Energy Efficiency Finance

Options and Roles for Utilities

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SWEEP

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About SWEEP: The Southwest Energy Efficiency Project is a public interest organization dedicated to advancing energy efficiency in Arizona, Colorado, Nevada, New Mexico, Utah, Wyoming. For more information, visit www.swenergy.org.

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I. Introduction

Electric and natural gas utilities across the United States are encountering increasing pressure to expand energy efficiency programs. They have responded to this pressure by proposing new investments in energy efficiency across all consumer sectors. As utilities' energy efficiency goals have grown more ambitious, it is clear that their traditional strategies to fund energy efficiency investments (for example, relying only on ratepayers' direct investment, channeled through utility programs) are no longer sufficient. In many states private capital is assuming an enhanced role in funding energy efficiency through utility financing programs.

This paper focuses on the following topics:

- Why it makes sense to add financing to utility energy efficiency programs
- The many roles that utilities can play in financing programs
- Lessons learned from different utility financing programs
- Case studies on financing programs that involve utilities

Why Financing?

Financing programs are now worth examining for several reasons:

1. Efficiency goals or standards may be so ambitious and/or costly to achieve that they require looking beyond ratepayer capital in many cases. These efficiency goals or standards will vary from one utility and state to another, but it is worthwhile for utilities to examine whether financing options are a prudent means to help meet ambitious efficiency goals. Financing provides four benefits that are relevant here:
    a. It can cover 100 percent of the upfront cost.
    b. It may make an efficiency investment cash-flow neutral or cash-flow positive for the customer under some circumstances.
    c. It is paid to the customer immediately; unlike some rebate programs, customers generally do not have to pay any funds up-front. Many financing programs pay contractors directly.
    d. It may leverage ratepayer funds; that is, a small amount of ratepayer funds can bring in private capital to pay for a large investment in efficiency.

2. Utility cost-effectiveness tests are becoming increasingly challenging, especially with the lower natural gas costs that exist today. A financing program can reduce the amount of ratepayer funds required to achieve efficiency goals, thereby making it more likely that a program will pass a cost-effectiveness test.

3. The general trend away from heavy reliance on lighting upgrades as an energy efficiency measure may require larger and potentially more complex efficiency investments. These larger investments, whether whole-house energy retrofits or larger-scale commercial projects, are very appropriate for financing programs.

4. Financing programs can provide an easy pathway to encourage businesses and homeowners to make deeper investments in energy efficiency, going beyond the measures that they could afford using rebates and cash alone.

5. Financing makes efficiency affordable for people with good credit but limited cash. In other words, a business or homeowner that does not have the cash to invest in efficiency, even with a rebate that covers a part of the cost may be able to do so with the assistance of a financing package.

6. Ratepayers, utilities and regulators are becoming more sensitive to the rate impact of efficiency programs. Financing can reduce the amount of ratepayer capital required by substituting larger amounts of private capital.

II. What Are Some Key Objectives of Any Finance Program?

As a rule, finance programs supported by ratepayer funds (whether through interest rate buydown, loss coverage, direct investment of funds, coverage of expenses, or other means) should provide better terms, conditions or more convenient access to capital than would be available from financial institutions in the absence of that utility ratepayer support. Following are examples of the characteristics of the more successful programs as well as some benefits that utilities should be able to expect:

1. *Integration with marketing, rebate, quality control and other functions:* Financing alone does not build volume; it supports a broader efficiency program that includes marketing, quality control, contractor management and other features. Combining these program features can lead to a successful program.

2. *Program simplicity:* The financing program must be easy for contractors or other project partners to understand and communicate to their customers.

3. *Simple and fast origination, as appropriate to the borrower:* Customers need easy and fast access to capital. Experience from multiple finance programs has shown that an easy process can be even more important to customers than a low interest rate. Whether this is facilitated by an on-line form or a toll-free number for a residential application, or an easy-to-access service agreement in the commercial sector, simplicity and quickness are key.

4. *Attractive rates:* Although a zero percent interest rate is impossible without an expensive buydown, and is rarely necessary except perhaps as a short term promotion, utility funds should provide customers with a lower interest rate than is otherwise available. The definition of what constitutes an attractive interest rate varies with the type of activity the utility wants to promote. Only small interest rate incentives may be required to convince a homeowner to replace a broken down furnace with a more efficient model. Convincing a customer to invest in a whole-house retrofit that isn't really necessary is a tougher sell, and could require a bigger incentive. A similar dynamic occurs in the commercial sector.

5. *Attractive terms:* Monthly payments decline quickly with longer terms (a $10,000 loan divided by 36 monthly payments will cost more each month than a $10,000 loan with 60 monthly payments), so a long term financing vehicle can be an attractive way to create a match between principal and interest payments and energy cost savings. That said, the risk of default increases as terms increase; a 10-year loan with 120 monthly payments is riskier than a 3-year loan with 36 monthly payments. Utility-supported programs should balance the monthly payment benefits of a longer term with the increased risk, but offer a better-than-market term.

6. *Some flexibility in underwriting criteria:* A loan loss reserve or other credit enhancement covers a lender's risk of default, typically measured through a credit

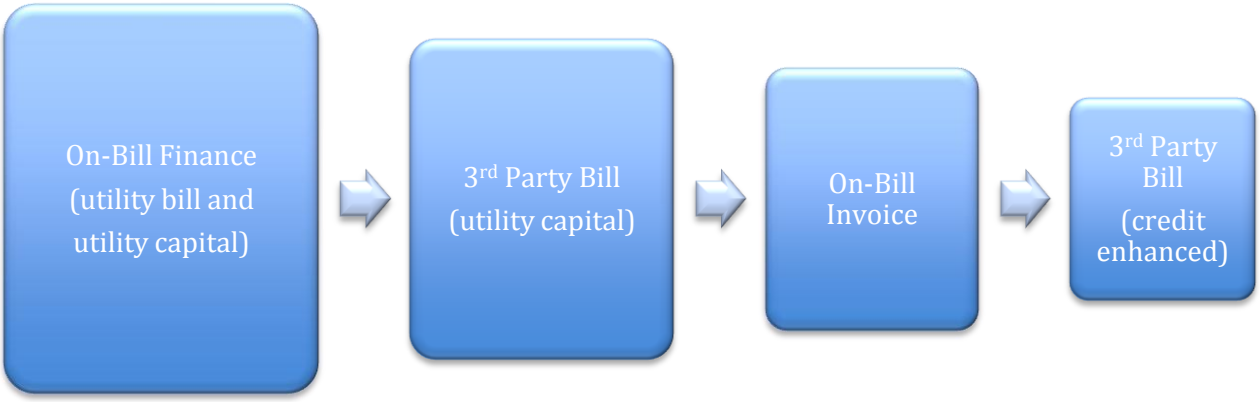
score or similar mechanism. The loss reserve should increase a lender's ability to lend to borrowers with credit scores somewhat lower than might otherwise be acceptable. That said, it is important to note that default and delinquency rates rise quickly as credit scores decline. Loans to individuals with credit scores of 640-680 might have delinquency rates of three times that of loans to those with 720+ credit scores.

7. *Keep transaction costs at levels appropriate to the loan characteristics:* The small loans that characterize the residential sector (rarely in excess of $10,000) need to be designed to keep transaction costs as low as possible. This is important because the costs to collect data and file liens can sometimes overwhelm the value of a small loan (a secured loan can easily cost in excess of $750 just to originate, with loan servicing costs in the range of $10 per loan per month, or $600 over the life of a 5 year loan). Efficiency lending in the residential sector should aim to reduce these transaction costs as much as possible, while maintaining an appropriate balance of due diligence and underwriting to maintain strong loan performance. Often, this may mean that small loans should be unsecured as one way to reduce these transaction costs. Larger residential loans and most business lending will require more detailed underwriting.

III. What Roles Can Utilities Play in Financing Energy Efficiency?

Many people assume that there is only one type of utility energy efficiency financing: on-bill financing through which the utility provides loan capital, loan origination and loan servicing to customers. However, the financing options go well beyond this single option, and while on-bill financing may be appropriate for some markets and customers, it may not be appropriate for others. The following graphic illustrates the spectrum of options for utility engagement in efficiency financing (only one of which involves a utility engaging in all three roles of providing loan capital, origination and servicing).

Figure 1: Spectrum of Options for Utility Engagement



The options for utilities include:

1. *On-Bill Finance (utility bill/utility capital):* In this structure, the utility uses its own shareholder capital or ratepayer capital to lend. It carries loans on its books until they reach maturity, and it originates and services all loans. In other words, the utility does everything.

2. *3rd Party Bill (Utility Capital):* The utility provides shareholder or ratepayer funds to a third party, who conducts all loan origination and servicing. Customers do not pay finance charges on their utility bill and the utility may or may not hold loans or other financial instruments on its books.

3. *On-Bill Invoice:* The utility invoices for the energy financing using the customer's utility bill. It may or may not originate the loan. Importantly, however, it does not provide the financing capital. That comes from other sources, such as banks, credit unions, foundations, bond issuances, federal or state grants, etc.

4. *3rd Party Bill (Credit Enhanced):* The utility agrees to cover a pre-specified amount of losses that a bank, credit union, bondholder or other investor incurs for making

energy efficiency financing available. The utility does not originate or service loans, and it does not hold the financial instrument on its books. Customers do not pay their financing charges through the utility bill; they pay the lender directly.

These four categories can cross-pollinate as well. For example, a utility could credit-enhance a financing structure for which it also provided the billing services, or a utility might use its credit to secure a loan or lease from a third-party investor and then use an on-bill structure to loan or lease funds to its customers.

Finally, utilities can use ratepayer funds to buy down interest rates from a market rate to a subsidized rate in almost any of the above scenarios. Interest rate buydowns often form a part of these options. For example, third party capital could fund a loan with an interest rate and terms that are lower than the market rate because of a loss reserve, and an interest rate buydown will lower the interest rate even further. Interest rate buydowns differ from a loan loss reserve, however, in that they do not recycle, and act instead like a one-time fee that cannot be re-used. For instance, a 10 percent loss reserve has the effect of reducing interest rates because it assumes part of the investor risk, and if actual portfolio losses are 3 percent, then the remaining 7 percent in the reserve fund (plus any accrued interest) can be recycled to support additional lending.

IV. General Observations

This section lays out a number of broad lessons learned from the financing programs profiled below.

Utility Billing System Issues and Concerns

The cost of revising utility billing systems to allow them to place new items on the utility bill varies from almost nothing up to $1,000,000. Many smaller cooperative utilities use centralized billing services that allow them to purchase "modules" to integrate finance program billing. Some billing systems were built to allow easy integration of a finance product. Others were not, and those systems are the most costly the most to change.

Reducing Interest Rates

Interest rates are a function of the risk that investors expect as well as the transaction costs to process a loan application and to service a loan portfolio. Higher transaction costs and higher risks produce higher interest rates. One way to reduce interest rates is to locate the parties with the highest quality credit rating and provide the loan to them, having them assume some of the credit risk. For instance:

- The Mountain Association for Community Economic Development (MACED), a Kentucky-based community development financial institution (CDFI) took out a low-interest loan (also called a Program Related Investment) from the Ford Foundation and used the proceeds of that loan to fund a loan pool for utilities, which in turn provided capital through an on-bill program to support energy efficiency retrofits on their customers' property. This structure achieves:
    a) low transaction costs for the primary lender (the Ford Foundation would not be able to do origination and servicing for hundreds or thousands of customers); and
    b) high credit quality for the loan pool since the utilities take the risk that the loans might go bad.

- A new program in Illinois, yet to begin operation, will achieve low interest rates because the utilities assume the risk of losses on loans, and then pass losses (if they occur) to ratepayers. Investors provide capital to the loan program based on the high quality credit of the utilities, not the credit of the individuals who are applying for loans.

Importance of Net Cash-Positive/Cash-Neutral Compared to Interest Rates

The value proposition to a commercial or residential consumer who is considering an energy efficiency upgrade through a financing program consists of a combination of factors including rate, term, rebates, ease of the transaction, and energy cost savings. Ideally, the combination of all these features could put a consumer in a position in which energy cost savings exceed principal and interest payments. This may not always be possible without a combination of rebates and a finance product, particularly in the residential sector where paybacks on whole house retrofits can be 10 years or greater.

Some programs have addressed this issue in the residential sector by finding flexible capital sources that allow for paybacks that extend as long as 15 years. Almost no traditional investors (insurance companies, banks, etc.) will accept such long loan terms on traditional loans, so the total funding pool for such long-term loans in the residential sector is limited.

Paybacks on many commercial sector efficiency projects tend to be faster, and while a combination of rebates and financing is also important to the value proposition, the length of the loan (or other financial instrument) does not need to be as long.

Financial Regulations

Utilities need to pay attention to federal financial regulations such as the Truth in Lending Act and numerous state financial regulations. As a rule, financial regulations that apply to consumer lending (residential customers) tend to be stricter than the regulations that apply to business lending. In some cases, utilities or certain types of utilities such as cooperatives may be exempt from financial regulations. In other cases, utilities have clarified, through legislation, that they should be exempted from the regulations. Different kinds of financing programs also trigger different regulations; a finance program through which a utility provides lending capital and does loan origination and servicing may trigger financial regulations while one through which the utility only provides a cash reserve to cover potential losses may not trigger these regulations for the utility. Penalties for failure to comply with these requirements can be large, so utilities should examine the situations in their own states with experienced counsel before engaging in a finance program.

V. Finance Program Case Studies

This section provides case studies of utility-based finance programs. These case studies illustrate different types of finance programs (on-bill, 3rd party billing etc.) along with the ways in which different types of utilities (public power, cooperative and investor-owned) can create finance programs.

California: Sempra Energy Utilities[1]

Table 1: Sempra Utilities Information and Program Characteristics

Type of Utility	Investor owned utilities
Size of Utility Customer Base	22,300,000
Website	www.socalgas.com www.sdge.com
Program Administrator	Southern California Gas Company and San Diego Gas and Electric
Start Date/End Date	2006
Eligible Sector(s)	Commercial, industrial, government and non-owner occupied muti-family
Eligible Measures	All business energy efficiency rebate and incentive programs
Capital Source and Cost of Capital	Utility rates (rate payers)
Financing Term Maximum	5 years for business customers; 10 years for government/institutional customers
Interest Rate or Customer Charge and Fees	0%; no fees
Disconnection for Non-Payment	Yes
Disclosure or Lien?	Yes, disclosure

Sempra Utilities provides one of two examples in this document of an on-bill commercial program and is of particular interest because it has shown strong consumer interest and excellent loan performance. (The other is United Illuminating in Connecticut.)

Sempra offers zero-interest unsecured loans that are combined with a rebate to cover energy efficiency measures. The size of the rebate depends on the specific measure and type of customer, and maximum rebates tend to range from 15 to 20 percent of project cost. The utility or vendor identifies measures through an energy efficiency audit. The loan term is based on the simple payback of the project, where the monthly loan installment is

[1] This section based heavily on personal interviews and communication with Frank Spasaro, Sempra Utilities.

then determined by simply dividing the loan amount by the term (what Sempra calls "bill neutral"). The minimum loan amount is $5,000; the maximums are $100,000 for business and $250,000 for government/institutional customers. Default on the loan can result in disconnection of electric/gas service.

Loan terms are capped at 5 years for business customers and 10 years for government/institutional customers. To qualify for a loan, the applicant must be in business at their current location for at least two years and may not have received a notice of disconnection of service within the past 12 months.

Loan volume has been increasing steadily since the program's inception in the third quarter of 2006. As of May 2011 Southern California Gas (SoCalGas) has made 24 loans totaling $864,416 and has an additional $1.3 million committed to 8 loans. San Diego Gas and Electric has made 747 loans totaling $11,033,515 with an additional 205 loan commitments worth $7,720,847. Typical loan amounts on the electric side are approximately $20,500 and on the gas side total $34,000, with many of the gas projects tending to be more expensive, custom projects. Natural gas-only projects have proven to be more difficult due to the high up-front capital cost of projects compared the savings. SoCalGas has been investigating methods to work jointly with the various electric service providers to combine the project calculations to enhance the ability to qualify gas projects.

Defaults on the program have been small, with no defaults on the gas side and only five, totaling $76,988, on the electric side. The public benefits fund covers any potential losses.

Discussion and Lessons

Why Pursue a Finance Program?

Sempra staff noted that its upper management made a strong commitment to establishing a finance program and put money behind its commitment. Customers told Sempra that they needed financing, and that the on-bill structure makes it simple for them. Uptake studies on Sempra's energy efficiency programs indicate that many people would not have installed the efficiency measures without the financing. Sempra staff also note that while defaults had originally been a concern, they turned out to be very small, at about 0.5 percent thus far.

Financial Regulations

California business and consumer lending regulations determined the original focus of the Sempra on-bill finance programs. The Sempra utilities determined that establishing this on-bill financing program would make Sempra subject to regulation as a financial institution, with attendant reporting, fees and registration requirements. For example, one fee was based on a percentage of corporate revenue, which would have been extremely expensive. Sempra was able to secure an exemption from these regulations for business lending, but was unsure that it would be able to secure an exemption for consumer lending.

As a result, Sempra focused its finance program on business and government customers and does no consumer lending.

Interest Rates and Terms

Low interest rates are an attractive selling point for the program, but the most important feature is Sempra's ability to use a combination of low interest rates, flexible loan lengths, and rebates to put customers in a net cash-positive position.

Sempra limits its commercial loan terms to no longer than 5 years to guard against defaults resulting from businesses moving or closing.

Partial Payments and Order of Payments

Sempra's billing system splits consumer payments so that the loan and the rest of the bill are paid at the same time, in proportion to their size. For instance, assume a consumer had a $1,000 total bill made up of a $100 finance charge and $900 energy and related charges. If the customer made a partial payment of $500, the financing account would receive a payment of $50 and the rest of the energy bill would receive $450.

Billing Systems

Revisions to Sempra's billing systems were challenging because Sempra's billing was not set up to manage loan repayments. SDG&E spent approximately $1,000,000 to build a new billing system to accommodate the finance program, and approximately $500,000 to adapt SoCalGas' billing system to the finance program. In retrospect, staff felt that even though it cost more at the start, building a new billing system was easier and more successful than altering a legacy system.

Contractor Issues

Contractor relationships have proven to be critical to the success of the program. The ability to realize projected energy efficiency savings depends on a quality experience between the contractor and the customer, and the utility has dedicated significant resources to education and training for contractors.

Connecticut: United Illuminating[2]

Table 2: United Illuminating Information and Program Characteristics

Type of Utility	Investor owned utility
Size of Utility Customer Base	324,000
Website	www.uinet.com
Program Administrator	United Illuminating
Start Date/End Date	2000 – present
Eligible Sector(s)	Small business with less than 200kW average 12 month demand
Eligible Measures	Lighting/Controls, Refrigeration/Controls, HVAC, Motors (ECMs), Bldg Management Systems
Capital Source and Cost of Capital	Incentives from the Public Fund, Financing from shareholder funds Cost of Capital: 6.31%
Financing Term Maximum	4 years
Interest Rate or Customer Charge and Fees	0%
Disconnection for Non-Payment	Yes
Disclosure or Lien?	No

United Illuminating (UI) is the second example of an on-bill commercial lending program and is included in this document because it was one of the first on-bill programs in the country and is still in operation. The UI program is part of a coordinated statewide efficiency lending program in Connecticut; however, this document provides details for only the UI portion of the program.

UI is a Connecticut-based utility that serves approximately 20 percent of the state's electric load. UI began an on-bill financing program in 2000. The program offers zero percent interest financing for energy efficiency improvements in small businesses (defined as load of less than 200 kW). The program works both with businesses that own their premises and with leased spaces; eligibility to participate in the program is tied to the name on the utility bill and not the property owner. Approximately 60 percent of installations are in leased spaces.

[2] This section based heavily on personal interviews and communication with Dennis O'Conner, United Illuminating.

The maximum loan term is 48 months. UI combines the loans with a customer buydown (equivalent to a rebate) to cover 30 percent of lighting efficiency measures and 40 percent of costs for other measures. If the customer/borrower elects to install two or more measures, the customer buydown grows to 50 percent of the cost, thus encouraging a more comprehensive approach to efficiency investments. The combination of the rebate and the loan gives small business customers an immediate monthly financial benefit.

The program has closed 4,250 loans worth approximately $34,000,000 since the program began operation, averaging about 380 loans worth approximately $3.2 million each year. Typical project sizes range from $8,000 to $12,000. The total program size is limited to $7.5 million as an allowed maximum amount of loans outstanding.

Utility shareholder funds capitalize the program loans, and the utility earns its allowable rate of return on those funds once they are deployed into loan capital. The utility's weighted average cost of capital is approximately 2 percent less than its allowable return on these funds, so UI is earning money on all loan capital that it deploys. Ratepayer funds buy the consumer interest rate down to zero percent and provide loss coverage.

Lighting upgrades represent fully 75 percent of measures that the program finances. Refrigeration makes up the bulk of the remaining measures installed. Recent trends have been to install more LED lighting fixtures and variable speed drives. The program installs these measures in a wide range of facilities including convenience and liquor stores, common areas in offices, and manufacturing facilities.

Default rates historically have been less than 1 percent, and have typically been on the order of 1-3 per year. Defaults have increased slightly in the difficult economic environment of the last two years, and they now stand at a little greater than 1 percent, or a total of $324,000 through the program's history. The program manages defaults by screening customers to be sure they have had at least one year in business with satisfactory credit (no more than 30 day arrears in the most recent six months).

Ninety-three percent of the applicants do qualify for financing. The UI program staff also work closely with the UI credit department to identify customers who may be having trouble paying bills, and to work out payment terms.

Discussion and Lessons

Why Pursue a Finance Program?

UI staff noted that financing was critical to getting energy efficiency projects done in the commercial sector. Some statistics are revealing. Of the 93 percent of applicants who qualify for financing, fully 54 percent decide to participate in the efficiency program. However, of the 7 percent who do not qualify for the financing portion, more than 80 percent decide not to participate because they do not have the funds for the remaining balance. Some of these customers are mom and pop stores in the Latino business

community and receive additional help through a Hispanic organization that covers all of the installation costs.

In addition, UI saw a significant increase in participation among small businesses, with loads up to 200 kW, when it began to allow these small businesses to participate in the finance program. Previously, they did not have the funds for the remaining balance after the incentive portion of the project was paid.

Financial Regulations

Financial regulations were not a significant consideration for UI because the utility determined it was not subject to business lending regulations.

Interest Rates and Terms

As with the Sempra program, UI found that low rates, combined with flexible terms and a rebate can give the customer a net positive cash flow even after the loan charges. UI staff felt that this net-positive cash position was probably more important than simply having a zero percent interest rate; a low rate is important for marketing purposes, but the real driver for customers is being able to secure both an attractive rate and a positive cash flow.

UI also felt it was important to keep loan terms short in order to guard against defaults. UI does allow a business owner to transfer the payment obligation to a subsequent owner, as a voluntary agreement between the owners.

Partial Payments and Order of Payments

Partial payments are made towards the loan first, leaving the energy portion of the bill unpaid. If the energy portion of the bill goes past 60 days, electric/gas service can be discontinued.

Billing Systems

Billing system changes for UI were minimal because the company's billing system had been designed to easily accommodate additional line items, including a financing program charge.

Contractors and Installation

Contractor relationships have proven to be critical to the success of the program. The ability to realize projected energy efficiency savings depends on a quality experience between the contractor and the customer, and the utility has begun to focus significant resources on education and training for contractors.

United Illuminating conducts pre- and post-installation audits on a random basis to check the quality of the contractors' work. UI is also required by its utility regulators to submit a Program Savings Documentation report that includes an analysis of all end use energy efficiency savings. These two features help to ensure that the actual savings match projected savings.

Contractors must sign an agreement with UI, undergo a drug and a background check, and must carry liability insurance. UI gives contractors temporary photo identification to provide credibility as they enter the businesses.

Interviews with contractors revealed that the on-bill finance program was central to their business. All three contractors interviewed for this project indicated that the UI work accounted for most or all of their business, and supported from 12-20 employees each.

UI holds quarterly meetings with the 14 contractors who are currently qualified to perform services under the program. UI also holds the contractors to certain metrics. For example, large contractors must bring in business that saves at least 1,000,000 kWh per year and small contractors must bring in business that saves at least 400,000 kWh per year. Other metrics have to do with the numbers of leads generated and projects completed, and the time it takes to complete projects. If contractors regularly fail to meet these metrics, UI will disqualify them and bring new contractors on. UI maintains a checklist to measure contractor performance. In the past year, UI disqualified two contractors.

Other Considerations

United Illuminating staff noted that the utility had faced particular challenges with restaurants; bankruptcies in this sector appear more common than in other sectors with which the utility has been involved.

Georgia: Habersham EMC – How$mart® Program[3]

Table 3: Georgia How$mart® Program Information and Characteristics

Type(s) of Utility	Electric Cooperative
Size of Utility Customer Base	33,000
Website	http://www.habershamemc.com/home.aspx
Program Administrator	Habersham Electric Member Cooperative
Start Date/End Date	2009 – present
Eligible Sector(s)	Residential
Eligible Measures	Heat pumps; windows, doors; water heaters; ductwork, vents, etc.; insulation; caulking; heat pump water heaters; lighting.
Capital Source and Cost of Capital	ARRA and Georgia Environmental Facilities Authority Cost of Capital: 5%
Financing Term Maximum	5- or 10-year terms
Interest Rate or Customer Charge and Fees	0 % financing for up to $5,000 (5-year term), 5 % financing for >$5,000 (10-year term). No program fees
Disconnection for Non-Payment	Yes
Disclosure or Lien?	Restrictive Covenant Filed

The Georgia How$mart® Program provides an example of an on-bill tariff program operated by an electric cooperative. An on-bill tariff is distinct from an on-bill loan (such as is offered in Connecticut or Massachusetts) because the payment obligation transfers "with the meter," meaning that when one utility customer moves, the new occupant assumes the payment obligation as part of the utility bill. The financing is deemed to be part of the tariff and an essential service. Although relatively new, this program is showing strong interest from consumers in its initial phases.

The Georgia How$mart program serves Lumpkin, White, Rabun, Habersham, Hall and Stephens counties. The program began in January 2009 and provides an on-bill tariff for energy efficiency improvements based on the energy savings resulting from these improvements. The utility began the aggressive efficiency finance program because it saw efficiency as a way to delay the huge capital cost of building a new power plant.

Energy savings should offset the cost of financing for the customer, averaged over the full year, and for the most part the Georgia How$mart program does so. The loan principal and interest payment is designed to be at 90 percent of the estimated energy cost savings, with options of 5-, 8- or 10-year loan terms. The average monthly cost savings for the customer

[3] This section based heavily on personal interviews and communication with Curt Arulf, Habersham Electric Corporation.

is $40 and 425 kWh, although some individual customers varied considerably from the average, with much greater savings in some cases.

As of December 2010, the Georgia How$mart® program has closed more than 300 loans totaling $1.8 million. The program had more applicants than it was prepared to handle when the program first launched. Some delays occurred because the program had too few staff to handle the number of energy audits needed. As of mid-2011, most loans required approximately 3-4 weeks to close. As with most utilities, Habersham had also had little expertise with financing programs, including origination and servicing.

The utility requires that any borrower have been a customer of the utility for at least one year, and will look at up to three years of utility bill history when considering applications. Defaults have been less than one percent, but the program is also very new so there is little data at this point to indicate a loan level or portfolio performance. The utility does set aside one percent of the value of every loan made to establish a bad debt recovery fund and files a UCC-1 lien.[4] Such a lien serves mainly to disclose to a new owner that an unpaid loan exists but is not likely to result in any kind of recovery if the borrower goes bankrupt or defaults.

The Habersham Electric Membership Corporation administers this program; its responsibilities include program administration, origination and collection processes. The utility uses internal funds for this program.

American Recovery and Reinvestment Act (ARRA) funds provide loan capital along with additional funding from the Georgia Environmental Facilities Authority.

The utility bases the loan collection process on its established collections process for overdue electric bills. The loan payment for the How$mart® program supersedes the electric payment; if a customer makes a partial payment, the loan amount is paid off first.

Discussion and Lessons

Why Pursue a Finance Program?

Georgia How$mart® staff noted that they began the financing program because the cooperative utility's customers wanted the financing option. Rebates did not cover the full cost of energy efficiency installations, and the utility was able to design the combination of loans and rebates so that customers were in a net cash-positive position even after making loan payments.

The program has been popular with customers, with 40 percent of approved applicants accepting the loan and pursuing the efficiency upgrade.

[4] UCC-1 is one of the standard mortgage documents listed in the Uniform Commercial Code. The UCC-1 Statement lists and describes any personal property that is provided by the borrower as collateral for the loan. This document must be filed with either the Secretary of State or another appropriate official.

Financial Regulations
The utility determined that it was not subject to regulation as a financial institution.

Interest Rates and Terms
The program manages rates and terms with the goal of putting customers in a net positive cash flow position after accounting for energy cost savings, principal and interest payments.

Partial Payments and Order of Payments
Partial payments are made towards the loan first, leaving the energy portion of the bill unpaid. If the energy portion of the bill goes past 60 days, service can be disconnected.

Billing Systems
Billing system changes were immaterial for the utility, in part because it has been offering similar types of non-energy offerings to its customers through the utility bill for many years.

Other Considerations
The program focused on Heating, Ventilation and Air Conditioning (HVAC) system upgrades since these are often the most cost effective and fastest payback items. It found that the program helped to keep many HVAC contractors in business during a period of low economic activity.

Hawaii: Hawaiian Electric Company – SolarSaver Program[5]

Table 4: SolarSaver Program Information and Characteristics

Type of Utility	Investor-owned utility
Size of Utility Customer Base	1.2 million
Website	www.heco.com
Program Administrator	Hawaiian Electric Company
Start Date/End Date	2007 – 2009
Eligible Sector(s)	Residential
Eligible Measures	Solar Water Heaters
Capital Source and Cost of Capital	Utility Ratepayer Funds
Financing Term Maximum	12 years
Interest Rate or Customer Charge and Fees	Monthly customer charge will not exceed 2/3 of the projected energy cost savings, effectively guaranteeing monthly savings for the customer in all cases. Typical customer charge ranges from $30-$65.
Disconnection for Non-Payment	Yes
Disclosure or Lien?	Property owner/landlord is required to agree to and sign a separate contract committing the property owner/landlord to disclose the obligation to successor customers at the location. Utility ordered to submit SSP agreement to land and title records in the Bureau of Conveyances of the State of Hawaii.

The Hawaii SolarSaver program provides an example of an investor-owned utility operating an on-bill tariff program, in this case for solar hot water heaters.

Hawaiian Electric Company, Hawaiian Electric Light Company and Maui Electric Company proposed an on-bill tariff program in 2007 designed to eliminate the up-front costs of installing solar water heaters. This proposal was the direct result of Act 240 (SB 2957), enacted in 2006.[6] The Hawaii Public Utilities Commission (HPUC) approved the SolarSaver pilot program (SSP) in 2007. The three-year pilot program lasted only two years because demand exceeded available funds, and the HPUC decided to move all energy efficiency programs, including solar hot water programs, to a third-party administrator. The HPUC felt that the third-party administration of efficiency programs was not easily compatible with a utility-operated efficiency-financing program; therefore, it discontinued the

[5] This section based heavily on personal interviews and communication with Warren Bollmeier, President of Hawaii Renewable Energy Alliance.
[6] Information retrieved from http://www.capitol.hawaii.gov/session2006/lists/acts_list_bybill.htm.

program, but reserved the prerogative to restart it at a later date. The program ceased taking new applications at the end of its second year of operation.[7]

The SolarSaver program targeted single and multi-family residential buildings. Using ratepayer funds, the utility paid the upfront cost of the solar hot water systems, and participants' financing charges were included on their utility bill. The fixed payment amount and term (up to a maximum of 12 years) varied in order to ensure monthly customer savings.

The program attracted 616 applicants over its two-year life. Of those 616 applicants, the program rejected about 10 percent because of poor credit (based on poor utility bill payment history). An additional 5 percent of applicants dropped out of the program before the solar hot water heater was installed. The total approved 513 applications fell slightly short of the goal for installing 550 projects.[8]

Seventy-one percent of program participants in the second and final year of the program reported a decrease in their monthly electricity use. Eight percent reported an increase, 4 percent reported their use remained the same, and 17 percent did not know if their electric use changed.[9] The program has experienced almost no defaults as of the writing of this paper.[10]

Discussion and Lessons

Why Pursue a Finance Program?

The utility wanted to eliminate customers' up-front costs of installing solar water heaters.

Application/Servicing/Collections Process and Billing Systems

Program application, servicing and collections were challenging for the utility. Program administration in the first year caused complications for staff, customers and contractors. The application process required sign-off from and coordination among the utility, customer, contractor, State Bureau of Conveyances and, in some cases, the Department of Hawaiian Home Lands or other government assistance housing agencies. Notarization requirements for documents also delayed the application process, particularly for those living in low-income housing. This complex system led to delays in the application process, a critical determinant for customer and contractor satisfaction.

The evaluators recommended streamlining this process, and the Year 2 evaluation reported that the application process improved considerably, with far fewer sign-offs required from various agencies.

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[7]Docket 2006-0425 2009-04-09 Order denying HECO Cos Amendments to SSP Program. Dec. 31, 2008.

[8] Katherine Johnson, *2 Year Process Evaluation Report for SolarSaver Pilot Program* (Place: Johnson Consulting Group, Oct. 15, 2009); and Katherine Johnson, *1 Year Process Evaluation Report for SolarSaver Pilot Program* (Place: Johnson Consulting Group, Nov, 26, 2008).

[9] Ibid.

[10]Any discussion of defaults must take into account the age, or "seasoning," of the financing in question. A young portfolio will not be expected to have many defaults. The Hawaii SolarSaver program and the Midwest Energy programs are only now beginning to be old enough to be able to demonstrate sufficient seasoning of the portfolio to show results that will be considered meaningful to most analysts.

In Year 2, the program staff reported that, although the application process worked smoothly, payment tracking and collections issues had become challenging. Some customers chose to pay their energy bills through an automated system, while their SolarSaver program bill came separately through the mail. Some customers paid their energy bill but not their SolarSaver program bill. Evaluators recommended the program work with the utility's IT department to create new reports and assist with tracking and collections. Because the program was terminated, the utility did not have an opportunity to fully adopt these recommendations.

Although utility staff reported low delinquency rates, staff did express concern that future delinquency rates would increase, and that the utility might not be fully prepared to track and collect these delinquent accounts. A further concern was that, although initial program applicants had passed underwriting criteria for a SolarSaver program, a future occupant of the home might not be as creditworthy.

Contractors in Year 1 reported a high level of dissatisfaction with the complexity of the application process. High levels of staff turnover at the utility also created confusion and communication issues for contractors. After the application process was streamlined in Year 2, contractors reported a high level of satisfaction and expressed disappointment that the Solar Saver Program was suspended.

Customers reported overall satisfaction with the SolarSaver program except for some concern about the cumbersome Year 1 application process. As with the contractors, satisfaction increased notably with a more streamlined application process.

Other Considerations

Financing programs for the rental sector pose significant challenges. The SolarSaver program managed to attract only twelve rental properties over its two-year life—five in Year 1 and seven in Year 2. Program evaluations from both years indicated significant challenges in reaching this sector and noted the need to develop a concerted marketing campaign for the rental market. Budget constraints prevented the program from fully implementing this recommendation, and rental property participation remained small. (Note that Hawaii's experience in reaching the rental market sector differed from that of the Midwest Energy program, described below, which had better success in reaching this sector.)

The SolarSaver program originally was designed to focus on the rental sector. At the direction of the commission, however, it was opened both to rental and homeowner properties. Evaluators believed homeowners would have bought solar hot water heaters in the absence of the SSP program but asserted that landlords and renters would not have bought them unless the program existed. The evaluators recommended that the program refocus on the rental sector during Year 2. SolarSaver, however, continued to allow both rental and owner-occupied properties, but increased its outreach to the rental sector until funding became unavailable.

Further study would be required to more fully understand this issue, in part because one of the assumed benefits of an on-bill tariff is its ability to resolve the lack of incentive for landlord/tenants to invest in energy efficiency.

Free ridership was an issue of concern to the Commission and program evaluators. The Year 1 program evaluation noted that 36 percent of program participants said they would have purchased a solar hot water heater even if the SolarSaver program had not been available.[11] The Year 2 program evaluation noted that the free ridership statistic had fallen considerably in that year, in part as a result of a more concerted marketing campaign. In Year 2 of the program, only 11 percent of customers said they would have purchased a solar hot water heater if the program had not been available; most cited lack of money as a deterrent, which the SolarSaver program addressed. The free ridership concern during the first year of the program was one of two reasons cited by the Commission for suspending the program. The other, probably more important, reason was a broader decision to move all efficiency programs to third-party administration.

[11] Katherine Johnson, *1 Year Process Evaluation Report for SolarSaver Pilot Program.*

Kansas: Midwest Energy – How$mart Program[12]

Table 5: Kansas – Midwest Energy How$mart Program Information and Characteristics

Type of Utility	Electric Cooperative
Size of Utility Customer Base	90,000
Website	www.mwenergy.com
Program Administrator	Midwest Energy Inc.
Start Date/End Date	2007 – present
Eligible Sector(s)	Residential and Commercial
Eligible Measures	Insulation; Air sealing; HVAC
Capital Source and Cost of Capital	Utility Funds, Kansas Housing Resources Corporation, Efficiency Kansas, and other sources. Cost of Capital: 4-8%, dependent on availability of 0% capital to blend with the 8%.
Financing Term Maximum	Residential: 15 years or ¾ of the expected life of the measure, whichever is less; Commercial: 10 years. Geothermal loops (only): 30 years, Commercial Lighting application 7 years.
Interest Rate or Customer Charge and Fees	0-6.8%; In addition, a fee of up to 5% of project investment is added to the principal balance owed. Customer monthly charges will not exceed 90% of the projected energy cost savings.
Disconnection for Non-Payment	Yes
Disclosure or Lien?	UCC fixture filing lien placed on property; disclosure of payment obligation required at sale.

Midwest Energy's How$mart® program provides an example of one of the first utility-operated finance programs performed through an on-bill tariff. It is included in this report because it is the most seasoned program of this type in the country.

The How$mart® program serves commercial as well as single- and multi-family residential properties that are either owner-occupied or rental properties. The program uses an on-bill tariff-based approach to financing the efficiency retrofits. This means that customers who participate in the program opt to pay a tariff that is set to pay for their energy efficiency upgrade, with interest, over a period of up to 15 years. The monthly tariff charge is set at a maximum of 90 percent of the projected energy cost savings. To reduce the amount financed and achieve the 90 percent goal, Midwest Energy allows customers to pay cash for a portion of the energy efficiency measures. The tariff is tied to the location, not the individual customer, so if a customer moves the tariff stays with the property until it

[12] This section based heavily on personal interviews and communication with Michael Volker, Director of Midwest Energy Regulatory and Energy Services.

expires.

The finance product is offered at various interest rates, ranging from zero to 6.8 percent depending on the availability of low-cost financing sources.

How$mart® asks customers to participate in a free energy efficiency audit in order to identify which combination of insulation, HVAC and other measures to install, and also to estimate the likely energy and cost savings. Customers pay a $200 fee to cover efficiency audit costs if they choose not to enroll in the How$mart® program and proceed with measures recommended in the audit. Midwest Energy applies this fee to the consumer's bill six months after the Conservation Plan (audit and recommendations) has been provided to the customer and spreads the fee over four months ($50/month).

Midwest Energy does not conduct a full credit check of its customers using an outside credit agency; instead, it requires only that participants be current on their utility bills. The utility does, however, have the ability to disconnect service to customers for nonpayment of the How$mart® charge. Midwest Energy did not initially incorporate any lien into its program, but began doing so shortly after the program began operation because it provided some certainty that, upon transfer of property ownership, the new owner would be aware of the How$mart® obligation.

The program has completed 576 projects since its inception in early 2007 worth approximately $3.3 million, at a rate of about $1.1 million per year. Average project size is $5,730. Defaults have thus far been less than one percent, tracking very closely the utility's overall base default rate.

The program is unique among the nation's financing programs in its penetration of the rental housing market; approximately 13 percent of participants are renters. Although this percentage is higher than other financing programs, it does not yet match the proportion of renters in the Midwest Energy service territory.

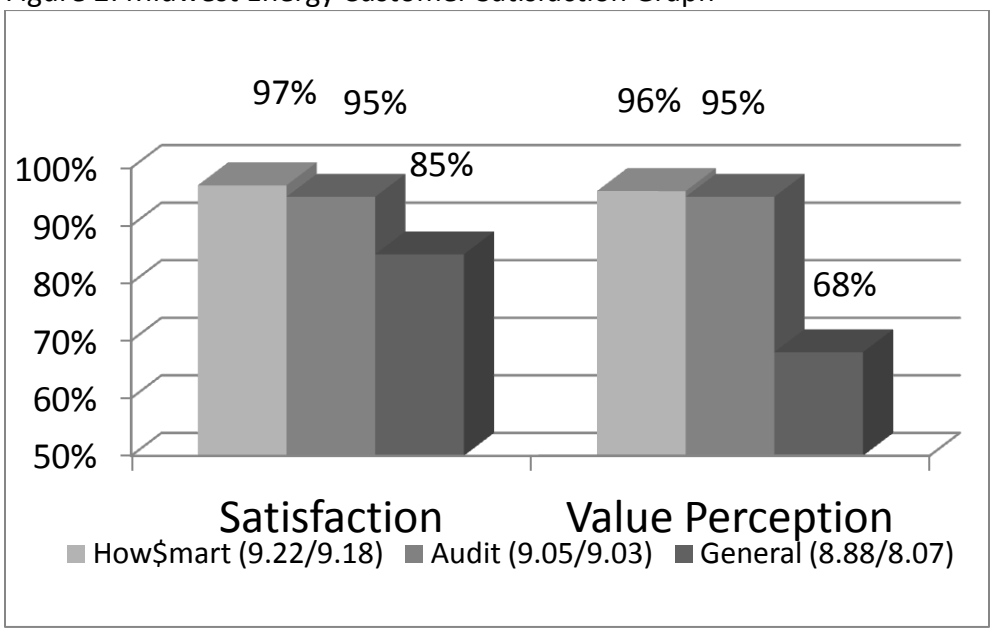
Discussion and Lessons

Why Pursue a Finance Program?

Midwest Energy implemented the How$mart® program because it strengthened its relationship with its customers. Figure 2 shows clearly that customer satisfaction and value perception of the utility increase dramatically among those customers who have received an energy audit, and that How$mart program participants rate the highest in satisfaction and value perception. So from Midwest Energy perspective, the value of the financing program is not just about saving energy; it is also about building customer satisfaction.

The program has helped convert energy audits to actual projects; Midwest Energy staff estimate that one-half to two-thirds of customers who receive an audit go on to do a project using the program.

Figure 2: Midwest Energy Customer Satisfaction Graph



Financial Regulations

Initially, state financial regulations appeared to pose a barrier to the finance program. However, legislation enacted in Kansas created an exemption from financial regulations for utilities operating financing programs, exempting this type of tariff from financial regulation as follows (Consumer Credit Code: 16a-1-202): "transactions under public utility or common carrier tariffs if a subdivision or agency of this state or of the United States regulates the charges for the services involved, the charges for delayed payment, and any discount allowed for early payment."

Interest Rates and Terms

Midwest Energy's program offers customers a projected net cash-positive outcome after cost savings from energy efficiency. The utility achieved this outcome by giving participants extended terms (up to 15 years) to pay back their financial obligation. The tariff structure of the program makes the long repayment terms possible, since the energy efficiency surcharge stays with the meter and is transferred to new occupants until the obligation is paid off. As an added security measure, Midwest Energy can disconnect service to customers if they fail to pay their utility bill, including the efficiency tariff. As noted above, the utility has generally used its own capital to fund this program; few outside investors are willing to provide capital for such long terms.

Partial Payments and Order of Payments

Partial payments are allocated to the loan first, leaving the energy portion of the bill unpaid. If the energy portion of the bill goes past 60 days, service can be disconnected.

Billing Systems

Midwest Energy staff reported that billing changes were not difficult and did not require a significant new investment.

Other Considerations

Many projects take a long time to complete, due to the time it takes for customers to make a decision and also due to a shortage of qualified contractors available to schedule and complete the projects. Midwest Energy staff reported that early expectations about the pace of the program had to be adjusted for these delays.

Midwest Energy staff reported that it was more difficult than expected to ensure that new tenants and property owners receive sufficient notice of the surcharge. As noted above, this is one reason that Midwest Energy began to place a lien on the property when customers enrolled in the program.

As is the case with many energy efficiency programs that involve energy audits, Midwest Energy found that some people who request an audit do not proceed with the recommended measures. As a result, Midwest Energy set a $200 fee for those that use the audit but do not install efficiency measures through the financing program.

Rental properties remain a challenge. Although the How$mart® program successfully engaged more rental properties than most other finance programs around the country, the proportion of renters in the program does not match the proportion of renters in the service territory as a whole. Midwest Energy staff members note that some landlords have been particularly reluctant to participate, perhaps due to concerns that the utility will discover safety violations that require repair.

Kentucky: How$mart Program[13]

Table 6: Kentucky How$mart Program Information and Characteristics

Type of Utility	Rural Electric Cooperatives
Size of Utility Customer Base	100,000
Website	www.maced.org
Program Administrator	Multiple cooperative utilities partnering with Mountain Association for Community Economic Development (MACED)
Start Date/End Date	Spring 2011 through Spring 2013
Eligible Sector(s)	Residential
Eligible Measures	Residential: Air sealing; HVAC; insulation
Capital Source and Cost of Capital	*Current funding sources:* $500,000 from MACED cash on hand & $1 million loan from the Ford Foundation for capitalization KY Housing Corporation provided $300,000 in operating funds. Ongoing operations funded from general support. Cost of Capital: 3%
Financing Term Maximum	Residential: 75% of the estimated life of the measure or 15 years, whichever is less.
Interest Rate or Customer Charge and Fees	3 % Interest rate. Fee of 5% of project cost, capitalized into the amount financed.
Disconnection for Non-Payment	Yes
Disclosure or Lien?	Landlords and owners are contractually obligated to disclose the EE agreements to prospective tenants and/or purchasers of the property. Utilities must file a UCC filing on the title. The utilities also must notify new customers of the meter charge when they become new customers.

The Kentucky How$mart® program profiled here is another on-bill tariff program that involves cooperative utilities. It is of particular interest, however, because it resulted from a unique collaboration among utilities and a community development lender that had access to foundation capital. Although it uses the utility's bill to collect payments, the program does not rely on utility ratepayer funds.

In December 2010, the Mountain Association for Community Economic Development (MACED) launched a 2-year, 300-home, on-bill financing pilot program for energy efficiency in collaboration with four rural electric cooperatives (Big Sandy Rural Electric

[13] This section based heavily on personal interviews and communication with Nina McCormick, Strategic Initiatives Director, MACED.

Cooperative Corporation, Fleming-Mason Energy Cooperative Inc., Grayson Rural Electric Cooperative Corporation, and Jackson Energy Cooperative). As of the spring 2011, the program was very new, yet it has already revealed some interesting features.

Like the Midwest Energy program, the Kentucky program relies on an on-bill tariff that is set up in a very similar way to the Midwest Energy program, with a tariff that transfers payment obligations from one owner to the next. Terms of the opt-in tariff extend to 15 years and the utility sets the level of the tariff to be no more than 90 percent of the expected energy cost savings, guaranteeing monthly net savings to the consumer. Underwriting relies solely on customers' bill payment history.

The embedded finance charge in the rates is 3 percent and the utility charges a 5 percent administration fee to the consumer. The maximum project size is $10,000. The utility will disconnect service if a consumer fails to pay the utility bill, including the tariff charge.

Landlords and owners are contractually obligated to disclose the efficiency agreements to prospective tenants and/or purchasers of the property. The utilities also must provide new customers notification of the meter charge when they begin electric service. (See Appendices B & C for sample documents.)

The program uses a $1 million, 10-year term Program Related Investment (PRI) from the Ford Foundation (priced at 1 percent for loan capital), and $600,000 in start-up and administration funds provided through a grant from the Ford Foundation to the Kentucky Housing Corporation. The PRI is made to MACED, a Kentucky-based Community Development Financial Institution (CDFI). MACED then provides a line of credit to the 15 participating utilities, which draw down that line of credit as they fund loans. Loans remain on the utilities' books, with the utilities taking credit risk in the event of customer default. MACED created a "principal is patient" structure, where an unpaid account has a grace period of 12 months during which time the utility only has to pay the interest. After 12 months the utility must pay in full.

The program is on track to fund 100 projects totaling $400,000 in the first twelve months of the pilot. Typical project sizes are $4,000-10,000. Because utility rates are low in Kentucky and the tariff charge must be less than the projected savings, most homes are able to finance around $4000 per job. Any remainder is covered through a combination of upfront customer contributions and rebates from the utility or Kentucky Home Performance with ENERGY STAR.

Discussion and Lessons

Why Pursue a Finance Program?

Program staff saw energy efficiency as an important strategy to avoid the capital costs of building new power plants, but felt that with the area's lower income population it would be impractical to ask customers to bear the full cost of an efficiency retrofit. Property

Assessed Clean Energy (PACE) programs tied to the property tax assessment became impractical, so an on-bill finance structure seemed like an appropriate option.

Financial Regulations

Financial regulations did not appear to apply to this CDFI/cooperative-run program.

Interest Rates and Terms

Extended terms and low interest rates allow the utility to offer a program that provides immediate cost savings on a monthly basis to customers. The flexible capital source from the Ford Foundation PRI made this structure possible.

Partial Payments and Order of Payments

N/A

Billing Systems

Billing system challenges were minor depending on the circumstances of the participating cooperatives. For one cooperative, the billing system changes were implemented with only a few hours of labor by an internal staff person. For another coop which used an outside billing service, the changes cost a few hundred dollars. Many cooperatives rely on an outside billing service.

Other Considerations

This program provides a structure that may attract significant amounts of private capital because a CDFI takes out a single loan from a foundation, and then uses that loan to provide a draw-down, construction-like line of credit to utilities. Utilities then use the on-bill structure with streamlined underwriting criteria to provide loans to customers. Utilities need only opt-in to the program, and can rely on the capital and financial structure provided by the CDFI and the billing systems provided by an outside entity.

Massachusetts: Mass Save[14]

Table 7: Mass Save® Program Information and Characteristics

Type of Utility(s)	Investor-owned utilities
Size of Utility Customer Base	Varies
Website	www.masssave.com
Program Administrator	Mass Save® is an initiative sponsored by Massachusetts' gas and electric utilities and energy efficiency service providers, including Columbia Gas of Massachusetts, The Berkshire Gas Company, Cape Light Compact, National Grid, New England Gas Company, NSTAR, Unitil, and Western Massachusetts Electric Company. The Sponsors of Mass Save work with the Massachusetts Department of Energy Resources.
Start Date/End Date	2006 – present
Eligible Sector(s)	Owner occupied 1- to 4-family existing homes
Eligible Measures	Attic, wall, and basement insulation, high efficiency heating systems, high efficiency domestic hot water systems, solar hot water systems, 7-day digital programmable thermostats, ENERGY STAR® qualified replacement windows
Capital Source and Cost of Capital	Rate-based funding is used to buy rates down to 0%. Capital is provided by banks and credit unions, sourced at Prime +1% with a floor of 5%.
Financing Term Maximum	7 years
Interest Rate or Customer Charge and Fees	0%
Disconnection for Non-Payment	Loan defaults are not tied to utility service and will not result in termination.
Disclosure or Lien?	No

This investor-owned utility program provides an example of a program that uses a partnership of investor-owned utilities providing an interest rate buydown and robust delivery infrastructure to stimulate Massachusetts banks and credit unions to fund loans in the residential sector and, as of 2011, the commercial and residential rental sector.

In 2006, the State of Massachusetts implemented Mass Save®, an initiative sponsored by a consortium of Massachusetts' gas and electric utilities and energy efficiency service providers, including Columbia Gas of Massachusetts, The Berkshire Gas Company, Cape Light Compact, National Grid, New England Gas Company, NSTAR, Unitil, and Western Massachusetts Electric Company. This energy efficiency loan program offers unsecured

[14] This section based heavily on personal interviews and communication with Jerry Hanna, Residential Efficiency Program Manager, National Grid.

consumer loans with zero percent interest and a 7-year term for 1- to 4-family existing homes.

Twenty-three participating banks and credit unions perform the origination, underwriting and servicing. Standards differ by lender but a typical qualification is a credit score of greater than 620. To date, the program application approval rate is 87% with an average credit score of 734.[15] The average loan size rose from $6,860 in 2006 to $8,080 in 2010.[16]

The program uses utility funds to buy down the interest rate to 0% from market rates (defined as Prime plus 1% with a floor of 5%). The typical cost to buy down from 5% to 0% is approximately 15% of the loan amount (3:1 buydown ratio). In other words, utility cost is about $1,500 on a $10,000 loan.[17] Default rates are less than 1%.

The process for this loan:[18]

1. Properties undergo a qualifying home energy assessment through Mass Save (no cost).
2. Homeowner selects approved measures for improvement (including contractor bids).
3. Homeowner submits a HEAT Loan form for pre-approval.
4. Contractor/customer submits completed and finalized application/invoice to lender.
5. Lender issues dual signature check to customer (in name of contractor).
6. Customer signs bank issued check acknowledging work completed satisfactorily and remits to contractor.

Table 8: Mass Save® Program Results[19]

Year	Annual Loan Volume	# of Loans Issued
2006	$3,649,346	532
2007	$5,087,889	690
2008	$7,428,165	1014
2009	$19,095,819	2441
2010	$27,607,121	3416
Total	**$60,868,340**	**8093**

[15] "Mass Save® Residential HEAT Loan: Summary Results 2006-2010," Massachusetts Department of Energy Resources. April 2011.
[16] Ibid.
[17] Ibid.
[18] Ibid.
[19] Ibid.

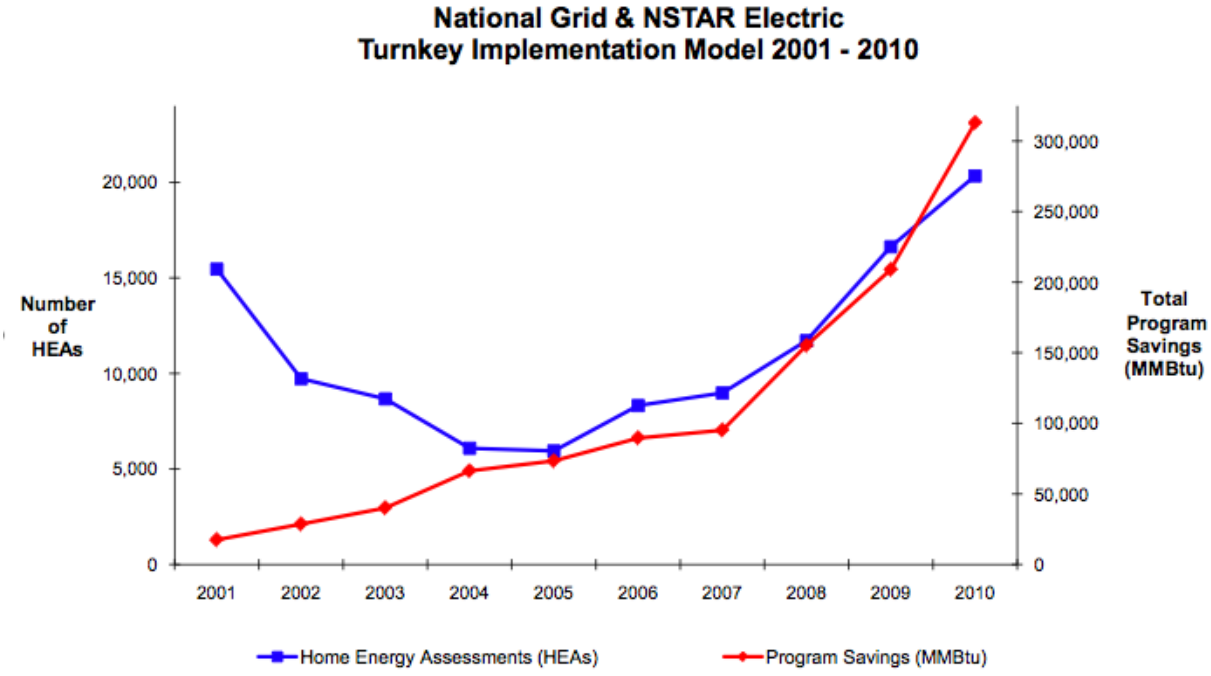
Discussion and Lessons

Why Pursue a Finance Program?

The Massachusetts utilities had previously experimented with efficiency programs that focused on: a) information alone; b) rebates and information; and c) rebates, information and financing. It became clear to the program administrators that financing is essential to the success of the program because overall participation increased significantly with an easy-to-access finance program that allows customers to install energy efficiency devices with zero upfront cost.

National Grid finance program managers pointed to the marked increase in energy savings that ensued after the company began to offer a financing program in 2006 (see Figure 3). With the financing program in place, the utility is realizing conversion rates (audits to actual projects) of more than 40 percent. For comparison, with a program based solely on informational materials without financing or rebates, the utility saw conversion of rebates to projects of only 11 percent. According to the program manager, state regulators view the financing program as a cost-effective use of program dollars.

Figure 3: National Grid & NSTAR Electric Turnkey Implementation Model 2001-2010[20]



[20] Chart courtesy of Jerry Hanna, National Grid.

Financial Regulations
Utilities do not originate the loans and do not provide lending capital. Utilities connect consumers to the banks and then provide an interest rate buydown. As a result, the banks, not the utilities, must comply with the relevant financial regulations. Banks do all collections and servicing for the program.

Interest Rates and Terms
The interest rate for the program is zero percent as a result of a utility rate buydown. The program views this as a marketing tool and a way to make it simple for consumers to understand.

Partial Payments and Order of Payments
EE loan billing for this program is separate. A customer must pay both an EE loan and their utility bill. Only non-payment of the utility bill can lead to termination of service.

Billing Systems
No billing system changes were required for this program.

Other Considerations
Operating an easy, streamlined system is critical. National Grid had previously operated a finance program using in-state banks that was complex and cumbersome for the customer. However, they worked with the banks to streamline the process in a number of ways; for example, most customers no longer need to visit the bank to close a loan. Simplifying the process has resulted in a significant improvement in overall project and loan volume.

The program does not require customers to choose between financing or rebates. Customers can access both effectively making it an additional incentive.

New Hampshire: Public Service of New Hampshire – Municipal SmartStart Program[21]

Table 9: Municipal SmartStart Program Information and Characteristics

Type of Utility	Investor-owned utility
Size of Utility Customer Base	400,000
Website	www.psnh.com
Program Administrator	Public Service of New Hampshire (PSNH)
Start Date/End Date	2001 – current
Eligible Sector(s)	Municipalities (including schools)
Eligible Measures	Street lighting; lighting upgrades; HVAC
Capital Source and Cost of Capital	Systems Benefits Charge
Financing Term Maximum	No more than ¾ of useful life of measures
Interest Rate or Customer Charge and Fees	Monthly customer charge will not exceed 2/3 of the projected energy cost savings, effectively guaranteeing monthly savings for the customer in all cases. In addition, customer pays a one-time fee of 5% to create a loss reserve fund to protect the utility against bad debt risks.
Disconnection for Non-Payment	Yes
Disclosure or Lien?	Property owner/landlord is required to disclose the obligation to successor customers at the location. If original owners chose an accelerated payment plan, the new customer has the choice to either assume accelerated plan or go to a standard payment plan.

This investor-owned utility finance program is included in this report because it offers an example of a finance program focused on government facilities. The program is structured as an on-bill tariff, meaning in this case that it is part of the utility electric bill to the participating local governments. In some respects, this program avoids one of the more challenging aspects of on-bill tariff programs (transfer of payment obligation from one occupant of a facility to a new occupant of the same facility) because local governments do not move.

Public Service of New Hampshire (PSNH) offers an on-bill tariff to local governments that seek to implement energy efficiency projects. This program began as a pilot program approved on November 29, 2001, and is not open to customers outside the local government sector. On December 30, 2004, the New Hampshire Public Utilities Commission (NHPUC) ended the pilot phase of the program and ordered the utility to

[21] This section based heavily on personal interviews and communication with Steven Elliott, Energy Efficiency Programs, Public Service of New Hampshire.

continue offering the tariff-based programs.

The PSNH Municipal SmartStart Program operates through a four-step process:[22]

1. PSNH applies rebates for all eligible retrofit measures.
2. PSNH finances the remaining costs associated with purchase and installation of approved measures.
3. A SmartStart Purchase and Installation Charge, set at two thirds of the monthly energy cost savings, is added to the municipal government's monthly electric bill. The term of financing is for not more than 75% of the useful life of the equipment installed. Program participants are guaranteed a net monthly savings.
4. The new energy-efficient equipment installed through this program pays for itself over time.

It is important to note that a financing program designed for a government entity is far different than one designed for a private entity. Government entities can assume long-term financing obligations, and do so as a matter of course. Lenders generally are willing to lend to government entities because, for the most, they are at least partially creditworthy. The advantage of offering an on-bill tariff to a government entity is that the tariff is not considered to be debt to the government. Therefore, the government entity need not go through an authorization or appropriation process that would be required for it to assume debt; such a process involves public hearings and may not be available if the government entity is near its debt limits. By using an on-bill tariff, the government entity simply continues to pay its utility bill at a rate that incorporates the efficiency tariff.

The PSNH program grew steadily from 2005 to 2009, and PSNH invested close to $900,000 in the loan program in 2009. Those investments are projected to result in total bill savings to participants of $3.25 million. As might be expected in a financing program in which the government is the borrower, default rates were nil.[23]

New legislation enacted in early 2010 cut overall energy efficiency program budgets and the SmartStart program was substantially scaled back; the number of new loans in 2010 was only at about 25 percent of 2009 levels.[24]

Discussion and Lessons

Why Pursue a Finance Program?

Unlike commercial or residential borrowers, local governments are stable and generally creditworthy because of their taxation powers. It is extremely rare for local governments to declare bankruptcy and, unlike homeowners or businesses, they do not move (thus avoiding the concerns about transferring payment obligations from one occupant to the next). In some respects, observers in New Hampshire reported that the utility did not see a

[22] Ibid.
[23] Energy Efficiency Institute Inc., *Status Report for Programs Based on Pay As You Save® (Place: EEI Inc.,* Sept. 1, 2010).
[24] PSNH-11-22-10-112210 3rd Qtr 2010 Filing.

major difference between tariff-type and other long-term financing; this fact added considerably to the utility's comfort level with the program.[25]

Local government entities often are required to complete complex processes to assume new debt. The SmartStart program, structured as a part of local governments' energy bills, did not require that they assume additional debt; the repayment was viewed as part of their electric service. This characteristic of the program makes it particularly attractive for local government entities.

[25] Commissioner Clifton Below, New Hampshire Public Utilities Commission, personal communication with author, January 2011.

Oregon: Clean Energy Works Oregon[26]

Table 10: Clean Energy Works Oregon Program Information and Characteristics

Type of Utility	Investor-owned utilities: NW Natural, Pacific Power and Portland General Electric
Size of Utility Customer Base	2,200,000
Website	www.cleanenergyworksoregon.org
Program Administrator	Clean Energy Works Oregon
Start Date/End Date	2010 – current
Eligible Sector(s)	Residential
Eligible Measures	Weatherization, home heating
Capital Source and Cost of Capital	Public and private; Cost of Capital: 3.5%
Financing Term Maximum	20 years
Interest Rate or Customer Charge and Fees	5.99 %
Disconnection for Non-Payment	No
Disclosure or Lien?	Deed of Trust

This Oregon program provides an example of a partnership between utilities, government and a community development lender. It provides an example of one way to incent utilities to place a payment obligation on the utility bill and to use a combination of several sources of capital.

Oregon enacted HB 2626, the Energy Efficiency and Sustainable Technology Act (EEAST) in 2009. The law provides easy-to-use financing for residential and commercial energy efficiency and renewable energy projects in Oregon by providing 100% upfront long term, low-interest loans to property owners that can be paid back on the utility bill. A pilot energy efficiency finance program in Portland known as Clean Energy Works Portland (CEWP) was already in operation at the time, and Clean Energy Works Oregon (CEWO) became a new program to replace CEWP.

The CEWP pilot stopped accepting new applicants in March 2011, with the launch of the expanded CEWO program. As of June 4, 2011, after nearly two years of operation, CEWP had assessed 979 homes, with 563 projects completed, and an additional 29 projects still in

[26] This section based heavily on personal interviews and communication with Andria Jacobs, Portland Bureau of Planning and Sustainability and Adam Zimmerman, Senior Vice President, Enterprise Cascadia.

progress. Energy efficiency measures most commonly included were air sealing (94 percent), insulation (91 percent), and duct sealing (30 percent).[27]

The utilities' responsibilities are to: 1) provide with utility bill history for loan underwriting criteria; 2) add a line item to the utility bill; 3) collect payments; 4) transfer payments to the relevant financial institution; and 5) close out accounts. Utilities receive $5 for providing utility bill history and approximately $5 per loan per month for costs associated with utility pass-through of loan repayments.

CEWO customers do have the option to transfer payment obligation to a new occupant through an arrangement in which either party pays an $850 transfer fee to the fund manager. The $850 fee covers administrative costs to underwrite the new occupant and to close and reopen accounts. No such transfers occurred during the pilot program.

At $12,300, the average project size is larger than is common in most financing programs. Project costs range from $1,300 to $22,500.[28] The maximum allowable maximum project size is $30,000. Loans are repaid over a period of up to 20 years at an interest rate of 5.99 percent, with underwriting done on the basis of a combination of utility bill payment history and credit scores. The lender filed a deed of trust on the loan, so the loans are technically a second mortgage product.

Discussion and Lessons

Why Pursue a Finance Program?

At the end of the pilot-phase, CEWP administered a survey to program participants. One question was asked to help understand what they might have done had they not had access to the CEWP financing program. Of the 31 participants surveyed, 42 percent completed the survey and provided feedback about their experience.

Of the 13 respondents:

- Ten reported they would not have completed the same project at all.
- One respondent reported that they would have completed their project, but postponed it for at least one year.
- One respondent reported that they would have completed their project without the program.

Financial Regulations

Utilities are not subject to lending regulations in this program. All loans are held on the participating financial institution's books.

[27] Ibid.
[28] Blue Tree Strategies. *"Pilot Program Data Analysis."* Accessed April 14, 2011.

Partial Payments and Order of Payments

Partial customer payments go first to the energy charges with any amount over what is applied to the energy charge going to the loan. If the loan is not paid within 90 days, the participating financial institution can request that the utility remove the loan payment from the utility bill and assign the receivable to the financial institution, with that financial institution then responsible for further collections or taking the loss. Contacts at the participating financial institution noted that the first unpaid loans had been removed in early February 2011.

Billing Systems

All three participating utilities reported that they had adapted their billing systems to allow for loan payment collection. Additionally, all had to consider how the loan payment would work for "equal pay" customers. The loan payment is derived by adding interest and principal and dividing the total by 239 equal payments. Equal pay customers do not experience seasonal variation in their energy bills because their energy use is averaged over the year to create a flat, predictable energy bill. Adding a loan payment to the bills of these customers should theoretically be simple, but all three utility contacts reported having to work with the billing system staff to add the loan payment without affecting the equal pay algorithm. In one case, equal pay customers appeared to be in arrears until the utility revised the payment allocation assumptions. All three utility contacts reported that they had resolved the issue.

Utility contacts mentioned other scenarios in which customer bill payment habits had resulted in unintentional arrearages. These scenarios revealed some of the mechanics of the bill assessment and credit processes and reflects the way people approach their utility bills. In one scenario, a customer was habitually paying their bill within a floating "window" or grace period where the bill might be late, but not officially in default—because of this gap, a customer's bill might have two months assessed, only one of which was current. This rolling payment allocation interfered with automatic allocation of additional funds to the loan payment. In another scenario, a customer set up automatic electronic, flat payments and let the bank automatically deduct the payment. Because the payment amount did not fully cover the loan payment, the difference built up each month. In both cases, as soon as the issue was identified, it was resolved.

All three utility contacts reported that adding the loan payment to customer bills required manual set up, and many of these bills continued to be reviewed manually—at least in the first few months of loan payment.

South Carolina: Rural Energy Savings Program[29]

Table 11: Rural Energy Savings Program Information and Characteristics

Type of Utility	Electric Cooperatives
Size of Utility Customer Base	Multiple utilities
Website	www.eesi.org/resp
Program Administrator	The Electric Cooperatives of SC, Central Electric Cooperative, and KW Savings Co.
Start Date/End Date	2010 – present
Eligible Sector(s)	Residential
Eligible Measures	Energy efficient heat pumps, replace strip resistance, electric furnaces, duct sealing, insulation, weatherization
Capital Source and Cost of Capital	Self-funded; USDA Rural Economic Development Loan Cost of Capital: 0%
Financing Term Maximum	10 years
Interest Rate or Customer Charge and Fees	2.5%; no program fees
Disconnection for Non-Payment	Yes, at utility's option
Disclosure or Lien?	The utility has the option of filing a UCC lien. A notice of meter conservation charge (not a lien on real estate) must also be filed with the county register of deeds.

This program provides an example of another cooperative utility offering an on-bill tariff program. The program is new and therefore has little in the way of performance data, but it is unique in that it has been able to access capital from the U.S. Department of Agriculture (USDA) to capitalize the program.

On March 9, 2010, South Carolina passed a law (Act 1096), authorizing electricity and natural gas providers to offer on-bill financing for installation of energy efficiency and conservation improvements.[30]

The Electric Cooperatives of South Carolina (ECSC), Central Electric Power Cooperative, Inc. (Transmission), Santee Cooper (Generation), and eight of the state's member-owned distribution cooperatives,[31] are participating in a pilot program using on-bill financing to

[29]This section based heavily on personal interviews and communication with Mike Couick, President and CEO of Electric Cooperatives of South Carolina.
[30] Information retrieved from http://www.scstatehouse.gov/sess118_2009-2010/prever/1096_20100309.htm on Feb. 15, 2011.
[31] The participating cooperatives are: Aiken Electric Cooperative, Black River Electric Cooperative, Broad River Electric Cooperative, Horry Electric Cooperative, Palmetto Electric Cooperative, Pee Dee Electric Cooperative, Santee Electric Cooperative, and Tri-County Electric Cooperative.

finance efficiency. The program began operation on July 1, 2011. The Environmental and Energy Study Institute, funded with a grant from the Doris Duke Charitable Foundation, is advising the pilot program and will issue a report on its results in the fall of 2012 after one year of data has been collected and analyzed.

The pilot program plans to make 100 loans during the second half of 2011. Eligibility is determined by whether a Building Performance Institute (BPI) home energy audit shows that the borrower's projected monthly savings will exceed the cost of repaying the loan. The utility will also look to the borrower's bill payment history, and it has the right to disconnect service for non-payment. The utility may also file a UCC-1 statement[32] to add some additional security to the loan if deemed necessary.

The sources of funds for the loan program are Central and a Rural Economic Development Loan from the U.S. Department of Agriculture. Low-cost capital from USDA made a very low interest rate possible for this program. Combined with a focus on the electric heat market segment, affordable financing has made it possible to project net positive cash flows to consumers after accounting for energy cost savings and principal and interest payments.

The program's long-term goal, which is contingent on securing affordable loan capital, is to reach approximately 200,000 homes.

Discussion and Lessons

Why Pursue a Finance Program?

South Carolina's electric cooperatives are currently dependent on coal powered generation for 84 percent of their electricity. They have identified energy efficiency as the least-cost alternative to coal powered generation, especially when compared to nuclear generation, which is presently the only other viable option available to meet demand in South Carolina.

South Carolina electric cooperatives view on-bill financing as the best way to make energy efficiency home improvements available to their members on a large scale. The cooperatives also point to a report from research economist Dr. Donald Schunck citing the co-op program's potential as an economic development engine that would create thousands of new jobs for energy auditors and residential contractors in their local communities, including those counties with persistent poverty.

[32] UCC-1 is one of the standard mortgage documents listed in the Uniform Commercial Code. The UCC-1 Statement lists and describes any personal property that is provided by the borrower as collateral for the loan. This document must be filed with either the Secretary of State or another appropriate official.

Financial Regulations

The pilot program has engaged the ECSC's credit union to conduct some aspects of the program associated with the loan transactions. The pilot project relied on the advice of legal counsel to ensure compliance with applicable state and federal regulations.

Interest Rates and Terms

The program offers unsecured residential loans with a term of up to 10 years and an interest rate of 2.5 percent. Loans range from $1,000 to $10,000; estimated average loan amounts will be $7,500.

Billing Systems

Although the initial start-up period has revealed some minor problems with billing (in part because of the number and diversity of participating cooperatives), the difficulties have not been severe enough to threaten the program. About two-thirds of the cooperatives outsource all their billing through SEDC, a leading-edge information technology cooperative that serves Tennessee Valley Authority and other distribution utilities nationwide. SEDC software can be modified, using a financing-type module, to accommodate an on-bill financing structure. The other one-third of participating utilities rely upon two other billing systems.

Other Considerations

The on-bill financing pilot program is new, and its results will not be finalized until the fall of 2012. It is the latest piece of a multi-year research effort aimed at understanding and tapping the energy efficiency potential of South Carolina's cooperative-served territories, which cover 70 percent of the state. Beginning in 2010, co-ops began installing individual weatherization measures in approximately 1,200 mostly manufactured homes through a funding partnership with the South Carolina State Energy Office. The data gathered from these homes is helping to demonstrate the real and cost-effective potential of residential energy efficiency retrofits such as new high efficiency heat pumps, reflective roofs, ENERGY STAR appliances and more.

Arizona: Arizona Public Service Company

Table 12: Arizona Public Service Company Program Information and Characteristics

Type of Utility	Investor-owned utility
Size of Utility Customer Base	1.1 million customers in Arizona, including approximately 978,000 residential and 119,000 commercial customers
Website	www.aps.com
Program Administrator	APS
Start Date/End Date	2010 – current
Eligible Sector(s)	Residential and non-residential
Eligible Measures	*Residential:* Duct sealing, Air sealing, Insulation, Shade screens, Qualified HVAC equipment, Variable and dual speed pool pumps, Tightwatt pool timer, CFL lighting retrofits, Solar water heaters *Non-residential*: varies upon incentive choice
Capital Source and Cost of Capital	Third party capital and APS shareholder investment.
Financing Term Maximum	*Residential:* unsecured up to 60 months and secured up to 120 months *Non-residential:* 12-60 months
Interest Rate or Customer Charge and Fees	*Residential:* APS would invest in an interest bearing Guaranty Reserve Account in order to allow customers to obtain below market interest rates ranging from 6.50 – 7.99 percent.[33] *Non-Residential:* 3.99 – 6.24 percent
Disconnection for Non-Payment	N/A
Disclosure or Lien?	N/A

This new program therefore has relatively little data available for detailed program analysis. However, it is included in this report as an example of a creative energy efficiency financing approach in the Southwest region.

The Arizona Corporation Commission issued two decisions requiring Arizona Public Service (APS) to offer an energy efficiency financing product in 2010. The first (Decision No. 71460) approved the Non- Residential Customer Repayment Financing option.[34] The second (Decision No. 71866) approved the Residential Energy Efficiency Financing option (REEF).[35] Directed by these decisions, APS partnered with the National Bank of Arizona (NBAZ) to offer these financing programs.

[33] Arizona Corporation Commission, DOCKET NO. E-01345A-08-0172, DECISION NO. 71 866, September 2010.
[34] Arizona Public Service Company, Demand Side Management Semi-Annual Report, September 2011.
[35] Ibid.

Non-residential Customer Repayment Financing Option

Initially, the Non-residential Customer Repayment Financing option included schools, municipalities and small businesses. However, Decision No. 72088 expanded these parameters to include all non-residential customers.[36] Launched in May of 2010, the APS Solutions for Businesses offers incentives for a prescriptive approach, a custom approach, technical assistance or energy study,[37] or Energy Information Services (EIS).[38] The incentives covered are capped as follows:[39]

- Prescriptive Retrofit: 75% of incremental measure cost
- Prescriptive New Construction: 75% of incremental measure cost
- Express Solutions Measures: 90% of incremental measure cost
- Custom Retrofit: 75% of incremental measure cost
- Custom New Construction: 75% of incremental measure cost
- Technical Assistance (Studies): 50% of study cost up to $10,000; 75% for retro-commissioning up to $20,000
- Energy Information Services: 75%, up to $12,000

New construction and major renovation projects are not eligible for financing. Financing cannot be provided for projects completed prior to program review, approval, and reservation of incentive funds.

***Interest Rate/Loan Amounts/Terms*[40]**

Interest rates are fixed and loan amounts and terms are as follows:

- $1000 - $2,500 12 months
- $2501 - $15,000 24 months
- $15,001 - $50,000 36 months
- $50,001 - $100,000 48 months
- Over $100,000 60 months

Application Process

The project and loan application process consists of 5 steps: [41]

1) Submit a pre-notification application.
2) Initial review/notification.
3) Submit NBAZ application for financing. All loans are processed through NBAZ. All loans $10,000 and over are subject to a loan documentation fee of up to $250.
4) Install equipment/perform approved work.

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[36] Ibid.
[37] The APS Solutions for Business Program offers incentives for four types of technical assistance services that investigate energy efficiency opportunities in existing facilities or in the design of new buildings. The 4 types are: feasibility studies, retro-commissioning, design assistance, commissioning services.
[38] EIS is a user-friendly online tool for tracking and analyzing a facility's energy consumption.
[39] Arizona Public Service Company, APS Solutions for Business Program Policies and Procedures, January 2011.
[40] Ibid.
[41] Ibid.

5) Submit Final Application/Final Application Review. (The NBAZ loan approval process will generally take from 1 to 5 business days after all required information and documentation has been submitted to the bank. Loan approval is subject to APS bill payment history and NBAZ credit review and underwriting.)

Residential Energy Efficiency Financing Option (REEF)

Launched in February 2011, the Residential Energy Efficiency Financing option (REEF, currently called APS Home Performance with ENERGY STAR® program) is offered to APS customers who have completed a $99 Home Energy Check-up. The following improvements qualify for this program:[42]

- Duct sealing
- Air sealing
- Insulation
- Shade screens
- Qualified HVAC equipment
- Variable and dual speed pool pumps
- Tightwatt pool timer
- CFL lighting retrofits
- Solar water heaters

Interest Rate/Loan Amounts/Terms[43]

- Loan amounts from $1,000 - $15,000
- Loan amounts for projects which include solar water heaters can be up to $20,000.
- No loan origination or documentation fees
- Fixed APR
- Unsecured loan options up to 60 months
- Secured loan options up to 120 months

Application Process[44]

1. Schedule an APS Home Performance with ENERGY STAR Checkup to identify potential home energy upgrades.
2. See how you may qualify for additional APS rebates.
3. Once your energy audit is completed, apply for financing through NBAZ.
4. Work with an APS qualified contractor to make recommended improvements.

Program Report: January 1 – June 30, 2011

During the first six months 2011, APS made 11 loans totaling $37,024, with zero defaults as of this writing (see Table 13).

[42] Information retrieved from http://www.aps.com/main/green/choice/choice_136.html October 2011
[43] Ibid.
[44] Ibid.

Table 13: APS Loans, January 1 – June 30, 2011[45]

Category	Number of Loans	Size of Loans
Large Existing	3	$96,458
Small	2	$6,737
Schools	1	$5,169
Total	6	$108,364

[45] Arizona Public Service Company, Demand Side Management Semi-Annual Report, September 2011.

VI. Conclusions

This paper examined several financing programs that used one or a combination of an on-bill structure, credit enhancement structures, utility capital or third party capital. One important conclusion from the study is that there are numerous ways to structure a utility finance program. On-bill structures that are frequently discussed in this context are only one among several different options. In addition, utility financing programs can be valuable for expanding the implementation of major energy efficiency projects in both the residential and small commercial sectors. Other high-level conclusions include:

- The capital source drives the structure of the finance program. Flexible capital sources that can allow for longer loan terms or lower interest rates can be key to making a financing program successful. Sources of this flexible capital may include utility ratepayer funds, system benefit funds, or grant money.

- Foundation program-related investment (PRI) funds could also be an important source of capital to seed energy efficiency financing programs.

- Current interest rates are low, and in a few cases are they are zero percent; however, a zero percent rate is not necessary for program success. A mix of rebates, low or moderate interest rates, and loan terms that produce an attractive cash flow for the consumer (energy cost savings that exceed principal and interest payments) may be most important to consumers.

- Utilities can play multiple roles in financing energy efficiency projects, and their role will vary according to the preferences of their management and regulators. Credit enhancements that attract private capital may be a good use of utility funds. However, utilities can play other roles as well, such as serving as collection agents when funds are provided by others.

- Implementing most forms of on-bill financing requires changes to utility billing systems, but the evidence shows that not all billing systems will require major overhauls. In fact, many cooperative utilities that use third party billing services may be able to make the necessary changes with minimal system upgrades.

- Losses resulting from non-payment of energy efficiency loans have been low or in line with other utility losses so far; however, most efficiency financing portfolios are relatively new and unseasoned. Careful program design, underwriting, collections and credit enhancements will be critical to continuing the good credit quality of these financing programs.

- Utilities should pay attention to financial regulations and be sure that they are either complying with or not subject to financial regulations at the state and federal levels. Programs should be designed carefully to address concerns with financial regulations.

Appendix A: Summary of Program Characteristics

Program	California: Sempra Energy Utilities	Connecticut: Small Business Energy Advantage	Georgia: How$mart	Hawaii: SolarSaver
Program Administrator	Southern California Gas Co. and San Diego Gas &Electric	United Illuminating	Habersham Electric Member Cooperative	Hawaiian Electric Company
Start/End Date	2006 – present	2000 – present	2009 – present	2007 – 2009
Eligible Sector(s)	Commercial, industrial, government and non-owner occupied multi-family	Small business under 200kW average 12 month demand	Residential	Residential
Eligible Measures	All business energy efficiency rebate and incentive programs	Lighting/Controls, Refrigeration/Controls, HVAC, Motors (ECMs), Bldg Management Systems	Heat pumps; windows, doors; water heaters; ductwork, vents; insulation; caulking; heat pump water heaters; lighting	Solar Water Heaters
Capital Source	Utility rates (ratepayers)	Incentives from the Public Fund, and Shareholder funds	American Recovery and Reinvestment Act (ARRA) and Georgia Environmental Facilities Authority.	Utility Ratepayer Funds
Financing Term Maximum	5 years for business customers and 10 years for government/institutional customers	4 years	5- or 10-year terms	12 years
Interest Rate or Customer Charge and Fees	0%, no fees	0%	0% financing for up to $5,000 (5-year term), 5 % financing for >$5,000 (10-year term). No program fees	Monthly customer charge will not exceed 2/3 of the projected energy cost savings, effectively guaranteeing monthly savings for the customer in all cases. Typical customer charge ranges from $30-$65.
Disconnection for Non-payment	None	None	Yes	Yes
Disclosure or Lien	Yes, disclosure	Yes	Restrictive covenant filed	Property owner/landlord is required to sign a separate contract committing to disclose the obligation to successor customers at the location. Utility ordered to submit SSP agreement to land and title records in the Bureau of Conveyances of the State of Hawaii.

Program	Kansas: How$mart	Kentucky: How$mart	Massachusetts: Mass Save	New Hampshire: SmartStart
Program Administrator	Midwest Energy Inc.	Multiple cooperative utilities with Mountain Association for Community Economic Development (MACED)	National Grid	Public Service of New Hampshire (PSNH)
Start/End Date	2007 – present	Spring 2011 through Spring 2013	2006 – present	2001 – present
Eligible Sector(s)	Residential and Commercial	Residential	1- to 4-family existing homes	Municipalities (including schools)
Eligible Measures	Insulation; Air sealing; HVAC; Geothermal loops; Commercial Lighting	Residential: Air sealing; HVAC; insulation	Heating/H2O, Insulation, Solar H2O, Windows	Street lighting; lighting upgrades; HVAC
Capital Source	Utility Funds, Kansas Housing Resources Corporation, Efficiency Kansas (ARRA funds), and other sources.	*Current funding sources:* $500,000 from MACED & $1 million loan from the Ford Foundation for capitalization. KY Housing Corporation provided $300,000 in operating funds. Ongoing operations funded from general support.	Ratepayer funding	Systems Benefits Charge
Financing Term Maximum	Residential: 15 years or ¾ of the expected life of the measure, whichever is less; Commercial: 10 years	Residential: 75% of the estimated life of the measure or 15 years, whichever is less.	7 years	No more than ¾ of useful life of measures
Interest Rate or Customer Charge and Fees	0-6.8% In addition, a fee of up to 5% of project investment may be added to the principal balance owed. Customer monthly charges will not exceed 90% of the projected energy cost savings.	3% Interest rate; Fee of 5% of project cost, capitalized into the amount financed	0%	Monthly customer charge will not exceed 2/3 of the projected energy cost savings, effectively guaranteeing monthly savings for the customer in all cases. Customer pays a one-time fee of 5% to create a loss reserve fund to protect the utility against bad debt risks.
Disconnection for Non-payment	Yes	Yes	No	Yes
Disclosure or Lien	UCC fixture filing lien placed on property; disclosure of payment obligation required at sale.	Owner/landlord contractually obligated to disclose the EE agreements to prospective tenants and/or purchasers of the property. Utilities must file a UCC filing on the title. The utilities must notify new customers of the meter charge when they begin service.	No	Owner/landlord is required to disclose the obligation to successor customers at the location. If original owners chose an accelerated payment plan, the new customer has the choice to either assume accelerated plan or go to a standard payment plan.

Program	Oregon: Clean Energy Works Oregon	South Carolina: Rural Energy Savings Program	Arizona: Arizona Public Service
Program Administrator	Clean Energy Works Oregon	The Electric Cooperatives of South Carolina, and KW Saves	APS
Start/End Date	2010 – present	2010 – present	2010 – current
Eligible Sector(s)	Residential	Residential	Residential and non-residential
Eligible Measures	Weatherization, home heating	Heat pumps, strip resistance heating, electric furnaces, duct sealing, insulation, weatherization	*Residential:* Duct sealing, air sealing, insulation, shade screens, qualified HVAC equipment, variable and dual speed pool pumps, Tightwatt pool timer, CFL lighting retrofits, solar water heaters *Non-residential*: Varies upon incentive choice
Capital Source	Public, private	Self-funded, and USDA Rural Economic Development Loan	Third party capital and APS shareholder investment.
Financing Term Maximum	20 years	10 years	*Residential:* Unsecured up to 60 months; secured up to 120 months *Non-residential:* 12-60 months
Interest Rate or Customer Charge and Fees	5.99%	2.5% and no program fees	*Residential:* APS would invest in an interest bearing Guaranty Reserve Account in order to allow customers to obtain below market interest rates ranging from 6.50-7.99%. *Non-Residential:* 3.99-6.24%
Disconnection for Non-payment	No	Yes, at utility's election.	N/A
Disclosure or Lien	Deed of trust	Yes, notice of meter conservation charge (not a lien on real estate) must be file with the local register of deeds, and a UCC financing statement may be filed at the utility's option.	N/A

Appendix B: KY Energy Retrofit Program – Automated Utility-Generated New Retrofit Customer Transfer Form

KY Energy Retrofit Program Model Form
Automated Utility-Generated New Retrofit Customer Transfer Form

New service start date: _____, 20 ___ Location ID# :_____

Customer Name: _____ Account Number: _____

Address: _____ Customer is: _____Tenant _____Owner

_____ Occupancy: _____ Owner _____ Renter

To save energy costs, Retrofit measures were installed at the above location where you have requested Company utility service. Monthly Retrofit charges will appear on your utility bill. The savings are estimated to be greater than the charges. The specific Retrofit measure(s) installed, the monthly payment, number of remaining payments and savings estimate(s) are noted below.

Retrofit Measure(s)	Monthly Payment	Est. Number Payments	Projected Cost	Estimated* Monthly Savings
Retrofit Measure Totals				

Date payments started_____, outstanding balance_____, expected payoff date_____*
*Savings estimates were developed by _____ prior to measure(s) installation on _____, 2____.
☐ If box is checked, some of your estimated savings will appear on another utility's monthly bill.

If Customer is a tenant, Customer is obligated to:
1. Make consecutive monthly payments specified above to Company as part of the utility bill until all payments have been made or until Customer no longer has an account with Company at this premise, whichever occurs first. Customer is not responsible for Retrofit obligations in these circumstances:
   (1) Landlord will assume the payment obligation at any time utility service is in the Landlord's name.
   (2) Landlord will assume the payment obligation anytime a Retrofit measure fails or is removed and after Customer notice the Landlord fails to repair or replace it within thirty (30) days. The Retrofit repayment obligation will revert to the tenant upon repair or replacement of failed measures.

2. Promptly notify Landlord of any Retrofit measure failures or maintenance needs. Responsibility for costs of maintenance and repairs shall be governed solely by the lease or rental agreement between the Landlord and Customer, subject to Kentucky law.

If Customer is the property owner, Customer is obligated to:
1. Make consecutive monthly payments specified above to Company as part of the utility bill until all payments have been made or another party assumes responsibility for utility bill payment at this premise, whichever occurs first. If any Retrofit measure should fail to operate properly and upon written notice to Company, Customer may suspend payment of Retrofit obligation for a maximum of sixty (60) days while the company arranges for repairs. Any such suspension will extend the Retrofit obligation until all required payments are made. Company may refuse suspension of payments if failure of the Retrofit measure cannot be substantiated.

2. Maintain the installed Retrofit measure(s) in place for at least as long as there are payments due and be responsible for all required maintenance and for all costs incurred from failure to properly maintain the measure(s).

Appendix C: KY Energy Retrofit Program – Transfer Customer Retrofit Disclosure Form

KY Energy Retrofit Program Model Form
Transfer Customer Retrofit Disclosure Form

Energy Retrofit measures were installed at this location to save on utility costs. Monthly Retrofit charges will appear on your electric/gas bill. The savings are estimated to be significantly greater than the charges.

Read below to understand what this means.
This form should be signed prior to signing a lease or purchase agreement for this property.

Property Address: _____ Unit #: _____

Location ID: _____

Whoever pays the utility bills at this location will be required to make monthly payments to Company for cost-saving energy Retrofit measures installed here. Payments will continue until the required number of payments for these measures has been paid. These measures were installed to lower the utility bills for this location. If you decide to occupy the premises you will get these lower utility bills. Therefore, you will help pay for these products as long as you receive the savings and there are remaining payments to be paid. The savings are estimated to be greater than the charges.

If you want more information **before buying this property or signing a lease**, you can call Company (1-800-000-0000) to learn about the:

- Specific Retrofit measures installed,
- Monthly payment amount,
- Number of payments remaining, and
- Your estimated savings.

When you request utility service, Company will send you a form outlining your Retrofit related Customer Responsibilities, including:

- Making monthly payments,
- If you rent, promptly reporting to your landlord if a Retrofit measure stops working, and,
- If you own the property, maintaining the measures in good working condition as long as payments are due.

My signature below indicates that I have read or have had this form read to me. I understand my obligation to make monthly payments for the Retrofit measures installed at this location should I choose to rent or buy the premises. I am signing this form before signing any purchase or lease agreement.

(Purchaser/Renter) Signature_____ Date _____

(Purchaser/Renter) Name (print) _____