

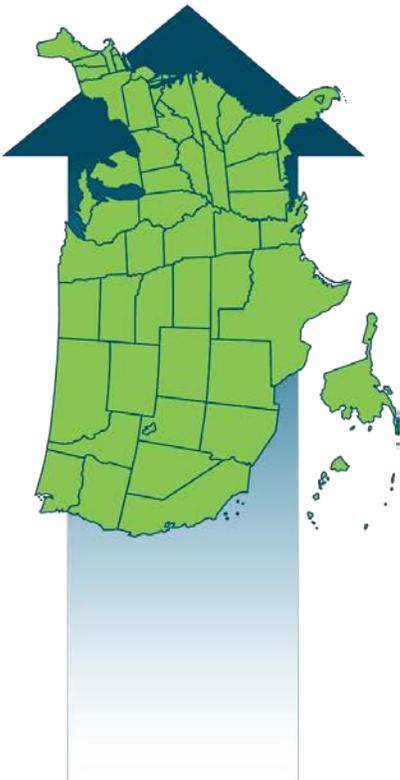
SEE Action

STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

Energy Efficiency Financing Program Implementation Primer

Financing Solutions Working Group

January 2014



The State and Local Energy Efficiency Action Network is a state and local effort facilitated by the federal government that helps states, utilities, and other local stakeholders take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020.

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Energy Efficiency Financing Program Implementation Primer was developed as a product of the State and Local Energy Efficiency Action Network (SEE Action), facilitated by the U.S. Department of Energy/U.S. Environmental Protection Agency. Content does not imply an endorsement by the individuals or organizations that are part of SEE Action working groups, or reflect the views, policies, or otherwise of the federal government.

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Table of Contents

List of Acronyms	iv
Acknowledgments	v
Introduction.....	1
1. Why Offer an Energy Efficiency Financing Program?	3
2. Energy Efficiency Financing Basics	5
3. Common Energy Efficiency Financing Tools.....	9
4. Lessons Learned from Existing Energy Efficiency Financing Programs	11
5. Additional Resources.....	13
6. Glossary of Terms.....	14



List of Acronyms

CDFI	community development financial institutions
CEFIA	Clean Energy Finance and Investment Authority
CEWO	Clean Energy Works Oregon
CPUC	California Public Utilities Commission
DOE	U.S. Department of Energy
HELOC	home equity line of credit
HUD	U.S. Department of Housing and Urban Development
HVAC	heating, ventilation, and air conditioning
LBNL	Lawrence Berkeley National Laboratory
LLR	loan loss reserve
NYSERDA	New York State Energy Research and Development Authority
OBF	on-bill financing
OBR	on-bill repayment
PACE	property assessed clean energy
QA	quality assurance
SEE Action	State and Local Energy Efficiency Action Network
WHEEL	Warehouse for Energy Efficiency Loans



Acknowledgments

Energy Efficiency Financing Program Implementation Primer is a product of the State and Local Energy Efficiency Action Network's (SEE Action) Financing Solutions Working Group. This guide was developed under the guidance of and with input from the working group. The guide does not necessarily represent an endorsement by the individuals or organizations of the working group members. This guide is a product of SEE Action and does not reflect the views or policies of the federal government.

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The authors received direction and comments from the Financing Solutions Working Group; members can be viewed at www.seeaction.energy.gov/members.html.

Introduction

This primer provides an overview of key considerations for state and local policymakers, utility energy efficiency program administrators, and program partners such as financial institutions and contractors in designing and implementing successful energy efficiency financing programs for existing buildings in the residential and commercial sectors.¹ It is intended to serve as an introductory resource that provides a foundational understanding of key issues related to the topic, and guides readers to existing resources to assist with more in-depth financing program design and implementation.

Many state policymakers and utility regulators have established aggressive energy efficiency targets, including for existing buildings. Reaching these targets will necessitate investing billions of dollars in these properties—and taxpayer and utility ratepayer funding is a small fraction of the total investment needed.² In the face of this funding gap, many energy efficiency program administrators are seeking to increase their reliance on customer financing with the aim of amplifying the impact of limited program monies.³ Energy efficiency is a low-cost energy resource that delivers a range of public, energy system, and private benefits.⁴ But, a range of well-documented barriers impedes broader customer energy efficiency adoption. Successful energy efficiency programs take a holistic approach to overcoming these barriers (see Figure 1).⁵

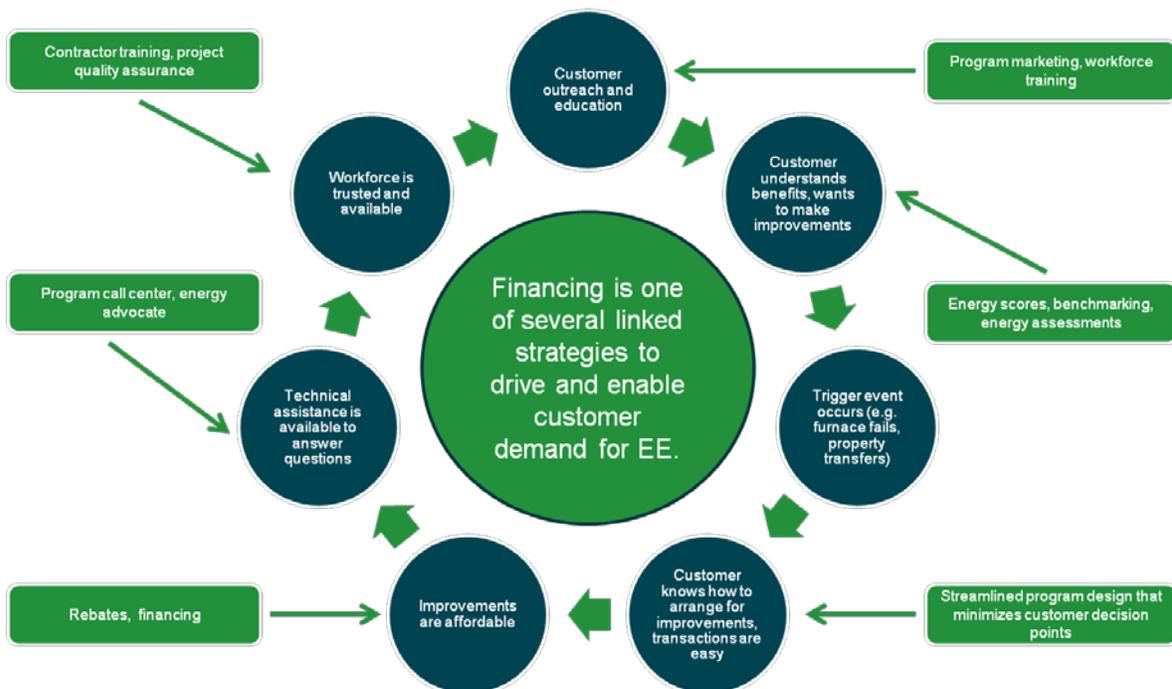


Figure 1. Program strategies to drive customer adoption of energy efficiency

¹We describe “offering financing programs” in the broadest sense—this may take the form of direct provision of public or ratepayer capital, direct or indirect support for private sector financial products (e.g., credit enhancement, co-marketing, customer intake), enabling or offering of novel financial products (e.g., on-bill financing) or some combination of these.

²In California, for example, to achieve the state’s policy goals, there needs to be an estimated \$70 billion of energy efficiency investment in existing buildings over the next decade—only a fraction of which will be provided by ratepayer funding (HB&C 2011).

³A few examples of this increasing reliance on financing: In California, the Public Utilities Commission (CPUC) has approved \$200 million of pilot programs to test whether transitional ratepayer support can trigger self-supporting (i.e., subsidy-free) programs (CPUC 2013). In Connecticut, the Clean Energy Finance and Investment Authority’s (CEFIA’s) 2013–2015 Strategic Plan notes that its programs “will reflect the strategic transition away from technology innovation, workforce development, formal education, and subsidies toward a focus on low-cost financing of clean energy deployment ... (in order to) seek to leverage ratepayer dollars ...” (CEFIA 2013). In New York, the \$1 billion Green Bank’s goals include overcoming disparate one-time subsidies and offering public credit and investment programs that require only a small amount of government funds (Cuomo 2013).

⁴For more information on the benefits of energy efficiency benefits, visit: www.epa.gov/statelocalclimate/state/topics/energy-efficiency.html.

⁵For more information on barriers to energy efficiency and financing’s role in overcoming them, download SEE Action’s *Using Financing to Scale up Energy Efficiency*, available at: www1.eere.energy.gov/seeaction/pdfs/financing_workplan_recommendations.pdf.



One significant energy efficiency adoption barrier is the high initial investment cost of energy efficiency improvements. These up-front costs are typically recouped over the lifetime of installed efficiency measures through energy savings, higher rents and property values, and/or higher tenant occupancy rates, but some customers lack the financial means or willingness to use their limited financial resources to make the initial purchase of these improvements. This guide focuses primarily on strategies for delivering broad customer access to attractive financing products that enhance customer capacity and willingness to invest in energy efficiency to address this “first cost” barrier. It is organized into the following sections:

1. **Why Offer an Energy Efficiency Financing Program?** An overview of market failures and/or policy goals that may warrant public or ratepayer intervention in the energy efficiency financing market.
2. **Energy Efficiency Finance Basics.** A description of the key elements that make up energy efficiency financing products and markets.
3. **Common Energy Efficiency Financial Tools.** An overview of financing tools available for consideration by energy efficiency program administrators.
4. **Key Lessons Learned from Existing Energy Efficiency Financing Programs.** A synthesis of key considerations for designing a successful financing program.
5. **Additional Resources.** Tools and resources containing more detailed information on the topics covered in this primer, as well as related topics.
6. **Glossary of Terms.** Terms highlighted in bold throughout this document are defined in the glossary.

ENERGY EFFICIENCY IMPROVEMENT BASICS

Customers invest in energy efficiency through multiple project types and transaction points. Depending on the target customer segment, a project’s timing and its features, different financial products may be appropriate. This box offers illustrative examples of these project types and transaction points.

Project types include:

- **Comprehensive improvements:** Multi-measure, performance-based improvements that achieve savings of 20% or more of total building energy use. These improvements have the highest up-front costs and typically include an **energy assessment**.
- **Bundled improvements:** Multi-measure improvements (e.g., insulation, air and duct sealing) typically performed without a full energy assessment and with less ambitious scopes than comprehensive improvements, typically achieving 10–20% energy savings.
- **Single-measure improvements:** Typically involve the installation or replacement of a major piece of equipment (e.g., heating, ventilation, and air conditioning [HVAC]; chiller), with varying savings and cost potential.

Transaction points include:

- **Equipment replacement:** The failure or end of the useful life of major equipment is a significant transaction point for energy efficiency improvements. Programs targeting **reactive projects** may prioritize financial products such as **indirect loans** that can be approved at the kitchen table over those that are cheaper but take days or weeks to approve and close.
- **Rehab/modernization of properties or tenant spaces:** Many customers invest in energy efficiency as an integrated part of a broader property rehabilitation or modernization (or during build out of a new tenant’s space). A range of traditional improvement financial products—often property-secured (e.g., mortgages, home equity lines of credit [HELOCs])—may be appropriate for these investments.
- **Proactive energy efficiency-only upgrades:** Comprehensive upgrades, which can have high up-front costs and take weeks or months to complete, often involve customers proactively seeking energy efficiency. These customers may prioritize low-cost, long-term financial products (e.g., property assessed clean energy [PACE]) over fast-close products since they won’t need to pay for projects until work is completed.

1. Why Offer an Energy Efficiency Financing Program?

The high first costs of energy efficiency have been one impetus for utilities, states, and local governments to offer program-supported financing for customers to pay for energy efficiency improvements. This focus on financing is also driven by a desire to encourage substantial cost contributions by participating customers that are investing in energy improvements, in order to stretch the impacts of limited taxpayer and ratepayer funding, and to minimize bill impacts for utility ratepayers.

Generally speaking, a range of private sector tools (e.g., mortgages, credit cards) are available to finance property improvements. These tools can enable customers to finance energy efficiency in the same manner they might finance non-energy efficiency property improvements.

Before implementing a financing program, it is important to start by clearly defining the problem(s) the program is targeting—several rationales may warrant public or ratepayer intervention to augment existing private sector tools.⁶ Common rationales include the following.

1. More information is needed before private capital providers can deliver appropriate financial products.

Energy savings from energy efficiency improvements reduce customer utility bills. This financial benefit may reduce customer **defaults** on financial products relative to other types of debts. Reduced defaults should improve the terms (e.g., interest rate, **duration**) of energy efficiency financial products and increase customer access to them. But, financial institutions lack sufficient data to assess and price these benefits. In this context, energy efficiency financing programs could be used as temporary interventions to drive customer adoption of energy efficiency by delivering more attractive financial products while developing the requisite data set to educate financial institutions on the performance benefits of energy efficiency financing.⁷

Example. Many Recovery Act-funded programs offer financial institutions credit enhancements to encourage them to reduce the interest rate, extend the term, increase the maximum loan amount, or expand underwriting for their financial products. Program administrators often plan to reduce or withdraw these credit enhancements in the future as data on the performance of these loan products becomes available. However, energy efficiency financing programs have been around for several decades and programs have not so far been structured or documented in a way that has led financial institutions to alter their risk assessments of this market (or program volumes have not been large enough to warrant their attention).

2. Financial product standardization and aggregation are needed for financial institutions to deliver attractive capital.

Energy efficiency financial products, particularly small **loans** and **leases** common in the residential and small business sectors, tend to be low-**margin** products for financial institutions. Financial institutions often participate profitably in markets like this by offering consumers standardized products that can be originated in high volume,⁸ aggregated, and re-sold to other investors through a highly organized **secondary markets** transaction (which re-capitalizes financial institutions with sufficient monies to originate more loans or leases).⁹ Today, however, the energy efficiency-specific financing market is characterized by low volume, lack of product standardization, and the absence of vehicles to aggregate financing pools for re-sale.

⁶Adapted from Lawrence Berkeley National Laboratory's (LBNL) *Getting the Biggest Bang for the Buck: Exploring the Rationales and Design Options for Energy Efficiency Financing Programs* available at: <http://emp.lbl.gov/publications/getting-biggest-bang-buck-exploring-rationales-and-design-options-energy-efficiency-fin>.

⁷The SEE Action Financing Solutions Working Group is supporting an LBNL-led scoping analysis to assess energy efficiency financing data collection challenges and opportunities.

⁸Standardization entails consistent financial product origination and servicing protocols, so that a loan or lease originated in California is similar to a loan or lease originated in Oklahoma or New York. This standardization is essential to the process of successfully aggregating and selling these financial products in sufficient volume to attract large pools of low-cost investor capital.

⁹The resale of financing products is known as a "secondary" sale (the primary sale is the financial institution's origination of the financial product for the borrower). Financial institutions typically earn fees when they sell financial products to secondary investors.



Taxpayer and utility ratepayer-supported financing programs could be used as a temporary or long-term intervention to standardize financial product terms across financial institution partners and/or to aggregate these financial products and facilitate secondary markets transactions. This access to secondary markets has the potential to deliver large pools of institutional investor capital for energy efficiency financing.

Example: The Warehouse for Energy Efficiency Loans (WHEEL) program, a new residential financing initiative launching initially in Pennsylvania and Kentucky, delivers standardized loan products and underwriting processes across jurisdictions. WHEEL relies on a capital markets partner, Citigroup, to purchase and warehouse pools of loans as they are originated across participant territories. As program volume grows, Citigroup anticipates pursuing a secondary markets sale of its unsecured loan portfolio, and doing so on a recurring basis as more and more loans are originated. The proceeds of each sale would then be used to replenish programs and fund more efficiency loans.

- 3. New financial products are needed to overcome energy efficiency's particular barriers.** The high up-front cost of some energy efficiency measures is one of several impediments to broader customer adoption of these improvements. Some financial products have special features with the potential to address both the high first cost barrier and other barriers such as **renter/owner split incentives**, long project paybacks, and **balance sheet treatment** that lead to customer under-investment in energy efficiency in certain customer segments (e.g., commercial tenant-occupied properties, multifamily properties). For example, two novel financial products that have garnered significant attention are **property assessed clean energy (PACE)** and **on-bill financing/on-bill repayment (OBF/OBR)**.

Example: OBF or OBR programs are operating in at least 24 states. To date, more than \$1.5 billion of capital has been delivered to tenant- and owner-occupied spaces for energy improvements.¹⁰

- 4. Some customer segments are under-served by private capital markets.** Financial institutions may not serve some customers (e.g., middle- and low-income households, small businesses) or serve them only with unattractive, high-cost products because the perception is that lending to certain customer segments represents too high a risk relative to the potential financial return. Better information on the performance of energy efficiency financing may be sufficient to make financing more accessible to these customers (see Rationale 1). However, there are some customers that may be deemed by private lenders as unprofitable to serve, regardless of better performance data. While private sector financial institutions, in general, seek purely financial return, taxpayer and utility ratepayer funds target a range of system and public benefits (e.g., cost-effective energy savings, reduced environmental impacts of electricity production, diversification of resource mix to reduce various risks). This more holistic view may lead to a different assessment of risk and return based on broader programmatic goals, and may warrant long-term provision of taxpayer or ratepayer direct loan capital, or credit enhancement to private markets, to deliver attractive capital to overcome barriers to adoption for hard to reach customer segments.

Example: Several OBF programs target primarily small businesses, for whom access to traditional financial products is typically difficult and expensive—if available at all. In Connecticut, United Illuminating's OBF program has served approximately 1/4 of eligible small businesses over the past decade, with average energy savings above 20%.

Depending on the market failures or policy goals an energy efficiency financing program seeks to address, different energy efficiency financing program designs and private sector partners will be appropriate. These program designs are discussed in more detail in the next several sections.

¹⁰LBNL survey of on-bill programs for forthcoming on-bill report, available in spring 2014.

2. Energy Efficiency Financing Basics

Energy efficiency financing involves the same key elements as other forms of finance (see Figure 2). This section describes these elements and the range of options within each element for program administrators to consider in program design (Table 1). For each of these key financing program elements, different choices may be appropriate for achieving different policy and programmatic objectives.

Capital source. Capital to fund financial products may come from utility ratepayers, taxpayers, or a range of private sources. The initial provision of capital from a financial institution to a customer is called the **primary market**. The secondary market entails the resale of a pool of financial products from the primary market to a second investor(s)—secondary market sales are often used to replenish the balance sheets of primary market lenders.

Originator/servicer. An originator typically intakes customer financing applications, approves or denies the application, and closes and funds the financial product. A servicer is responsible for sending borrowers payment statements, collecting payments, and remitting to lenders or investors and maintaining records. A range of public and private entities, including banks, **credit unions**, **community development financial institutions (CDFIs)**, **finance companies**, utilities, and state and local governments can perform origination and servicing functions. In the WHEEL program, for example, investors have partnered with a specialized originator/servicer to perform loan underwriting and bill collection. In many cases, however, the entity responsible for originating and servicing financial products also provides the capital to fund these products. For example, many Recovery Act grants were used by local governments to offer **loan loss reserves (LLRs)** to credit unions that, in turn, underwrite, fund, and service residential energy efficiency loans.

Financial product(s). A range of tools (e.g., unsecured loans, mortgages, leases, PACE) can be used to deliver financing to customers. The primary differences between these tools are their underlying security (i.e., lender or investor rights in the event of customer default) and the mechanism they rely on for customer repayment (e.g., utility bill, tax bill, separate bill).

Credit enhancement. In some cases, financial institutions are provided with a **credit enhancement**, a class of tools that reduce lender risk by providing them with a level of protection against, or a second source of payment for, losses in the event of borrower default or delinquency. Popular credit enhancements include **LLRs**, **loan guarantees**, and **subordinated capital**. For more information on credit enhancements, download the SEE Action's *Credit Enhancement Overview Guide*.¹¹

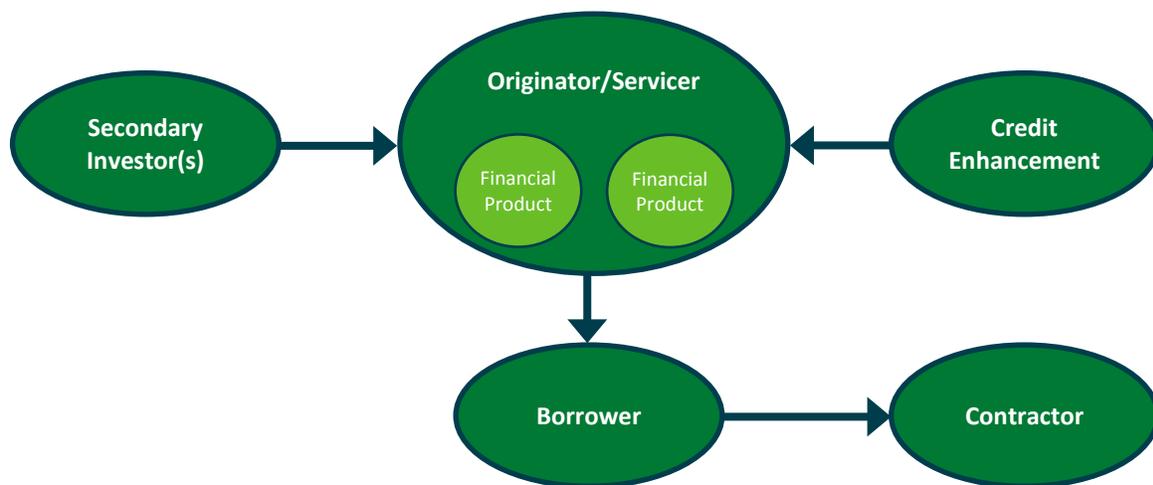


Figure 2. Key energy efficiency financing program elements

¹¹ www1.eere.energy.gov/seeaction/pdfs/credit_enhancement_guide.pdf.



Borrower. The borrower is typically the financing product customer, i.e., the property owner or tenant making investments in energy efficiency. In exchange for signing a contract to repay a financial product, the borrower is provided with funds to pay the contractor making the energy efficiency improvements for all, or substantially all, of the up-front costs of energy improvements.¹² Customers invest in energy efficiency through multiple project types and transaction points. Depending on a project’s timing and features, different financial products and program designs may be appropriate (see breakout box below).¹³

Depending on their level of capacity and expertise, and the market(s) they are serving, program administrators may take on a range of functions in designing, implementing, and evaluating financing initiatives. In addition to the unique financing program considerations described above, successful energy efficiency programs necessitate robust strategies for driving customer adoption of energy improvements and ensuring that high-quality work is being installed. A range of administration approaches have been implemented across the country from revolving loan funds for unsecured loans in which the administrator uses public monies to fund loans, approves the projects and financing, and verifies their completion itself to “open market” PACE models in which no utility ratepayer or taxpayer funds are used to finance projects, and customers are responsible for identifying a contractor and financial institution and verifying that projects have been completed satisfactorily. Successful programs rely on a confluence of enabling conditions and effective intervention strategies. For example, a successful OBF program may necessitate strong supporting legislation or regulations and smart program design targeted at attracting customers, energy efficiency service providers, and financial institutions to participate.

ACHIEVING LEVERAGE WITH PRIVATE CAPITAL

The following are examples of the multiple pathways for programs to leverage public or ratepayer monies by tapping private capital to fund financial products.

- **Clean Energy Works Oregon (CEWO): Credit enhancements for private lenders.** In Oregon, CEWO¹⁴ provided a 10% LLR to a private lending partner, Craft 3, a CDFI. This 10% LLR enabled Craft 3 to make more than \$27 million of residential energy efficiency loans, yielding 10 times leverage of each program dollar allocated to the LLR, excluding incentives and administrative costs).
- **Hawaii: Ratepayer-backed bonds.**¹⁵ In Hawaii, the state legislature authorized the issuance of \$100 million of bonds to support its emerging OBF program, with proceeds being lent to customers for renewable energy improvements. Customer repayments of on-bill loans will be used to repay the bonds. If repayments are not sufficient to cover bond payments, the bonds are secured by funds raised through the state’s Public Benefits Charge. This robust security shows promise in making large pools of low-cost private capital available to finance energy improvements. Administrators can avoid the risk of repayments falling short by setting customer interest rates high enough to offset any customer defaults.
- **New York State Energy Research and Development Authority (NYSERDA): Warehouse first, sell to investors second.** In New York, NYSERDA used a mix of Recovery Act, ratepayer, and Regional Greenhouse Gas Initiative monies to fund \$25 million of residential on- and off-bill loans through its Green Jobs-Green New York program.¹⁶ NYSERDA then sold a bond backed by the interest and principal repayments from these loans and a guarantee from the New York State Environmental Facilities Corporation to secondary investors with a net interest rate of less than 0.5% (the bonds were structured as qualified energy conservation bonds [QECBs], which provide issuers with a federal interest rate subsidy of approximately 2.75%).¹⁷

¹² In some cases, borrowers pay contractors directly for completed work; in others, the borrower assigns funds directly to a contractor who is paid directly by the financial institution.

¹³ For more information on the types of financial products and programs that may be appropriate for different customer segments (e.g., single family residential, small business), visit: www1.eere.energy.gov/wip/solutioncenter/marketsegments.html.

¹⁴ www.cleanenergyworksoregon.org.

¹⁵ For more information on ratepayer-backed bonds, visit: <http://saberpartners.com/oped/lowering-costs.pdf>.

¹⁶ www.nysesda.ny.gov/Energy-Efficiency-and-Renewable-Programs/Green-Jobs-Green-New-York.aspx

¹⁷ For more information on QECBs, visit: www1.eere.energy.gov/wip/solutioncenter/qecb.html.

Table 1. Key Financing Elements, Options, and Program Administrator Considerations

Program Element	Key Options	Considerations for Choosing Options
Source of Capital	<p>Three common financial product funding sources:</p> <ol style="list-style-type: none"> 1) Public funding 2) Ratepayer funding 3) Private funding <p>(There are multiple ways to tap into private capital. See breakout box on previous page)</p>	<p>The primary trade-off between these options is administrator flexibility versus program leverage.</p> <ol style="list-style-type: none"> 1) Public Funding: Most flexible, no short-term leverage. Public sector is free to define product terms and underwriting. No initial program leverage is achieved and available funding may be constrained. Secondary sales of publicly funded financial products are often challenging due to small deal sizes, poor liquidity, and non-standard terms and underwriting. 2) Ratepayer Funding: Some flexibility, no short-term leverage. Much of the same flexibility as public funding, but may be subject to cost-effectiveness restrictions that limit the scope of projects and customers that can be supported. Like public funding, lack of initial leverage constrains funding and secondary sales may be challenging. 3) Private Funding: Least flexibility, most leverage. Private capital provided directly to customers often creates substantial leverage of public or ratepayer funding. But, private lenders and investors typically require more restrictive underwriting and product terms (e.g., higher interest, shorter duration financial products), which may reduce customer energy efficiency adoption by limiting capital access and/or negatively impacting customer cash flow relative to lower interest, longer term financial products.
Originator/Service	<p>Three broad administrator choices in selecting financial partners:</p> <ol style="list-style-type: none"> 1) Whether to outsource origination/servicing 2) Type of entity(ies) to select for origination/servicing 3) Whether to select one or multiple originators/servicers 	<ol style="list-style-type: none"> 1) Administrators lending public or ratepayer funding may opt to outsource origination and servicing functions to third parties with core competency in performing these functions (and, in some cases, with the ability to indemnify the administrator against a range of lending risks). If administrators are leveraging private capital, most lenders have their own origination and servicing capacity. 2) In selecting originators/servicers, administrators should consider basics such as cost of service, experience in serving the program’s target customers, and experience working with contractors. For example, a CDFI with existing initiatives targeting low-income customers might be a good financial partner for an affordable multifamily energy efficiency at financing program. In addition, some financial partners may offer financial products such as indirect loans and leases that are not available through other potential program partners. 3) A single originator/service might simplify the contractor sales process. It may also simplify administrator oversight and maximize flexibility to make program alterations. However, some customers and contractors may value the option to pick the financial partner that best suits their needs from a suite of program-supported partners. Having multiple financial institution participants may also encourage competition and drive innovation.

Program Element	Key Options	Considerations for Choosing Options
Financial Product	<p>Two broad administrator choices in selecting financial products:</p> <ol style="list-style-type: none"> 1) One product or multiple products? 2) Which product type(s)? <ul style="list-style-type: none"> • Traditional financial product(s)? • Novel financial product(s)? <p>See Table 2 for an overview of the range of financial products that may be leveraged by energy efficiency financing program administrators.</p>	<ol style="list-style-type: none"> 1) Different customers and projects have different financing needs—a range of financial tools are necessary to meet these diverse needs. Like the choice of one or more financial partners, a single financial product might simplify the contractor sales process, but some customers and contractors may value the option to pick the financial tool(s) that best suits their needs from a suite of program-supported tools. 2) Many traditional financial products (e.g., mortgages, HELOCs, unsecured loans) that are used for home and business improvements can also be leveraged to finance energy efficiency measures. These products are typically underwritten to property owner creditworthiness or property value, and they have mature networks of financial product providers. Credit enhancements may be effective tools for improving the attractiveness of these products until better data on their performance is available. There are several federally supported traditional financial products that offer advantaged terms for energy efficiency improvements (e.g., HUD PowerSaver, U.S. Department of Housing and Urban Development [HUD] Multifamily GreenRefinance Plus) that program administrators may be positioned to utilize. Traditional financial products that are, generally, well understood by investors may also make secondary markets capital access easier than novel products. <p>Novel financial products such as PACE and OBF/OBR rely on non-traditional security that is often stronger than the security for traditional financial products (PACE is senior to all non-tax debt on a property, and non-payment can trigger property foreclosure; OBF/OBR may be structured with power shut-off rights and may survive property foreclosure). This enhanced security may catalyze both more attractive product terms and broader customer access to capital than through traditional financial products. In addition, these products may help to resolve problems such as split incentives and balance sheet treatment.</p>
Credit Enhancement	<p>There are three basic credit enhancement considerations:</p> <ol style="list-style-type: none"> 1) Are credit enhancements necessary? 2) Credit enhancement goal 3) Credit enhancement type 	<ol style="list-style-type: none"> 1) Credit enhancements are one strategy to achieving a range of program administrator goals. Other strategies, such as interest rate buy downs or customer rebates, may be as or more effective in achieving these goals. Program administrators should engage stakeholders to assess the extent to which allocating funding to credit enhancements is the most effective strategy for achieving their goals. 2) Credit enhancements can be leveraged to achieve a range of program administrator goals, including: <ul style="list-style-type: none"> • Encouraging lender or investor participation in energy efficiency financing programs (or provision of novel financing tools) with uncertain benefits and risks • Delivering more attractive financing products (lower interest rates, reduced origination, servicing fees, longer loan terms) than would otherwise be available in the market • Expanding customer access to capital • Delivering standard processes and protocols for lender interactions with program administrators and energy efficiency service providers and customers. 3) Depending on an administrator’s target customers, target improvements, and the financial product selected, different types of credit enhancement may be appropriate. Credit enhancement structures include LLRs, loan guarantees, subordinate debt, etc. For more information on designing a credit enhancement strategy based on one or more of the goals above, see SEE Action’s <i>Credit Enhancement Overview Guide</i>: www1.eere.energy.gov/seeaction/pdfs/credit_enhancement_guide.pdf.

3. Common Energy Efficiency Financing Tools

The table below provides an overview of financing tools available for consideration by energy efficiency program administrators.

Table 2. Common Financial Tools for Energy Efficiency Program Administrator Consideration

Financial Tool	Description	Target Customers	Best Used For	Example
Unsecured Loan	A loan that is supported only by the borrower's creditworthiness, rather than by a type of collateral. Unsecured loans can be categorized as installment versus revolving and dealer versus direct. The number of payments and maturity of a revolving loan are not fixed (e.g., credit card debt) whereas the number of payments and maturity are fixed for an installment loan. A direct loan is made from a financial institution to a borrower while a dealer (or indirect) loan is made from a contractor to a borrower and then sold to a financial institution.	Residential	<ul style="list-style-type: none"> • Small projects • Projects that require fast financial product origination and can tolerate relatively high interest rates and short loan terms (compared to secured loans) 	WHEEL—described above in text
Secured Loan	A loan that is supported by any type of collateral (i.e., a mortgage is a secured loan supported by a property). Loans can be secured by a range of assets (e.g., automobile, home, boat). Secured loans may be in the form of a first lien on a property (i.e., first mortgage) or a subordinated lien on a property (i.e., second mortgage).	All sectors	<ul style="list-style-type: none"> • Large projects • Projects for which low-interest rate and/or long-terms are important 	HUD Multifamily GreenRefinance Plus ¹⁸
PACE	A voluntary special tax assessment on a customer's property—this tax assessment is typically treated like all other tax assessments but may be subordinated to a customer's first mortgage in some programs.	Primarily non-residential due to regulatory challenges	<ul style="list-style-type: none"> • Large projects • Projects for which low-interest rate, long-term financing is important • Projects for which balance sheet treatment or split incentives may be key barriers to energy efficiency adoption • Programs for which expanding customer access to capital is a priority 	Connecticut CEFIA C-PACE ¹⁹

¹⁸ <http://portal.hud.gov/hudportal/documents/huddoc?id=GreenRefiPlusFactSheet.pdf>.

¹⁹ www.ctcleanenergy.com/YourBusinessorInstitution/CommercialPropertyAssessedCleanEnergyCPACE/tabid/642/Default.aspx.



Financial Tool	Description	Target Customers	Best Used For	Example
OBF	A class of financial products that are re-paid on the customer's utility bill and are often secured by the right to shut-off a customer's power should the financing charges go unpaid. OBF is used to refer to programs for which the source of capital is public, utility, or utility ratepayer capital.	All sectors	<ul style="list-style-type: none"> • Small and large projects • Projects for which low-interest rate, long-term financing is important • Projects for which balance sheet treatment or split incentives may be key barriers to energy efficiency adoption • Programs for which expanding customer access to capital is a priority 	NYSERDA On-Bill Recovery Finance Program ²⁰
OBR	Same financial products as OBF, but the source of capital is non-utility private capital.	All sectors	<ul style="list-style-type: none"> • Small and large projects • Projects for which low-interest rate, long-term financing is important • Projects for which balance sheet treatment or split incentives may be key barriers to energy efficiency adoption • Programs for which expanding customer access to capital is a priority 	California On-Bill Repayment Pilots ²¹
Lease	A lease is a contract that enables lessees (borrowers) to obtain the use (or purchase) of equipment or real estate. They are similar to long-term rental agreements where the lessee gets the use of equipment or real estate for a specified period of time in return for regular payments to a third party (lessor). Leases may be operating leases (these come with a purchase option that can be exercised at the end of the lease period) or installment purchase leases (the lessee assumes ownership of equipment at the time of lease origination).	Non-residential	<ul style="list-style-type: none"> • Small and large projects • Projects for which balance sheet treatment may be key barriers to energy efficiency adoption (operating lease) 	Michigan SAVES Business Energy Financing ²²

²⁰ www.nyserdera.ny.gov/Statewide-Initiatives/On-Bill-Recovery-Financing-Program.aspx.

²¹ www.caleefinance.com/.

²² <http://michigansaves.org/business#primary>.

4. Lessons Learned from Existing Energy Efficiency Financing Programs

There are many energy efficiency financing programs now operating across the United States. These programs have diverse goals and approaches, but their shared experience has yielded five key lessons learned for program design and implementation.

- 1. Clearly define target customers, improvements, and financing gaps.** A range of financing products may be appropriate for bridging energy efficiency financing gaps depending on the target customer segment, the target improvements, and the reason financial institutions are not currently adequately serving those customers. No single product will fill all of these gaps. Based on established policy goals, administrators should consider either:
 - Choosing one customer segment (e.g., single family residential boiler replacements, small business lighting upgrades) and focusing a loan product(s) and financial resources in that market
 - Creating a portfolio of financing products to serve different customer segments and needs.²³
- 2. Customer demand is key.** Many energy efficiency financing programs have failed to generate significant customer project volume, often because the primary barrier to energy efficiency adoption is low customer demand, not access to attractive capital. Simply put, customers don't take financing for products they don't want. Financing typically enables customers to adopt improvements once they've been sold on the benefits of the investment (similarly, auto dealers don't lead with financing offers, they sell customers on a vehicle first, then close the deal with low-cost financing). Program administrators should ask themselves—and other stakeholders—whether the programs they are designing are likely to be attractive to their target customers, and how to market them effectively. Administrators should recognize that there may be trade-offs between delivering substantial customer volume and achieving deep per-project energy savings—those energy efficiency financing programs that have generated substantial volume across the United States have often permitted customers to finance single measure improvements (e.g., boiler and HVAC replacements, lighting retrofits) in addition to more comprehensive approaches that deliver deeper energy savings. Administrators should strive to help contractors integrate financing into the energy efficiency sales process—when financing becomes “another” complicated customer decision point and transaction, fewer energy efficiency projects get completed. Programs need to be easy to access, understand, and use.²⁴
- 3. Reduce costs and deliver consistency by leveraging existing program delivery infrastructure.** Holistic program design, including financing, incentives, marketing and education, branding, contractor training, quality assurance (QA), and other features (see Figure 1), is essential to addressing the range of barriers to energy efficiency. However, delivering these program elements can be expensive and threaten program sustainability or capacity to scale. In many states, a range of utility ratepayer- or taxpayer-funded energy efficiency initiatives already exists. Administrators considering launching a financing program should leverage these programs to the greatest extent possible. In addition to reducing administration costs, harmonizing new programs with existing initiatives will maximize consistency in program guidelines for customers and contractors. For example, a publicly funded loan program could permit the same energy efficiency measures and require the same QA checks that the local utility incentive program requires to avoid both having to budget for QA or require contractors or customers to endure multiple QA processes.²⁵ Similarly, integrating financing into broader energy efficiency program marketing and education campaigns can help ensure that customers and contractors receive clear messaging about the suite of program offerings available to them without extensive additional program expenditure.
- 4. Engage with potential financing partners and contractors from the start.** For most programs, contractors are “in the trenches” selling energy efficiency improvements to customers. It is essential that program administrators engage contractors early in the program design process to understand what they need to be successful. The programs with the highest participation rates have strong contractor networks and regular

²³ Adapted from www1.eere.energy.gov/wip/solutioncenter/pitfalls.html.

²⁴ For more information on driving customer demand for energy efficiency in the residential sector, visit: <http://drivingdemand.lbl.gov>.

²⁵ For considerations on eligible energy efficiency improvements, visit: www1.eere.energy.gov/wip/solutioncenter/eligiblemeasures.html.



program communication with those energy efficiency service providers. Significant time and effort is often spent to make sure the contractors understand and are comfortable with the program (and have opportunities to influence its design). It is also critical that those programs seeking to partner with private sector capital providers (those who might provide financing directly to customers or purchase a pool of financing once the program has originated substantial loan volume) engage target financial institutions and investors during the program design stage. Many energy efficiency financing initiatives have been met with low (or, in some cases, no) financial institution or contractor participation (or have struggled to sell loan pools to private investors) because they have been developed without administrators engaging stakeholders to understand their needs. While administrators may ultimately opt for program design features that are unpopular with one or both of these groups, engaging with them early on in the design process will ensure that program administrators more fully understand the risks and opportunities of different program features. For financial institutions, there are a range of potential benefits to participating in energy efficiency financing programs, including:²⁶

- Low customer acquisition costs due to program marketing, high loan approval rates, and high loan approval to loan closing conversion rates
- High cross-selling rates of customers into other profitable financial products
- Low customer default rates.

5. Define “success” from the outset and design programs to test whether a strategy can deliver that outcome. Today, there are many uncertainties about the extent to which energy efficiency financing—and specific energy efficiency financing strategies—can cost-effectively achieve program administrator goals.²⁷ It is important to both clearly define success and to structure programs such that clear metrics can be collected and evaluated. In some cases, experiments may be necessary. For example, program administrators seeking to replace rebates with financing may want to test whether customers are more likely to adopt energy efficiency improvements with one approach or the other. For programs envisioned as “temporary interventions” until private markets play a larger role, clear timelines and milestones for an exit strategy should be developed and progress evaluated against them.

GETTING STARTED: FIVE KEY STEPS

- 1) Identify the target market(s) you want to serve.
Example: Single family residential homeowners.
- 2) Identify specific barriers or opportunities in that market.
Example: High interest rates on financial products hinder customers from pursuing energy efficiency projects.
- 3) Identify the program design, implementation, and evaluation role(s) that your organization has core competency to perform.
Example: Set eligible energy efficiency measures, contractor qualifications, and quality assurances processes. Issue request for proposals for program administrator and lending partners.
- 4) Engage stakeholders early in the program design process.
Example: Host contractor and financial institution workshops to get their perspectives on key program elements that can enable them to close more energy efficiency projects and loans.
- 5) Set program objectives that are quantifiable and measurable.
Example: \$0.05/kilowatt-hour verified energy savings across at least 1,000 home energy upgrades.

²⁶ See, for example, LBNL’s *Austin’s Home Performance with Energy Star Program: Making a Compelling Offer to a Financial Institution Partner* at: <http://emp.lbl.gov/sites/all/files/POLICY%20BRIEF%20Austin%20Energy%20Star.pdf>.

²⁷ For more information on this range of uncertainties, visit LBNL’s *Getting the Biggest Bang for the Buck: Exploring the Rationales and Design Options for Energy Efficiency Financing Programs*, at: <http://emp.lbl.gov/publications/getting-biggest-bang-buck-exploring-rationales-and-design-options-energy-efficiency-fin>.

5. Additional Resources

There are many energy efficiency financing program design and implementation resources available. Table 3 highlights several U.S. Department of Energy (DOE), SEE Action, and LBNL resources and provides brief descriptions of each to get you started.

Table 3. Additional Energy Efficiency Financing Program Design and Implementation Resources

Resource	Description
DOE State & Local Solution Center – Financing Solutions (www1.eere.energy.gov/wip/solutioncenter/financing.html)	This website provides information about setting up energy efficiency financing programs and tools that can fund energy improvements for buildings. It also provides links to helpful resources, including additional financing overview content, webinars, case studies, and more.
DOE Better Buildings Neighborhood Program (https://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/index.html)	This website provides a range of resources on designing residential energy efficiency programs based on best practices and lessons learned from more than 40 competitively selected state and local governments participating in the Better Buildings Neighborhood Program.
DOE guide, <i>Federal Finance Facilities Available for Energy Efficiency Upgrades and Clean Energy Deployment</i> (http://energy.gov/downloads/federal-finance-facilities-available-energy-efficiency-upgrades-and-clean-energy)	A “Yellow Pages” for federal financing resources, this guide describes the various federal financing programs for which energy efficiency and clean energy qualify—making it easier for government leaders and their private sector partners to find capital for energy efficiency and renewable energy projects.
SEE Action Financing Solutions Working Group Work Plan, “Using Financing to Scale up Energy Efficiency” (www1.eere.energy.gov/seeaction/pdfs/financing_workplan_recommendations.pdf)	This workplan provides an overview of the SEE Action Financing Solutions Working Group’s analysis of challenges and opportunities to increasing the deployment of private capital to support energy efficiency investment.
LBNL Report, <i>Getting the Biggest Bang for the Buck: Exploring the Rationales and Design Options for Energy Efficiency Financing Programs</i> (http://emp.lbl.gov/publications/getting-biggest-bang-buck-exploring-rationales-and-design-options-energy-efficiency-fin)	This report articulates key policy and program design questions—and options for answering them—regarding the role of financing for which we need better answers to inform decision making about the best use of taxpayer and utility billpayer funds.

6. Glossary of Terms²⁸

Term	Definition
Balance sheet treatment	Balance sheet treatment refers to whether a financial product is treated as “on-balance sheet” or “off-balance sheet” for accounting purposes. Off-balance sheet describes a case in which assets or liabilities do not appear on an organization’s balance sheet, and the organization can treat the entire financing payment as a business or operating expense. Treatment as an off-balance sheet item reduces the business’ taxable profit and, consequently, its tax liability. Off-balance sheet treatment also typically means that energy projects do not risk triggering restrictive lender covenants that may prohibit businesses from assuming new debt obligations.
Bonds	Long-term debt obligations that require issuers to make scheduled interest payments at specific periods at an agreed upon rate. Bonds are often used for large borrowings to enable borrowers to source capital from multiple lenders through a single transaction.
Community development financial institution (CDFI)	Nonprofit lender that aggregates lending capital from a mix of federal, state, foundation, and private sources and relends that money to targeted (and typically underserved) communities and customer segments (e.g., low-income households).
Credit enhancement	A range of tools that reduce lender or investor risk by providing them with a level of protection against losses in the event of borrower default or delinquency.
Credit union	Customer-owned, nonprofit cooperative organization with a charter to serve the specific needs of its members. Tend to be smaller than banks and often geographically focused.
Default	Failure of a borrower to meet the legal obligations of their financial product, typically triggered by failure to make principal and interest payments. Default may trigger a range of actions by the lender or investor that are defined by the underlying security of the financial product.
Duration (or Tenor)	The length of the financial product from loan closing to maturity.
Energy assessment	An expert review of a property’s energy savings opportunities, which typically includes an onsite inspection of a property and its systems and recommendations for energy savings improvements.
Finance company	Specialized financial institution that, unlike banks, is not a depository institution. Finance companies typically supply financial products on behalf of pools of investors—they often deliver financial products not offered by most banks, such as indirect loans and leases.
Home equity line of credit (HELOC)	Line of credit that uses the homeowner’s property as collateral. A line of credit enables the homeowner to borrow funds at their discretion up to the maximum pre-approved loan balance.
Indirect loan (or Dealer loan)	A loan that is originated by a contractor (or other non-bank entity) based on an agreement with a finance company and subsequently purchased by the finance company. Indirect loans (i.e., those not made directly by a financial institution or company) may be preferable to contractors because they enable them to close financial product transactions at a borrower’s kitchen table.
Lease	A lease is a contract that enables lessees (borrowers) to obtain the use (or purchase of) equipment or real estate. They are similar to long-term rental agreements where the lessee gets the use of equipment or real estate for a specified period of time in return for regular payments to a third party (lessor). Leases come with a purchase option that can be exercised at the end of the lease period.
Leverage	Leverage refers to the amount of private capital that an administrator attracts to a clean energy financing program for each program sponsor/administrator dollar.

²⁸ For definitions of additional financing-related terms, visit: www4.eere.energy.gov/wip/solutioncenter/finance_guide/content/glossary_terms.

Term	Definition
Liquidity	The ease with which a financial product(s) can be bought or sold to other entities without substantially affecting the financial product(s) price. The more liquid, the more easily bought and sold.
Loan	A contract whereby one entity (the borrower) is given money by another entity (the lender) for a period of time with a promise that the money will be paid back.
Loan guarantee	A form of credit enhancement through which a program sponsor (or other entity) promises to pay a lender or investor 100% of losses the lender endures on a financial product or pool of financial products.
Loan loss reserve (LLR)	A form of credit enhancement through which a program sponsor (or other entity) promises to pay a lender some portion (less than 100%) of losses the lender endures on a financial product or pool of financial products. 5% to 20% LLRs are common.
Margin	A measure of profitability. Low margin products are low profitability products.
On-bill financing (OBF)/On-bill repayment (OBR)	A class of financial products that are re-paid on the customer's utility bill and are often secured by the right to shut-off a customer's power should the financing charges go unpaid. OBF refers to programs for which the source of capital is public or utility ratepayer capital while OBR is used to refer to programs for which the source of capital is private entities.
Origination	The process from customer application for a financial product to financial product closing and funding.
Primary market	Broadly describes the direct transaction through which a financial institution originates a financial product for a borrower.
Property assessed clean energy (PACE)	A tool for financing energy improvements through a voluntary property tax assessment.
Reactive projects	Energy efficiency improvements undertaken by a customer at the end of the useful life—or failure—of energy equipment.
Recapitalization	For the purposes of this document, recapitalization refers to the process by which a program administrator (or other entity) sells a pool of financial products that it has funded. The proceeds of this sale “recapitalize” its funding and enable it to fund additional financial products.
Secondary market	Broadly describes the market through which financial products that originated in the primary market are re-sold to a second investor(s).
Split incentives	A term that refers to the challenge related to rental properties in which renters pay utility bills (and are positioned to benefit from reduced energy costs from energy efficiency improvements) while property owners are typically responsible for paying for energy improvements.
Subordinated capital	A form of credit enhancement, subordinated capital absorbs the potential first losses on a financial product or pool of financial products. Senior capital does not absorb any losses until the subordinated capital is exhausted.
Underlying financial product security	Financial products may be secured or unsecured. Secured financial products are defined by the borrower pledging assets (e.g., home, car) that the lender or investor may take if the borrower defaults or some other source of security (e.g., electricity shut-off). Unsecured financial products are supported only by the borrower's creditworthiness, not collateral or other clearly defined security.

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