

## **National Residential Energy Programs Comparison**

There are currently 6 identified residential energy programs that operate at the national level in the United States. Each program is designed differently and subsequently implemented differently. The goal of these 6 programs is primarily to help residents lower their energy bills, while reaping the associated benefits of creating: 1) a safer home; 2) a healthier home; and 3) a home that is better for the overall environment. Four of the six programs are sponsored by the Federal government and overseen by its representative agencies. Only HERS and LEED are overseen by entities that are completely separate from the Federal government. While each program is designed differently with unique characteristics, there exist many similarities and differences between the programs. The purpose of this paper is to compare the Weatherization Assistance Program to these other programs noting which aspects of these programs are most beneficial while also identifying potential barriers to successful implementation.

### **Target Recipients:**

The Weatherization Assistance Program (WAP) is unique in that it is the only program solely dedicated to low-income households. All of the other five programs appear to target middle-income to upper-income demographics. LEED is probably the most removed from the WAP in that it mainly targets new construction. When LEED addresses existing buildings, it does so more with commercial buildings than residential. In the existing residential market, LEED is more common amongst large multi-family buildings than single family homes. HERS is a program that in reality could target any income household, however, the cost of a HERS audit can be rather expensive. Thus, HERS audits are probably not a viable option for the majority of low-income persons.

### **Program Availability:**

The WAP is probably the most prolific residential energy program in the United States. It operates in all 50 states and recently expanded to the U.S. territories. The WAP's service territory reaches any area within a state/territory as long as a household meets program eligibility criteria. Home Performance with Energy Star (HPwES) is a very successful and fast growing program. HPwES, however, is currently available in parts of 29 states. It might be difficult at this time to create some linkage between WAP and HPwES since the coverage area

of HPwES is not as vast as WAP. It might be possible, however, to test a linkage through a pilot project of some kind under the right circumstances. HERS and Recovery Through Retrofit (RTR) are two programs that rely on local factors to be successful. HERS requires the availability of Energy Improvement Mortgages and RTR requires that a local municipality is able to assess energy efficient upgrades to the property tax of the dwelling. These variables pose potential hurdles to the nationwide success of these programs, whereas the WAP's network is already well established and does not have similar external obstacles.

### **Program Approach:**

When it was mentioned before that a linkage between WAP and HPwES could possibly occur, it was noted because both programs are designed to address energy efficient retrofits via a whole-house approach (i.e. the house as system). Both programs also have a focus on identifying health and safety issues, thus improving the quality of life as well as reducing energy costs. Home Star offers two options for a home owner to consider: either the whole-house approach similar to WAP and HPwES or allowing home owners to choose measures from a core set of pre-established energy saving measures. Clients of Home Star would receive up to \$2,000 for implementing 2 measures from the qualifying list, \$3,500 for implementing at least 4 measures from the list, or higher incentives for achieving a 20% or greater total energy savings in the dwelling. It should also be noted that the WAP does not allow client's to choose measures to be implemented.

HERS and LEED operate quite differently. HERS' approach is to rate a dwelling based on its current efficiency on a scale of 1-100 (the higher the score, the more efficient the dwelling). LEED assigns points for meeting various energy and environmental criteria. These points are then totaled and the dwelling is then assigned to a certain certification classification (i.e. silver level, gold level, etc.).

Recovery Through Retrofit's approach is to assign an "energy label" to a dwelling which then basically informs existing residents or prospective property buyers on the energy efficiency level of the dwelling. This approach is similar to the Energy Star labels consumers see on appliances in stores.

### **Program Funding:**

The large majority of these residential energy programs rely on a variety of financing options such as low-interest loans, rebates, and mortgage industry options. As noted before, the

Home Star program plans to offer a tiered approach to financing with incentive rebates capped at 50% of total project costs. Tiered approaches offer flexibility to the home owner in that they are able to undertake a number of energy efficient measures within their financial means should they financially not be able to implement all recommended measures. This way, the consumer can reap a certain amount of energy savings benefits rather than risk an all-or-none proposition.

Recovery Through Retrofit offers a unique and intriguing component to energy saving measure funding in that the costs of the measures are tied to the property itself and not the home owner. This is a novel concept especially since one constant barrier to implementing energy savings has been that the current owner of a dwelling may sell the home and not reap the complete benefits of the measures. By tying the costs of implementing energy savings to the property tax of a dwelling, a critical obstacle is removed from the equation. For this to be effective, the energy savings per month must be greater than the increase in property tax. This type of financing option might possibly be linked somehow with other programs as well.

The WAP is the one program that secures Federally appropriated funds on a yearly basis. It has successfully received funding for weatherization for over 30 years. The program is highly regulated and annually issues an average dollar cost per unit weatherized that should be maintained across the country. It bears consideration to look into ways that perhaps a linkage to RTF might be established for low-income dwellings where more measures might be installed than simply the per unit average. Perhaps added measures might be implemented (piggybacked) in low-income homes if the measures were tied to the property as opposed to the client and/or building owner?

### **Measure Implementation:**

With the exception of LEED and HERS, all of the other programs operate via a similar structure of having an Energy Auditor conduct a comprehensive analysis of the dwelling and then having a contractor perform measure installations and/or performance and safety testing. The WAP requires that an Auditor can't be the Installer on the same project, whereas HPwES allows the Auditor to also be the Installer on the same dwelling. By prohibiting an Auditor from also being the Installer, it helps to eliminate any potential conflict where an Auditor may recommend certain measures because he/she knows more money can be made by installing certain measures over other measures. The WAP is also the only program bound by regulation that states only materials approved for use in the Program may be installed in a dwelling. The WAP's list of approved materials is listed in Appendix A of the Final Rule (10 CFR, part 440). Other residential energy programs may opt not to prohibit the installation of materials in a

dwelling that do not meet specified quality and/or safety standards. Being a highly regulated program, the WAP is stricter about installed materials.

HERS does not conduct an audit per se. Instead HERS conducts a rating using specified criteria to rate a dwelling and provide an assigned score. HERS clients are then responsible for hiring a contractor if they choose to proceed with measure implementation. LEED does not conduct an audit either. LEED focuses more on reviewing a dwelling's energy and environmental criteria and then awarding points if the required criteria are achieved.

### **Measure Verification:**

The WAP conducts the most comprehensive on-site post-installation inspections of any of the six programs. The WAP requires that 100% of weatherized units receive on-site inspections. In addition, the WAP requires that Grantee Monitors perform 5% monitoring site visits to subgrantee weatherized units.

HPwES states that no less than 15% of completed units will be inspected by the Program Administrator. Home Star indicates that Inspectors will perform on-site inspections to monitor for quality and energy savings, but no percentage of completed units is referenced. LEED requires that all measures eligible for LEED points be verified, but this does not mean that an on-site inspection occurs. Likewise, RESNET will conduct a limited review of files, but not necessarily on-site inspections. It is unclear at this time exactly what the verification process will be for RTF as the program is brand new.

### **Training Requirements:**

None of these programs appear to offer a standard uniform training program. In fact, LEED and HERS rely more on passing an exam than providing any type of formal training. Both programs offer some self-study materials and possible courses, but training is not a major focus as it is with other residential energy programs.

While the WAP has no standardized training program in place at the national level, nearly every WAP staff member undergoes training at the Federal, State, or local level. Many field personnel (Auditors, Inspectors, etc.) complete training courses and are required by the Grantees to pass exams to become "certified". Many other non-certifiable training sessions are conducted in each Grantee's territories throughout the Program Year on a variety of technical,

program, fiscal, and health & safety related topics. Training is an integral part of the WAP and has been a key component of the Program's success over the years. Currently being developed is the Weatherization Assistance Program's "training curriculum" which will offer a uniform approach to training across the entire Weatherization network.

HPwES notes that training should include a combination of classroom training and field training along with a combination of building science principles, diagnostics training, and installation best practices. HPwES may also include business and sales training as this program's success is based on the ability of program personnel to convince clients to implement specific energy savings measures in their homes that require a financial commitment.

While Recovery Through Retrofit and Home Star are relatively new programs, RTR seems to have a focus on developing model training programs to help achieve success, whereas Home Star seems to focus more on contractors who are already experienced in performing energy saving retrofits. Home Star, as of yet, does not appear to have a stated training plan in place.

### **Certification Requirements:**

All six residential energy programs appear to promote some kind of certification as a requirement of being able to work on the respective programs. Successful "certification" of a workforce lends a certain degree of credibility to a program as well as demonstrates that program staff has achieved a certain level of proficiency and competence in the work that they perform.

The WAP currently does not have a national certification for personnel performing the various job descriptions throughout the Program. The topic of creating a national certification, however, has been recently discussed. At present, "certifications" are handled by each WAP Grantee with some trainees earning "certification status" upon successfully completing a training program and passing a subsequent exam. Other WAP Grantees offer no "certification", albeit they provide effective training for both their program and field staff.

A handful of WAP Grantees incorporate certifications from the Building Performance Institute (BPI) into their program structure. BPI certification is recommended for HPwES as well as Home Star. Recovery Through Retrofit favors the creation of a uniform set of national certification standards to qualify both energy savings and retrofit workers.

### **Contractor Incentives:**

Many programs do not specifically reference any incentives for contractors to participate in the programs. HPwES notes that there is the possibility that training costs and diagnostic equipment costs may be reimbursed. The criteria for such reimbursement under HPwES are not specifically noted. Recovery Through Retrofit also plans to incorporate some form of business development training as an incentive for contractors to attend trainings and become more successful while working on the Program. In the WAP, it has been noted by many Grantees over the years that it is hard to get contractors to attend training sessions. This is a dilemma for contractors because when they are attending training courses, they lose out on wages. The WAP needs to come up with a viable incentive plan to get field contractors to attend trainings. Without training attendance, the quality of the Program will suffer. It is vital for the WAP to increase the percentage of contractors that attend various trainings. Developing and implementing some functional structure of incentives for independent contractors may be a means to this end.

### **Consumer Incentives:**

The WAP is unique amongst residential energy programs in that consumer incentives are not as critical to the success of the Program. This is primarily due to the fact that a WAP client pays nothing for the services provided and the materials installed. For a client to participate in the WAP, program eligibility is all that needs to be verified.

Other programs must offer some type of consumer incentive as these programs require consumers to have a direct financial connection to the energy savings work that ultimately gets performed on a dwelling. HPwES relies on loans and rebates to aid consumers. Home Star offers a tiered approach to rebates. HERS allows the consumer to tie the cost of energy savings retrofits into an Energy Improvement Mortgage and spread the cost out over time rather than pay upfront. Recovery Through Retrofit offers a uniquely new spin on incentives.....one where the cost of energy savings retrofits is tied to the property and not the owner. This approach makes a lot of sense as a significant impediment to getting consumers to undertake energy retrofits has been significant upfront financial expenses. By moving the cost burden to the property itself, the current homeowner can spread out the cost over the years and is off the hook should the property be sold.

### **Cost Effectiveness:**

Given that these six residential programs focus on reducing energy usage, a measure of program effectiveness is how much energy may actually be saved. This energy savings will

directly result in lower energy costs for the consumer. HPwES, Recovery Through Retrofit, and Home Star estimate that between 20-40% of energy usage can be saved per dwelling. This might yield dollar savings per household anywhere between \$200-\$500 per year. These programs do not have set minimum criteria for cost effective measure installation. Generally they rely on payback calculations with the shortest payback being the highest priority for installation. It is then up to the consumer to determine which measures are to be installed given that the consumer is ultimately paying for the measures.

The WAP does not operate via payback calculations per se. Instead, the WAP uses a savings-to-investment ratio (SIR) to determine the cost effectiveness of measures. Any measure with an SIR greater than 1 may be eligible for installation. If an energy savings measure has an SIR less than 1, the measure does not meet the program's eligibility criteria for cost effectiveness and therefore cannot be installed.

With any of these programs, it is vital to incorporate a cost effectiveness component. Such a parameter aids in ranking measures and ensures that only the best measures are installed on a properly audited unit, thus conserving precious financial resources in the process.

### **Conclusion:**

Each of the six referenced residential energy programs is unique in their own regard. The WAP is the oldest and most established program. It is not a perfect program, but there is no such thing as a "perfect program". Each program has the potential to succeed in saving energy, and hopefully this comparative analysis has provided insight into the core components of each program. Success is often realized through building on the positive, creating effective solutions to overcome any barriers, all while remaining open-minded to change. Through adoption of this approach, Weatherization shall continue to work!