

Low-Income Programs: The Best Practices, Products and Services.

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ABSTRACT

This paper presents a selection of the best practices associated with low-income programs offered in the United States in 2000. The best practices presented were identified through a literature search and peer interview process conducted during the summer of 2000. During this effort 29 best practices were identified. Of these, 16 are presented and discussed in this paper. The practices presented in this paper include funding mechanisms, management systems, program design and operational methods and technology options. The goal of the paper is to encourage discussion and evaluation of these best practices to identify those that have significant potential for practice adoption within the low-income service delivery market.

Introduction & Methodology

To accomplish this study, a literature search and a peer referral effort were conducted in July-August of 2000 to identify "best practice" candidates. In this effort the authors reviewed conference proceedings and made telephone calls to a number of low-income service researchers and program providers, to identify a range of programs, products, services that could be considered as "best practices" in the field. Conference proceedings from the Affordable Comfort Conference, the International Energy Program Evaluation Conference, and the ACEEE annual Summer Study, and others sources were examined. In addition, calls for "best practices" were e-mailed to over 1,000 practicing energy service professionals subscribing to the AESP-net (Association of Energy Service Professional Network), resulting in 33 responses. TecMRKT Works also searched corporate databases and used the authors network of professional relationships to identify individuals involved with or knowledgeable about "best practice" work in the low-income field. This effort identified 68 individuals, knowledgeable about or involved with implementing, designing or administering one or more potential "best practices."

Once these individuals were identified, they were contacted by telephone to discuss the "best practice" with which they were associated or knowledgeable. This effort resulted in the identification of 49 potential "best practice" candidates. The 49 candidates were then subjectively placed into one of three contact groups (low, medium, and high priority). The criterion used to group the contacts was a subjective assessment of the potential impact of the best practice on the low-income energy services field. If the practice was thought to be of major importance to the field, it was labeled a high priority best practice/contact and placed in the study group population. This selection process identified 13 contacts for "best practices" interviews. While the medium and low priority contact groups were excluded from this study, we are certain that a number of additional potential best practices can be discerned from this group. Interviews from these two groups were excluded from this project.

Once the high-priority contacts were identified, TecMRKT Works staff conducted detailed interviews about the best practice and the attributes of the practice that, in the opinion of the interviewee, makes it a best practices. Altogether, 13 high priority interviews were conducted identifying 29 best practices. Sixteen of these are presented in this paper and all 29 are listed in the references.

The practices presented in this paper are:

1. Training, certification, inspection, and education
2. Small area pressure testing during whole-house blower door tests
3. Automated real-time, weather-adjusted monthly impact assessments
4. Combustion safety testing on all carbon-fueled equipment
5. Comprehensive program data management system
6. Refrigerator replacement of high-use units
7. Adding measures to weatherization programs for 30% more savings
8. Low income shared savings program
9. “Pay as you save” revolving fund mechanism
10. Participants “buy-down” the cost of measures
11. Distributed one-stop low-income program enrollment services
12. Immediate access to utility consumption records
13. Targeting energy programs to high users
14. Home Maintenance Service Program
15. Non-profit Energy Management Program
16. Percent of income payment plan educational program

Summary of Best Practices

This paper presents 16 best practices and indicates where the best practice is being used.

1. Training, certification, inspection, and education

It is important for low-income programs to provide service training, testing and certification for all program and service delivery staff. As part of this best practice, only certified staff are allowed to install measures or serve low-income customers. This process involves training and testing in the following areas:

- Measure selection and installation,
- Education of low-income customers,
- Customer interaction and communication,
- Program service and service delivery,
- Technology education and understanding, and
- Clean up practices and procedures following measure installation.

The training and certification process helps assure that low-income program participants are benefited through high-quality customer service standards against which program performance can be measured for all aspects of the service delivery process. In addition to the training and certification process, follow-up training and installation inspections are provided to make sure the installed measures are going in right and participants are getting the “highest energy savings possible.”

The interviewee indicated that when program staff deliver services without the training, certification and follow-up efforts, “measure installation and customer education are not always done in a way that provides the projected savings or savings persistence.” The interviewee noted that without proper training, certification and follow-up efforts “a new furnace can be installed without achieving any energy savings and in some cases the home may be worse off following the program.” According to the interviewee, many low-income programs have a goal to “install measures up to a dollar cap and then move on, with no attention to the aspects of the service that guarantee the savings.” The interviewee

suggested that training aspects involve an aggressive train-the-staff and educate the customer component. Examples of this best practice can be found at Texas Utilities and at Pacific Gas and Electric Company's Stockton Training Center.

2. Small area pressure testing during whole-house blower door tests

This best practice involves the use of a hand-held pressure gauge to pressure test the airflow and infiltration rates for each room of a home, rather than treating the house as a single room. This practice involves pressure testing attics, basements, rooms, closets and walls during whole-house blower door tests. This practice allows program staff to target problematic areas within the home that provide the best savings opportunities within the per-home budget cap of the program. According to the interviewee, "this practice allows the auditor to pinpoint where the house is leaking air and target specific actions that correct a specific air leak." However, the interviewee also indicated that it is hard to know when to use the extra pressure tests, because each home is different and not all homes need a room-by-room test. Examples of this best practice can be found in parts of Wisconsin and Minnesota where the practice is routinely used in conjunction with public funded weatherization programs.

3. Automated real-time, weather-adjusted monthly impact assessments

In this best practice, software was developed and used to provide a monthly, automated, program-wide and per-participant weather normalized electric and gas impact evaluation. The evaluation runs off the utility's integrated participant tracking system, networked to the customer billing system to obtain participant pre and post-program consumption information. The software is also linked to the Internet to automatically download daily pre and post-program weather data to correlate with the consumption records. The software is run once a month to provide participant-specific and program-wide summaries of both pre and post-program weather-normalized consumption comparisons for kilowatt-hours and therms of natural gas. The results are provided in automated graphic reports for each participant and/or for the program as a whole. The software provides a rigorous, real-time weather adjusted energy impact evaluation. This tool allows managers to routinely monitor the energy savings associated with each participant and for the program as a whole within minutes of running the software. Example of the use of this software can be found in Cinergy's low-income programs.

4. Combustion safety testing on all carbon fueled equipment

Many low-income programs service combustion appliances, and as a result, encounter combustion safety issues. Other programs want to make sure the home is safe after energy measures are installed that "tighten" up the home. This best practice is to test all combustion appliances in participant's homes for Carbon Monoxide (CO) emissions before any program measures are installed in the home, and then test again following the installation of program measures. This best practice provides a pre and post-program combustion test procedure for all carbon fueled equipment in the home, including heating, cooking or cooling equipment and secondary heating sources such as wood stoves. In this best practice, the tests are conducted by trained combustion experts who understand combustion science and appliance engineering, know the health issues associated with CO levels, and who understand the corrective issues involved. This practice has the benefit of first testing all combustion equipment to assure that program related actions will not increase CO levels in the home, and then testing again, after measures are installed, to confirm that CO levels are not increasing. The tests also help provide legal protection for the program and may keep measures that will concentrate CO from being installed in a home. An example of this best practice can be found in Sun Power's low-income programs delivered in Colorado.

5. A comprehensive program data management system

This best practice establishes an on-going comprehensive program operations database to feed the program management and evaluation process instead of having program managers and evaluators gather data each time they conduct a process, market or energy impact study. The data management system consists of a comprehensive monthly-up-dated tracking system that supports program management and provides evaluation staff the data they need to conduct their evaluations. As a result, managers have the information they need to monitor and manage programs, and evaluators have the data they need to conduct their research without the need to submit data requests. The database includes measure-specific and contractor-specific installation as well as program operations and cost data, and is built to plug directly into impact evaluation tools like PRISM. The database includes a breakdown of all administrative, management, labor and material costs associated with low-income programs. It is also used for desktop program monitoring at the state level and provides a historical costing database for unit costing/job estimations at the local level.

Using the database, managers are able to conduct or support fast, cost-effective evaluations by e-mailing evaluation staff the complete database, enabling the evaluator access to all program operations records. This database allows for comparative performance analysis by agency, crew, and subcontractor at the state and local levels. In addition, it easily generates custom queries and reports at the local, regional and state level. It also allows for payment and expenses tracking by funding source. The program provides significant benefits to program managers, implementers and evaluators, allowing for the tracking of the expenditure and performance of public low-income programs. Managers can extract customized reports by district, city, town, county, service provider, customer or customer profiles. The database can provide reports on measures, costs, savings, materials, labor, management and administration, and a wide range of other program management reports, and provides this data within a few seconds. An example of this best practice can be found in Vermont's low-income weatherization program.

6. Refrigerator replacement of high-use units

In this practice, program audits include metering refrigerators to determine if they are using more energy than needed. The assessment is performed during the program's in-home audit visit. Initially, the program replaced refrigerators that used over 15 kWh's per day, however this was lowered to replacing units that use more than 10 kWh's per day. The replacement decision is not based on a model number estimation criterion, but is based on short-term metered energy consumption. This method allows "energy efficient" units to be replaced or repaired if they are using more energy than predicted. A drawback of the process is that the metering aspects of the audit increase costs. However, the process is identifying many inefficient units that would not have been identified through a check of the model efficiency rating. The use of the metered data is demonstrating that there is a wide range of consumption profiles for the same make, model, type and size of refrigerator, and that reliable refrigerator operating costs cannot be estimated through model efficiency ratings alone. Three examples of this best practice can be found in the Massachusetts Electric Appliance Management Program, Cinergy's weatherization programs, and in the State of Texas CAP implemented pilot weatherization programs.

7. Adding measures to weatherization programs for 30% more savings

This best practice is an expansion of a typical weatherization program to include the use of more aggressive audit tools, additional gas weatherization measures and the inclusion of a wider range of

electric measures into a weatherization program. The goal of the program is to install all measures that are appropriate for a participant's home regardless of fuel type or Federal policy decisions that may act to limit technology options. The project includes refrigerator replacements based on metering, CFLs and other lighting measures, advanced duct sealing, low cost water heating measures, solar heating, fuel switching measures, efficient washers and dryers and furnace replacements, including oil furnace replacements, among other standard measures actions. This program does not have the usual spending limits that prevent many cost-effective measures from being installed in participating homes and is showing an energy savings that is 30% higher than their standard weatherization program. An example of this best practice can be found in a State of Texas pilot weatherization program implement through CAP agencies. Another example of this best practice is the Shared Savings Pilot Program implemented in Wisconsin in which all measures that produced cost effective paybacks over the life of the measure were installed through the program.

8. Low-Income Shared Savings Program

Residential low-income shared savings programs can install energy efficiency measures with multi-year paybacks and recover part of the cost of the service through a shared savings agreement. The shared savings approach can help lower participant's bills and at the same time provide a funding stream for the service provider that enables the provider to continue or expand their services. In some cases the program can act as the payment agent for the participant in which the customer pays their energy bill and the shared savings fees to the service provider, who then pays the utility bill on behalf of the participant. As a result, the participant obtains financial help in the form of a reduced monthly energy bill. Once the shared savings agreement has expired, the customer receives all of the savings and takes over bill payment responsibilities directly to the utility. Shared savings programs provide a way to supplement weatherization programs by installing actions beyond federal or state budget levels or measure restrictions through a shared savings agreement. One example of this practice is the Wisconsin Shared Savings Pilot Program implemented in Dodgeville Wisconsin.

9. "Pay As You Save" revolving funding mechanism

A practice somewhat similar to the shared savings program discussed above is the "Pay As You Save" concept, in which a participant pays a fee associated with program installed measures. The participant agrees to add a fee to their utility bill to cover the cost of the item until the measure is paid. As long as the measure saves more dollars than it costs per month, there is positive cash flow to the customer. In this program the customer pays the full cost of the measure, but obtains a reduction on their utility bill from what the bill would have been if the measures were not installed.

This is presented as a best practice because it represents an alternative approach for increasing the energy efficiency of the housing stock, without costing the customer additional dollars per month. Theoretically, there is an unlimited budget to keep installing measures as long as customers save more than they pay. The State of Vermont is currently planning a program to test this concept.

10. Participants "buy down" the cost of measures

In this practice, a low-income program offers customers a wider mix of measures that can be installed in their home by having the customer "buy down" the cost of the measure until it becomes cost-effective. In many cases a program's cost-effectiveness requirements limit what a program can do to help a customer. In some cases measures must be "cost-effective" at the utility's avoided cost rate rather than at the higher retail rate paid by the customer. Customer "buy downs" can reduce the cost of a

measure until the measure becomes cost effective at the utility's avoided cost rate. Through this method it is possible to significantly expand the measures that can be offered to a customer by having the customer contribute a small amount toward the selected measures. This "buy-down" allows programs to achieve significantly more savings than what would be obtained if the buy-down was not allowed. At the same time, it helps the customer obtain more measures and improve their ability to pay lower bills. One example of a type of customer buy-down is Vermont's low-income program where customers are able to buy-down the cost of a measure by contributing a measure fee.

11. Distributed one-stop low-income program enrollment services

In this best practice, energy programs and other social services are coordinated into a single enrollment process, through a network of organizations distributed in the communities where low-income customers live. This allows low-income participants to enroll in all available social services and public benefits programs at one time, through one enrollment process that is coordinated with all service providers. This practice often creates new partnerships between local utilities, weatherization provides and other services in a way that leverages utility incentives, WAP subsidies, and program investments to implement a wider selection of coordinated services. In one example a general residential assistance program is combined with a weatherization program to provide expanded energy and non-energy related services. Coordinating the enrollments into multiple low-income service programs, via a statewide community-based network, allows participants better access to programs and services to which they are entitled by law. According to one interviewee, "In some states we have seen program enrollment centers located more than 30 miles from their customers, essentially providing enrollment services only to people who can travel to the enrollment center." A distributed enrollment system, that coordinates all low-income services, is a best practice because it acts to equalize the availability of services to all eligible customers. In addition, a distributed process, coordinated through one enrollment process can gain administrative and operational cost efficiencies, by pooling different organization's marketing and site visit responsibilities into one seamless delivery unit.

The one-stop-shopping enrollment approach was tested in two small programs in Colorado and Spokane. Other examples of this practice are Vermont's Residential Energy Efficiency Program (REEP) and Texas Utilities Comprehensive Energy Assistance Program (CEAP).

12. Immediate access to utility consumption records

This public-private information partnership allows CAP agencies direct access to customer billing records to support program operations. Local CAP agencies have immediate access to gas consumption records without the need for data requests, long waiting periods, or public service commission data requests, allowing the CAP agency to rapidly analyze energy bills to determine the cost-effectiveness of program measures for each participant. By allowing local CAP agencies direct access to participant consumption records program costs are reduced and the timeline over which energy measures are installed is improved. This best practice is used in Wisconsin Gas's service territory in a pilot program funded by the State of Wisconsin, implemented through the Social Development Corporation.

13. Targeting energy programs to high users

This practice involves the targeting of program efforts toward high-energy consumers so as to maximize energy savings per program dollar. In one example of this practice (the Smart Comfort Program) two energy consumption tiers were established for program targeting. As participants are enrolled in the program, their energy histories are examined and each customer is placed in one of two

tiers. The first tier is the low energy consumer tier. For this group a small package of inexpensive, rapidly installed measures are provided. The service for these customers requires one visit that typically takes about two hours. The second tier consists of higher-use customers. These customers are provided an audit and more extensive measures.

In another example, Cinergy (in cooperation with Morgan Marketing Partners) designed a weatherization program that uses three tiers for tailoring energy services. Cinergy's program classifies customers by their energy consumption per square foot. As participants are enrolled in the program an energy intensity assessment is conducted that divides the annual household gas consumption by the square feet of the home. A quick and simple walk-through audit determines the square footage of the home and is combined with energy usage records compiled prior to the audit. This data is used to classify each home into one of three tiers for identifying available weatherization services. Homes in tier-1 use less than 1 therm per square foot per year. Tier-2 homes use from 1 to 1.5 therms, and tier-3 homes use over 1.5. The tier 3 homes get the most aggressive treatments while the tier 1 homes are served with a limited number of measures that are installed in a single 2 to 4 hour visit. The tier 2 homes are serviced at a more aggressive level than tier 1, but less than tier 3. Each tier has a budget cap associated with each home to limit total expenses. This best practice uses total energy consumption per square foot as the method for identifying how aggressive to treat a home and helps focus the majority of installed measures in homes that provide the most savings.

14. Home Maintenance Service Program

This best practice provides energy maintenance services to low-income customers who are unable to maintain their energy equipment on their own. One of the aspects of low-income energy programs is that many customers are impaired and cannot physically maintain their energy equipment, yet they are still able to live in their home. A Home Maintenance Service Program targeted at impaired or disabled low-income customers helps maintain energy savings by conducting routine maintenance operations on their primary energy consuming equipment. We have identified this as a best practice because the program provides a way to maintain the efficiency gains from weatherization or other program services over the long-term for a select set of customers who are physically unable to maintain their equipment. Cinergy Services Inc. and Morgan Marketing Partners implemented an energy saving maintenance program targeting elderly disabled low-income customers.

15. Non-profit Energy Management Program

The non-profit energy services delivery sector provides low-income customers with needed services, yet the organizations themselves typically have energy technologies that are the oldest and most energy inefficient in the market. This sector is largely ignored by both residential and commercial programs. They are not residential, so they are missed by typical low-income or residential programs. However, they are also not private companies that can take a tax deduction of 100% for the costs of equipment up-grades. Likewise they are typically working off grants and public funds to service their low-income clients, and have little funds to improve the energy efficiency of their own buildings. These agencies are also typically located in low-income areas, in buildings that are among the oldest in the community, and have energy technologies consistent with the age of the buildings.

This is a best practice because it recognizes a neglected market that directly provides energy services to low-income customers. By reducing the energy cost for these organizations, the energy savings are used to provide additional low-income services. In addition, while these organizations typically promote energy efficiency to their clients, they often do not "practice what they preach." In many cases these organizations do not have the resources to become energy efficient themselves. This program helps the providers of energy efficient services become an example for the practices they are

trying to instill in others. Cinergy Services Inc. and Morgan Marketing Partners have implemented a test program called the Non-Profit Energy Management Program.

16. Percent of Income Energy Payment Plan Educational Program

In this best practice, low-income participants who enroll in a Percent of Income Payment Program (PIPP), and are automatically signed up to participate in an aggressive PIPP-Education Program. In one example, participants received seven contacts over a 2-year period consisting of four in-home visits and three telephone follow-up visits. The visits built on each other, and provided a sustained educational presence in the customer's home for controlling energy use. In this example, the program also provided a family budget counseling session in addition to an energy education. This is important because many participants have never heard of a household budget, or know how to plan for their expenses. This example also provided an incentive in the form of arrearage forgiveness based on how much energy is saved. The incentive helped reduce energy consumption in participating homes. The program is a best practice because it goes beyond most in-home training programs and helps the customer control their budgets and pay their bills, while reducing their consumption and helping pay down arrearages. Cinergy and Morgan Marketing Partners implemented a pilot program using this best practice in conjunction with their Ohio's PIPP program.

Conclusion

This assessment identifies 16 activities considered to be best practices in the low-income energy services field. These practices are most likely to shape future low-income energy programs, products and services, as these practices and the evaluations associated with them become available. The intent of this paper is to present a portion of the best practices identified in this research in order to encourage the development and study of these practices and to more fully discuss their associated strengths and weaknesses.

References

The 29 interviews completed in this research are categorized into 7 areas and referenced below.

Training, quality assurance, and diagnostic tools

1. Certification standards for weatherization installers (E-WISE example)
Name: Nancy Brockway & Harlan Lachman, Title: Commissioner and Principal
Organization: New Hampshire PUC & Energy Efficiency Institute Inc.
2. Pressure testing during whole-house blower door
Name: John Krigger, Title: Weatherization trainer / manual writer
Organization: Saturn Resource Management
3. Automated real-time, weather-adjusted monthly impact assessments
Name: Nick Hall & John Reed, Title: Owners and Principals
Organization: TecMRKT Works
4. Cooling systems diagnostics (Super-heat or Subcooling measures)
Name: John Proctor, Title: President
Organization: Proctor Engineering Group
5. Combustion safety Testing on all equipment
Name: John Proctor, Title: President
Organization: Proctor Engineering Group

6. Installation training & follow-up quality assurance and control inspections to gain maximum savings
Name: Charles F Segerstrom, Title: Supervisor, Energy Efficiency Training
Organization: PG&E, Stockton Training Center
7. Train the trainers to train, and then they can educate the customer
Name: Charles F Segerstrom, Title: Supervisor, Energy Efficiency Training
Organization: PG&E, Stockton Training Center

Administrative practices and information tools

8. Weatherization Data Management System (WDMS)
Name: Jules Junker, Title: Administrator/Evaluator
Organization: Vermont Office of Economic Opportunity

Technology and Energy Efficient Measure Practices

9. Testing and monitoring to qualify new measures
Name: Danny Parker, Title: Evaluator
Organization: Florida Solar Energy Center
10. Refrigerator replacement for high usage units as a part of weatherization
Name: Elliot Jacobsen, Title: Executive Director
Organization: Action Inc.
11. Adding measures to standard weatherization programs for a 30% savings
Name: Linda Berry, Title: Researcher
Organization: Oakridge National Laboratories (ORNL)
12. Window Heat Pump Demo Project in Texas
Name: Linda Berry, Title: Researcher
Organization: Oakridge National Laboratories (ORNL)

Funding and Payment Mechanisms

13. Vermont's Weatherization Trust Fund
Name: Jules Junker, Title: Administrator/Evaluator
Organization: Vermont Office of Economic Opportunity
14. Fuel blind weatherization expenditure
Name: Elliot Jacobsen, Title: Executive Director
Organization: Action Inc.
15. "Pay As You Save" Revolving door funding mechanism
Name: Nancy Brockway & Harlan Lachman, Title: Commissioner and Principal
Organization: New Hampshire PUC & Energy Efficiency Institute Inc.
16. Lease Fees or Co-Payments for measures (Vermont SmartWise example)
Name: Nancy Brockway & Harlan Lachman, Title: Commissioner and Principal
Organization: New Hampshire PUC & Energy Efficiency Institute Inc.
17. Low Income Shared Savings Programs (Wisconsin Example)
Name: Nick Hall, Title: Principal
Organization: TecMRKT Works
18. Weatherization Revolving Loans Pilot (Wisconsin Energy Bureau Example)
Name: Bobbi Tannenbaum, Title: Project Manager/Specialist
Organization: Energy Center of Wisconsin (ECOW)

Partnerships and Collaboratives

19. Coordination of public benefits programs & services (Colorado and Spokane Examples)
Name: Roger Colton, Title: Consultant, Low-income advocate
Organization: Fisher, Sheehan and Colton

20. Collaborative and decentralized (utility-based) approach to designing affordable payment programs
 Name: Wayne Williams and Janis Hummel, Title: Evaluator and Analyst
 Organization: Pennsylvania Public Utility Commission
21. One-stop shopping major leveraging for multi-family (Vermont's REEP)
 Name: Jules Junker, Title: Administrator/Evaluator
 Organization: Vermont Office of Economic Opportunity
22. Piggy-backing general residential program onto weatherization (Texas Utilities CEAP Example)
 Name: Nancy Brockway & Harlan Lachman, Title: Commissioner and Principal
 Organization: New Hampshire PUC & Energy Efficiency Institute Inc.
23. Refrigerator Replacement Piggy-back Program (Cinergy example)
 Name: Rick Morgan, Title: President
 Organization: Morgan Marketing Partners
24. CAP Agency Access to Utility Customer Records (Milwaukee Energy Linkage Pilot)
 Name: Bobbi Tannenbaum, Title: Project Manager/Specialist
 Organization: Energy Center of Wisconsin (ECOW)

Targeting Practices

25. Targeting of energy programs to high users (SmartComfort example)
 Name: Roger Colton, Title: Consultant, Low-income advocate
 Organization: Fisher, Sheehan and Colton
26. Targeting of weatherization to high consumption homes
 Name: Rick Morgan, Title: President
 Organization: Morgan Marketing Partners

Other Unique Practices

27. Home Maintenance Service Program (Cinergy)
 Name: Rick Morgan, Title: President
 Organization: Morgan Marketing Partners
28. PIPP Education Program (Cinergy)
 Name: Rick Morgan, Title: President
 Organization: Morgan Marketing Partners
29. Non-profit Energy Management Program (Cinergy's NEMP)
 Name: Rick Morgan, Title: President
 Organization: Morgan Marketing Partners