effective
- 4 Very effective
- 5 Don't know

**Q.73 What could be done to improve the effectiveness of refresher courses?**

---

---

**AGENCY TRAINING: FIELD AGENCIES**

**Q.74 How often is formal training provided by your agency?**

---

**Q.75 Where does the formal training take place?**

---

**Q.76 Who provides the formal training?**

---

**Q.77 Who attends the formal training (delegates, peers, contractors...)?**

---

**Q.78 Please describe how formal training curricula are designed and sources of training materials.**

---

---

---

---

---

---

**Q.79 What types of informal training are provided (excluding OEE Monitor training)?**

---

---

**Q.80 How often is informal training provided?**

---

**Q.81 Who provides informal training (excluding OEE Monitors)?**

---

**Q.82 What are the main objectives of the training your agency offers?**

---

---

---

**Q.83 What are the strong points of the training you offer?**

---

---

---

**Q.84 What areas of your training need to be improved?**

---

---

---

**MONITORING TRAINING: *FIELD AGENCIES***

**Q.85** What types of training by OEE Monitors does your staff receive?

---

---

---

**Q.86** What percent of your staff have received OEE Monitor training?

---

---

---

**Q.87** What are the advantages of this training?

---

---

---

**Q.88** What improvements could be made to the OEE Monitor training?

---

---

---

**Q.89** What, if any, additional Monitor training would be helpful?

---

---

---

**IN FIELD AND MONITORING TRAINING: *OEE, FIELD AGENCIES***

**Q.90** How much time do you estimate that your organization spends training people in the field each year?

---

---

---

**Q.91 How much of this training is provided to contractors?**

---

---

---

**Q.92 What types of observations often prompt you to perform training in the field?**

---

---

---

**Q.93 What links exist between OEE's monitoring process and training?**

---

---

---

**Q.94 What actions do local agencies take after a monitoring visit?**

---

---

---

**Q.95 What effect do monitoring visits have on field use of best practices?**

---

---

**Q.96 Is the feedback between monitoring and training effective?**

---

---

**Q.97 What could be done to improve the links and feedback between monitoring and training?**

---

---

---

**Q.98 Would a standardized grading system to assist in the monitoring of agencies be useful?**

- 1 No **GO TO Q.100**
- 2 Yes
- 3 Don't know **GO TO Q.100**

**Q.99 How should such a system be designed and implemented to be most useful?**

---

---

---

**Q.100 What information would be most useful to include in the monitoring reports?**

---

---

---

**CLOSING: ALL**

**Q.101 What other comments do you have about the roles of the different types of training currently available?**

---

---

---

---

**Q.102 In your view, what are the most important steps to take to improve the training and its effects on weatherization?**

---

---

---

---

---

---

---

**THANK YOU VERY MUCH FOR YOUR TIME AND OBSERVATIONS**

# Appendix B: Other Training Center Interview Instrument

---

## Training Evaluation Weatherization Training Program

**Q.1** What is the training center's service area? \_\_\_\_\_

**Q.2** Is the training center a non-profit organization? \_\_\_\_\_

**Q.3** How is the program funded, and what percentage of the operating budget comes from each source?

- 1 State funds \_\_\_\_\_%
- 2 Federal funds \_\_\_\_\_%
- 3 Student tuition \_\_\_\_\_%
- 4 Membership Dues \_\_\_\_\_%
- 5 Other \_\_\_\_\_%

**Q.4** If students pay tuition, what is the average cost per student? \_\_\_\_\_

**Q.5** What sort of marketing is done to promote the Training Center?

---

---

---

**Q.6** Who is the marketing geared toward, and how is enrollment typically represented?

- 1 Utilities \_\_\_\_\_%
- 2 Contractors \_\_\_\_\_%
- 3 State and City Employees \_\_\_\_\_%
- 4 Private citizens \_\_\_\_\_%
- 5 Other \_\_\_\_\_%

**Q.7** If contractors or other private sectors are encouraged to enroll, what special efforts are made to reach them?

---

---

---

**Q.8** What is the average enrollment for each class? \_\_\_\_\_

I.1.1.1.1. What is the average size restriction? \_\_\_\_\_

**Q.9** Please characterize student attendance:

- 1 Student cancellations (cancelled before 2nd week of class) \_\_\_\_\_%
- 2 Student drop outs (failed to cancel before 2nd week, or did not cancel) \_\_\_\_\_%

**Q.10** Please describe scheduling process, including what considerations are most influential (available funding, student/teacher availability, student demand, time considerations.)

---

---

---

**Q.11** How often is the schedule developed?

- 1 Monthly
- 2 Quarterly
- 3 Annually
- 4 Other \_\_\_\_\_

**Q.12** How often are classes held?

- 1 Monthly
- 2 Quarterly
- 3 Annually
- 4 As needed \_\_\_\_\_

**Q.13** How are the needs of students assessed?

---

---

---

**Q.14** How is the curriculum developed?

---

---

---

**Q.15** How are prerequisites handled? Describe any special considerations that are made regarding the scheduling of classes.

---

---

---

**Q.16** Do you perform any reading assessment or math skills testing prior to accepting students?

- 1 Yes- Reading\_\_\_\_Math
- 2 No

**Q.17** If these assessments are conducted, please describe their benefit and impact

---

---

---

**Q.18** How are students graded? \_\_\_\_\_

**Q.19** What is the pass/failure rate, on average? \_\_\_\_\_ % pass

\_\_\_\_\_ % fail

**Q.20** Which classes have higher than average failure rates?

---

---

---

😊😊😊 Thank you for your time and attention 😊😊😊