

Digging Deeper for Energy Savings: A Look at Successful On-Bill Financing Program Designs

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ABSTRACT

First-cost has been an ongoing barrier to the installation of energy efficiency measures since the advent of energy efficiency programs in the early 1980s. As a result, energy efficiency programs have developed multiple strategies to reduce the first cost, or premium, associated with making investments in energy efficient measures. These strategies have ranged from simple rebates to more complex financing mechanisms including leases, loans, and bonds.

Energy organizations are developing new and innovative strategies to appeal to residential customers as a way to encourage them to make “whole house” or comprehensive retrofits to their homes. These strategies include on-bill financing (OBF) as well as off-bill financing, e.g., using a line of credit, a home equity loan, or a similar type of credit arrangement. Besides renewed interest in Property Assessed Clean Energy (PACE) financing model, there are several new models involving a mix of home energy audits and personal “concierge services” including the program formally known as Clean Energy Works Oregon (now Enhabit) and the Clinton Climate Initiative in Arkansas.

Several rural electric cooperatives throughout the US have also developed an innovative loop lease program designed to reduce the upfront cost of major investments such as geothermal heat pumps.

This paper summarizes successful practices and lessons learned from financing programs around the country. It draws on the findings from a literature review of financing successful practices, a review of geothermal loop lease offerings and a strategy to deliver on-bill financing to customers in hard-to-reach markets such as Arkansas.

Introduction

For the past two decades, utilities, energy organizations, and government agencies have been trying to develop financing strategies that will reduce the premium associated the higher costs of energy efficiency technologies. Energy efficiency financing models are evolving to take advantage of both new sources of capital as well as new tactics to move beyond the traditional secured loans to include on bill tariffs, loans tied to the properties rather than the customers, and offerings designed to simplify this often complex transaction.

This paper begins with a summary of four new financing strategies that are becoming more widespread across the United States. It follows with a deeper examination of the program designs and progress to date made by some of these innovative financing programs. It concludes with a summary of the best practices and lessons learned as a result of fielding these program designs.

Overview of Financing Program Models

Since the advent of energy efficiency programs in the early 1980s, first-cost has been an ongoing barrier to the installation of energy efficiency measures since. As a result, energy efficiency programs have developed multiple strategies to reduce the first cost, or premium, associated with making investments in energy efficient measures. Specifically, these strategies are designed to encourage residential customers to implement “deep” retrofits to their homes. These strategies include on-bill financing as well as off-bill financing, e.g., using a line of credit, a home equity loan, or a similar type of credit arrangement. More recently, new program financing models are being tested in several jurisdictions, summarized next.

PACE Programs

Property Assessed Clean Energy (PACE) programs were developed as a way to overcome some of the challenges to implementing a successful financing program, such as requiring a credit score above 640. From 2008 through 2010, 24 states and the District of Columbia passed legislation enabling PACE programs.

In 2015, a number of states from Alabama to Rhode Island enacted legislation to encourage PACE funding. However, the PACE formula has been reconstituted as a way to overcome the barriers established by Fannie Mae. The new PACE programs offer local governments the option to create a special purpose assessment for energy efficiency improvements via assessments on a building owner’s property tax bill. During the past few years, the new PACE formula has gained traction nationwide (Block et al, p. 16; Durkay 2016).

Concierge Financing Programs

Energy Trust of Oregon, Inc. (Energy Trust) worked with Clean Energy Works Oregon (CEWO) in 2009 to develop and offer an innovative on-bill financing program in accordance with a legislative requirement to provide easy-to-use financing for residential and commercial energy-efficiency and renewable energy projects in Oregon.

The program focused on recruiting customers to complete “deep retrofits” that lead to cost-effective energy savings, while also operating in a free market environment. Furthermore, it is committed to creating jobs, paying a “living wage” and reaching out to under-served customers across the entire state. It also had to be self-sustaining that would continue to be successful well past the American Recovery and Reinvestment Act (ARRA) funding cycle (Johnson 2012).

On-Bill Financing Programs

The concept of on-the-bill financing was formalized in the Pay-As-You-Save® Program Model developed by the Energy Efficiency Institute (EEI). A particularly appealing aspect of this model is that it focuses on reducing a common market barrier: split incentives for landlords and property developers (Brown, 2011).

The on-bill financing programs use capital from revolving loan funds, public benefits funds, utility shareholder funds, grants or private investors. Some programs use the customer loan model—where the loan is tied to the property owner—while others use a tariff model—where the loan is tied to the meter. Tariffs may not create a lien and are ideal for rental properties, as the debt—and benefits of the upgrade—stay with a property when a tenant moves (Durkay 2016).

One of the early leaders in using this approach was Delta Montrose Electric Association (DMEA) an electric utility that serves 28,000 customers in four southwest Colorado counties. DMEA developed its financing program using the concept of “chauffage” or guaranteeing heating bills to promote geothermal heat pumps. Its program design has led to several variations offered by both rural electric cooperatives and investor-owned utilities in the US including Corn Belt Energy.

This model has slowly gained traction among both traditional investor-owned utilities (IOUS) as well as through rural electric cooperatives (REC). Currently, there are more than 45 on-bill tariffed programs offered to customers throughout the United States, with many centered in the Southeast (Block et al 2014).

The key feature of a successful on-bill program is this “bill neutrality” which means that the energy efficiency savings on the monthly bills are greater or equal to the customer’s loan payments (Durkay 2016). In essence, the energy savings funds the energy improvements and the loan is repaid every month on the utility bill. The cost of the energy efficiency improvements may be further reduced when coupled with the utility rebates (Johnson et al 2010).

Default rates have been found to be lower than with other loans, making them lower risk for lender as customers are more likely to make payments since they are part of the customer’s monthly utility bill (Johnson et al 2010; Durkay 2016)

A variety of other programs on-bill financing programs are offered by rural electric cooperatives, such as Dixie Electric, Midwest Energy, Michigan Saves and Guadalupe Valley Electric Cooperative. Several investor-owned utilities also now offer residential on-bill financing programs including Black Hills Energy, National Grid’s customers in Massachusetts, New Hampshire, New York and Rhode Island and New Jersey Natural Gas (Durkay 2016).

Corporate-Based Models

The Home Energy Assistance Loan (HEAL) program is implemented by the William J. Clinton Climate Initiative (CCI). This program encourages energy efficiency through two channels:

- Large businesses receive a free audit and information regarding energy efficiency improvements, for which they can then receive federal funds for implementing; large businesses in CenterPoint’s territory are eligible for CenterPoint’s C&I programs, including the C&I Solutions program.
- As a condition of receiving these funds, the employer must set aside a fund available to employees to provide loans for home efficiency improvements. Eligible improvements include ceiling insulation, duct repair, and air sealing.

CenterPoint, a natural gas utility in Little Rock, Arkansas, partnered with CCI to provide co-funding and incentives for eligible residential measures installed within their service territory

for customers with gas space heating. The program used both utility funds as well as leveraged other federal funding to promote residential efficiency improvements. CenterPoint's HEAL Partnership funding also provided incentives to residential HEAL participants for air sealing, duct repair and insulation projects (ADM Associates 2015).

Digging Deeper on Financing Strategies

This section summarizes the successes and challenges from these program strategies and provides some unique insights on their feasibility going forward based on their results to date.

PACE Programs

According to the pacenation website, residential PACE programs have funded 82,000 home upgrades for a total project value of \$1,697 million. Several states have been successful with promoting PACE projects to residential customers including Vermont and Maine:

Vermont's PACE Program: Since 2011, more than 30 local governments have passed local ordinances to implement PACE programs throughout the state. These municipalities create PACE Districts to provide financing to owners of a "dwelling" for renewable energy and energy efficiency projects. Voter approval is required to establish a PACE district. Eligible renewable energy technologies include solar water and space heating, photovoltaics (PV), biomass energy heating systems, small wind systems, and micro-hydroelectric systems. In addition to completing an energy audit, participating property owners must also agree to a special assessment and lien on the property and pay a one-time, non-refundable fee (equal to 2% of the assessment) to support the reserve fund created to cover losses in the event of foreclosure of participating properties (DSIRE USA).

Maine's PACE Program: This program, similar to Vermont, provides loans to Maine homeowners, to finance the cost of making eligible energy-saving improvements to their property (ODC 2013). These loans range in value from \$6,500 to \$15,000 and offer a repayment period ranging from five to 15 years at a fixed interest rate of 4.99% APR, with no processing fees. The loans are available for residential buildings with one to four units located in municipalities that have passed a PACE ordinance. Homeowners must meet underwriting requirements set by the PACE Loan Program which include:

- a debt-to-income ratio of no more than 45%;
- a loan-to-value ratio less than 100%;
- property tax and sewer payments being current; and
- no outstanding liens; no reverse mortgages; and no mortgage default, foreclosure, or delinquency.

PACE-eligible energy improvements include: insulation, air sealing, energy efficient heating systems, lighting and appliances, windows and doors, and solar energy systems. Under current program guidelines, the homeowner's package of energy efficiency improvements must generate savings of at least 20% of home energy usage or 25% of heating and hot water energy usage to qualify for a PACE loan (ODC 2013)

Concierge Programs

CEWO is perhaps one of the best known “concierge” programs in which energy advisors guide residents through the energy efficiency audit process through installation. Although the focus of the program was to make it easy for customers to participate, a process evaluation determined that it took, on average, 78 days for a customer to navigate this process from the first step of test-in to the final loan disbursement and project inspection. Not surprisingly, these relatively long project timelines led to program dropouts or attrition.

More than 1,200 customers exited the CEWO and its pilot program during the first two years of operation. While the reasons for program attrition varied from customers’ becoming impatient to customers not qualifying for the loan, this attrition rate did contribute to significant overhead costs that CEWO had to absorb. One of the highest costs were the use of Energy Advisors, energy experts who acted as “concierges” to help customers navigate through this complex program and complete energy projects. But even this high-cost, hands-on approach did not prevent participants from dropping out of the program (Johnson 2012).

Based on this feedback, CEWO developed a more streamlined application process to emphasize a one-stop shopping approach that resonated well with customers. CEWO also leveraged its relationships with the Energy Trust of Oregon to leverage available incentives and instant rebates, which combined with financing, makes energy efficiency investments more affordable (Johnson 2012).

But the high cost associated with this high-level of service has proved to be a non-sustainable business model. The organization also faced a significant decline in its sales from \$7.6 million in 2012 to \$3.1 million in 2013, which led to cuts in the workforce and a shift in the business model. During the past year, the program has changed its name to Enhabit and its focus to “home renewal” beyond the traditional home performance upgrades to include seismic upgrades, radon reduction systems, and solar energy installations (Portland Business Journal 2015). In addition, up to 49 percent of financing can also be used for non energy measures, creating an avenue for contractors to fund non-energy related improvements.

On-Bill Financing

There has been a steady increase in the availability of on-bill financing programs for customers in several jurisdictions, especially those served by rural electric cooperatives. Several utilities, including Midwest Energy and Corn Belt Energy, have developed variations of the on-bill financing program first developed by DMEA. The programs are designed as tariffed programs, not traditional loans. The focus is to reduce the high first cost associated with installing premium energy efficient equipment, primarily geothermal heat pumps.

Corn Belt Energy’ GeoCents Program: This on-bill tariffed program launched in in late 2015. This program is especially appealing to the rural electric cooperative as it provides an opportunity for the utility to invest in long-term capital intensive assets while reducing the high first cost associated with installing a geothermal heat pump to its members. Corn Belt Energy pays for and owns the loop. However, customers may opt to purchase it outright.

The program is open to both new and existing residential homes or businesses. To participate, the member or builder must give utility easement for the loops. In this way, the program structure is akin to the utility owning underground cable on the upstream side of the member's meter – it will be a part of normal utility service.

Corn Belt charges a connection fee on the utility bill of \$7.00 per ton per month and also requires that the geothermal system is sub-metered. But the members benefit by being eligible for the winter heating rate. Through this program, the cooperative is allowing for a member to buy the loop from Corn Belt Energy while still generating a profit for the cooperative. Contractors must be certified by the International Ground Source Heat Pump Association (IGSHPA).

The program requires some documentation including: member agreement, a contractor agreement, easement documentation, and an informational lien on the property. These requirements will ensure that if the property changes hands, any prospective purchaser will be informed of the tied to the geothermal system (Volker 2015).

Table1: Key Metrics for the GeoCents Program

Number of Installations as of 5/16	24 Vertical Loop Installations- 102 tons installed
Corn Belt's Investment to Date	\$53,800
Typical Loop Charge	\$24- \$30/month for a payback of 12.5 years

Ouachita Electric Coop (OECC): Several electric distribution cooperatives have implemented programs similar to the HEAL program within their service territories. OECC has 7,000 members in rural Arkansas living in older homes but the cooperative had difficulty getting contractors to implement measures. This program provided an opportunity to engage contractors as well as proactively resolve high bill complaints.

This comprehensive customer service program began in 2013 as a HEAL pilot program with the CCI. However, the HEAL pilot program never developed the employer component, and in 2014 became the OECC administered HELP (Home Energy Loan Program). It starts with an energy audit, provides financing if needed, hires and pays contractors to implement measures, and conducts verification. Thus far, measures only include insulation, duct and air sealing although there are some exceptions. OECC has outsourced its auditors and contractor network management. However, OECC provides all marketing and outreach via audit contractor and other promotion.

Loans are unsecured. The Arkansas Energy Office has made available \$100,000 for a Loan Loss Reserve (LLR) to entities within the State, including OECC. OECC does not have a default recovery process and would try to recover default amount. If this fails, would recover unpaid funds from LLR.

This is an on-bill financing program (OBF) with a separate line item on the customer's bill. The goal is to be a revenue-neutral bill for the customer, after considering the energy savings cost and loan repayment costs. In 2016, the Arkansas Public Service Commission approved this as a tariffed on-bill financing product, which will be the model used going forward.

OECC does credit check by reviewing utility bills and payments and has made an effort to reach underserved or hard-to-reach customers in its service territory. The utility plans on

expanding the program to include HVAC measures and residents living in manufactured homes (Johnson, Bhedwar & Ambach, 2015). The results through 2015 are summarized in Table 2.

Table 2: Key Metrics for the OECC On-Bill Financing Program

Capital Source	OECC's operating funds
Approval rate:	100%
Number of loans:	275
Interest Rate	3.5%
Value of loans:	N/A
Default rate:	0%
Average loan:	\$3,000

Corporate Approaches

The Clinton Climate Initiative (CCI) developed the Home Energy Affordability Loan (HEAL) program, a facilitated third-party financing program delivered through an employer-based model, allowing the use of payroll deduction to facilitate repayment of loans. This program, which was offered and administered in Arkansas by CCI from 2010 to 2014 and subsequently piloted in six additional states.

CCI developed the facilitated third-party financing program delivered through an employer-based model, allowing the use of payroll deduction to facilitate repayment of loans. Loans are unsecured. Two lending models were used, one in which the employer provided the loans directly and a second, more common version in which a third party financial institution (credit union) performed the role of lender. In both models, the employer provided payroll deductions that simplified loan repayment for the employee and lender, if applicable.

CCI provided the marketing and outreach services to employees of participating companies, scheduled audits and retrofits and provided enhanced quality control inspections. The program also employed Client Care staff that was available to answer questions and facilitate the scheduling of activities as needed. It is important to note that HEAL incorporated the existing residential program offerings of CenterPoint, Entergy, SWEPCO and SourceGas which combined with the client care and program delivery enhancements provided by the model, saw participation in audit and/or retrofit activities of up to 30% of eligible employees within participating companies.

This program is available to employees of HEAL participating employers. The major difference between the two models was credit qualification as the employer provided loans generally were available to all employees, where the third party model involved credit qualification by the credit union. It is noteworthy that credit qualification criteria for HEAL was generally more relaxed than that generally applied in the market due to the additional risk mitigation provided by the payroll deduction.

The average loan size in Arkansas and other states tended to be approximately 25 percent higher than the average retrofit cost in the respective market. The higher job costs of employees using financing seemed to be primarily driven by a higher percentage of HVAC or furnace replacement than found in the general retrofit population (Johnson, Bhedwar & Ambach 2015). Key details regarding program performance through 2015 are summarized in Table 3.

Table 3: Key Metrics for the HEAL Program

Approval rate:	Employer provided 99%, Third-party 70% (estimated)
Number of loans:	Approximately 350
Value of loans:	\$1.2 million
Default rate:	0.25%
Average loan:	\$3,600 Arkansas, \$5,500 Midwest
Employer provided loans:	0% to 1%;
Third Party (no LLR):	5.25% to 5.75%;
Third Party (5% LLR):	3.75%

Table 4 summarizes most recent results from the 2015 evaluation of Arkansas’ HEAL program (ADM 2015).

Table 4: HEAL Partnership Historical Performance Against Goals

Program Year	# Participants		Budget	
	Actual	Goal	Spent	Allocated
2011	113	304	\$25,523	\$129,620
2012	75	368	\$65,871	\$141,431
2013	147	368	\$199,532	\$154,509
2014	25	368	\$25,988	\$54,509

Uncovering the Keys to Success

As this paper illustrates, there is more than one way to develop a successful financing program. However, the following “best practices” apply to all types of residential financing programs, regardless of the delivery mechanism and the key takeaways are summarized next.

Make an Offer They Can’t Refuse

Nothing is more appealing to a customer than a low interest loan with attractive terms. Several utilities in California and New York have been able to offer zero interest loans by buying down interest rates. An even more promising trend is to offer low interest loans, between three to six percent, which still attracts both residential and commercial customers. Of course,

offering longer loan terms, from seven to 10 years, allows the energy savings to help offset the loan repayment, especially for an on-bill payment program. Finally, bundling the loan proceeds with rebates, tax credits or other grants further reduces the up-front payments and makes it even easier for customers to pull the trigger and invest in energy efficiency improvements (Block et al 2014; Johnson et al 2012).

Keep the Application Process Simple

These programs are most successful when the application process is simple and straightforward. Successful program models such offer quick application processing, often with approval over the phone for unsecured loans, and several programs deposit loan funds directly into contractors' accounts as soon as customers sign off. In addition, many lenders offer decisions within three days making the deal easier to close for the contractors (Fuller 2009; Johnson et al 2010; Block et al 2014).

To address the complexities associated with these types of programs, several utilities have specifically identified ways to keep the application process as simple as possible. Corn Belt Energy's approach has been to simplify the program's paperwork as much as possible by working closely with local dealers and installers to fully educate them on the process required (Volker 2015).

But the application process should not be too easy. A critical finding from the CEWO evaluation recommended the program should develop some type of pre-screening checklist for customers to help identify viable candidates while reducing the "tire-kickers" who just want a free test-in. This will also help to set customer expectations, and may enhance program closure rates by focusing in on those customers who are truly interested in completing a home energy retrofit (Johnson 2012).

Invest and Engage in Contractors

The most successful financing programs invest in their contractors, as these are the critical program ambassadors. Many successful programs demonstrated a strong sense of commitment to these contractors by offering them training and by treating them an essential partner in this process. The utility needs the contractor to install the equipment and the contractors benefit by being able to expand into a new customer group that may not have participated previously- those customers who did not have the money for equipment installations and could not finance it on their own. Moreover, because the program provides mutual benefits to both the contractor and the utility, this makes it easier for utilities to require post-equipment installations. The first step these organizations take is to invest wisely in successful and experienced contractors. All of these programs contractors must have proper industry training and qualifications such as certification by Building Performance Institute (BPI) or certified geothermal installers (Fuller 2009; Block et al 2014; Volker 2015).

Another successful approach is to provide marketing materials free of charge to their participating contractors. This reduces the burden of developing marketing materials for contractors and promotes a consistent a uniform message to customers, thus increasing brand recognition (ODC 2013).

Offer One-Stop Shopping

CEWO's approach evolved based on feedback from customers to offer a simple one-stop-shopping model. This program offers no-money-down, no-fee financing, and a simple

qualification process. This program bundles multiple energy upgrades into a one-time, one-stop Home Energy Remodel and equips homeowners with expert guidance from start to finish.

CEWO's approach of emphasizing "easy" resonated well with customers, as demonstrated by the strong customer satisfaction scores on all CEWO program elements from the customer surveys (Johnson, 2012).

Maine also offers an easy approach by allowing residents to apply for a PACE loan either online or by calling Efficiency Maine directly (ODC 2013 41).

This one-stop coordination and shop process can also be linked with a quality assurance "test-out" by a third party inspector to ensure all that the work undertaken is being performed to a high, consistent standard. The model is the new de facto approach for the best, most effective utility programs. It is also the basis for the energy performance contracting program model, in which a single firm possesses all of these capabilities at once; audit, design, installation and quality assurance (Block et al 2014).

Make Sure the Program Finances Energy Efficiency Measures

One big challenge is ensuring that the financing is invested in energy efficiency measures. According to a 2011 study conducted by Lawrence Berkeley National Laboratory (LBNL), 28 percent of U.S. homeowners completed home improvements in 2009, with an average project size of approximately \$9,000. But energy efficiency-related projects, such as including HVAC equipment upgrades, major appliance installations, insulation improvements, and window and door replacements – represented a much smaller percentage of the larger home-improvement market (Brown 2011).

While this requirement has been deemphasized in the Enhabit Program, other lenders remain committed to encouraging investments in energy efficiency. For example, AFC First Pennsylvania residential loan program encourages larger loans at lower interest rates for program participants who install comprehensive energy efficiency measures. AFC First offers three percent loans for homeowners who achieve 25 percent savings from multiple measures, and nine percent loans for standard HVAC replacements. A few utility partners, such as the New York State Energy Research and Development Authority (NYSERDA), also structure their financial incentives for residential and commercial building owners to emphasize comprehensive solutions (Block et al 2014).

It is also critical to ensure that these programs still make "economic sense" by generating these long term positive cash flow – a key benefit of on-bill financing programs (Johnson et al 2010; Johnson 2012).

Minimize "lost opportunities" by offering choices

Several financing programs are offering a menu of loan options, including smaller and unsecured loans to complement secured loans. This approach, called bridging, lowers the program's overall customer acquisition cost while providing attractive options to a wider pool of applicants.

CEWO's program offers other solutions to program dropouts and thus "bridge them" from CEWO to another Energy Trust program. By identifying program dropouts earlier in the process and redirecting them to more appropriate program offerings, this will lower the acquisition costs required to enroll customers (Johnson 2012).

Other successful financing programs offer alternative or complementary loans, rebates or other financing options for those customers who do not want to continue in an on-bill financing program or commit to a long term loan.

The most successful programs use the rebates to reduce the first-cost of the equipment, or to offset the costs associated with an in-home assessment. When possible, offering combinations of financing and rebates can be valuable, both to improve customer attraction and to allow the financing component to be cash flow positive for homeowners.

Conclusion

This paper offered a summary of some of innovative strategies and approaches used to help residential customers reduce the first-cost associated with making comprehensive energy efficiency improvements. It identified some strategies that are gaining traction in the United States and highlighted the some of the critical components necessary to develop an effective and appealing energy efficiency financing program to residential customers.

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