



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

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Abstract – This paper summarizes the successful practices and lessons learned from financing programs around the country including information from process evaluations focusing on emerging strategies and “best practices.”

Keywords - energy efficiency, financing, program design and evaluation.

I. INTRODUCTION

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 program administrators 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” such as the program offerings in Clean Energy Works Oregon 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 including information from process evaluations focusing on emerging strategies and “best practices.” 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 a variation of on-bill financing to customers in hard-to-reach markets such as Arkansas.

II. OVERVIEW OF ENERGY FINANCING PROGRAMS

A variety of energy efficiency financing programs have been offered to U.S. customers in the past two decades, including programs offering traditional secured and unsecured retail installment contracts (RIC), energy efficiency mortgages, and home equity lines of credit. While these programs differ in many design details, most share the following key characteristics [1] [2].

- The target market is single-family owner-occupied homes, with a few programs open to multifamily homes and rental properties.
- Marketing channels are mostly through contractors and direct marketing from utilities.
- Loan amounts range from \$4,000 to \$10,000.
- Interest rates vary from 0% to 12%, with most programs offering interest rates of 4% to 8%.
- Terms tend to be for five to eight years, with a few programs offering longer terms.
- Most programs serve less than 0.1% of the customer base.
- Annual default rates range from near 0% to around 3% [3].

2.1 PACE LOANS

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 many cases, this legislation established special energy improvement districts that gave municipal authorities the ability to engage in contractual assessments by which loans are provided to home and property owners. These loans are subsequently repaid through the property tax bill and typically have senior lien position [4].

Several states may require legislative amendments to existing PACE authority to allow subordinate-lien PACE special assessment districts, as a way to mitigate potential risk [4].

Although the US Department of Energy (DOE) and current administration support pilot PACE financing programs, its future is still unclear in the current regulatory environment due to the increasing scrutiny these programs have been facing from the lending community [5].

2.2 CONCIERGE FINANCING PROGRAMS

Energy Trust of Oregon, Inc. (Energy Trust) worked with Clean Energy Works Oregon (CEWO) 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. [6].

2.3 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 [7].

This financing approach has been especially appealing to rural electric cooperatives that are unregulated electric utilities that serve primarily rural customers throughout the United States. 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. DMEA’s program, called “CO-Z,” was designed to

promote long-term geothermal loops as a way to reduce the upfront costs of this equipment installation to residential customers [8].

2.4 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 [8].

III. PROS AND CONS OF THESE DELIVERY STRATEGIES

3.1 PACE PROGRAMS

The PACE program structure a variety of advantages to local governments, property owners, and local businesses, compared to other types of financing programs, as Table 1 shows.

TABLE 1: BENEFITS OF PACE PROGRAMS

Local Government Benefits
Means to effectively implement energy conservation/GHG reduction policies
Stimulus for local economies
Means to support retrofit/renewable energy programs without committing general fund dollars
Property Owner Benefits
Means to pay for energy efficiency improvements or renewable energy systems with no upfront cost
Loan for energy efficiency improvements with no credit score or other type of borrower history qualification
Long-term payback
Loan is tied to the property and does not need to be repaid at the time of sale if the property is sold
Way to overcome the 5-7 year home ownership turnover barrier to making long-term improvements
Hedge against rising energy prices

But despite their appeal, PACE programs face an uncertain future in the U.S. Based on a detailed review of the PACE model, US regulators determined that PACE programs violated standard mortgage provisions and could trigger a mortgage default. These stringent mortgage requirements effectively stopped PACE as a residential loan offering [4].

In October 2009, the White House issued a Policy Framework for PACE Financing Programs which included guidance on various aspects for PACE programs including: the use of qualified auditors, inspectors, and contractors; targeting PACE financing to “high value” projects and measures with the highest energy savings-to-investment ratio; and limiting financing to no more than 10% of property value and restricting applications to only those customers whose property value clearly exceeded mortgage debt [4].

Despite this guidance, there were still concerns among many of the participating local governments, so many of these early programs were suspended while the commercial-only PACE programs continued [5].

3.2 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 recently completed 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 [3].

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 [3].

3.3 ON-BILL FINANCING

DMEA’s one of the first utilities in the country to offer a monthly on-bill tariffed program. The focus was to reduce the high first cost associated with installing geothermal heat pumps. To reduce this market barrier, DMEA developed its CO-Z Energy Plan, which was a monthly service agreement between the customer and the utility.

The Co-Z Energy Credit is intended to cover the majority of the system’s estimated energy operating costs averaged over 12 months. The system is financed for up to 50 years using a monthly lease payment that includes equipment maintenance. The program loaned an estimated net \$700,000 in present value revenues from the first 150 geothermal installations they have so far— a pretty handsome return on a \$200,000 investment (8).

This approach has been so appealing, that several other utilities developed similar on-bill financing programs. Hawaiian Electric Company (HECO) and Midwest Energy Inc. (Midwest Energy) both developed variations of this financing strategy, leveraging the lessons learned from DMEA.

These programs are designed to help “close the loop” between tenants and landlords by providing them strategies that encourage the installation of long-term energy efficiency measures. Table 2 compares the HECO and Midwest Energy program approaches for on-the-bill financing programs [3].

TABLE 2: COMPARISON OF UTILITY PROGRAM APPROACHES

	HECO	Midwest Energy
Targeted Equipment	Solar Water Heaters	Space and Water Efficiency Measures
Marketing Approach	Contractor Driven	Customer Driven
No Customer Down Payment	√	√
On-the-Bill Financing of Efficiency Improvements	√	√
Utility Tariff Service	√	√
Installation Tied to Location	√	√
Implemented through Approved Contractors	√	√
Required Post Inspection/ Verification	√	√
Term of Loan (Maximum)	12 years	15 years
Additional Features	<ul style="list-style-type: none"> • \$1,000 rebate • Equipment Warranty • Free Maintenance 	<ul style="list-style-type: none"> • Comprehensive Energy Audit • Economic Analysis • Contractor Management

Although both utilities have experienced some challenges in implementing these programs, the overall conclusions are that: this approach is an effective way to reduce market barriers in the rental housing market, encourage customers to invest in high efficiency energy improvements, and expand the reach of traditional energy efficiency programs beyond home owners.

Several other rural electric cooperatives, including Corn Belt Energy, are investigating offering similar strategies as a way to promote high cost energy efficiency measures, such as geothermal heat pumps to residential customers by offering similar geothermal heat loop leases.

3.4 CORPORATE APPROACHES

The HEAL Partnership began in 2011. CenterPoint provided funding to the CCI to continue their outreach activities with large employers to engage their employees in home retrofits. Table 3 summarizes the program’s results to date [8].

TABLE 3: 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

In 2014, the HEAL Partnership retrofitted 25 homes in 2014, which included:

- Air sealing at 2 homes;
- Ceiling insulation at 21 homes; and
- Duct repair in 22 homes.

In terms of per-home comprehensiveness, the program provided:

- Three measures to 64.0% of participants;
- Two measures to 28.0% of participants; and
- One measure to 8.0% of participants [8].

IV. LESSONS LEARNED FOR PROGRAM DESIGN

As this paper illustrates, there are 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. These lessons are summarized next.

4.1 KEEP THE APPLICATION PROCESS SIMPLE

Loan applications for these programs, especially requiring liens and notarized documents, can be a very cumbersome process. 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. For example, Midwest Energy was able to leverage its existing skills and capabilities into the How\$mart Program while HECO had to develop this entire program from the ground up.

These programs are most successful when the application process is simple and straightforward and the contractors receive prompt payment for their services. Despite the challenges associated with the application processing, HECO has found ways to streamline its application process and accelerate payments to the contractors. All are critical determinants for program success.

Successful program models such as Manitoba, SMUD, AFC First, Viewtech, and Clean Energy Works Oregon 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 [1][6].

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 [3].

4.2 INVEST AND ENGAGE IN CONTRACTORS.

These programs demonstrate the importance and value that a strong contractor network has in delivering utility programs. Many of the most successful programs, including those had strong contractor support. Moreover, they 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 benefited 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) [1]

CEWO has one of the more stringent “closed network” programs. Not only does the program require contractors to meet licensing and training requirements, but they also have to meet financial criteria and agree to pay a “living wage” to their employees [3].

In return for these requirements, CEWO invests heavily in contractor training and supporting the Home Performance Contractors Guild, a local trade association, by offering both

training and support to strengthen the home performance contracting community in the state. CEWO has also provided contractors with Executive Coaching, mentoring, and business management classes to ensure that their contractors are equipped to deal with the anticipated program volume [3]. AFC First, for example, dedicates staff to travel around Pennsylvania offering contractors training in marketing techniques and in the mechanics of the financing product.

Many programs also provide marketing support to contractors. This ensures consistency in messaging among contractors and provides contractors with valuable tools to explain the program and benefits of home energy improvements to potential participants.

For example, the Keystone HELP program provides marketing materials free of charge to their participating contractors. This reduces the burden of developing marketing materials for contractors as well as promotes a consistent a uniform message to customers, thus increasing brand recognition [3].

4.3 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 [3].

4.4 FINANCING NOT ENERGY EFFICIENCY DRIVES DECISIONS

According to a research study conducted by Lawrence Berkeley National Laboratory (LBNL), slightly more than one-quarter (28%) 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 smaller percentage of the larger home-improvement market [7].

Several recently completed reviews of financing programs identified the importance of offering financing to "qualifying measures" rather than just home improvement projects. But it is critical to ensure that these programs still make "economic sense." Furthermore, these projects should be able to generate long term positive cash flow so the term of the loan should not exceed the useful life of the improvements [3][6].

To address this issue, Midwest Energy creates a "conservation plan" as part of the audit, which is essentially the work scope that contractors must follow in order for participants to receive funding. This approach ensures that

only the most cost-effective measures are completed, while also simplifying the decision-making process for customers. [1][3][6].

4.5 SPEAK ENGLISH NOT ENERGY TO CUSTOMERS.

It is important to promote these programs in plain English. Some marketing "best practices" include the following [3].

- *Sell Something People Want*

Marketing messages should focus on crafting specific messages designed to appeal to both proactive and reactive customers executed by skilled marketing professionals [5] [6].

The language should be easy to understand and carry positive connotations. Suggested terms include:

- "Improvements," "home improvements," and "home efficiency improvements" are recommended while "retrofit" and "remodel" are discouraged because of their suggestion of a more extensive project consuming significant time and money.
- "Home energy assessment" suggests opportunity while "audit" foreshadows scrutiny of one's worth as a homeowner.
- "Home" is warmer than "residence"[3].

4.6 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 [3]. 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 [3].

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.

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.

IV. CONCLUSION

This paper offered a summary of some of the most innovative strategies and approaches used to help residential customers reduce the first-cost associated with making comprehensive energy efficiency improvements. It also identified key strategies for success that program implementers should consider when designing energy efficiency financing programs.

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