WHAT HAVE WE LEARNED FROM ENERGY EFFICIENCY FINANCING PROGRAMS?

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FOREWARD

This report is part of a series being issued to facilitate improved energy efficiency financing programs that substantially increase the implementation of energy efficiency projects in the residential and commercial sectors. The goal of this series is to provide a set of tools that make it easier for states, municipalities, utilities, and private lenders to learn from past experience and offer effective energy efficiency programs going forward—programs that can provide capital to increase the pace of residential and commercial building energy efficiency implementation. The work was undertaken under contract with Argonne National Laboratory, with funding from the U.S. Department of Energy.

This particular report is designed to summarize the results and lessons learned from energy efficiency finance programs that have moved beyond the initial start-up phase; it is written for energy efficiency program planners and implementers. Also in the series are (1) *Energy Efficiency Finance 101: Understanding the Marketplace*, an introduction to the field of energy efficiency finance, designed for those who are new to the field or for those who want a quick "refresher;" and (2) a forthcoming more in-depth look at on-bill financing and ways to address some of the unique opportunities and challenges of this financing approach.

We hope you find this series useful and we welcome your feedback on it, and other steps ACEEE should consider for encouraging increased use of energy efficiency finance.

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EXECUTIVE SUMMARY

The building sector consumes about 74% of the electricity used in the United States (EIA 2011a). ACEEE and others have found that electricity consumption can be cost-effectively reduced by about 20–30% in the next 10–15 years (Eldridge et al. 2010; Granade et al. 2009). These savings would reduce annual electricity consumption in the residential and commercial building sector by over 695 billion kWh annually (EIA 2009). These savings are enough to power the entire western United States (including Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming) for a year (EIA 2011b). This reduction would mean a reduction in electricity bills for American consumers and businesses by over $78 billion per year.[1] Similarly, natural gas consumption can be cost-effectively reduced by approximately 22% in the near term (Eldridge et al. 2010). This would save over 1,795 billion cubic feet of natural gas annually, which equates to over $20 billion per year of reduced energy bills for consumers.[2] This is more than enough to offset the natural gas consumed to heat hot water by every household in the U.S. (EIA 2005). These numbers don't account for the corollary energy benefits of improved building efficiency such as improved occupant comfort and safety.

Loan programs are a mechanism used to help achieve energy savings in the building sector by providing financing to pay for energy efficiency retrofits. While several programs have many years of experience and have issued thousands of loans, this market has yet to come to scale. There is a lack of information, uniformity, and standards that make it difficult for private lenders to evaluate the risk these types of loans present. The lack of uniformity also makes it difficult to package these small loans into larger portfolios for sale to larger financial institutions on the secondary market. Without access to private capital there will be limited funding for efficiency retrofits—and the associated jobs, energy and cost savings, and environmental benefits will not be realized.

This report is a first step toward scaling up efficiency financing. Our research summarizes the results of a survey of efficiency loan programs throughout the nation. The quantitative results of our research focused on data such as loan terms, interest rates, default rates, application approval rates, participation rates, and loan amounts. All of this information is reported in the body of the report and summarized in tables in Appendix A. We also looked at funding sources, finding that these programs are being funded by a range of sources. In some states funding was provided by the state via a legislative mandate or collected via a charge on utility rates. Some programs are privately funded by participating financial institutions. In many cases program funding is a combination of both public and private sources. For example, public funding may be used to buy down interest rates for loans provided by private institutions such as banks and credit unions.

The programs surveyed with the largest origination budgets (i.e., the total dollar amount of loans issued during the life of the program) were the Sacramento Municipal Utility District (SMUD) ($447.4 million), Southern California Home ($300 million), and Texas LoanStar ($296.3 million) programs. Further we found that:

- Only one program required all loans to be secured though most programs do require a credit review and many offer a secured loan product.
- Default rates were very low ranging from 0–3% (cumulative).
- Loan application approval rates averaged approximately 76% though there was a wide range across programs with several programs reporting approval of 100% of applicants.
- Most programs do not base project approval on measureable energy savings though most have pre-approved measures. Some programs link the loan repayment to energy savings by requiring that savings exceed loan repayment amount. This can effectively limit the types of measures that will qualify for approval as all programs have repayment time limits.

[1] Based on a price of electricity of 11 cents per kilowatt hour
[2] Based on a price of natural gas of $11.20 per thousand cubic feet of gas

- Participation rates are generally low across programs. The percentage of total customers in the classes served by programs compared to the total number of program participants reveals that only two of the programs surveyed had rates that exceeded 3% of the customers targeted by the programs and more than half of the programs had participation rates below 0.5%. These two were SMUD and Connecticut Light & Power's Commercial & Industrial Financing (CL&P CI) and Small Business Energy Advantage (CT SB) programs.

We found that very little data on energy savings data is available. Although energy savings are rarely reported, those that we were able to find fall within a similar range of 12–17% of annual energy use for the eligible customer class served by the utility or utilities participating in the program. Table A5 in Appendix A provides reported savings data.

Based on our research we were able to make some general observations. Key findings include:

- Most programs are not penetrating the market of potential customers;
- Some residential programs have high rates of application decline;
- Residential loan program participants tend to be "reactive;"
- Project bottlenecks sometimes occur due to burdensome and inflexible program requirements;
- Minimum program size can attract additional lenders;
- Good loan terms don't assure the success of a program;
- The housing market crash has tightened the lending market;
- Some programs with interest rate buy-down have found the costs to be high; and
- There is a lack of uniform criteria for evaluating credit of small businesses and institutions.

A key purpose of efficiency loan financing programs is to maximize the energy savings achieved with the program's limited resources. Energy savings can be maximized when programs implement a large number of projects ("broad participation") and when each project achieves significant energy savings ("deep retrofits"). No single program design element can guarantee the success of a program. Program characteristics that may play a role include program design, eligible measures, audit requirements, points of access by customers to program, incentives, length of program duration, utilization of one-stop contracting, sophistication and extent of marketing strategy (including use of trade ally and neighborhood partners), trustworthiness and credibility of program sponsor, skills and sophistication of program contractors, and quality assurance procedures, to name a few. In order to expand the scope of these programs to a larger audience, we make several recommendations to achieve broad participation in these programs such as:

- Budget for and invest in ongoing marketing of the program;
- Simplify the loan application process;
- Offer attractive loan terms;
- Design the program for a target audience; and
- Consider on-bill financing

In order to maximize energy savings we make several recommendations for achieving "deep retrofits" including:

- Require whole house energy audit to educate consumers about all cost-effective options;
- Package loan programs with utility incentives and rebates;
- Require additional complementary measures to reach beyond the "reactive" market;
- Tier program benefits (such as loan terms) to incentivize greater energy savings; and
- Train participating contractors to ensure the credibility of the program and the achievement of energy savings.

Additional detailed results including appendices summarizing our quantitative results and individual program summaries are included in the full report.

INTRODUCTION

The building sector consumes about 74% of the electricity used in the United States (EIA 2011a). ACEEE and others have found that electricity consumption can be cost-effectively reduced by about 20–30% in the next 10–15 years (Eldridge et al. 2010, Granade et al. 2009). These savings would reduce annual electricity consumption in the residential and commercial building sector by over 695 billion kWh annually. These savings are enough to power the entire western United States (including Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming) for a year (EIA 2011b). This reduction would mean a reduction in electricity bills for American consumers and businesses by over $78 billion per year.[3] Similarly, natural gas consumption can be cost-effectively reduced by approximately 22% in the near term (Eldridge et al. 2010). This would save over 1,795 billion cubic feet of natural gas annually, which equates to over $20 billion per year of reduced energy bills for consumers.[4] This is more than enough to offset the natural gas consumed to heat hot water by every household in the U.S. (EIA 2005). These numbers don't account for the corollary energy benefits of improved building efficiency such as improved occupant comfort and safety.

Loan programs are a mechanism used to help achieve energy savings in the building sector by providing financing to pay for energy efficiency retrofits. Although Fannie Mae offers an "energy improvement" mortgage and the Department of Housing and Urban Development and the Federal Housing Administration all offer efficiency financing products, there is no widely used national energy efficiency loan program, making state programs particularly important. States across the U.S. have implemented efficiency loan programs with varying degrees of success. While several programs have many years of experience and have issued thousands of loans, this market has yet to come to scale.

Byrd (2011) found that the three biggest obstacles inhibiting large-scale implementation of energy efficiency loan programs are:

- a lack of data with which to predict delinquency and default rates;
- the small, pilot-level stage of most programs; and
- a lack of uniform loan term and underwriting criteria.

This lack of information, uniformity, and standards makes it difficult for private lenders to evaluate the risk these types of loans present. The lack of uniformity also makes it difficult to package these small loans into larger portfolios for sale to larger financial institutions on the secondary market. Without access to private capital there will be limited funding for efficiency retrofits—and the associated jobs, energy and cost savings, and environmental benefits will not be realized.

Because capital is scarce for energy efficiency finance programs, most use either utility or government funding for the loans, or they rely on small banks and credit unions. While this approach has had some success, large scale implementation is not likely. Small firms do not have the balance sheet capacity to scale up a program to reach a volume that would attract larger banks and institutions, trapping them at the pilot stage. The local lender may issue $20 million in loans, or perhaps a collection of firms will issue $50 million, but when they reach capacity there is no secondary market in which to sell the loans. Thus, there is no way to recapitalize for additional lending. Further, local firms employ underwriting and loan terms that often do not conform to the standards used by national banks and institutions. The fragmented universe of local lenders is limiting the secondary market, while local lenders remain the only option to tap private capital, a conundrum that is preventing the market from scaling beyond pilot programs (see Byrd 2011 for more discussion of this issue).

This report is a first step toward scaling up efficiency financing. Our research summarizes the results of a survey of efficiency loan programs throughout the nation. The research compiled includes data on default rates, loan terms, loan amounts, interest rates, underwriting criteria, and many other variables. These

[3] Based on a price of electricity of 11 cents per kilowatt-hour
[4] Based on a price of natural gas of $11.20 per thousand cubic feet of gas

results are followed by a discussion of many of the challenges that have arisen for existing programs, highlighting potential pitfalls that can be avoided. The discussion is followed by a set of recommendations based on successful elements of programs with significant experience. This report will be useful to policymakers as well as program planners and operators. These recommendations and "best practices" can be incorporated during the design and development of new efficiency financing programs to make existing programs more effective.

Our results, a discussion of our observations, and our recommendations follow. These are presented with program planners and financers in mind and with the specific focus on achieving greater energy savings through deep retrofits and broad program participation. The recommendations or "best practices" are intended to serve as a guide for states or utilities to replicate. Appendix A contains more detailed tables showing our results. Appendix B contains individual program summaries.

METHODOLOGY

Research for this report began with a discussion and high-level research of loan programs that finance energy efficiency retrofits. Based on these findings, several programs were identified and selected for further study. The programs selected are representative of a range of program approaches including those with enough experience for program results to have been reported as well as a few newly implemented programs. We conducted detailed research on these programs, including interviews with experts involved with each program (when possible). The programs included in this report are not exhaustive of all programs in all states, but were selected based on the criteria above. The results, discussion, and recommendations presented in the remainder of this report are based on the results of this research.

QUANTITATIVE RESULTS

Table 1 lists some of the basic terms included in the loans for the programs surveyed. These results are listed as averages according to program type, either residential or commercial/industrial/public (C/I/P). These averages are based on survey results from 16 residential programs and 11 C/I/P programs. Our results indicate that interest rates are somewhat higher for residential borrowers (5.3%) than C/I/P borrowers (2.8%). It is important to note that the interest rates reported here are customer rates that may be the result of a subsidized buy-down from a higher market rate. Residential borrowers, on average, are permitted to pay back their loans over a longer time period (11 years for residential versus 8 for C/I/P); however, these are averages of the maximum years allowed and a payback period of 3–5 years for a residential loan is common in practice. Program participants in both C/I/P and residential programs are borrowing only a fraction of the maximum amounts available for a loan. In the residential sector the average loan amount is $9,100 while the average maximum amount available is $29,900. In the commercial sector the average loan amount is $73,900 while the maximum amount available is $327,600.[5] Tables A1 and A2 in Appendix A provide additional detail by program.

[5] These averages exclude the TX LStar program, which would increase these numbers to $216,000 and $911,700, respectively.

Table 1: Averages for Basic Terms of Surveyed Loan Programs

	Interest rate	Loan Amount	Loan Range	Maximum Loan Amount	Maximum Loan Amount Range (not average)	Maximum Loan Repayment Term	Maximum Loan Repayment Term Range (not average)
Residential	5.3%	$9,100	$5,000–$12,500	$29,900	$13,000–$100,000	11 years	5–20 years
Commercial/ Industrial/ Public	2.8%	$73,900	$3,950–$560,000	$327,000	$7,500–$750,000	8 years	2–15 years

Funding for the loan programs surveyed comes from a range of sources. In some states funding was provided by the state via a legislative mandate or collected via a charge on utility rates. Some programs are privately funded by participating financial institutions. In many cases program funding is a combination of both public and private sources. For example, public funding may be used to buy down interest rates of loans provided by private institutions such as banks and credit unions.

The programs surveyed with the largest origination budgets (i.e., the total dollar amount of loans issued during the life of the program) are the Sacramento Municipal Utility District ($447.4 million), Southern California Home ($300 million), and Texas LoanStar ($296.3 million) programs. All three of these programs have been established for more than 15 years each. There is no standard program size, but annual origination budgets for the largest programs were around $20–27 million. Annual origination budgets for residential programs surveyed ranged from $1–2 million to the low $20s (million). Some programs that were just getting started appear to have a “ramp up” period where initial loan funding is much lower than this range. Table A3 in Appendix A provides additional details from our funding research by program.

Table 2: General Funding of Loan Programs Surveyed

	Funding Sources	Average Annual Origination Budget	Total Lifetime Origination Budget
Residential Programs Surveyed	Of 18 programs at least 8 used or sought private funding.	$11 million	$16,000–447.4 million

Loan programs manage risks differently. Some approaches include requiring secured loans and stringent credit requirements. We analyzed these factors as well as program application approval rates, default rates, and program participation rate. Some key results include:

- Only one program required that all loans are secured though most programs do require a credit review.
- Default rates were very low ranging from 0–3% (cumulative).
- Loan application approval rates averaged approximately 76% though there was a wide range across programs with several programs reporting approval of 100% of applicants.
- Most programs do not base project approval on measureable energy savings though most have pre-approved measures. Some programs link the loan repayment to energy savings by requiring that savings exceed loan repayment amount. This can effectively limit the types of measures that will qualify for approval as all programs have repayment time limits.
- Participation rates are generally low across programs. The percentage of total customers in the classes served by programs compared to the total number of program participants reveals that

only two of the programs surveyed had rates that exceeded 3% of the customers targeted by the programs and more than half of the programs had participation rates below 0.5%.

Table 3 summarizes these results. Tables A4 and A5 in Appendix A provide additional detail by program.

Table 3: Factors Related to Loan Approval for Surveyed Programs

Basis for Application Approval	Secured or Unsecured?	Repayment Tied to Energy Savings?	Application Approval Rate	Default Rate	Total Number of Loans Closed During Life of Program
Of 12 programs, 10 review an applicant's credit rating.	Of 18 programs, only 1 requires that all loans must be secured. 5 have some form of secured loans.	Of 14 programs, only 4 tie loan approval to energy savings resulting from the project.	Average of 76% (ranging from 40–100%)	0–3%	Ranging from 4–84,000

Very little data on energy savings were reported; however, we are able to make two tentative observations. First, in programs that estimate projected energy savings, these estimates may value efficiency measures using one of several approaches. Energy savings may be based on a fixed number of years where, for example, all measures, regardless of type, are assumed to produce savings for 12 years. Alternatively programs may assign an expected "life" for the measure based on the type of measure. This approach may mean that residential measures are assumed to produce energy savings for 15 years while commercial measures are assumed to achieve savings for 10 years. Finally, programs may evaluate each measure individually and assign an expected lifetime for the energy savings generated by the measure.

The second observation we can make is that even though energy savings are rarely reported, those that we were able to find fall within a similar range of 12–17% of annual energy use for the eligible customer class served by the utility or utilities participating in the program. The exception to this was a Vermont program that focuses solely on lighting, which reported savings of 5%. Table A5 in Appendix A provides reported savings data.

Appendix B summarizes additional program-specific information.

DISCUSSION AND OBSERVATIONS

This discussion includes some general observations and lessons learned based on the experience and feedback we collected from the programs surveyed.

Energy savings data is not made available by most programs—Most programs surveyed don't measure or track energy savings that result from financed efficiency projects. In the New Hampshire SmartStart program, repayment of the loan is based on energy savings, but the program sponsors do not try to quantify the actual savings from the energy efficiency measures installed. Some programs that do track energy savings don't maintain the data in a format that can be shared and understood by those outside the program. Furthermore, even when a program did track savings data, in some cases requests for that information were refused due to confidentiality issues. One explanation for the lack of energy savings data was the existence of a disconnect between the entity monitoring energy savings (a utility) and the entity tracking financing data (a lender).

Most programs are not penetrating the market of potential customers—The two programs with the highest participation rates are the SMUD program with 16% of residential customers and the Connecticut Light & Power Commercial and Industrial and Small Business Energy Advantage programs with 8.2% of C/I/P customers. The SMUD and Connecticut programs have been operating for over a decade. The

Nebraska Dollar & Energy Savings Loans $ES program has reached 2.7% of residential and C/I/P customers in the state after more than 20 years of operation while in comparison the Kansas How $mart program has reached 1.3% of commercial and residential customers after just 3 years of operation. All other programs for which we received information have participation rates of 0.5% or less.

Where possible, we looked at the number of customers served by utilities in each program and compared this with the total number of program participants to determine a participation rate for each program. This approach does not account for "eligibility" of customers. Most programs have eligibility requirements such as credit rating or debt-to-income ratio. Most residential programs are also targeting homeowners and renters cannot participate. These types of requirements can reduce the number of "eligible" participants and therefore the participation rates reported by some programs may be higher than what we have calculated here. Our calculation did not consider program design beyond the class of customer targeted. For example, if the program is targeting the residential sector we based our calculation on the total number of residential customers served by the participating utility. We acknowledge that there is room to debate the best approach for calculating a program participation rate, but we believe our approach shows that across surveyed programs there is a pattern of very low market penetration by these programs.

This observation implies that energy efficiency financing programs alone are not the "silver bullet" that will solve all energy efficiency challenges or meet every individual's needs. Achieving the full potential of efficiency improvements available in the buildings sector will likely require additional complementary services and approaches.

Some residential programs have high rates of application decline—Residential loan programs typically require the homeowner to submit an application applying for funds. The loan program administrator reviews this application and generally qualifies the applicant for the program or denies the application. The basis by which an application is approved or denied varies by program. The approach used by the majority of residential programs surveyed is to base this decision on the credit rating of the homeowner (primarily by using a Fair Isaac Corporation or FICO score) and perhaps the homeowner's debt-to-income ratio. While approval rates can reflect differences in program design/philosophy, respondents for several programs reported that application acceptance rates were lower than desired. For example, in the Green Jobs–Green New York (GJGNY) program there is a requirement that program applicants must submit two full years of utility bills. This requirement has proved to be an obstacle for many applicants and has resulted in a high rate of application decline. The Maryland Home Energy Loan Program (MHELP) program has also had high rates of application decline. In the MHELP program the application process is administered by AFC First Financial (a financial institution) and the cause of the high decline rate is unknown to Maryland Energy Administration program staff.

In contrast, some programs have built in flexibility that allows the program staff to adjust or interpret program requirements. For example, the Oregon State Energy Loan Program (OR SELP) program allows staff to make determinations as to what it means for a loan to be "secured." The application decline rate for this program is very low, in part because program staff work closely with applicants and encourage withdrawal if an application doesn't meet requirements. In the Efficiency Kansas How $mart (KS How$mart) program, 100% of applications are accepted because the utility-administered program accepts any applicant who has paid her utility bills. Table A4 lists some of the factors that are considered by various programs when an application is reviewed as well as the application approval rates for the same programs.

Residential loan program participants tend to be "reactive"—Respondents suggested that residential loan programs tend to capture the reactive market (i.e., homeowners who are "reacting" to an immediate need such as a broken furnace). For example, in the Connecticut Home Energy Solutions (CT Home) program it was reported that 79% of the projects financed were heating, ventilation, and air conditioning (HVAC) replacements only (with no insulation). This is viewed as a significant problem because many of these replacements would have arguably happened without the program financing. Some programs have attempted to avoid this problem by requiring complementary work. For example, the MHELP program initially required duct sealing and insulation if a new furnace was purchased; however, this requirement was abandoned in Maryland because it was seen to be holding up projects.

Project bottlenecks may occur due to burdensome and inflexible program requirements—Multiple respondents raised this concern, citing slow loan processing, delays, and complicated paperwork and requirements. In the MHELP program, the Maryland Energy Administration (MEA) and the program administrator, AFC First Financial (AFC), each had qualification processes that contractors were required to complete in order to participate in the program. Initially only 10 contractors qualified for the entire state. MEA later agreed to use AFC-approved contractors, which doubled the amount of approved contractors. The program now has about 100 qualified contractors.

Minimum program size can attract lenders—Our research indicates that there is no common dollar amount used to fund efficiency loan programs and the total dollar amount of loans financed varies across programs, ranging from several million dollars per year to over $25 million per year. We don't have enough evidence to say whether there is a de minimus level of funding after which a program "has legs," though we did receive feedback indicating that once a program reaches a certain scale it will attract the interest of a greater number of lenders willing to partner with a program. This was the case in the Mass HEAT program, which now attracts the interest of multiple lenders per week. Opinions of experts we consulted vary on where this threshold lies, but estimates ranged from $25 million per year to more than $100 million per year.

Programs must be "sold" to borrowers—Some programs with lower than market interest rates reported low numbers of project applications. Consumers don't seem to take advantage of the opportunities provided by a loan program simply because it's a "good deal." The reasons behind consumer behavior are beyond the scope of this survey; however, program administrators have observed that marketing makes a significant positive difference in the number of applications received. Multiple respondents indicated that packaging programs for ease of use by consumers is also a very important factor affecting whether the program will be used by a wide pool of borrowers. In addition to marketing and packaging, respondents indicated that one-on-one counseling on a project-basis is helpful.

Impacts of the housing market crash—In spite of the recent U.S. housing market meltdown, default rates across commercial and residential loan programs have been extremely low, ranging from 0–3% across the programs surveyed. Regardless of the low number of defaults, market conditions have impacted programs. One respondent explained that in the last four years the credit environment has changed and lenders' assumptions also had to change. He clarified that with unsecured financing normally home values don't come into play; however, given the current market it is something that should be reviewed and considered. The respondent described the emergence of "strategic defaulters," which is a situation where a homeowner abandons a home when the mortgage is "under water" (i.e., the mortgage balance is greater than the current market value of the home). In this case the program administrator had to develop measures to identify these borrowers (or potential borrowers) and mitigate this increased risk.

Another aspect of efficiency loan programs affected by the recent changes in the U.S. housing market impacts the ability of a lender to secure a loan. Securing a loan by granting the lender a claim to the value of the property owned by the borrower is a method used by some lenders; however, a secured loan requires that the homeowner has equity in the home. The nationwide decline in home prices has left many homeowners with little or no equity in their homes. This is likely to reduce eligible program participants. Table A4 lists whether surveyed programs offer secured or unsecured loans.

Some programs with interest rate buy-down have found the costs to be high—Some programs leverage public funding by buying down interest rates for loans funded by private institutions.

In the CT HOME program, a 0% interest rate has been highly attractive to residents; however, the interest rate buy-down to achieve the 0% rate was reported as being "exorbitantly expensive." In the New York Residential Loan Fund (NY RLF) program, the interest rate reduction approach was also reported as being very costly. In New York an alternative financing program, GJGNY, has been established as a revolving loan fund to complement the NY RLF interest rate buy-down and provide alternative access to low-interest financing to support energy efficiency upgrades.

As an alternative to interest rate buy-down, some newer programs establish loan loss reserves. A loan loss reserve is a pool of money, some fraction of the total dollar amount of outstanding loans, that is set aside and essentially functions as insurance in the case of a default. This lowers risk to the lender, which in turn means the lender can offer lower interest rates. The Pennsylvania Home Energy Loan Program has a 10% loan loss reserve. The state of Maryland is starting a new program using a loan loss reserve approach and the state of Vermont is exploring the use of funds from the Regional Greenhouse Gas Initiative (RGGI) to serve as a loan loss reserve.[6]

There is a lack of uniform criteria for evaluating credit of small businesses and institutions—While large corporations may have a credit rating, for myriad small businesses and other firms, there is no uniform metric like FICO scores. The lack of uniform criteria complicates underwriting for C/I/P programs. Credit analysis and underwriting involves a more specific review of each business and project, with business appraisals sometimes necessary. Criteria frequently considered are the number of years the applicant has been in business and utility bill payment history.

RECOMMENDATIONS

A key purpose of efficiency loan financing programs is to maximize the energy savings achieved with the program's limited resources. Energy savings can be maximized when programs implement a large number of projects ("broad participation") and when each project achieves significant energy savings ("deep retrofits"). It is important to keep in mind that no single program design element can guarantee the success of a program. As previously mentioned, good loan terms and interest rates alone do not seem to be enough. Additional program characteristics that may play a role include program design, eligible measures, audit requirements, points of access by customers to program, incentives, length of program duration, utilization of one-stop contracting, sophistication and extent of marketing strategy (including use of trade ally and neighborhood partners), trustworthiness and credibility of program sponsor, skills and sophistication of program contractors, and quality assurance procedures, to name a few.

The following section discusses some of the program elements that our research indicates may foster broad participation and deep retrofits. At the end of the section we highlight three "model" programs that have implemented many of the program elements recommended in this report. These three short case studies include the Sacramento Municipal District Residential Loan Program (SMUD), Connecticut Light and Power's Commercial & Industrial and Small Business Energy Advantage Programs, and Oregon's Clean Energy Works program.

Broad Participation

Many finance programs have reported lower than desired program participation rates. In addition, our review of participation rates shows that most programs have been unsuccessful at penetrating potential markets. The two programs with the highest participation rates are the SMUD and CL&P Small Business programs. The OR CEW program and the KS How$mart programs were implemented more recently, but have had quick ramp-up periods. These programs informed the guidance below.

In addition to reaching many people, a concurrent "broad participation" goal across many programs is to remove financial barriers for customers who would otherwise not have the means to invest in efficiency measures. While this may be the intent behind many programs, most banks continue to review applications using typical financial industry criteria. For example, many banks use the exact same criteria used for standard home loans and do not consider the impact of the energy savings on ability to repay a loan. This approach, to some extent, will prevent the program from serving individuals who can't otherwise access financing through a standard home loan.

[6] See Freehling (2011) for additional discussion of this approach.

Our results suggest that a combination of five key elements can help to ensure that program participation is maximized and that resources are distributed to participants that will benefit most. These five elements are described below.

1. Marketing—There are a number of programs that offer zero or below market interest rates; however, the great financial terms of the program alone are not enough to "sell" it. Respondents indicated that investment in ongoing marketing efforts throughout the life of a program can make a significant difference in program participation. Marketing can raise public awareness of the opportunity provided by the financing mechanism and legitimize the program in the eyes of the target audience. In Oregon the CEW program has included a significant marketing effort. Marketing efforts have included utility mailers, targeted e-mails, radio, and print ads. The CEW effort led with messages related to comfort (such as, "Cold in the winter, hot in the summer? We can help!") and economics (such as "lower your home energy use with no upfront costs"). Homes are also recruited through social marketing targeted to neighborhoods through open houses, door hangers, and information tables at local events. A program representative indicated that these marketing efforts have been crucial to achieving participation goals and maintaining public interest in the program.

2. Simplified process—The application process should be simple and straightforward. Programs should make it easy for potential applicants to apply for funding and participate in the program. Respondents indicated that complex and slow application processes can cause interest in the program to wane. Processes that are perceived as administrative burdens may cause potential applicants to abandon the program. Even fairly straightforward administrative requirements can cause obstacles. One respondent reported that the requirement of a notary witness to the applicant's signature on the loan application was an obstacle for a rural program.

   In addition to a simple and straightforward application process, program administrative requirements should minimize the amount of time and effort a program participant must expend. For example, some programs approve loans almost instantly while a contractor is still in the home. A program can provide all necessary assistance that a participant might need, a "one-stop shop" that assists participants with all aspects of the program from application through home audit, review of proposed measures, contractor selection, and evaluation of savings. This is the approach of the Oregon Clean Energy Works program, which exceeded its participation goals in the first phase of the program. A major aim of CEW was to streamline the entire home upgrade process from energy assessment through financing and installation. According to a program administrator, CEW met this goal by offering a fully guided, bundled service. Upfront costs were eliminated and confusion with contractors was greatly reduced. Participants could apply online and received intensive hand-holding from "Energy Advocates" with credible technical expertise. CEW placed a strong focus on being consumer friendly, providing excellent service, and using the highest quality vetted contractors. Programs must be designed to find the right balance between providing these services to customers and increased operating budgets, which could raise the fees associated with the loan.

3. Attractive loan terms—As previously mentioned, current economic conditions have lowered interest rates and made the terms of private loans increasingly attractive. Private loans will generally not specify what types of efficiency measures make sense for a given building and don't educate the program participant about which options will be most cost-effective. The terms of an efficiency financing loan therefore should be comparable, if not better, in order to be as attractive as a private sector loan. Many programs use funds to buy lower interest rates for customers that apply to loans offered by private lenders. While this can attract participation it can also be expensive. Program administrators must balance the benefits of lower interest rates against program budget concerns.

   Programs can also help attract participation by offering repayment terms that are longer and by requiring that the monthly repayment amount is equal to or less than the monthly savings from the efficiency investments. Some programs (including Kansas How$mart and New Hampshire

SmartSTART) set the loan repayment amount to an amount that is less than the total energy bill savings generated by the project. This creates a positive cashflow for the customer and makes the program more attractive when compared to a standard loan. It should be noted that this approach can be a tradeoff since deeper retrofits with payback periods longer than the terms of the loan may not be eligible for financing.

Finally, any fees associated with the loan should be minimal to make the program attractive to potential participants.

4. Design for a target audience—In the current economy, interest rates available through a private loan are at historic lows. Private loans are also likely to allow greater flexibility in terms of what kinds of home improvements can be financed (as compared to efficiency loans). In many cases home and business owners have existing relationships with banks through which they pay their mortgages and taking a second loan is a relatively simple process. In cases where home and business owners already have access to comparable financing resources via the private sector, the efficiency loan financing program can end up competing for participants with private lenders. A better use of the limited resources of efficiency loan financing programs is to target potential participants who don't already have opportunities for achieving the energy savings offered by the efficiency financing program. This approach can maximize a program's limited resources and impact. Potential target participants may include low-income individuals, individuals with marginal credit ratings, and small to mid-sized businesses.

   Methods by which a program might be structured to target a specific group could include issuing loan guarantees for the target group to lower a private lender's risk or for the organization administering the program to function as a lender. The Efficiency Vermont Agricultural Services (VT Ag) program guarantees the loans made to farmers, which also results in a 100% application approval rate. In some cases utilities act as lenders. When a utility is the lender it can base application approval on whether the customer is paying the utility bill as opposed to a credit review. This can result in a significantly higher approval rate for program applicants than more traditional methods. The Kansas How$mart program is an example of a residential program where the approval rate approaches 100% because approval is based on a customer's good standing with the utility. The Efficiency Vermont Lighting Plus Program (VT Light) was designed for a very specific target audience and was retired after three years due to market saturation.

5. On-bill financing—Efficiency loan programs are often administered by financial institutions. This approach creates two separate bills whereby a program participant pays a utility bill as well as a second bill for reducing the utility bill. Combing the utility bill and the loan repayment has the potential to create a clear link between energy use and savings, enabling a program participant to relate a reduction in energy consumption with the investments made through the loan program. One method for combining energy consumption charges with efficiency financing loan repayment is to have the utility administer the loan repayment via the utility bill. This approach is known as "on-bill financing." In an on-bill program a utility will collect payment for the loan, but the capital for the loans can come from a variety of sources such as the government, the utility, or private lenders. On-bill financing can leverage existing relationships the utilities have with customers and combine available rebates with loan financing at a single point for program participants. Examples of on-bill financing programs include CL&P SBEA, OR CEW, KS How$mart, and Sempra.

Deep Retrofits

As previously discussed, energy savings data are not available for most efficiency loan programs. This lack of data makes it challenging to draw conclusions about what variables result in "deep" energy savings. Mindful of this limitation, we have observed a range of program features designed to maximize energy savings for each project. Although we cannot fully evaluate the effectiveness of these program features, we do have anecdotal evidence based on feedback from survey respondents to suggest which approaches are working and which have been ineffective. We have identified five features that programs are using to target deep retrofits. These are discussed below.

1. Whole house energy audit—A number of residential programs require a whole house energy audit to identify potential efficiency measures. These audits are performed by trained professionals and generally address multiple systems. The audit is essentially a list of opportunities for improving the efficiency of the home that the homeowner may not have been aware of. As previously mentioned, a number of respondents indicated that a high percentage of program applicants are "reactive," turning to the financing program only when something breaks or needs replacing. The home energy audit can educate the homeowner about additional efficiency opportunities specific to her home.

   Some programs require the homeowner to pay for the home energy audit, though the charge may be reduced or effectively negated via discounts or rebates provided if the homeowner implements one or more of the recommended measures. The KS $mart, MHELP, GJGNY, CEW, Mass HEAT, and Sempra loan programs are examples of programs that offer free or reduced cost whole house energy audits.

2. Package offers—Many utilities offer rebates, coupons, and other discounts to customers for the purchase of higher efficiency products such as light bulbs and appliances. Some loan financing programs take advantage of these offers to leverage the benefits to program participants by packaging these opportunities and offering them in conjunction with the loan program. SMUD, MHELP, Pennsylvania HELP, Mass HEAT, and Sempra program are examples of this.

   In contrast some programs have had to compete against these offers. In New Hampshire the SmartSTART program meets many of our recommended criteria for program design; however, the state also offers financial incentives for efficiency improvements that cannot be used in combination with the loan program. Businesses must opt to take either the financial incentives (cash upfront) or a loan. Participants have overwhelmingly opted for the cash upfront while the loan program has languished, closing only eight loans in nearly ten years.

3. Require additional complementary measures—As previously noted, many efficiency loan program participants are "reactive." While the home energy audit can educate a program participant about additional measures it doesn't guarantee that those measures will be adopted. The purchase of new technology to replace broken or malfunctioning equipment will almost always result in efficiency improvements simply because of technological advances and improving efficiency standards; however, systems that function inefficiently in the home can undermine the savings that come with a new appliance. In order to maximize energy savings, projects should make cost-effective efficiency upgrades to systems as well as components. This issue arose in the Connecticut Home program where approximately 80% of projects were HVAC unit replacements without upgrades to the insulation of the HVAC systems (often a cost-effective upgrade).

   In order to achieve additional energy savings, some programs have required complementary measures. In the MHELP program there was initially a requirement for duct sealing and insulation if a new furnace was purchased as part of the program; however, this approach was abandoned as it was perceived to be the cause of reduced customer participation. The MHELP program no longer requires the additional measures, but now offers a tiered interest rate (see below). While additional measures have trade-offs (such as increasing the complexity of the program), they should be considered as a method for upgrading whole "systems" and therefore achieving deeper energy savings.

4. Tier benefits—In order to achieve deep retrofits, programs can be designed so that benefits to participants increase according to the level of energy savings a project achieves. One such method is to offer lower interest rates for projects that achieve deeper energy savings. In the MHELP program, participants receive a 9.99% interest rate for replacement of equipment; however, participants can qualify for a 6.99% interest rate if they include upgrades to insulation and duct sealing as part of the project. In the Pennsylvania HELP program, interest rates are significantly lower (2.99% versus 7.99%) if air sealing and insulation are included as part of the project.

5. Train participating contractors—Licensed contractors may be unfamiliar with current technologies and approaches for improving the energy efficiency of a home or business. This can result in poor workmanship that doesn't actually achieve anticipated energy savings. This undermines the goals of the loan program and can damage the reputation of the program while indebting a homeowner or business without providing the anticipated energy benefits. Some programs require that program participants use only approved contractors that have obtained a specific license or certification to guarantee a minimum proficiency. MHELP, Pennsylvania HELP, SMUD, Southern California Home, and Oregon CEW are examples of programs that include such a requirement.

CASE STUDIES

CALIFORNIA—Sacramento Municipal Utility District (SMUD) Residential Loan Program

The Sacramento Municipal Utility District Residential Loan Program has the highest participation rate and the largest number of loans of any program we surveyed.

How They Did It: Since 1977, SMUD has offered its Residential Loan Program to help customers improve energy efficiency. Operating under its current business model since 1991, SMUD is a contractor-driven, point-of-sale financing program for residents looking to replace aging systems and equipment with more efficient alternatives.

Since October of 1990, over 84,000 loans have closed under the program, with a participation rate of approximately 16% among the utility's residential customers. The high participation rate in the SMUD residential program may very well be attributed to its customer-friendly evaluation and application process. Marketing revolves around informing targeted customers of contractors vetted by SMUD and trained to assess home energy performance at the subsidized rate of $99 per inspection. Through whole house energy inspections, customers are informed of any possible upgrades and presented with options for both implementation and financing right in their homes.

Once they have collected information and can make specific recommendations, contractors simplify the application process by sitting down with customers and helping to fill out all necessary paperwork. After all completed forms are turned in and creditworthiness is determined, approval normally takes only a day or two.

Both secured and unsecured loans are offered with attractive loan terms, depending on the nature of projects covered and type of dwelling. The average secured loan term is a maximum of 10 years, with an average interest rate of 8.75%. For unsecured loans, the average term is a maximum of 3 years, at a 10.75% interest rate. The total average loan amount per recipient for both varieties of loan is $9,100. Applicant creditworthiness is based on both a SMUD account payment record and an outside credit report.

Program Description: This is a contractor-driven, point-of-sale financing program. Secured loans cover improvements related to HVAC, windows, and renewable energy projects and unsecured loans include building insulation, duct testing, duct sealing, and other envelope improvements. Installation must be performed by a SMUD-approved contractor.

Underwriting Criteria: SMUD does not use a minimum FICO score, rather it assesses the applicant's FICO score along with other credit information and bill payment history. There is a maximum debt-to-income ratio of 0.4, though, unless the applicant's income is very large. The borrower must have a satisfactory payment record as a prerequisite to qualify for any new SMUD loan. SMUD will also obtain a credit report from an outside agency to help determine creditworthiness. Where appropriate, SMUD may require additional financial statements or records for the loan evaluation process.

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Program Information

Lead implementing organization	Sacramento Municipal Utility District
Financial services partner(s)/subcontractor(s)	None
Sector(s)	Residential
Geographic area served	Sacramento County, CA
Program start date	1977; 1991 under current business model
Program end date	Still operating
Is financing under this program secured or unsecured?	Both
Program budget since inception	NA
Program budget by program year (millions)	1990 = $7.38 2005 = $32.48 1995 = $48.57 2010 = $18.97 2000 = $21.72 March 2011 = $3.09
Sources of capital	Utility

Financing Statistics

Loans closed, number, and $ amount	1977–1989 = 52,090 1990 = 5,955 1995 = 8,904 2000 = 3,683 2005 = 4,324 2010 = 2,012 2011 (through March) = 340	$496.4 million in 1987–March 2011
Loans denied, number, and $ amount	1996 = 597 2000 = 954 2005 = 893	NA
Avg. loan term	10-year max for secured; 3-year max for unsecured	
Avg. loan APR (if variable, please provide)	8.75% for secured loans; 10.75% for unsecured loans. Previously had only one interest rate for all loan types. 1990 = 7.92% 2005 = 7.50% 1995 = 8.50% 2010 = 8.50% 2000 = 9.85% March 2011 = 8.75%	
Avg. program financing recipient loan $ amount	$9,100	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

CONNECTICUT—Connecticut Small Business Energy Advantage Program (CT SB) and Connecticut Light & Power C&I Financing (CL&P CI)

The Connecticut Light & Power programs targeting the small business and commercial sectors (CT Small Business Energy Advantage and Commercial and Industrial Financing programs) have an 8.2% participation rate, which is the highest rate of any program targeting these sectors and the second highest participation rate of all programs surveyed.

How They Did It: In conjunction with the Connecticut Energy Efficiency Fund, Connecticut Light & Power offers its commercial and industrial customers financing options through the Commercial and Industrial (C&I) Financing and Small Business Energy Advantage (SBEA) programs. These programs offer interest rate buy-downs for customers who implement eligible energy-saving measures, keeping rates low. The

average loan interest rate is 10.5–15% prior to buy-down—the buy-down brings the interest rate to 0%. This is an extremely attractive loan term to customers, given the typically high costs of equipment upgrades.

Loans must be used for the upgrading or replacement of existing equipment and systems. Loans range from $2,000 to $250,000, with subsidized low-interest financing eligible on the first $100,000. The balance of the project can be financed separately at market rates, or may be covered through a separate small business program for qualifying customers. For larger commercial and industrial customers, the average loan amount is between $25,000 and $50,000. For smaller business, the average loan amount is around $8,000.

The use of on-bill financing, which allows customers to easily see the benefits of their investments and simplify payment, is likely another factor that has contributed to the 8.2% participation rate.

Furthermore, customers are offered the chance to have a fully-trained, CL&P-approved contractor conduct an energy assessment of their facilities at no cost to them. Contractors provide customers with a comprehensive proposal outlining all measures that could increase energy efficiency, as well as an estimate of costs and energy savings. This valuable marketing tool simplifies the process and helps customers understand full energy savings potential, rather than simply making a reactive adjustment to one piece of equipment or system. As many customers lack the time, resources, or in-house expertise needed for in-depth analysis of energy use, this is a good method for targeting smaller businesses in particular.

Connecticut Small Business Energy Advantage Program (CT SB)

Program Description: Program is for small commercial and industrial businesses. CL&P customers with an average monthly demand of less than 200 kW are eligible. There is a pre-approved list of contractors to provide energy assessments and installation of energy efficiency measures. Program offers 0% interest and on-bill financing for credit-qualifying customers.

Underwriting Criteria: Customer must have at least 6 months of utility payment history (in business for at least 6 months because they need at least that much credit and usage history), and must be under 60 days in arrears.

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http://www.cl-p.com/Home/SaveEnergy/Rebates/HomeEnergySolutions.aspx

Program Information

Lead implementing organization	Connecticut Light & Power
Financial services partner	None
Sector	Commercial, industrial, and municipal
Geographic area served	Areas of Connecticut served by CL&P
Program start date	2003
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured
Program budget since inception	$20 million
Program budget by program year	Approximately $1 million per year for interest rate buy-down
Sources of capital	Utility

Financing Statistics

Loans closed, number, and $ amount	2463 (loans outstanding)	$15 million
Loans denied, number, and $ amount	4%	NA
Avg. loan term	Less than 3 years	
Avg. loan APR	0%	
Avg. program financing recipient loan $ amount	$8,000	
Avg. program financing participant project annual energy savings	19,000 kWh	
Estimated average life of project energy savings (years)	12 years	

Connecticut Light & Power C&I Financing (CL&P CI)

Program Description: Interest rate buy-down program for commercial and industrial customers who implement eligible electric energy savings measures. Loans must be used for the upgrading or replacement of existing equipment with high-efficiency equipment. The loan limits are $2,000 to $250,000, with subsidized low-interest financing on the first $100,000.

Underwriting Criteria: A minimum of 3 years in business.

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Web site: http://www.cl-p.com/Business/SaveEnergy/Financing.aspx

Program Information

Lead implementing organization	Connecticut Light & Power
Financial services partner	Univest Capital Inc.
Sectors	Commercial & industrial
Geographic area served	Areas of Connecticut served by CL&P
Program start date	2009
Program end date	Still operating
Is financing under this program secured or unsecured?	Secured
Program budget since inception	NA
Program budget by program year	Approximately $250,000 annually for interest rate buy-downs
Sources of capital	Third party

Financing Statistics

Loans closed, number, and $ amount	66	NA
Loans denied, number, and $ amount	NA	NA
Avg. loan term	3–5 years	
Avg. loan APR	10.5–15.5% (before the interest rate buydown)	
Avg. program financing recipient loan $ amount	$25,000 to $50,000	
Avg. program financing participant project annual energy savings	70,000 kWh	
Estimated average life of project energy savings	10 to 12 years	

OREGON—Clean Energy Works (OR CEW)

The Oregon Clean Energy Works program is a good model for achieving program participation goals—in just a few years it has grown substantially.

How they did it: Launched as a pilot program in June 2009, OR CEW provides long-term, low-interest financing to homeowners for whole-home energy upgrades. At the onset of the program a participation goal of 500 loans in the first year was established. As of February 2011, the program had met this goal and had to turn away applicants. The high success rate of the pilot program can likely be attributed to a variety of strategic choices. For one, expert "Energy Advocates" and pre-selected contractors conduct all inspections, allowing for all customer questions and concerns to be addressed immediately. These experts receive training and are monitored by the program to avoid negative customer experiences and protect the reputation of the program. Customers are helped throughout the process of determining which improvements to make, how to file all paperwork, and how to get the proper financing for their projects. In addition, the program is structured with an "on-bill" financing option that allows customers to pay back loans through their utility bills. This approach leverages the existing relationship between the customer and the utility company and helps the customer to link the loan repayment directly to a reduction in energy costs.

In addition, the OR CEW program targeted very specific customers by pre-screening to find the homeowners who were most likely to act quickly and the homes most likely to achieve high energy savings. Customers were screened based on a minimum required credit score and a history of utility bill payment. Depending on the projects undertaken and the type of dwelling, loans were offered at attractive rates from 3.99% to 5.99%, with a term of up to 20 years. Average loan size has been around $12,500, with monthly payments of approximately $70.

Program Description: On-bill financing program for whole-home energy upgrades designed to reduce energy use 10–30%. Program systematically reduced barriers to residential energy efficiency adoption—upfront costs, project complexity, and consumer hesitation in selecting contractors. The loan product was developed based on modeled savings, historic measure costs, and assumptions regarding how many projects would be completed in each category. The program managers were able to roughly estimate the savings associated with different levels of investment.

Underwriting Criteria: Credit score and utility history

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Web site: http://www.cleanenergyworksportland.org/ (See also ACEEE, 2011)

Program Information

Lead implementing organization	City of Portland Bureau of Planning and Sustainability
Financial services partner(s)/subcontractor(s)	Enterprise Cascadia/Energy Trust of Oregon/Local Utilities /Nonprofits
Sector(s)	Residential
Geographic area served	Portland, Oregon
Program start date	June 2009
Program end date	Still operating/expanding
Is financing under this program secured or unsecured?	Unsecured—loans are currently due upon property sale, but may be changed to stay with meter
Program budget since inception	$8 million for pilot (500 loans); $20 million additional awarded in 2010
Program budget by program year	NA
Sources of capital	Federal stimulus funds, city resources, foundation-related investments & grants

Financing Statistics

Loans closed, number, and $ amount	500	
Loans denied, number, and $ amount	NA	NA
Avg. loan term	20 years	
Avg. loan APR	4–6%	
Avg. program financing recipient loan $ amount	$12,500	
Avg. program financing participant project annual energy savings	Electricity savings of 700,000 kWh; natural gas savings of 180,000 therms; household utility bill savings of $312,000 (totals for 500 projects)	
Estimated average life of project energy savings (years)	30 years (expected combined measure life)	

CONCLUSION

This report is a first step toward helping to "scale up" efficiency financing in the building sector. Our research has identified a number of challenges the market is currently facing including:

- Most programs are not penetrating the market of potential customers;
- Some residential programs have high rates of application decline;
- Residential loan program participants tend to be "reactive;"
- Project bottlenecks sometimes occur due to burdensome and inflexible program requirements;
- Minimum program size can attract additional lenders;
- Good loan terms don't assure the success of a program;
- The housing market crash has tightened the lending market;
- Some programs with interest rate buy-down have found the costs to be high; and
- There is a lack of uniform criteria for evaluating credit of small businesses and institutions.

Based on these observations and our research we were able to make a number of recommendations for consideration as design elements in an efficiency loan program in order to maximize the impact of limited resources by achieving broad program participation and deep efficiency retrofits. Our recommendations to achieve broad participation in the program are:

- Budget for and invest in ongoing marketing of the program;
- Simplify the loan application process;
- Offer attractive loan terms;
- Design the program for a target audience; and
- Consider on-bill financing

In order to maximize energy savings by achieving "deep retrofits" we recommend:

- Require whole house energy audit to educate consumers about all cost effective options;
- Package loan programs with utility incentives and rebates;
- Require additional complementary measures to reach beyond the "reactive" market;
- Tier program benefits (such as loan terms) to incentivize greater energy savings; and
- Train participating contractors to ensure the credibility of the program and the achievement of energy savings.

As a follow-up to this work, ACEEE is now conducting a more in-depth analysis of on-bill financing programs, focusing in particular on barriers to these programs and ways to address these barriers. We are focusing on these programs because they offer the potential for higher participation rates as indicated by the fact that half of the programs with high participation rates in this current study are on-bill finance programs.

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For specific program contacts and Web sites, see Appendix B.

APPENDIX A—ADDITIONAL TABLES

Table A1: Basic Terms of Surveyed Residential Loan Programs

Program	State	Interest Rate	Average Loan Amount	Maximum Loan Amount	Maximum Loan Term (Years)
Sacramento Municipal Utility District Residential Loan Program (SMUD)	California	8.75% (secured) 10.75% (unsecured)	$9,100	$30,000 $5,000	10 3
Southern California Gas Company Home Energy Upgrade Financing (SoCal Home)	California	13–15%; utility/state programs 7.5–13%	$10,000	$20,000	12
Connecticut Home Energy Solutions (CT Home)	Connecticut	0% (>$7k); 3% (<$7k)	$11,200	$20,000	10
How$mart—Efficiency Kansas (KS $mart)	Kansas	3% (can range from 0–8%)	$5,600	$20,000	15
Maryland Home Energy Loan Program (MHELP)	Maryland	7%	$8,200	$20,000	10
MassSAVE HEAT Loan Program (Mass HEAT)	Massachusetts	0%	$4,200–8,200	$25,000	7
Center for Energy and Environment Home Energy Loan Program (MN CEE)	Minnesota	0% for 3 years or less; 4.99% for 3–10 years	$7,360	$20,000	10
Dollar & Energy Savings Loans Residential (NE $ES)	Nebraska	3.5–5%	$9,000	$100,000 (single-family or duplex) $250,000 (multi-family)	15
Green Jobs–Green New York (GJGNY)	New York	3.6%	$8,200	$13,000	15
New York Energy $mart (NY $mart)	New York	4–6.5% less than lender's standard rate	$11,000	$20,000; $5,000,000 for multifamily	10
Residential Loan Fund Program (NY RLF)	New York	Floor of 3%; buy-down of 4%	NA	$20,000 ($30,000 for ConEd customers)	10
State Energy Loan Program (OR SELP)	Oregon	6–7.5%	$16,000 (includes renewables)	No maximum	15
Clean Energy Works (OR CEW)	Oregon	4–6%	$12,500	$30,000	20
Keystone HELP (PA HELP)	Pennsylvania	7%	$5,000	$35,000	10
Vermont Home Performance with Energy Star (VT EStar)	Vermont	3.5%	$8,000	$15,000	5
Wisconsin Focus on Energy Loan Program (WI Focus)	Wisconsin	9.99%	NA	$20,000	10

Table A2: Basic Terms of Surveyed Commercial, Industrial and Private Loan Program

Program	State	Interest Rate	Average Loan Amount	Maximum Loan Amount	Maximum Loan Term (Years)
Sempra On-Bill Financing (Sempra)	California	0%	$29,500	$250,000; $1,000,000 for state accounts	10
Connecticut Light & Power Commercial & Industrial Financing (CL&P CI)	Connecticut	0%; raised to 7%	$25,000–$50,000	$250,000	5
Connecticut Light & Power Small Business Energy Advantage Program (CT SB)	Connecticut	0%	$8,000	$100,000	<3
Sustainable Agriculture Loan Program (MN Ag)	Minnesota	3%	NA	$40,000 (individual) $160,000 (joint)	7
Smart Savings Through Retrofit Technologies (SmartSTART)	New Hampshire	5.64%	$10,000	NA	5
Dollar & Energy Savings Loans Commercial (NE $ES)	Nebraska	2.5–5%	NA	$750,000	15
Green Jobs–Green New York (GJGNY)	New York	3.6%	$8,200	$26,000	15
State Energy Loan Program (OR SELP)	Oregon	6–7.5%	$560,000 (includes renewables)	No maximum	15
Texas LoanStar (TX LStar)	Texas	3%	$1,500,000	$5,000,000	10
Efficiency Vermont Agricultural Services (VT Ag)	Vermont	0–2%	$5,400	$7,500	4
Efficiency Vermont Lighting Plus Program (VT Light)	Vermont	0%	$3,950	NA	2

Table A3: Funding of Programs Surveyed

Program	Funding Sources	Administrative Budget	Total Lifetime Origination Budgets
SMUD	Utility	$1.9–2.94 million (offset by fees)	$447.4 million (Oct 1990–Mar 2011)
SoCal Home	Private funding, loans sold to Fannie Mae	NA	$300 million (1995–2011)
Sempra	Utility	NA	$15.5 million (2006–Mar 2011)
CT Home	Private funding, loans sold to Fannie Mae	$4.5 million	$10.1 million
KS $mart	Funding is through a company's access to leveraged debt and federal stimulus money	NA	$3.2 million (Aug 2007–Mar 2011)
MHELP	Federal stimulus money	$500,000 (first 4–5 months; averaging $10,000 per month)	$16,000 (Jan 2011–Mar 2011)
Mass Heat	Privately funded by 48 Massachusetts institutions	NA	$75 million (2006–2009)
MN CEE	Government-funded, additional capital from Dept. of Commerce and CEE	NA	$9.2 million (1993–June 2011)
NE $ES	Oil overcharge funds and state energy office	$36 million revolving pool to leverage loans through private lenders	$218.5 million (1990–Mar 2011)
GJGNY	Launched with money legislated by state. Federal bond funding (QECB) and public benefit funds.	$112 million to launch; $21 million from QECB; $20 million per year from public benefit fund	$1.03 million (2011); additional $3.07 million pending
NY RLF	Private institutions issue loans. NYSERDA provides interest rate buy-down.	NA	$2.24 million
NY $mart	Public benefits charge; private lenders	NA	$27 million (2007)
OR SELP	State bonds	NA	$183.7 million (1980–early 2011)
OR CEW	Local government, foundations and federal grant	$28 million (may include loans)	$6.25 million
PA HELP	State treasury	NA	$37 million (2006–2009)
TX LStar	Petroleum violation escrow funds	$98.6 million original investment to launch	$296.3 million (1988–June 2011)
VT Light	Capital from private lenders, interest rate buy-down from program budget	$4.1 million in 2010	$59,212 (2010)
VT EStar	Private lenders and public benefits charge	NA	$257,000 (2007)

Table A4: Risk Management Approaches of Surveyed Programs

Program	Basis for Application Approval	Secured or Unsecured?	Project Approval Tied to Energy Savings?	Application Approval Rate	Default Rate	Number of Loans Closed
SMUD	Credit rating, good standing with utility, debt to income ratio	Both	No	65–70%	0.04–4%	84,000 (Oct 1990–Mar 2011)
SoCal Home	Credit rating, debt to income (Fannie Mae guidelines)	Unsecured	No	65–70%	NA—outperforms credit cards by 2–3 times	30,600 (1995–2011)
Sempra	Active utility account and >2 years in good standing	Unsecured	No—but the length of the loan term is	NA	0.5%	686 (2006–Mar 2011)
CT Home	Credit rating	Unsecured	No	61%	NA	1,117 (2009–Mar 2011)
CL&P CI	Credit rating and at least 3 years in business	Secured	NA	43%	NA	66 (2010)
CT SB	Utility bill must be in good standing for at least 6 months	Unsecured	NA	96%	<1%	1,400 (2010); 9,000 approximate (avg 1,000/year 2003–2011)
KS $mart	Utility bill must be in good standing	Unsecured—nonpayment may result in utility disconnect	Yes—monthly payments must be less than 90% of energy savings	100%	0% as of 2008	540 (2007–Mar 2011)
MHELP	Credit rating and debt to income ratio	Unsecured	No	40%	0%	2 (early 2011)
Mass HEAT	Varies with lender	Both	NA	87%	<0.5%	10,000
MN CEE	No income guidelines	Unsecured	No	NA	NA	1,246 (1993–June 2011)
NE $ES	NA	Both	No—but measures must meet payback timing requirements	Not tracked	0.1%	26,328
SmartSTART	Credit rating and good relationship with utility	Unsecured	Yes—repayment is 75% of savings	NA	NA	8 (2002–2011)
GJGNY	Fannie Mae guidelines and 2 years of utility bills	Unsecured	Yes—savings to investment ratio of 1	60%		126 (Nov 2010–Mar 2011)

Program	Basis for Application Approval	Secured or Unsecured?	Project Approval Tied to Energy Savings?	Application Approval Rate	Default Rate	Number of Loans Closed
NY RLF	Varies with lender	Both	No	NA	NA	411 (Dec 2009–Mar 2011)
OR SELP	Ability to secure the repay the loan	Secured with flexibility (not necessarily a lien)	Possibly—assessment of ability to repay loan conducted on a case-by-case basis	Almost 100%	0.044% (1980–2008); 3% (post 2008)	>700 (1980–Mar 2011)
OR CEW	Credit score and utility history	Unsecured	Yes	NA	NA	500 (June 2009–Feb 2011)
PA HELP	Credit score and debt to income ratio	Both	No	65%	0.5%	6,000
VT Ag	None	Unsecured, but guaranteed	NA	100%	2.5% (1 loan)	40 (2003–2010)
VT Light	None	Unsecured, but guaranteed	No	100%	0%	4 (2010)

Table A5: Savings and Participation Rates for Surveyed Programs

Program(s)	State	Eligible Customer Class (Residential, Commercial, Industrial, Public or All)	Total Program Participants	Participation Rate	Average Annual Electricity Consumption per Eligible Customer	Average Annual Electricity Savings per Program Participant	Percent of Electricity Savings Achieved by Program Participants
SMUD	CA	R	84,000	16.0%	9 MWh	NA	NA
CL&P CI and CL&P SB	CT	C and I	2,529	8.2%	111 MWh	19 MWh	17%
CT Home	CT	R	1,117	0.1%	9 MWh	NA	NA
KS $mart	KA	R and C	540	1.3%	15 MWh	1.8 MWh	12%
Mass HEAT	MA	R	10,000	0.4%	7 MWh	NA	NA
MHELP	MD	R	2	0.0%	12 MWh	NA	15%
MN CEE	MN	R	1,246	0.1%	10 MWh	NA	NA
NE $ES	NE	A	26,328	2.7%	29 MWh	NA	NA
SmartSTART	NH	C and I	8	0.0%	68 MWh	NA	NA
GJGNY	NY	R	126	0.0%	7 MWh	1.2 MWh	17%
OR SELP	OR	A	700	0.1%	27 MWh	NA	NA
OR CEW	OR	R	500		12 MWh	1.4 MWh	12%
PA HELP	PA	R	6,000	0.1%	10 MWh	NA	NA
TX LoanStar	TX	P	205	NA	NA	641 MWh	NA
VT Light	VT	C	4	NA	40 MWh	2.1 MWh	5%

APPENDIX B: PROGRAM SUMMARIES AND CASE STUDIES

This appendix contains program summaries for most of the programs surveyed as part of this study.

CALIFORNIA
Southern California Gas Company Home Energy Upgrade Financing (SoCal Home)
Contact name: Tim McFarland
Contact phone: 714-695-3309
Contact e-mail: Tmcfarland@viewtechfinancialservices.com
Web site: http://www.sdge.com/residential/homeImpFinance.shtml

Program Information

Lead implementing organization	Viewtech Financial Services
Financial services partner(s)/subcontractor(s)	Fannie Mae
Sector(s)	Residential
Geographic area served	Southern California
Program start date	1995
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured
Program budget since inception	NA
Program budget by program year	NA
Sources of capital	Viewtech administers the program. Fannie Mae purchases the loans made by Viewtech.

Program Description: This loan was developed to provide homeowners with an unsecured financing option for specified energy-efficient home improvements. Preapproved contractors help customers fill out application and communicate with Viewtech. Upon completion of approved projects payment is wired to the contractor.

Financing Statistics

Loans closed, number, and $ amount	30,600	$300 million
Loans denied, number, and $ amount	NA	NA
Avg. loan term	10 year with average payoff in 48 months	
Avg. loan APR, (if variable, please provide)	12.99–14.99% open market rates. Utility/state programs have rates from 7.5%—12.99%.	
Avg. program financing recipient loan $ amount	$10,000	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria:

- 640 FICO scores and above
- 50% or less DTI ratio
- No Bankruptcies, foreclosures, repossessions in the last 7 years
- No unpaid judgments, charge-offs, collections exceeding $2500

CALIFORNIA
Sempra On-Bill Financing
Contact name: Frank Spasaro
Contact phone: 800-644-6133
Contact e-mail: fspasaro@semprautilities.com
Web site: http://www.socalgas.com/for-your-business/rebates/zero-interest.shtml
http://www.sdge.com/business/rebatesincentives/programs/onbillfinancing.shtml

Program Information

Lead implementing organization	Sempra Energy Utility, Southern California Gas & Electric, and San Diego Gas and Electric
Financial services partner	NA
Sectors	Commercial, industrial, agricultural, owners of multi-unit housing and public entities
Geographic area served	Southern California/San Diego region
Program start date	Late 2006
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured
Program budget since inception	NA
Program budget by program year	NA
Sources of capital	Utility customers

Program Description: Offers eligible customers 0% financing for qualifying energy-efficient business improvements. Institutions are eligible for up to $250,000 with up to a 10 year payback. State entities are eligible for up to $1 million. Non-institutions are eligible for up to $100,000 with a 5 year maximum payback. Repayment is limited to no more than the useful equipment life. Free energy audits are available for qualified projects. Loans are unsecured, but defaults can lead to utility shut off.

Financing Statistics

Loans closed, number, and $ amount	686 (through 3/11)	$15.5 million
Loans denied, number, and $ amount	NA	NA
Avg. loan term	Up to 10 years	
Avg. loan APR	0%	
Avg. program financing recipient loan $ amount	$29,500	
Avg. program financing participant project annual energy savings	Not tracked	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: The business must have a SoCalGas account active for two consecutive years, and that account must be in good standing. There is no “minimum years in business” requirement.

CONNECTICUT

Connecticut Home Energy Solutions (CT Home)
Contact name: Steven Bruno, Diane del Russo
Contact phone: 860-832-4942
Contact e-mail: brunosj@nu.com
Web site: http://www.cl-p.com/Home/SaveEnergy/Rebates/HomeEnergySolutions.aspx

Program Information

Lead Implementing Organization	Connecticut Light & Power; United Illuminating
Financial services partner(s)/subcontractor(s)	AFC Financial
Sector(s)	Residential
Geographic area served	Connecticut
Program start date	2009
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured
Program budget since inception	$3.4 million
Program budget by program year	NA
Sources of capital	AFC Through Fannie Mae

Program Description: This was a pilot for financing residential whole-house retrofits. An authorized contractor performed energy assessments, making on-the-spot improvements such as caulking, and sealing of critical air leaks. Depending on eligibility, rebates were provided for appliances, HVAC systems and insulation. Financing was introduced to Home Energy Solutions vendors to help promote installation of next tier weatherization.

Financing Statistics

Loans closed, number, and $ amount	842	$8.5 million
Loans denied, number, and $ amount	NA	NA
Avg. loan term	10 years	
Avg. loan APR	Interest rate on loans subsidized to 0% interest for 85% of loans	
Avg. program financing recipient loan $ amount	Estimated at $5,000	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: Credit rating

KANSAS
Efficiency Kansas How$mart Program
Contact name: Michael Volker
Contact phone: 785-625-1476
Contact e-mail: mvolker@mwenergy.com
Web site: http://www.mwenergy.com/howsmart.aspx

Program Information

Lead implementing organization	Midwest Energy
Financial services partner(s)/subcontractor(s)	Efficiency Kansas
Sector(s)	Residential, commercial and public
Geographic area served	Most of the western half of Kansas
Program start date	August 2007
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured—however nonpayment results in utility disconnect. Midwest also registers the obligation with the county
Program budget since inception	NA
Program budget by program year	NA
Sources of Capital	Midwest Energy

Program Description: All customers are eligible. Audits are free for those that go through the program and complete projects. If recommendations are not followed, a $200 fee for the audit is assessed after 6 months. Based on recommendations from the audit the customer selects a contractor. When the work is complete Midwest Energy pays the contractor and adds the loan repayment charge to the customer's bill. Charges must be less than 90% of estimated monthly savings. There is no formal credit check, but utility bills must be current. Funds are from Midwest Energy, although Midwest may access "Efficiency Kansas" funding to provide a low cost source allowing low interest rates to be passed on to customers. Midwest Energy accesses stimulus funds through the Efficiency Kansas program for about 80% of all investment with the remainder of funding from Midwest's ordinary sources. Prior to Efficiency Kansas, Midwest accessed some funding from the Kansas Housing Resources Corporation.

Financing Statistics

Loans closed, number, and $ amount	540	$3.2 Million
Loans denied, number, and $ amount	None	None
Avg. loan term	Residential: 15 years Commercial: 10 years	
Avg. loan APR	Variable. Funding has been as low as 0% for some projects to as high as 8%. Current funding rates are 3% for most residential loans and 6.6% for most commercial loans.	
Avg. program financing recipient loan $ amount	$5,600	
Avg. program financing participant project annual energy savings	1,800 kWh per year 270 therms per year	
Estimated average life of project energy savings (years)	Savings are modeled over life of investment, generally 15 years for residential, 10 for commercial, and 7 for commercial lighting applications.	

Underwriting Criteria: Efficiency Kansas and Midwest Energy have no income restrictions or underwriting criteria. Any Kansas homeowner or landlord with an existing home or small business can apply. The customer must have a current account balance for at least 12 months.

MASSACHUSETTS
MassSAVE HEAT Loan Program (Mass HEAT)
Contact name: Birud Jhaveri
Contact phone: 781-441-3456
Contact e-mail: Birud.Jhaveri@nstar.com
Web site: http://www.masssave.com/residential/heating-and-cooling/find-incentives/incentive-details-heat-loan-program

Program Information

Lead implementing organization	NStar (also National Grid)
Financial services partner(s)/subcontractor(s)	48 financial institutions
Sector(s)	Residential
Geographic area served	Massachusetts
Program start date	2006
Program end date	Ongoing, with significant expansion in 2011
Is financing under this program secured or unsecured?	Both
Program budget since inception	$75 million in financing
Program budget by program year	NA
Sources of capital	Private

Program Description: The HEAT Loan Program provides customers with a loan from participating lenders to assist with the installation of qualified energy efficient improvements in their homes. The loans are available for up to $25,000 (depending on the utility). To apply for the loan, the customer must own a 1–4 family residence and obtain a MassSAVE Home Energy Assessment. The loan can be used for improvements such as:

- 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

Financing Statistics

Loans closed, number, and $ amount	10,000 since 2006 4,200 in 2010	$75 million
Loans denied, number, and $ amount	NA	NA
Loan term	Maximum 7 years	
Avg. loan APR	0%	
Avg. program financing recipient loan $ amount	$4,200-$8,200	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: There are no standardized underwriting criteria for the HEAT Loan Program, each local lender uses its own criteria, and there are over 35 participating firms.

MARYLAND
Maryland Home Energy Loan Program (MHELP)
Contact name: Terry Daly
Contact phone: 301-738-6280
Contact e-mail: loans@mdcleanenergy.org
Web site: http://mdcleanenergy.org/programs_and_incentives/clean_energy_home_owner_loan_program

NOTE: The Maryland Home Energy Loan Program is a very new program and when the initial research for this report was done only two loans had been closed. These two loans were used in the average calculations provided in the body of the report and the information reported below. We have since received an update on the status of this program which as of the beginning of August 2011 has closed a total of 23 loans for a total of $176,481 and an average loan amount of $7,673.

Program Information

Lead implementing organization	Maryland Energy Administration and Maryland Clean Energy Center
Financial services partner(s)/subcontractor(s)	AFC First Financial
Sector(s)	Residential
Geographic area served	Maryland
Program start date	January 20, 2011
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured
Program budget since inception	$500,000 (4-5 month budget). Could be increased; looking at private funds.
Program budget by program year	NA
Sources of capital	Federal stimulus funding

Program Description: Loans are available for up to $20,000. Measures typically include insulation and HVAC equipment upgrades but are not limited to these improvements. Property must be a primary residence and located in the state in order to be eligible. Single-family detached homes and townhouses are eligible. Condominiums and coops are unable to participate. AFC First receives the application and handles approval, funding and servicing. The program has a tiered interest rate depending on the measures included in the project.

Financing Statistics

Loans closed, number, and $ amount	2 (11 approved)	$16,400
Loans denied, number, and $ amount	37 out of 50	NA
Avg. loan term	10 years	
Avg. loan APR	9.99% for equipment upgrades; 6.99% with energy audit, insulation and duct sealing	
Avg. program financing recipient loan $ amount	$8,200	
Avg. project cost for participants	$9,650	
Avg. program financing participant project annual energy savings	15% is what they are seeing on audit, but they only have 2 closed loans.	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: Credit rating and debt to income ratio.

NEW HAMPSHIRE
Smart Savings Through Retrofit Technologies (SmartSTART)
Contact name: Craig Snow
Contact phone: 603-536-8673
Contact e-mail: snowc@nhec.com
Web site: http://www.nhec.com/

Program Information

Lead implementing organization	New Hampshire Electric Coop, also offered by Public Service of New Hampshire
Financial services partner(s)/subcontractor(s)	None
Sector(s)	Commercial and industrial
Geographic area served	Covers approx. 80% of state
Program start date	2002
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured
Program budget since inception	NA
Program budget by program year	NA
Sources of capital	Utility

Program Description: New Hampshire Electric Co-Op's SmartSTART Program is a no-money-down option to have energy efficient products installed in New Hampshire businesses. The cost of the improvements is repaid based on 75% of the estimated energy bill savings. If the customer moves and the efficiency measures stay, the obligation to pay for the measures passes to the next customer at that meter. The SmartSTART program has mostly been used for lighting upgrades, but can also be used for weatherization, air sealing, insulation, and other efficiency measures. Program approval is based on the customer's good standing with the utility. There is no credit review required.

Financing Statistics

Loans closed, number, and $ amount	8	NA
Loans denied, number, and $ amount	NA	NA
Avg. loan term	5 year maximum	
Avg. loan APR, (if variable, please provide)	5.64%	
Avg. program financing recipient loan $ amount	$10,000 (estimated)	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: Credit rating and good standing with the utility.

NEW YORK
Green Jobs—Green New York (GJGNY)
Contact name: John Ahearn
Contact phone: 518-862-1090 x3519
Contact e-mail: mja@nyserda.org
Web site: http://www.getenergysmart.org/SingleFamilyHomes/Existing Building/HomeOwner/Financing.aspx#

Program Information

Lead implementing organization	New York State Energy Research & Development Authority (NYSDERA)
Financial services partner(s)/subcontractor(s)	Energy Finance Solutions (EFS) for residential loan origination; tbd for small, commercial and multifamily
Sector(s)	Residential (1-4 family), multifamily, and small commercial/not-for-profit
Geographic area served	New York
Program start date	November 15, 2010 for residential; spring 2011 for multifamily and small commercial
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured residential loans; TBD for other loans.
Program budget since inception	$112 million from legislation with program launch. Additional $21 million in federal stimulus being used to lower interest rates.
Program budget by program year	NA
Sources of capital	Legislation, federal stimulus and private

Program Description: Loans are available for the installation of eligible energy efficiency measures in owner-occupied 1–4 family homes. NYSERDA established underwriting criteria with EFS originating the loans which NYSERDA purchases at closing. Initial interest rate is 3.49% with ACH payment; 3.99% with automatic payment by check. Maximum loan amounts available are $13,000 for residential, $26,000 for small commercial, and $500,000 for multifamily. A Comprehensive Home Assessment must be performed by a certified contractor. Borrowers must work with the contractor to decide what improvements should be made. Improvements must have a savings to investment ratio of at least 1.

Financing Statistics

Loans closed, number, and $ amount	126	$1,026,441
Loans denied, number, and $ amount	325	NA
Avg. loan term	11.6 years	
Avg. loan APR	75% at 3.49% and 25% at 3.99% interest rate for 3.62% overall rate	
Avg. program financing recipient loan $ amount	$8,194	
Avg. program financing participant project annual energy savings	1,194 kWh and 48 MMBTU	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: The New York legislature passed the Green Jobs–Green New York (GJGNY) Act in 2009. Prior, financing was available through Fannie Mae Energy Loans, which required a minimum 640 FICO score to qualify. Apparently, 30% of applications were rejected. Financing through the GJGNY platform attempts to lower the rate using alternative underwriting criteria.

In November 2010, NYSERDA replaced its Fannie Mae Energy Loan with two tiers of underwriting standards for unsecured loans, up to 15 years, from $3,000 to $13,000 with an initial interest rate of 3.99%. Tier 1 loans adhere to the Fannie Mae Energy Loan criteria historically used in New York, while Tier 2 requires reliable utility bill payment and good standing on outstanding mortgage obligations. Both tiers apply a minimum debt-to-income ratio of 0.5.

NEW YORK
New York Energy $mart
Contact name: John Ahearn
Contact phone: 518-862-1090 x3519
Contact e-mail: mja@nyserda.org
Web site: None. See instead: http://www.nyserda.org/resloanfund.asp

Program Information

Lead implementing organization	NYSERDA
Financial services partner	Private lenders
Sector	Residential—single and multi-family
Geographic area served	Customers of specified utilities (excludes Long Island and NY Power Authority and municipal utility districts)
Program start date	July 1998
Program end date	Still operating
Is financing under this program secured or unsecured?	Both
Program budget since inception	NA
Program budget by program year	NA
Sources of capital	Utility public benefits charge

Program Description: The program provides an interest rate reduction off of a participating lender's normal interest rate for a term up to 10 years. Projects in existing 1–4 family homes may include heating, insulation, windows and appliances. All other sectors may include renovation or new construction projects that install energy-efficient measures such as lighting, air conditioning, motors, and renewable energy technologies. The participating bank receives an up-front lump sum payment of the subsidy from NYSERDA within 30 days after closing documents for the full term of the loan.

Financing Statistics

Loans closed, number, and $ amount	369 (2007)	$27 million
Loans denied, number, and $ amount	NA	NA
Avg. loan term	Up to 10 years	
Avg. loan APR	4–6.5% less than lender's normal market rate	
Avg. program financing recipient loan $ amount	$11,000; $20,000 maximum (single family)	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

NEW YORK
Residential Loan Fund (NY RLF)
Contact name: Joseph DeRosa
Contact phone: 518-862-1090 x3487
Contact e-mail: jgd@nyserda.org
Web site: http://www.nyserda.org/resloanfund.asp

Program Information

Lead implementing organization	NYSERDA
Financial services partner	Network of participating loan fund lenders (currently 36 lenders)
Sector	Residential—existing 1 to 4 family homes
Geographic area served	The six SBC-participating investor-owned utilities in NYS (statewide minus Long Island and municipal utilities)
Program start date	November, 2009
Program end date	Still operating
Is financing under this program secured or unsecured?	Secured or unsecured, at the option of the lender and the borrower
Program budget since inception	NA
Program budget by program year	NA
Sources of capital	NYSERDA and private lenders

Program Description: Fund provides low-interest financing through a network of Participating Residential Loan Fund Lenders to support the installation of qualified energy efficiency improvements in existing 1–4 family homes. The Residential Loan Fund provides an Interest Rate Reduction up to 4%, but may be adjusted to maintain a minimum program interest rate of 3%.

Financing Statistics

Loans closed, number, and $ amount	411 (Dec 2009–Mar 2011)	Approximately $2.2 million
Loans denied, number, and $ amount	NA	NA
Avg. loan term	Up to 10 years	
Avg. loan APR	Minimum is 3%	
Avg. program financing recipient loan $ amount	Loans up to $20,000, except up to $30,000 in Consolidated Edison territory	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: Typically, each participating lender will issue loans according to its own underwriting criteria. There are 36 participating lenders.

OREGON
GreenStreet Lending Program
Contact name: Energy Trust of Oregon
Contact phone: 866-790-2121
Contact e-mail: info@energytrust.org
Web site: http://www.greenstreetloan.com/

Program Information

Lead implementing organization	Energy Trust of Oregon
Financial services partner	Umpqua Bank
Sector(s)	Residential and commercial
Geographic area served	Customers of PGE, Pacific Power, NW Natural or Cascade Natural Gas
Program start date	2008
Program end date	Ongoing
Is financing under this program secured or unsecured?	Both options are available
Program budget since inception	NA
Program budget by program year	NA
Sources of capital	Private bank

Program Description: Program offers financing options to help residential and commercial consumers carry out energy efficiency improvements. Residential loans include unsecured home improvement loans and home equity loans. Small businesses and owners of multifamily residential property are eligible for commercial real estate improvement loans and business term loans. The loans have no fees or closing costs and can be used for efficient heating and cooling systems, water heating systems, insulation, windows, solar energy systems, air and duct sealing, lighting, appliances, and exterior doors and windows.

Financing Statistics

Loans closed, number, and $ amount	>125 (late 2008-May 2011)	NA
Loans denied, number, and $ amount	NA	NA
Avg. loan term	NA	
Avg. loan APR	NA	
Avg. program financing recipient loan $ amount	Res: $1,000-$50,000 Small Business: $5,000-$200,000	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

OREGON
Small-Scale Energy Loan Program (SELP)
Contact name: Kathy Estes
Contact phone: 503-378-4040
Contact e-mail: Kathy.estes@state.or.us
Web site: http://egov.oregon.gov/energy/loans/selphm.shtml

Program Information

Lead implementing organization	Oregon Department of Energy
Financial services partner	Directly to borrower
Sectors	Residential, commercial, industrial, public, and non-profit
Geographic area served	Statewide
Program start date	1980
Program end date	Still operating
Is financing under this program secured or unsecured?	Secured—they decide what that means. Could be letter of credit, income stream, etc. Savings defray debt service, but do not count as security.
Program budget since inception	Enterprise fund, self-supporting.
Program budget by program year	NA
Sources of capital	Sale of bonds

Program Description: The program promotes energy conservation and renewable resource development by offering low-interest loans. Loans may be used for projects that save energy, produce energy from renewable resources, use recycled materials, or use alternative fuels. Created by a voter authorization for the sale of bonds. The sale of bonds is made on a periodic basis and, occasionally, may be done accommodate a particularly large loan request. There is no legal maximum loan. Size ranges from $20,000 to $20 million (there is no maximum loan amount). Terms vary, but are generally set to match the term of the bonds that funded the loans.

Financing Statistics

Loans closed, number, and $ amount	1980–2009: 690 2009: 14	$183.7 million $26 million
Loans denied, number, and $ amount	NA	NA
Avg. loan term	5–15 years	
Avg. loan APR	Residential and commercial rates: 6–7.5%	
Avg. program financing recipient loan $ amount	$20,000–20 million for projects	
Avg. program financing participant project annual energy savings	They always do proposed energy savings and work with project to get an estimate. They are in the process of implementing an energy tracking program that will compare actual and expected savings.	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: The underwriting criteria for this program are not credit score driven, and they will look at the whole picture with credit score as one factor. In addition to a "decent" credit score, the applicant must have good payment history (utility, mortgage, anything that would show up in a credit report), and the debt-to-income should be below 40–45%. C&I projects are very project-specific, but the normal range is 1.25–1.5 debt service coverage ratio, plus a business appraisal will be conducted similar to other lending programs for businesses. The program issues loans conservatively because of the funding source and return requirements.

PENNSYLVANIA

Keystone HELP—Energy Efficiency Loan Program (PA HELP)
Contact name: Tessa Shin
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Contact e-mail: tshin@afcfirst.com
Web site: http://www.keystonehelp.com/index.php

Program Information

Lead implementing organization	Pennsylvania Department of Environmental Protection, Pennsylvania Treasury Department, and Pennsylvania Housing Finance Agency
Financial services partner(s)/subcontractor(s)	AFC First Financial
Sector(s)	Residential
Geographic area served	Pennsylvania
Program start date	February 2009, Revised in 2010
Program end date	Still operating
Is financing under this program secured or unsecured?	Both
Program budget since inception	$40 million in loans at one point—seeking to sell a $25 million portfolio
Program budget by program year	NA
Sources of capital	Pennsylvania Treasury sponsored using its balance sheet to fund loans

Program Description: Low rate, low payment financing program for energy efficiency home improvements and geothermal heat pump systems. Homeowners who own and make qualifying improvements to their one- or two-unit primary residence located in the state and whose combined annual household income does not exceed $150,000 are eligible to apply for loans under this program. Eligible applicants may receive only one loan during each fiscal year, but they may apply for additional loans in future years, as long as the additional projects comply with the published guidelines current at the time of application.

Financing Statistics

Loans closed, number, and $ amount	6,000+	$45.8 million
Loans denied, number, and $ amount	NA	NA
Avg. loan term	10 years	
Avg. loan APR	7%	
Avg. program financing recipient loan $ amount	$5,000	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: Consumers are eligible for HELP loans down to a FICO score of 640, though a 680 FICO is required to obtain the maximum loan volume of $15,000. Besides income verification, the only other underwriting criteria is that individuals with lower FICO scores have a maximum debt-to-income ratio of 45% and those with higher FICO scores have a maximum debt-to-income ratio of 50%. The average FICO score is 767 and the average debt to income ratio is 36%.

TEXAS

Texas LoanStar Program (TX LStar)
Contact name: Eddy Trevino
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Web site: http://seco.cpa.state.tx.us/ls

Program Information

Lead implementing organization	State Energy Conservation Office
Financial services partner(s)/subcontractor(s)	None
Sector(s)	Public entities, including state, public school, colleges, university, and non-profit hospital facilities
Geographic area served	Texas
Program start date	1989
Program end date	Still operating
Is financing under this program secured or unsecured?	NA
Program budget since inception	NA
Program budget by program year	$126 million/$21 million annual loan allocation/$98.6 million revolving loan amount
Sources of capital	Petroleum violation escrow funds from federal government

Program Description: Low-interest loans for Energy Cost Reduction Measures (ECRMs). Measures include, but are not limited to: HVAC, lighting, and insulation. Funds can be used for retrofitting existing equipment or, in the case of new construction, to finance the difference between standard and high efficiency equipment. Projects are repaid through energy cost savings. Maximum loan amount of $5 million.

Financing Statistics

Loans closed, number, and $ amount	1989–2007: 191 2009: 5 2010: 4	>$240 million >$22 million $7 million
Loans denied, number, and $ amount	NA	NA
Avg. loan term	5.7 years; 10 year maximum	
Avg. loan APR	3%	
Avg. program financing recipient loan $ amount	NA	
Avg. program financing participant project annual energy savings	$252 million cumulative energy savings	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: This program does not have any underwriting criteria, the only requirement is that it is a state agency buildings or public higher education building.

VERMONT
Efficiency Vermont Lighting Plus Program (VT Light)
Contact name: Rich Fleury
Contact phone: 888-921-5990 x1189
Contact e-mail: rfleury@veic.org
Web site: NA

Program Information

Lead implementing organization	Efficiency Vermont
Financial services partner(s)/subcontractor(s)	Opportunities Credit Union/RISE Engineering
Sector(s)	Commercial
Geographic area served	Rutland/Chittenden/Southern Vermont/ Saint Albans — demand constrained areas of Vermont
Program start date	September 2007
Program end date	March 2011
Is financing under this program secured or unsecured?	Guaranteed by Efficiency Vermont
Program budget since inception	Approximately $16 million for entire Lighting Plus budget including financing
Program budget by program year	2007—<500K (Startup and pilot phase) 2008—$7.5 Million 2009—$4.1 Million 2010—$4.1 Million 2011—Approx. $1.9 Million
Sources of capital	Capital came from Credit Union partners. Interest rate incentives came from the program budget

Program Description: Turn-key lighting retrofit services targeting small and medium sized customers in Vermont that are located in demand constrained areas. Program discontinued in 2011 due to market saturation. In 2007 no financing was necessary because Lighting Plus program paid for 100% of the cost of installing the lighting measures. Starting in 2008 incentives were reduced and negotiated for each project so that remaining investment by customer would be earned back within one year through energy savings. Subsidized financing was offered for the customer investment amount..

Financing Statistics

Loans closed, number, and $ amount	4	$24,677
Loans denied, number, and $ amount	0	NA
Avg. loan term	2 years	
Avg. loan APR	0%	
Avg. program financing recipient loan $ amount	$3,950	
Avg. program financing participant project annual energy savings	32,056 kWh	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: This program does not really have any underwriting criteria because the loans are guaranteed by Efficiency Vermont.

VERMONT

Efficiency Vermont—Agricultural Services (VT Ag)
Contact name: Jennifer Osgood
Contact phone: 802-658-6060 x1314
Contact e-mail: josgood@veic.org
Web site: www.efficiencyvermont.com

Program Information

Lead implementing organization	Efficiency Vermont
Financial services partner(s)/subcontractor(s)	Opportunities Credit Union
Sector(s)	Agricultural
Geographic area served	Vermont
Program start date	2003
Program end date	Still operating
Is financing under this program secured or unsecured?	Efficiency Vermont will guarantee loan if needed
Program budget since inception	No specific budget allocated
Program budget by program year	NA
Sources of capital	Energy Efficiency Charge on all electric bills in the state of Vermont for administrative costs. Capital comes from commercial sources.

Program Description: Provides loans to Vermont farmers interested in completing energy efficiency improvements on farms. Credit union administers loan and Efficiency Vermont provides technical assistance and interest rate buy-down. Program has 100% application approval rate.

Financing Statistics

Loans closed, number, and $ amount	40	$217,221
Loans denied, number, and $ amount	0	0
Avg. loan term	2–4 years	
Avg. loan APR	0–2%	
Avg. program financing recipient loan $ amount	$5,400	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria: This program does not really have any underwriting criteria because the loans are guaranteed by Efficiency Vermont

WISCONSIN
Focus on Energy Home Performance & Efficient Heating and Cooling Loan Program (WI Focus)
Contact name: Nancy O'Brien
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Contact e-mail: efs@energyfinancesolutions.com or nancyo@weccusa.org
Web site: http://www.focusonenergy.com/Residential/ and
http://www.energyfinancesolutions.com/main/homeownerswione/title/%3EWisconsin

Program Information

Lead implementing organization	Focus on Energy
Financial services partner(s)/subcontractor(s)	Energy Finance Solutions (EFS)
Sector(s)	Residential
Geographic area served	Wisconsin (specific utilities only, see list here: http://www.focusonenergy.com/files/Document_Management_System/Misc/participatingutilities_list.pdf)
Program start date	1995
Program end date	Still operating
Is financing under this program secured or unsecured?	Unsecured
Program budget since inception	NA
Program budget by program year	NA
Sources of capital	Government and private lender

Program Description: Loans up to $10,000 available with no fees or closing costs and 100% of installation costs can be financed. The approval process is very quick (30 minutes or less). Applicants must have a minimum credit score of 640. Eligible measures include heating and cooling system, water heating, insulation and air sealing. The program requires the use of pre-approved contractors. Customers using financing cannot also receive cash-back rewards for the same measures from Focus on Energy

Financing Statistics

Loans closed, number, and $ amount	NA	NA
Loans denied, number, and $ amount	NA	NA
Avg. loan term	3, 5, 7 or 10 years	
Avg. loan APR	9.99%	
Avg. program financing recipient loan $ amount	Up to $10,000	
Avg. program financing participant project annual energy savings	NA	
Estimated average life of project energy savings (years)	NA	

Underwriting Criteria:

Tier I: Minimum FICO score of 640, a maximum debt to income ratio of 50%, no bankruptcies within the last 7 years and no judgments/collections/tax liens in excess of $2,500.

Tier II: This was intended to increase eligibility/participation for those who do not meet Tier I. Additional requirements are included for utility bill payment and mortgage payment history:

- No minimum FICO score, but there is a maximum D-to-I ratio of 55%;
- If the applicant has a 680 FICO score or higher, the D-to-I ratio can rise up to 70%;
- There can be no bankruptcy in the last 5 years;
- There can be no outstanding judgments/collections/tax liens in excess of $2,500.
- The utility bill must be current for 2 consecutive months during each of the last two years;

- There can be no utility or mortgage payments more than 60 days late in the last 2 years; and
- Applicant must be current on mortgage payments for the last 12 months.