Today’s Best Opportunities for Improving Manufactured Homes Efficiency

By Katherine Dayem, Xergy Consulting

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WHAT HAS CHANGED IN THE INDUSTRY?
Improving the efficiency of manufactured homes and providing savings for low- to moderate-income residents remains a priority for cooperatives. Recently, government agencies and electric industry stakeholders have considered the effectiveness of whole home replacements for inefficient manufactured homes as opposed to the more traditional energy-efficiency measures on the existing homes. To that end, zero-interest loans to utilities and non-profit groups have expanded to now include whole home replacement of manufactured homes. The question then follows: “In what situations is manufactured home replacement more cost-effective than other efficiency improvements such as weatherization?”

Our research showed that, in most cases, home replacement is not a cost-effective means to reduce energy bills. Costs of home replacement include not only the cost of the new home, but also site preparation, transportation, and shipping costs, which are too large to be offset by resulting energy savings. Replacement only makes sense for homes with structural damage or health and safety hazards. Even at that, the cost to purchase a new home may be cost-prohibitive for someone who has long paid off the cost of their current home. Weatherization measures, however, can be a cost-effective, short payback means to improve energy efficiency and reduce energy bills.

This paper provides an update on NRECA’s prior reports on manufactured home weatherization opportunities, presents weatherization efforts undertaken by several co-ops, and explores funding mechanisms that can be used to implement these improvements.
WHAT IS THE IMPACT ON COOPERATIVES?

About 20 million people live in 6.7 million manufactured homes across the United States (MHS 2017). These homes are disproportionately weighted to the rural areas of the country, and can comprise 25 percent or more of co-op residential building stock (Cody 2011). Although the purchase price of a manufactured home is considerably less than a stick-built home, energy bills of manufactured homes can be much higher, due to inefficient heating and cooling systems and building envelopes. Unfortunately, for those who live in manufactured homes because of their perceived affordability, high energy bills can cause major financial stress.

Co-ops are impacted by high manufactured home energy use. It can lead to increased frequency of high bill complaints, risk of non-payment, and decreased member satisfaction (Cody 2011). In addition, because most manufactured homes use electric space heating and air conditioning, inefficient HVAC systems and building envelopes drive up load and contribute significantly to co-op demand peaks (Cody 2011). Co-ops that identify and assist members with energy improvements, therefore, can not only improve the manufactured homeowner’s living situation, but also reduce electricity bills of their entire membership by reducing peak demand costs.

WHAT DO COOPERATIVES NEED TO KNOW OR DO ABOUT IT?

Co-ops can help their members access funding for energy reduction strategies that reduce electricity consumption and pay for themselves in a few years or less. To defer the initial cost of these strategies, co-ops can leverage low and zero interest loans, like the U.S. Department of Agriculture’s (USDA) Rural Energy Savings Program (RESP), rebates, and other funding.

On-bill financing (OBF) can be used to recoup payment for the loans, especially if the post-measure cost of the loan and electricity is less than what the member was previously paying for electricity on a monthly basis. Co-ops can encourage efficiency in new homes as well, by promoting, rebating, or financing efficient heat pump HVAC systems or ENERGY STAR homes. In all cases, it is important for co-ops to remain particularly sensitive to helping members save money on a monthly and total basis, and make sure that they are not making the financial situation worse for a potentially vulnerable member.

As part of NRECA’s Advancing Energy Access for All initiative, NRECA intends to explore and research ways to develop a collective, cooperative effort to improve manufactured home energy efficiency on a large scale at co-ops across the country. A goal of this effort would be to help co-ops share and expand on their collective experiences, allowing them to identify successful approaches, lessons learned, and knowledge gaps. By sharing this information widely, co-ops would have access to a broad range of information and resources to help make their programs successful.

As we discuss in this article, many co-ops have identified opportunities to improve manufactured home efficiency and positively impact the financial situation of low- to moderate-income members. Many of these opportunities are “low hanging fruit”—they are low cost, tried-and-true energy savings measures. In fact, the biggest challenge many of these co-ops face is reaching and engaging with members who are most in need of energy efficiency improvements. Although many in the efficiency community perceive commercial and multifamily efficiency measures as delivering the most energy savings for the least investment, manufactured home improvements have the potential to deliver similar results, especially if co-ops are able to share and build on their collective efforts.
Replacing inefficient space conditioning components with a central or mini-split heat pump system has large energy savings potential.

Energy Reduction Strategies for Manufactured Homes

Improving energy efficiency in manufactured homes is important to co-ops, especially those serving a large proportion of manufactured homes. Seventy-four percent (74%) of co-ops surveyed for the NRECA 2011 Manufactured Housing Survey said improving energy efficiency of manufactured homes is important or extremely important (Cody 2011). Fortunately, a variety of energy reduction strategies are available for existing homes, and a subset of these can be applied to new or replacement homes. These strategies are discussed below and summarized in Table 1.

Ducts in existing manufactured homes are often another source of inefficiency. The ducts are usually underneath the home, and are often constructed of flimsy material that can be damaged by animals or weather, or simply fall apart with age. In particular, the crossover duct, which connects sections of multi-section homes like double-wides, is a common source of air leakage in the ductwork. Repairing and sealing ductwork ensures that the conditioned air is delivered into the home, rather than being pumped out beneath the home.

Mini-split, or ductless, heat pumps do away with the duct issue altogether, since they move heat between paired indoor and outdoor units connected by a short run of conduit rather than through a duct system. Ductless systems can be sized to replace the central system entirely or to save cost; or can be slightly undersized and used to offset a majority of the existing central system’s load.

Building Envelope Improvements

Typical manufactured home building envelope improvements include:

- Upgrading insulation to reduce heat transfer between the home and the outdoors,
- Air sealing windows and doors to reduce air transfer between the home and the outdoors (e.g., drafts into the home and the loss of conditioned air out of the home), and
- Installing a moisture barrier to reduce moisture damage and mold development.

These improvements are typically carried out to varying degrees below, around, and above the home’s conditioned space.

Improving insulation and moisture barriers underneath the home is often the primary focus of manufactured home weatherization.

Table 1: Energy reduction strategies for existing and new or replacement manufactured homes

<table>
<thead>
<tr>
<th>Area of Improvement</th>
<th>Existing Home</th>
<th>New or Replacement Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVAC System</td>
<td>• Replace existing HVAC with heat pump (central or ductless)</td>
<td>• Install heat pump (central or ductless) HVAC system</td>
</tr>
<tr>
<td></td>
<td>• Repair ductwork, especially crossover duct</td>
<td></td>
</tr>
<tr>
<td>Building Envelope</td>
<td>• Improve underbelly insulation and moisture barrier, protect against future damage</td>
<td>• Promote ENERGY STAR qualified or other efficient homes.</td>
</tr>
<tr>
<td></td>
<td>• Air seal marriage joint(s), windows, doors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Improve attic insulation</td>
<td></td>
</tr>
</tbody>
</table>

EXISTING HOMES

Existing manufactured homes present unique opportunities for energy savings improvements, which can be different from strategies typically used for stick-built homes. These strategies generally have low upfront costs, short payback periods, and meaningful electric bill reductions. They include: HVAC system improvements, insulation and moisture barrier improvements, and air sealing. More costly improvements, such as upgrading windows, are generally not viable for manufactured homes, as improvement costs can quickly approach the value of the structure itself.

HVAC System Improvements

HVAC improvements include replacing inefficient furnaces and air conditioning equipment with heat pump units, and repairing duct work. A large proportion of manufactured homes use electric resistance furnaces and window or room air conditioning (EIA 2013). Replacing these inefficient space conditioning components with a central or mini-split heat pump system has large energy savings potential.
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Manufactured homes are often leaky, especially at the marriage joint between sections and around windows and doors.

Even in new homes, significant HVAC savings can be realized by upgrading to a heat pump system.

Environmental Protection Agency (EPA) began an ENERGY STAR program to recognize energy efficient homes that are at least 30 percent more efficient than a home designed to meet the 1993 Council of American Building Officials Model Energy Code and have efficient HVAC systems, water heaters, and building envelopes. Even with the improvements resulting from the HUD code, however, most manufactured homes are still sold with electric resistance heating systems. Significant reduction in HVAC energy use can be realized by upgrading to a heat pump system.

Case Studies: Research and Programs for Decreasing Manufactured Home Energy Use

Many co-ops and other utilities and organizations actively work on improving manufactured home energy efficiency to reduce electricity bills and peak demand. In this section, we highlight some key experiences that may help other co-ops address the energy use of this segment of their membership.

PROMOTING HEAT PUMPS

Central Heat Pump Systems

As noted earlier, space conditioning comprises a large fraction of a typical manufactured home’s energy consumption, and is a prime opportunity for energy savings. Inefficient space conditioning not only impacts member electric bills directly, but also has potential to impact co-op peak demand, both in the summer with air conditioning peaks and in the winter with heating peaks. Promoting efficient space conditioning like heat pumps, therefore, is a priority for some co-ops (see Figure 2).
Realizing that partnerships are important in educating members about and encouraging them to adopt heat pumps, PSEC also provides an incentive of $100 per unit to the contractor (in the case of a replacement) or the home dealer (in the case of a new home). Barbara Edmondson, Marketing Representative at CVEC, notes that education is key to realizing energy savings. Not only do contractors and dealers need to understand and promote heat pumps, but members need to understand how to use them. As a key element of CVEC’s program, Edmondson explains key maintenance and behavioral practices that can help members achieve the most energy savings. These include replacing dirty air filters to ensure that the heat pump runs efficiently, and turning down thermostat temperatures when nobody is at home to avoid heating unoccupied space.

**Ductless Heat Pumps**

Although, at the time of this paper, we did not learn of any co-ops promoting ductless heat pumps, this solution has been explored for manufactured homes in the Pacific Northwest. A 2012 Bonneville Power Administration (BPA) pilot retrofitted 20 homes with ductless heat pumps, offsetting the majority of existing electric furnace heating load. BPA estimated that heating costs of participating homes decreased by 39 percent (BPA 2012). More recently, an Energy Trust of Oregon pilot of 100 homes found 20 to 23 percent savings (Cadmus 2017). Another NRECA TechSurveillance article, *The Business Case for Retrofitting Manufactured Homes with Mini-Split Heat Pumps: Facing Down the Inefficiency Challenge*, outlines the business case for ductless heat pumps, and steps to increase adoption of the technology (Funkhouser et al., 2016).

**IMPROVING BUILDING ENVELOPES**

Co-ops have also worked to improve building envelopes of manufactured homes. Buckeye Power, Inc. (Buckeye), a G&T co-op serving Ohio, self-funded a study to weatherize and improve homes, several of which were manufactured homes, in the early 2010s. According to Bernie Woller, formerly the Director of Facilities and Special Projects at Buckeye, they generally focused efforts on low-cost improvements to the underbelly of the home (see Figure 2).
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Sealing and repair, HVAC repair, and insulation upgrades. On average, the measures cost $5,500, saved members $670 a year, and had a payback period of 11 years (CEPCI 2012). The savings varied over a wide range, however. About 18 percent of the homes experienced a payback period of less than 5 years, and 44 percent achieved payback in 5 to 10 years. Payback periods for the remaining 38 percent of homes were greater than 10 years.

Additional weatherization in South Carolina has been carried out by the Help My House program, a collaborative effort between the Electric Cooperatives of South Carolina (a state-wide trade association), CEPCI, and South Carolina distribution co-ops. This program provides low-interest loans with OBF to carry out weatherization measures on both stick-built and manufactured homes. It was piloted in 2011, and included 72 manufactured homes of 125 total retrofits (Keegan 2013). Homes were initially audited with a blower door test, then contractors performed air sealing and other weatherization improvements. Afterward, home performance improvement was confirmed with a second blower door test conducted by an independent auditor. Although results were combined for manufactured and stick-built homes, they show most homes (over 80 percent) realized energy cost savings larger than the monthly loan repayment. Coincident peak demand savings were 27 percent of the June summer peak and 45 percent of the January winter peak (Keegan 2013).

Help My House was introduced as a full program in 2013. Jay Kirby, Vice President of Public Affairs at Santee Electric Cooperative, Inc. (Santee), noted good success with the Help My House program at the distribution co-op. Of the approximately 240 participating homes, about 60 of which are manufactured, Santee has had no write-offs and only had to disconnect electricity on one occasion for non-payment of the loan. Santee’s experience has led them to focus on homes newer than 1992, as older homes tend to have other issues like failing roofs and leaky floors. They also require a 10-year parts and labor warranty priced into installed equipment, so that if it fails, the member is able to have it repaired.

FIGURE 3: Spray foam installed between floor joists under a manufactured home. Photo courtesy of Buckeye Power

Figure 3), improving insulation, sealing ducts, and installing moisture barriers. The cost of improvements varied from less than $1,000 to more than $3,000 per home, saved homeowners $440 to $830 per year, and had payback periods of 2 to 4 years. Buckeye performed higher-cost improvements to one home that included attic insulation and duct modifications, in addition to underbelly improvements, for a cost of over $5,000, saved about $700 a year, and had a payback period of 8 years. Buckeye also learned an important lesson: the water pipes under one of the low-cost improvement homes froze because the pipes were no longer warmed from the conditioned space. Although they successfully repaired the damage and insulated the water pipes, they decided to focus other efforts on homes with foundations that can keep pipes from freezing.

Central Electric Power Cooperative, Inc. (CEPCI), the G&T that serves South Carolina distribution co-ops, has been an active promoter of manufactured home weatherization. In 2010, they weatherized 79 manufactured homes as part of their GoodSense Program, funded by American Recovery and Reinvestment Act stimulus money (CEPCI 2012). Appropriate weatherization measures were determined for each home, and included duct sealing and repair, HVAC repair, and insulation upgrades. On average, the measures cost $5,500, saved members $670 a year, and had a payback period of 11 years (CEPCI 2012). The savings varied over a wide range, however. About 18 percent of the homes experienced a payback period of less than 5 years, and 44 percent achieved payback in 5 to 10 years. Payback periods for the remaining 38 percent of homes were greater than 10 years.
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NEW HOME PROGRAMS

East Kentucky Electric Cooperative (EKPC), a G&T in Kentucky, offers rebates to offset the cost of upgrading from a standard efficiency new home to an ENERGY STAR qualified home with a heat pump. In early years of the program, which began in 2014, EKPC rebated the home manufacturing plant directly to cover the incremental cost of the participating member’s new ENERGY STAR home. Although this allowed the member to pay a reduced up-front cost, the rebating process was slow and cumbersome, according to Josh Littrell, DSM Program Manager at EKPC. EKPC is currently restructuring the program, and plans to offer a rebate to the member of $1,150 on the purchase of an ENERGY STAR home with a heat pump. According to Littrell, most of the savings opportunity is in upgrading to a heat pump, since new homes are fairly tight, and have improved ducts compared to older homes.

Cost and Benefits of Energy Reduction Strategies

As the co-op experiences included in this article indicate, a variety of energy reduction strategies are available for manufactured homes. In this section, we make a first estimate of the cost and energy benefits of several strategies, from simple upgrades to home replacement, based on previous co-op work and other published estimates (see Table 2). These estimates are presented as (sometimes large) ranges, in part due to variability in the limited data, and in part due to site-specific factors that need additional study. For any particular home, energy reduction strategies undertaken will depend on the age and condition of the home, and the funds available to carry out the improvements. In addition, realized energy savings for that home depends not only on the improvements, but other variables, such as climate and behavior changes. Additional research and experience is needed to develop solid cost, savings, and payback period estimates. The estimates presented here are meant to start this conversation and work, rather than be a guideline on which to base program development.

Even with large uncertainties, we can begin to draw some conclusions that can shape how co-ops approach manufactured home energy reduction, and highlight areas for additional study. It is clear that upgrading an existing home’s HVAC system and/or implementing weatherization measures can be cost efficient with shorter payback periods than measures for new homes. Expected energy savings for an ENERGY STAR home relative to a standard home, however, is poorly known and likely highly dependent on climate, home size, and occupant behavior. For these reasons, we place little certainty on the savings and payback estimated for this strategy, and recommend further study.

Replacing an existing home with a new home cannot be justified by energy savings alone. For any particular home, energy reduction strategies undertaken will depend on the age and condition of the home, and the funds available to carry out the improvements.

TABLE 2: Estimated cost and benefits of a range of energy reduction strategies

<table>
<thead>
<tr>
<th>Energy Reduction Strategy</th>
<th>Incremental cost ($)</th>
<th>Estimated savings ($/yr)</th>
<th>Payback (yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace electric resistance furnace with heat pump&lt;sup&gt;a&lt;/sup&gt;</td>
<td>350 – 600</td>
<td>300 – 500</td>
<td>1</td>
</tr>
<tr>
<td>Improve underbelly insulation, seal and repair ducts, install moisture barrier&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1000 – 3000</td>
<td>400 – 800</td>
<td>2 – 4</td>
</tr>
<tr>
<td>Purchase ENERGY STAR new home instead of base efficiency home&lt;sup&gt;c&lt;/sup&gt;</td>
<td>2000 – 4000</td>
<td>400</td>
<td>5 – 10</td>
</tr>
<tr>
<td>Replace existing home with new home&lt;sup&gt;d&lt;/sup&gt;</td>
<td>40,000 – 80,000</td>
<td>700 – 1300</td>
<td>30 – &gt;100</td>
</tr>
</tbody>
</table>

Notes and Assumptions:

a. Cost, savings, and payback estimates based on PSEC and CVEC results. Incremental cost is difference between heat pump and electric resistance furnace.

b. Cost, savings, and payback estimates based on results from CEPCI GoodCents program and BEC study results. Incremental cost is the cost of the weatherization measures.

c. Cost and payback estimates from Furman (2014). Annual savings calculated by dividing cost by payback. Incremental cost is the estimated cost difference between an ENERGY STAR and a non-ENERGY STAR home.

d. Cost estimates from Furman (2014) for single and double wide homes. Does not include delivery, site preparation, title fees, or taxes. Estimated savings based on combining savings estimates related to heat pump upgrade and weatherization (strategies 1 and 2). Payback estimated by dividing cost by savings.
homes in poor condition can make up almost a quarter of manufactured home building stock (VCHR 2016).

**Financing and Funding Options**

Fundamental to the success of any weatherization measure or home upgrade is members’ access to financing or other funding to cover the initial costs of the upgrade. Co-ops are and should be sensitive to the costs borne by members who live in manufactured housing and make sure that members who embrace energy reduction strategies do not end up worse off from a financial perspective. In many cases, financial assistance, often in the form of low interest loans or rebates, is necessary to defer improvement costs.

The USDA offers several programs to aid rural areas. RESP, the program noted earlier that finances weatherization and home replacement, offers zero-interest loans to eligible borrowers, such as utilities, municipalities or states, and non-profits. Loan terms are up to 20 years. The borrower, be it the co-op or a government or non-profit partner organization, relends the money to members at an interest rate of up to 3 percent, to be repaid in 10 years or less. RESP has been offering financing for weatherization measures since 2016, and in 2018, expanded financing to include manufactured home replacement, if the new home “would be more cost-effective in saving energy” (USDA 2017a, USDA 2018). The program allows for a wide range of energy efficient improvements (see Table 3).

Co-ops may be familiar with other USDA programs including the Energy Efficiency and Conservation Loan program (EECLP) and the Rural Economic Development Loan and Grant (REDLG), which can be used to fund energy efficiency and peak demand reduction measures (see Table 4). Compared to RESP, EECLP has shorter terms, higher interest rates, and limits borrowing entities to utilities that provide electric services in rural areas (USDA 2013, 2017a,b). REDLG has funded energy efficiency programs such as the South Carolina Help My House program (Keegan 2013), with zero percent interest loans with a 10-year maximum term (USDA 2015). Of these options, RESP may be the preferred choice of co-ops.

Once the co-op (or partner government or non-profit entity) secures funding, it issues loans to members. OBF streamlines this process by collecting repayment via a monthly charge on the electric bill. Ideally, post-measure

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**TABLE 3: Energy efficiency improvements that can be financed by RESP. Common co-op measures are shown in bold type.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVAC</td>
<td>Duct sealing, Heat pumps, ENERGY STAR qualified central air systems,</td>
</tr>
<tr>
<td></td>
<td>ENERGY STAR qualified furnaces, Programmable controls, Economizers,</td>
</tr>
<tr>
<td></td>
<td>Air handlers</td>
</tr>
<tr>
<td>Building Envelope</td>
<td>Insulation (added beyond existing levels, or beyond existing building code)</td>
</tr>
<tr>
<td>Improvements</td>
<td>Caulking and weather stripping around doors and windows, Door upgrades</td>
</tr>
<tr>
<td></td>
<td>and ENERGY STAR qualified windows</td>
</tr>
<tr>
<td>Energy Audits</td>
<td>Pre- and post-measure blower door tests, Whole home audits</td>
</tr>
<tr>
<td>Home replacement</td>
<td>Replace existing home with more efficient new home</td>
</tr>
<tr>
<td>Lighting</td>
<td>Efficient bulbs and fixtures, Lighting controls</td>
</tr>
<tr>
<td>Other</td>
<td>Water heater, Appliances (if attached to real property), Irrigation,</td>
</tr>
<tr>
<td></td>
<td>Renewable energy, Energy storage</td>
</tr>
</tbody>
</table>

**TABLE 4: Summary of USDA loan programs.**

<table>
<thead>
<tr>
<th>Program</th>
<th>Eligible Borrower(s)</th>
<th>Interest Rate</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESP</td>
<td>Utilities, Nonprofit organizations, Municipalities, States</td>
<td>0% for the Eligible Borrower, who may relend to consumers (co-op members) at rate up to 3%.</td>
<td>Up to 20 years for the Eligible Borrower, who may relend to consumers (co-op members) on terms up to 10 years.</td>
</tr>
<tr>
<td>EECLP</td>
<td>Utilities that serve rural areas</td>
<td>Current direct US treasury rate for the Eligible Borrower, who may relend to at rate up to 1.5% greater than direct treasury rate</td>
<td>Up to 15 years.</td>
</tr>
<tr>
<td>REDLG</td>
<td>Utilities that serve rural areas</td>
<td>0% (Utility and consumer)</td>
<td>Up to 10 years (Utility and consumer)</td>
</tr>
</tbody>
</table>
Co-ops may also benefit from forging partnerships with community or advocacy groups that focus on helping low- and-moderate income families.

Exploring a Co-Op Collective Effort to Improve Manufactured Home Efficiency

Many co-ops like the ones highlighted in this article are assisting members who live in manufactured homes implement energy efficiency improvements. But, many more co-ops do not have programs in place that would benefit these often low-income members. NRECA is exploring opportunities to expand manufactured home energy efficiency improvement through a collective co-op effort. By working together, co-ops can leverage previous co-op experience as a resource to develop research and programs, as well as share experiences and lessons learned. Below, we outline potential components of this collective effort.

BUILDING ON CO-OP EXPERIENCE

Co-ops are already having success with existing home measures by providing financing and incentives for participating members. Although it may be difficult to use current data to make accurate estimates of savings and payback for a weatherization measure without additional pilots and experiences across the country, co-ops have shown that they can help members living in manufactured homes in a variety of ways. These include:

- Promoting HVAC system and building improvements.
- Leveraging low-interest financing and OBF.
- Promoting energy efficient new homes (ENERGY STAR homes or homes with heat pump systems).
- Educating members on efficient technologies and behaviors, and building relationships with contractors and dealers.
- Building partnerships with municipalities and community assistance programs.

Co-ops may also benefit from forging partnerships with community or advocacy groups that focus on helping low- and-moderate income families.

electricity savings is greater than the loan payment, and the member sees a smaller electricity bill after the improvements. OBF allows the co-op to assign the loan to the meter, rather than the member. If the member sells the home, the loan is passed to the new owner. This ensures that the member that pays the loan is also the member that benefits from the energy efficiency improvements.¹ Co-ops have a history of using OBF for a wide variety of energy efficiency and distributed energy programs (Keegan et al. 2016). Ouachita Electric Cooperative, a distribution co-op serving southern Arkansas, is a leader in OBF weatherization programs, offering the program for single-family, multi-family, and even commercial buildings to renters and owners (Ouachita Electric Cooperative 2017). Applied to manufactured homes specifically, OBF has been successful in the Help My House program in South Carolina, as discussed earlier.

Co-ops may also benefit from forging partnerships with community or advocacy groups that focus on helping low- and-moderate income families. Although the roles of the co-op and the partner(s) will vary depending on the resources each brings to the table, partner groups could take on a wide range of roles, such as procuring and administering RESP financing, securing charitable contributions or other funding, and providing staff resources to identify members in need and provide them with information on the program, or perform other outreach activities. Successful partnerships include the Help My House program’s collaboration KWSavings, a non-profit that oversees loan processing for the weatherization program. In another example, South Carolina co-ops have partnered with Home Works of America, a nonprofit organization that provides home repair services to low-income homeowners. In this partnership, Home Works first addresses health and safety issues, then the co-ops perform weatherization improvements.

Finally, co-ops can fund efficiency improvements through a familiar tool: rebates. This is especially popular in situations where members are replacing equipment, like furnaces, as a way to cover the incremental cost of the efficient model.

¹ For a comprehensive discussion of OBF, see NRECA’s 2016 TechSurveillance article Financing Member Investment in Efficiency and Solar: A Solution for Cooperatives?
SHARING EXPERIENCE AND LESSONS

No pilot or program is without unforeseen issues or consequences. Sharing those experiences and the solutions developed can help other co-ops avoid the same issues. Co-ops interviewed for this paper shared some key lessons, including:

- Weatherization measures inadvertently leading to frozen water pipes at Buckeye.
- The decision by Santee to require a parts and labor warranty built into the cost of new HVAC equipment, so that if it breaks, the member is not hit with a large, unplanned expense.
- Education for members, contractors, home dealers, and other partners is key to success.
- Leveraging partnerships can stretch resources, allowing the co-op to do more to help their members.

No single solution will apply to every co-op, but sharing experiences will provide additional information to co-ops as they develop programs to suit their needs.

COLLECTING AND SHARING INFORMATION

Although a good amount of information has been collected by co-ops in the Southeast, because space conditioning and weatherization approaches are inherently dependent on climate zone, a broader information collection and sharing effort across the county is needed. Such questions include:

- Which homes are a good fit for measures? Are some deemed too risky for non-energy reasons (home is unsafe, home is at risk of abandonment due to financial stress)?
- What climates are central and ductless heat pump systems a viable and cost effective improvement on existing systems?
- What building envelope improvements are cost effective in various climates?
- How much do the measures cost?
- What financing structures are most cost efficient?
- What partnerships can co-ops leverage to increase accessible funding and staff resources?

Co-ops serve a large portion of low- and moderate-income households. Consequently, co-ops are uniquely positioned to be a trusted community resource that helps reduce the financial burden of high energy bills. By leveraging efficient technologies, novel financing mechanisms, and partnerships, co-ops can develop energy reduction programs that positively impact their members’ lives while improving the co-op’s bottom line. Working together, co-ops can collect the information and experience needed to expand these manufactured home programs, helping not just their own members, but helping other co-ops improve lives of their members too.

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