



Help My House Pilot Program Summary Report – June 23, 2012

PREPARED FOR
Central Electric Power and
The Electric Cooperatives of South Carolina

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The Need for On-Bill Financing

Central Electric Power Cooperative (Central) supplies power to South Carolina's 20 electric cooperatives which in turn serve 1.5 million consumers. In 2010, Central's Board of Directors adopted a set of energy efficiency objectives including a 10% reduction in residential energy use within 10 years and a reduction in average wholesale power costs to serve residential users, while maintaining or improving member satisfaction. Working closely with the co-ops' marketing and public policy partner, The Electric Cooperatives of South Carolina (ECSC), Central is striving to accomplish its energy efficiency goals in a region where family income levels are 15 percent below the U.S. average.

Low income homeowners are often unable to participate in energy efficiency programs because they lack the funds or the access to financing for purchasing efficiency measures. Central and ECSC have been exploring On-Bill Financing (OBF), which enables a consumer to borrow money for energy efficiency and repay it as part of their electric bill, as a way to address this problem. Both organizations supported the 2010 South Carolina legislation that authorized utilities to offer OBF. This legislation eliminated the need for credit checks by allowing loan repayment to be tied to the meter rather than to the borrower and by allowing for disconnection of power if loan payments were not made. It laid the foundation for the state's utilities to reach an income group that had never been able to invest in energy efficiency. South Carolina co-ops also support federal legislation — the Rural Energy Savings Program (RESP) Act — which would provide co-ops across the country with enough loan dollars to build sustainable on-bill financing programs to help their members improve energy efficiency.

An economic analysis from Coastal Carolina University estimated that a full-scale energy efficiency effort by South Carolina co-ops that included a fully implemented OBF program could save co-op members \$270 million per year in electricity costs and produce up to 1500 new jobs after one year and more than 7,000 jobs after 20 years.

Creating the Pilot

After RESPA passed the U.S. House in September 2010, but failed to reach the Senate floor, Central and ECSC began discussing the possibility of a pilot program based on the RESPA model. The idea attracted the attention of the Environmental and Energy Study Institute (EESI), a Washington, DC energy policy think-tank supported and respected by both parties in Congress. EESI offered to partner with S.C. co-ops and advise them on a possible pilot program.

In spring 2011, Central's Board opted to proceed with an OBF pilot program with the following objectives:

1. To develop a template that could be used with a full-scale RESP
2. To establish a record that could be used in applying to the federal RESP once the legislation is passed

3. To determine how a full-scale RESP could best be structured to meet Central's goals.

EESI received funding from the Doris Duke Charitable Foundation to assist with pilot design and outreach and to report to key stakeholders, including Congress and state and national opinion leaders. Central applied for a loan from a USDA-Rural Utility Service program, agreeing to form KW Savings, a nonprofit entity that would process consumer loans for energy efficiency. The Rural Economic Development Loan and Grant (REDLG) program approved a \$740,000 loan that would enable the pilot to offer 2.5 percent financing, the first time this type of loan was applied to energy efficiency.

Pilot Planning

Co-ops expressed initial interest in participating in the pilot at an April 2011 kickoff meeting. Central hired Ecova, a firm specializing in utility energy efficiency programs, to lead the pilot planning and staff the pilot once launched. Central, ECSC and Ecova developed a planning process featuring an implementation team and six advisory groups, each comprised of staff from the participating co-ops, Central, ECSC and Ecova. Non-participating co-ops also were invited to join the advisory groups. Overseeing the advisory groups was a steering committee made up of all 20 co-ops and a leadership team of staff from Central, ECSC, EESI and Ecova.

Integral Analytics, an energy efficiency consulting firm, led development of an Impact Analysis Plan that established the research questions the pilot was designed to answer. Those questions were:

- How much energy and peak demand was actually saved by each pilot program participant?
- How did installation of measures impact participants' load factor (average kW/Peak kW)?
- How accurate were the savings estimates calculated during the on-site evaluation?
- How accurate were the preliminary cost estimates provided by the contractors?
- How do the projects' actual cash flows compare to the cash flows estimated by the audit?
- How do the actual savings compare to the savings estimated by DOE-2, a building energy simulation tool, using a prototypical South Carolina house?

Shaped around these questions, the pilot would aim to assess whether energy savings could cover the costs of the measures. The pilot also was designed to explore the market potential for a full-scale program and gauge co-op members' satisfaction with their co-ops and the concept of On-Bill Financing as a method of payment for home energy efficiency improvements.

ECSC and Central enlisted Carton Donofrio Partners (CDP), a full-service marketing and consumer research firm based in Baltimore, to better understand market potential, test the program model with consumers and address the question of member satisfaction. CDP's efforts were intended to help answer an important question: what would it take in a full-scale program to get consumers to participate? CDP developed a plan to visit homes, observe consumer interactions with the pilot staff

and process, conduct surveys and report on the views of pilot participants. CDP was also responsible for developing messaging, assisting with the selection of a pilot name, and creating marketing materials as needed by participating co-ops.

The co-ops worked with the team from Central, Statewide and Ecova to develop a plan for retrofitting 100 homes. Each co-op contributed a local plan describing the pilot functions and activities they would carry out with their own staffs.

The eight co-ops that remained completed plans and proposed to play a variety of roles. Seven co-ops decided to conduct their own outreach and marketing, and designated a co-op Energy Adviser to conduct brief initial walk-through energy audits to pre-qualify homes before the required bookend comprehensive audits (CAs) performed to Building Performance Institute (BPI) standards. Two co-ops volunteered staff to perform the CAs, important quality assurance tests for consumers that serve to diagnose home energy efficiency issues, prescribe any work needed and determine if the work was done properly by contractors before they are paid. One co-op relied on turn-key support from Ecova for all field and administrative activities. Some co-ops agreed to qualify and weatherize as many of the 100 homes as possible in their service areas while others developed implementation plans that limited the number of homes touched by them in the pilot.

PARTICIPATING COOPERATIVES

Aiken Electric
Black River Electric
Broad River Electric
Horry Electric
Palmetto Electric
Pee Dee Electric
Santee Electric
Tri-County Electric

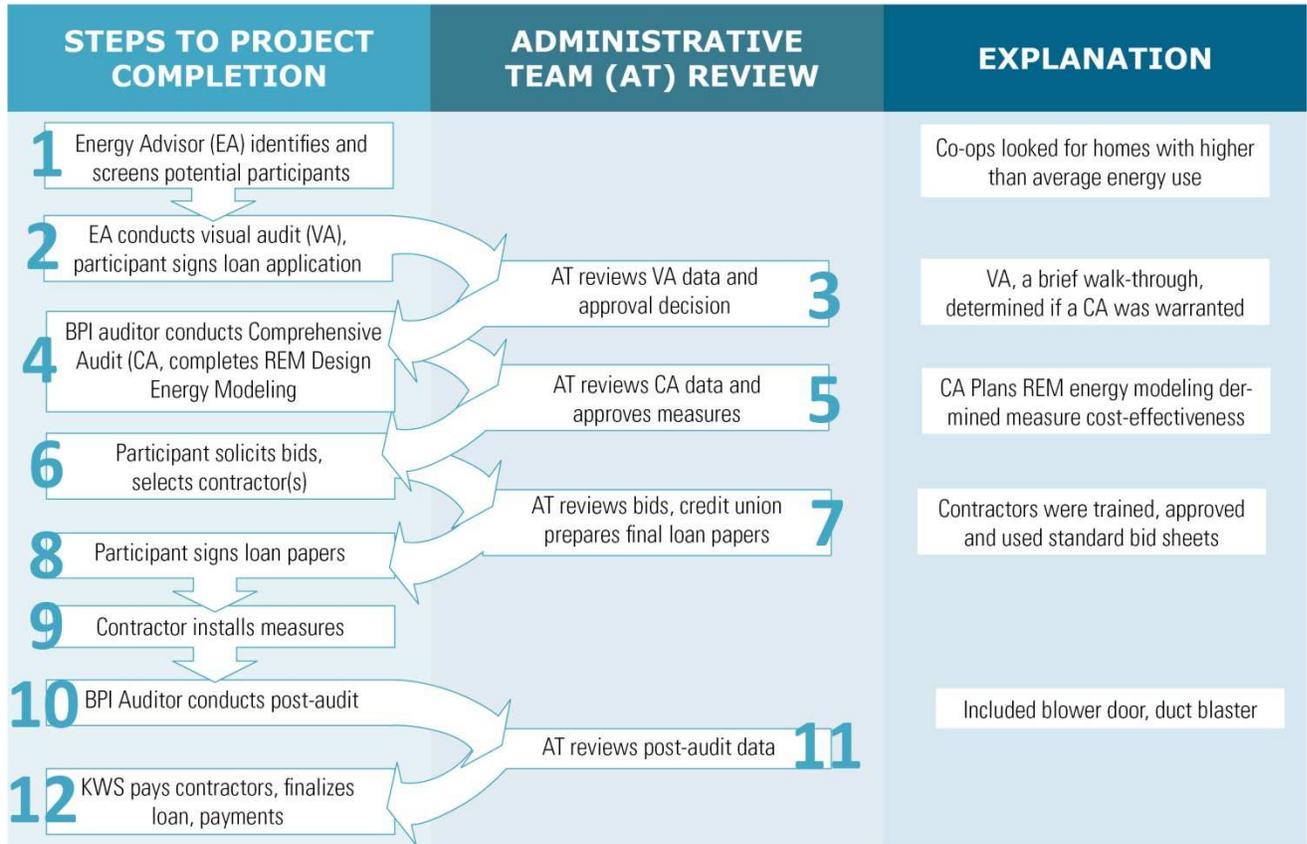
The administrative team—comprised of staff from Central, ECSC and Ecova—developed the pilot procedures and processes. Once the pilot was under way, these organizations would schedule the auditors, track each participant and allocate resources and technical support to assist the co-ops. Quality assurance was a central focus throughout the pilot’s implementation.

To help ensure data quality, the pilot plan also stipulated that each major step of the process would feature review and approval by the administrative team.

Two other affiliated organizations played key roles: 1st Cooperative Federal Credit Union prepared and processed loan documents and KW Savings paid contractors and managed loan repayments.

The following chart illustrates the full workflow.

PROJECT WORKFLOW



Preparing for Launch

Developing Pilot Processes and Procedures

The administrative team set up procedures and training, prepared forms, and established data transfer mechanisms, review processes, and tracking systems. A legal team developed contracts for the auditors and the contractors. They also prepared a packet of seven loan documents for consumer-members to sign to formalize their participation in the pilot.

Measure Identification

As the eight participating co-ops honed their implementation plans, preparations began for the pilot's launch. One important step was measure identification, which required a preliminary analysis of projected energy savings for weatherization and HVAC measures. To conduct this analysis, Integral Analytics used DOE-2 building energy simulation software, inputting local weather data and cost estimates provided by many of the contractors interested in the pilot.

Integral Analytics assisted the administrative team in selecting REM/Design™ as the audit software for the pilot because it was widely used, well supported and capable of modeling the cost-effectiveness of measures on any house in the pilot. Cost-effectiveness was defined as a set of measures that were projected to provide a positive cash flow on a 10-year, 2.5 percent interest loan. REM/Design is also customizable, which was important in the pilot because the audit software was a tool for screening measures on each home and for data collection. REM/Design contains libraries of building components that could be tailored for South Carolina housing and would ensure that auditors applied consistent assumptions in their analyses. The administrative team put together a separate spreadsheet tool to incorporate data that was not contained in a REM/Design file and put in place quality assurance procedures to ensure that audits and data collection were being done correctly.

Auditor Selection and Training

South Carolina's On-Bill Financing law (S1096) requires an audit and a final inspection by an auditor certified by the Building Performance Institute (BPI) or a similar organization. The administrative team recruited and selected four qualified independent auditors. Two of the co-ops had staff members with the qualifications to conduct the audits.

Advanced Energy, a subcontractor to Ecova, conducted a two-day training to ensure that all auditors were using consistent procedures for the on-site audits and the REM/Design modeling and recognized their role in determining whether contractors were paid or not at the end of a job. Energy Advisors from the participating co-ops stayed an additional day to learn how to conduct visual audits.

Contractor Selection and Training

The state's On-Bill Financing law requires utilities to provide a list of qualified contractors to members upon request. The administrative team involved the co-ops in assembling a list of prospective contractors, solicited applications from the contractors and then ranked candidates based on their qualifications. Twenty contractors were approved and participated in a two-day training session. When training was complete, contractors were required to sign an agreement with KW Savings before they were allowed to bid on homes in the pilot. The agreement stipulated that contractors must hold all necessary permits, licenses and insurance and clearly stated that contractors would not be paid for completed work until a post-retrofit comprehensive audit verified that the work had been completed to pilot standards. The pilot's field manager provided on-site training as crews began installing measures in the homes. A handful of additional contractors expressed interest later in the pilot and were added to the list after they received training and signed agreements.

Pilot Marketing and Participant Selection

The marketing firm Carton Donofrio Partners offered several ideas for a pilot name. "Help My House" a name that South Carolina's electric co-ops had used for previous residential energy efficiency efforts, was selected. CDP also developed direct mail marketing materials for some of the

participating co-ops and talking points that Energy Advisors could use to educate interested co-op members.

Marketing was designed to reach co-op members who had higher than average electric energy use, because those homes would most likely yield a cost-effective project. Some co-ops marketed the pilot to members who called to complain about high electric bills. Other co-ops directed their marketing efforts toward members with average monthly bills over a certain amount. The administrative team provided minimum criteria for accepting applicants into the pilot: to ensure that baseline data was available and that homes were all electric.

Implementation

The Help My House pilot was implemented as eight coordinated but separate pilots. Co-ops played different roles, used different outreach approaches and had different priorities and timelines. One co-op selected prospective participants and conducted visual audits in June 2011, before planning was even completed. Others didn't begin those activities until the fall.

Loans require a lengthier and more complicated process than the traditional form of energy efficiency program incentive, the simple rebate. Because this was a pilot with ambitious research goals it required more detailed screening of participants and measures and enhanced procedures to ensure data quality. The more complicated process took time for participants to navigate, even with support from their Energy Advisor. A pilot analysis indicated that early participants experienced the longest delays, with the process taking more than 100 days from the visual audit to project completion, while participants who entered the pilot later were able to complete it in 70 days or less.

As shown in the table below, different goals, priorities and approaches of the participating co-ops resulted in different levels of participation. The end date of the pilot was scheduled for mid-December, and 100 completed projects were approved by that date. The pilot sponsors and participating co-ops decided to extend the end date to allow members to complete their projects even if they did not yet have all measures installed and approved. This resulted in 125 homes being retrofitted by February of 2012.

Participation by Co-op

CO-OP	VISUAL AUDITS*	COMPREHENSIVE AUDITS	LOANS TO CREDIT UNION	POST AUDITS APPROVED	CONTRACTORS PAID
Aiken Electric	34	28	18	18	18
Black River Electric	39	29	26	25	25
Broad River Electric	40	24	16	16	16
Horry Electric	9	8	7	6	6
Palmetto Electric	9	7	4	4	4
Pee Dee Electric	3	3	1	1	1
Santee Electric	34	25	19	19	19
Tri-County Electric	47	39	37	36	36
Total	215	163	128	125	125

Results to Date

The pilot exceeded its goal for the number of homes participating, completing retrofits on 125 homes, more than half of which were mobile homes. More than 350 data points were collected on each home and its residents. Integral Analytics completed an Interim Impact Analysis, which used the actual costs from completed homes and the energy savings projected with the REM/Design analysis.

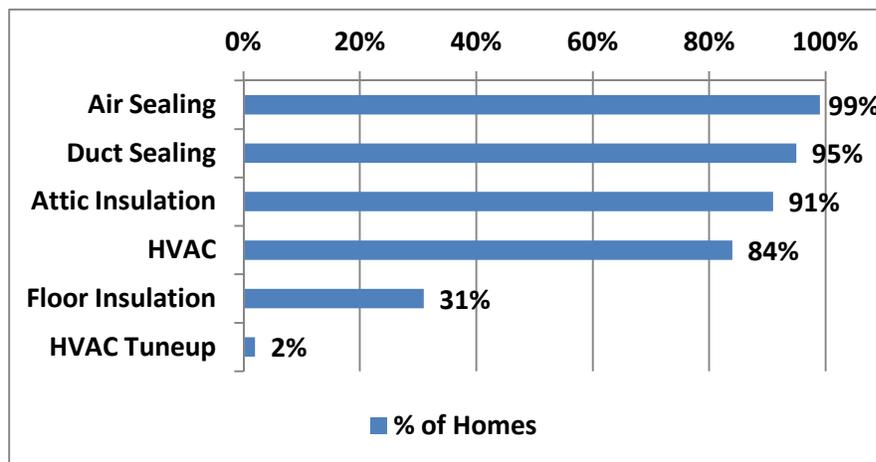
The average loan was more than \$7200. Energy savings were predicted to average more than 11,000 kWh/year, as shown in the table below, which is more than 35 percent of the average total electric use. Integral Analytics will complete a final Impact Analysis in early 2013, after all of the homes have been monitored for one year. However, actual savings could be less than projected if participants decide they can now afford to improve comfort levels by turning up their winter thermostat settings in their more efficient homes.

Projected Energy Savings from Average Home Participating

	MONTHLY	ANNUAL
Projected electric Savings (kWh)	933	11,191
Projected \$ Savings	\$103	\$1,240
Loan Repayment	\$73.22	\$878.64
Net (Savings - Loan)	\$33.62	\$403.44

The interim analysis showed that homes selected for the pilot provided an ample supply of efficiency opportunities. Most of the homes were poorly insulated —more than 90 percent required attic insulation, for example. Eighty-nine homes had attic insulation measuring R11 or less, far below the standard recommendation of R38. More than 90 percent of homes needed air sealing and duct sealing.

Measures Installed in Pilot Homes



While retrofits of inefficient heating and cooling (HVAC) systems were prevalent among participating homes and on average proved to be cost effective with a simple pay back of 7.88 years, it was the longest payback of measures completed. This pilot applied a “whole house” approach, in which all of the measures are evaluated as part of the same system. In many cases the longer payback of HVAC retrofit was offset as part of the larger package of measures.

Measure Costs and Projected Savings

MEASURE	AVERAGE PROJECTED ANNUAL KWH SAVINGS	AVERAGE PROJECTED ANNUAL \$ SAVINGS	AVERAGE ACTUAL INSTALLED COSTS	AVERAGE SIMPLE PAYBACK (YRS)	AVERAGE PROJECTED SAVINGS PER MONTH
Attic Insulation	1,937	\$217	\$1,231	5.66	\$18.11
Floor Insulation	4,153	\$469	\$735	1.57	\$39.10
HVAC	5,848	\$647	\$5,094	7.88	\$53.90
HVAC Tune Up	2,549	\$237	\$157	0.66	\$19.78
Duct Sealing	1,845	\$203	\$681	3.35	\$16.95
Air Sealing	1,410	\$154	\$971	6.30	\$12.83

Satisfaction with the Pilot

Carton Donofrio Partners conducted a survey of both participants and co-op members who knew of the pilot but did not participate.

The survey revealed that the vast majority of co-op members contacted about the pilot had the same or higher satisfaction (92 percent) with their co-op as a result of being contacted. The few members who were less satisfied were mostly nonparticipants who were disappointed that their homes did not qualify despite high energy bills.

Three-fourths of participants surveyed demonstrated an awareness of the core aspects of the pilot, and more than 90 percent indicated that they liked each aspect. Nearly all (96 percent) of participants were satisfied with the installation of the efficiency measures. The same percentage of participants (96 percent) responded that they believe that their homes were more comfortable after the improvements. The remaining four percent could not feel a discernible difference in their homes' comfort one month after the work was completed.

Contractors were asked to provide feedback, and 14 of the 16 contractors who did any work on the pilot attended a debriefing meeting at Central. They stressed the value of the co-op serving as "trusted adviser" and asked that co-ops continue playing this role and convert the pilot to an ongoing energy efficiency loan program. They also offered useful ideas on how to streamline the process.

The eight participating co-ops provided very detailed feedback to the implementation team via in-person presentations. Six saw a need for an on-bill financing loan program and four expressed an interest in launching similar programs locally. The co-ops praised the contractors for their constructive and positive reaction to quality assurance visits and noted that contractors routinely went above and beyond the scope of work without additional compensation. All of the co-ops recommended streamlining the process to save money and expedite projects.

Conclusions and Observations

This report is not the final word on the Help My House pilot program. A final Impact Analysis will be completed in early 2013 after one year of post-retrofit usage data has been collected on the 125 homes. In the meantime, the pilot has:

Served as a model for national policy as the first energy efficiency effort to access USDA/RUS REDLG loan dollars for an On-Bill Financing program

Been presented by S.C. co-op leaders to officials at the White House Council on Environmental Quality, the U.S. Department of Energy, the U.S. Department of Agriculture, the Environmental Protection Agency, the Office of Management and Budget, the Aspen Clean Energy Institute, the Southeast Energy Efficiency Alliance, the Southwest Energy Efficiency Program, and the Nicholas Institute at Duke University

Shown that homes of South Carolina co-op members may indeed provide an ample supply of cost-effective (projected positive cash flow with a 10-year, 2.5 percent interest loan) energy efficiency opportunities (though this finding should be tempered with the fact that the homes in this pilot were targeted because of their high energy use).

Demonstrated a level of projected energy savings (average of 35%) substantially higher than many whole-house retrofit programs are achieving

Been well received by participants, with 96 percent rating themselves satisfied or very satisfied

Aided substantially by the trust members have in their co-ops, been successful in transforming a high percentage of prospective participants into those with completed energy efficiency projects (of 151 homes approved to solicit bids, 125 projects were completed)

Not addressed load management, which is a key strategy for improving load factor and reducing wholesale power costs. The administrative team decided to leave load management measures out of the pilot for the sake of simplicity and data quality. Central intends to include load management measures in future programs.

Built a network of contractors who are investing in training and equipment and who show a desire to offer more energy efficiency products and services

Perhaps the most telling result, however, is the participating co-ops' change in perspective on OBF financing programs. As the pilot began, none of the co-ops involved had expressed any intention to offer an ongoing OBF program. However, at the pilot's end, four co-ops were already making plans to launch their own OBF programs in 2012. They later were joined by three co-ops that had not participated in the pilot.