SEE Action

STATE AND LOCAL ENERGY EFFICIENCY ACTION NETWORK

# Using Financing to Scale Up Energy Efficiency: Work Plan Recommendations for the SEE Action Financing Solutions Working Group

Prepared for the SEE Action Financing Solutions Working Group
by Lawrence Berkeley National Laboratory and Harcourt, Brown, and Carey

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SEE Action

STATE AND LOCAL ENERGY EFFICIENCY ACTION NETWORK

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# Acknowledgments

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The authors received input and comments from the SEE Action Financing Solutions Working Group; members can be found at www.seeaction.energy.gov/members.html.

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# Presentation Outline

# Working Group Members

## Co-Chairs

Keith Welks
Pennsylvania Treasury Dept.

Bryan Garcia
Connecticut Clean Energy Finance and Investment Authority

## Federal Facilitators

Johanna Zetterberg
U.S. DOE

Brian Ng
U.S. EPA

| Financial Institutions | |
|---|---|
| Al Griffin | Citigroup |
| W. Robert Hall | Hall Associates Consulting, LLC |
| Peter Krajsa | AFC First Financial Corporation |
| Bill Jenkins | Deutsche Bank |
| **Industry and Commercial Groups** | |
| Don Gilligan | National Association of Energy Service Companies |
| Erin Hutson, Richard Metcalf | Laborers' International Union |
| Stockton Williams | HR&A Advisors |
| Yumi Yi, Tom Rowlands-Rees | Bloomberg New Energy Finance |
| Neal Skiver, Frank Norcross | Green Campus Partners |
| Austin Whitman | M.J. Bradley and Associates |
| Mary Schlaefer | Wisconsin Energy Conservation Corporation |
| **Regional, Research, and Advocacy Groups** | |
| Philip Henderson | Natural Resources Defense Council |
| Joel Kurtzman | Milken Institute – Center for Financial Innovations |
| Robert Sahadi | Institute for Market Transformation |
| Mark Wolfe | Energy Programs Consortium |
| Mijo Vodopic | MacArthur Foundation |
| Stuart DeCew | Yale Center for Business and the Environment |
| Ted Hesser | Saviva Research, LLC |
| Brad Copithorne | Environmental Defense Fund |
| Steven Klein | First Infrastructure, Inc. |

# Working Group Members (cont'd)

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| State Energy Officials and Policymakers | |
|---|---|
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| Birud Jhivari | Massachusetts Department of Energy Resources |
| Jeff Pitkin | NY State Energy Research and Development Authority |
| David Terry | National Association of State Energy Officials |
| Pat Shaughnessy | Pennsylvania Treasury Department |
| **Utilities and Utility Associations** | |
| David Logeman | Electric Cooperatives of South Carolina |
| Janis Erickson | Sacramento Municipal Utility District |
| **Utility Commissions** | |
| Jennifer Finnigan | California Public Utilities Commission |
| James Gardner | Kentucky Public Service Commission |
| Lorraine Akiba | Hawaii Public Utilities Commission |
| **Advisors** | |
| Mark Zimring | Lawrence Berkeley National Laboratory |

# Working Group Goal

Remove financing barriers to energy efficiency (EE) in the United States through improved financing tools and mechanisms. Removing these barriers may yield broad customer access to attractive capital that will enable widespread adoption of EE improvements by:

- Scaling and leveraging secondary markets
- Reflecting true assessment of risk
- Providing more liquidity
- Reducing borrowing costs.

# Presentation Outline

# Presentation Objectives and Recommendations Development Methodology

**Presentation Objective:** Offer recommendations to the working group on activities it might undertake to support the deployment of private capital to support EE investment.

**Recommendations Development Methodology:**

- Interview key market actors and other subject matter experts on EE financing barriers and opportunities
  - Investors (e.g., banks, market and mission based investors, credit unions, community development lenders)
  - Finance product originators and servicers (e.g., lease, loan, and service agreement originators)
  - Property owners (e.g., commercial building owners)
  - Governments (e.g., state energy offices, regulators)
- Analyze U.S. EE financing markets and programs

# Presentation Scope

- **The working group's primary initial focus is the residential market:**
  - The residential market represents a large technical opportunity for EE (over one-third of U.S. end-use efficiency potential. See Granade, Hannah Choi, et al. "Unlocking Energy Efficiency in the US Economy." 2009.)
  - Residential buildings tend to employ a standard set of EE measures that rely on well-established technology (e.g., HVAC, building shell), which lends itself to standardization (although some regional variation does exist due to climate zone differences).
  - Residential lenders typically utilize more standardized underwriting criteria to evaluate customer creditworthiness (e.g., credit score, debt-to-income ratio) than commercial lenders.
  - Leverage recent federal residential EE efforts (e.g., DOE Better Buildings Neighborhood Program, FHA Power Saver Loan Program).
- **However, many elements of this presentation are relevant to both the residential and non-residential sectors, and some sections explicitly reference commercial EE financing barriers and opportunities (a secondary focus of the working group).**

# Presentation Outline

# Project Demand is Driven by a Range of Motivators

Generally, consumers and businesses invest in EE to:

1. Replace aging or failed equipment
2. Reduce operating (or household) costs
3. Increase safety, reliability, comfort
4. Pursue sustainable ("green") practices

# Common EE Adoption Barriers

There are a range of barriers to EE adoption—financing, alone, cannot overcome all of these barriers.

**Lack of information**

- Many customers don't know how to arrange for the installation of an EE project, do not understand the benefits of efficiency or may lack the knowledge of where to find the technical assistance needed to address their concerns.

**High transaction costs**

- The time and effort required to get enough information to make a decision, apply for financing and arrange for the work to be done may not be perceived as worth the return in energy savings and other benefits.

**Poor private economics**

- In certain climates and for certain types of deep energy improvements, the private economics of these investments may not be sufficient to motivate customer adoption.

# Common EE Adoption Barriers (cont'd)

However, financing may be an effective tool for overcoming some barriers.

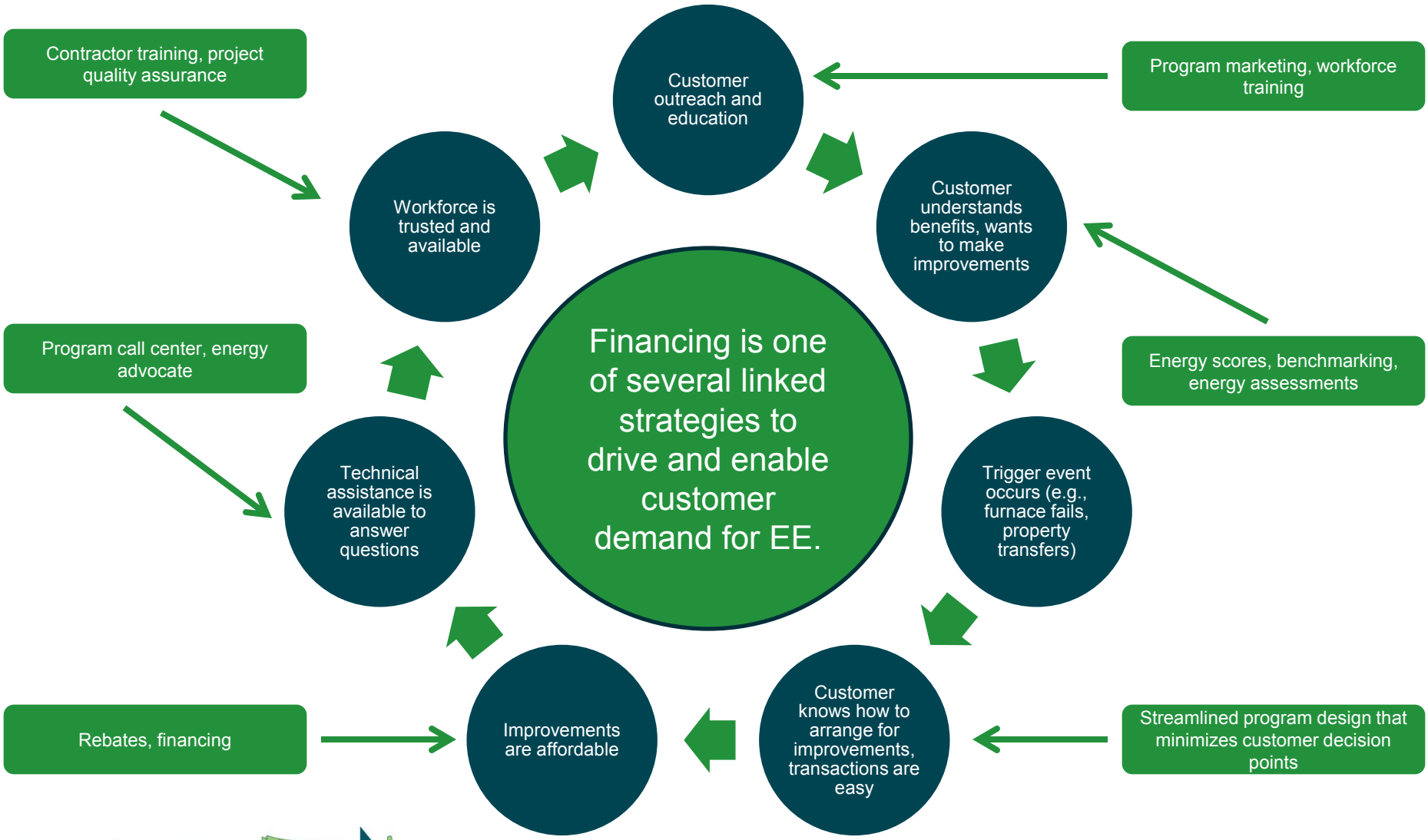
| | |
|---|---|
| **Lack of confidence in savings** | • Homeowners and businesses may not trust that the improvements will yield the benefits claimed. |
| **Split incentives** | • Split incentives occur when the decision maker does not receive many of the benefits of the improvements. Ex: rental property owners lack incentives to invest in building efficiency upgrades when the tenant pays the utility bill. |
| **Long paybacks** | • Homeowners and business owners may not want to invest in retrofits if they do not plan to stay in the building long enough to recoup their investment. |
| **High up-front costs** | • The first cost of a project may deter investment, either because the resident or business does not have access to capital or they choose to make other higher-priority investments with their available funds. |

# Financing Tools May Help to Overcome Some EE Barriers

| Examples of EE Barriers | Potential Financing Solution | How Solution Addresses Barrier |
|---|---|---|
| Lack of confidence in savings | ESA/MESA, energy performance guarantees | These financial tools can shift EE performance risk from customers to EE providers. In the event savings don't materialize, customers don't pay for the improvements. |
| Renter/owner Split Incentives | PACE, OBF/OBR, ESA/MESA* | These financial tools can enable property owners to pass the cost of EE improvements on to the beneficiaries—tenants who are benefiting from EE. |
| Long paybacks | PACE, OBF/OBR financing | These financial tools can enable property owners to transfer the balance of their financing to a subsequent owner (who will benefit from the EE improvements) upon property sale. |
| High up-front costs | A range of financial products | Financing enables customers to make low- or no-upfront payments for EE. Instead, customers make payments over the life of the financing tool, which is often aligned with the expected savings from the EE improvements. |

*These financing tools are described in more detail on slide 21.

# Financing Is Part of a Holistic Approach to Overcoming the Range of Barriers to EE Adoption



# Effective EE Programs: The "Three C's"

A combination of three critical elements—Confidence, Capital, and Convenience (the "Three C's")—is necessary to create a successful EE program. Success requires more than low-cost, accessible financial products.

| | Attribute |
|---|---|
| **Confidence** | • Customer comfort with, and trust in, the project, financial product, and providers<br>• Investor confidence in financial product performance<br>• Program sponsor (e.g., utility, regulator, policymaker) confidence in energy savings<br>• Confidence from all parties that a robust EE market will emerge to justify investments of time and money |
| **Capital** | • Attractive interest rates and terms and high applicant approval rates for customers and contractors<br>• Attractive yields to investors |
| **Convenience** | • A simple, fast customer and contractor program participation process |

# Presentation Outline

# Overview of U.S. EE Finance Markets

- **Financing enables customers to overcome** the **high up-front costs** of a range of investments, including EE.
- Financing can be broken down into two basic categories:
  - **Financial Products.** A range of tools (e.g., loans, leases) that can be used to deliver financing to customers.
  - **Capital Providers.** A range of financial institutions originate and service financial products. In some cases, these entities also provide the capital to fund these products. In other cases, these functions are separated—financial institutions provide origination and servicing functions for investors that provide capital to fund the financial products. Capital provision can be divided into two markets:
    - **Primary Market.** Financial institutions issue financial products and provide capital directly to customers.
    - **Secondary Market.** Financial products (or financial instruments secured by those financial products) are re-sold to investors by financial institutions or other investors.
- **Financing for EE involves the same basic market infrastructure as other forms of finance**. In some cases, EE's unique properties (e.g., uncertain savings, split incentives, long paybacks) may warrant the development of novel financial products or delivery mechanisms.

# Traditional Financial Products Are Often Harnessed for EE

Many “traditional” financing products (i.e., those used by customers to finance items such as cars, granite kitchen counter tops, home renovations) have been adapted to support EE improvements.

| Residential Product (all Loans) | Description |
|---|---|
| Unsecured/ Revolving | Number of payments and maturity not fixed. No loan collateral—based solely on borrower creditworthiness (e.g., credit cards) |
| Unsecured/Installment—Direct | Loan made directly from financial institution to borrower. Number of payments and maturity fixed. No loan collateral (e.g., bank, credit union, consumer lender loans) |
| Unsecured/Installment—Dealer | Loan made from contractor to borrower. Contractor then assigns agreement to financial institution . Number of payments and maturity fixed. No loan collateral. (e.g., Warehouse for Energy Efficiency Loans [WHEEL]) |
| Secured/ Second Lien | A loan secured by a second lien on a property (also known as a second mortgage). Number of payments and maturity fixed. (e.g., HUD PowerSaver Loan Program) |
| Secured/ First Lien | A loan secured by a first lien on a property (also known as a first mortgage). Number of payments and maturity fixed. (e.g., energy-efficient mortgage) |

# Novel Financial Products Have Also Been Developed for EE

Novel financial products using unique security (e.g., tax assessment, utility tariff) or repayment (e.g., on-utility bill) are being tested across the U.S. These products are targeted at improving access to capital, delivering more attractive capital, or overcoming specific customer investment barriers beyond up-front costs.

| Residential Financing Product | Description |
|---|---|
| Tax Assessment: Priority Lien—Property Assessed Clean Energy (PACE) | A voluntary special tax assessment is placed on the customer's property—this tax assessment is treated like all other tax assessments. Due to regulatory challenges, PACE is not currently viable for the residential sector. |
| Tax Assessment: Subordinate Lien—Property Assessed Clean Energy (PACE) | A voluntary special tax assessment is placed on the customer's property—this tax assessment is subordinate to other tax assessments and the customer's first mortgage. |
| Tariff—On-Utility Bill Financing* (OBF) | A tariff is placed on the customer's utility meter. The tariff is typically treated like all other utility tariffs (and non-payment subjects customer to same processes and protections as standard IOU collections process, including the potential for utility service disconnection). |
| Loan—On-Utility Bill Repayment* (OBR) | Loan charges are placed on the utility bill (typically as a line item) and customer loan repayment is made alongside utilities payment. Loan security is not tied to the meter—customer loan default typically triggers loan charge removal from the utility bill. A range of loan security (e.g., unsecured, mortgage) can be used. |

*Note: For the purposes of this report, OBF and OBR are differentiated by their underlying security (tariff vs. loan). Others have defined OBF and OBR by their source of capital (OBF using utility capital and OBR using third-party capital).

# Capital Providers—Primary Markets

A range of entities provide capital to EE customers through **primary markets**:

- **Banks.** Banks take in capital from investors and depositors, and loan funds out through a range of financial products including mortgages and unsecured loans.
- **Credit Unions**. Credit unions are member-owned cooperative financial institutions—their members are their depositors and borrowers. They offer many of the same financial products as banks and have actively partnered with a range of public- and utility ratepayer-funded EE programs to deliver EE financing products.
- **Community Development Financial Institutions (CDFIs).** CDFIs fill in gaps left by traditional lenders, offering financial products in communities or to customers that other financial institutions have been historically unwilling or unable to serve.
- **Finance Companies.** Companies that originate and service financial products on behalf of other investors.
- **Public Sector (e.g., taxpayers).** Public entities have offered a number of EE loan programs using public capital as a revolving loan fund—as loans are repaid, monies are then re-lent.
- **Utilities (e.g., utility ratepayers, shareholders).** Utility ratepayer program administrators offer a range of EE loan programs using ratepayer or shareholder capital.

# Capital Providers—Limits of Primary Markets

During the American Reinvestment and Recovery Act (ARRA), many community banks and credit unions partnered with local and state governments to launch EE financing programs. As EE markets grow, it will be necessary to develop secondary markets to tap into larger pools of capital than these entities have available given limits to their balance sheets.

The amount of primary markets capital is limited. In a few cases, this limited capital has been a barrier to EE program expansion. In other cases, customer demand—not capital—availability has been the barrier to program growth.

Secondary markets may provide a virtually unlimited capital source.

Large financing volume and confidence in the performance of that financing is necessary to attract secondary markets capital.

# Capital Providers—Secondary Markets

Secondary markets represent a “holy grail” of sorts—in well-functioning secondary markets (e.g., mortgages, time shares), large pools of standardized financing products are purchased by institutional investors, a class of organizations that pool and invest large sums of capital. Common examples of institutional investors include:

- Investment Banks
- Insurance Companies
- Pension Funds
- Retirement Funds
- Hedge Funds

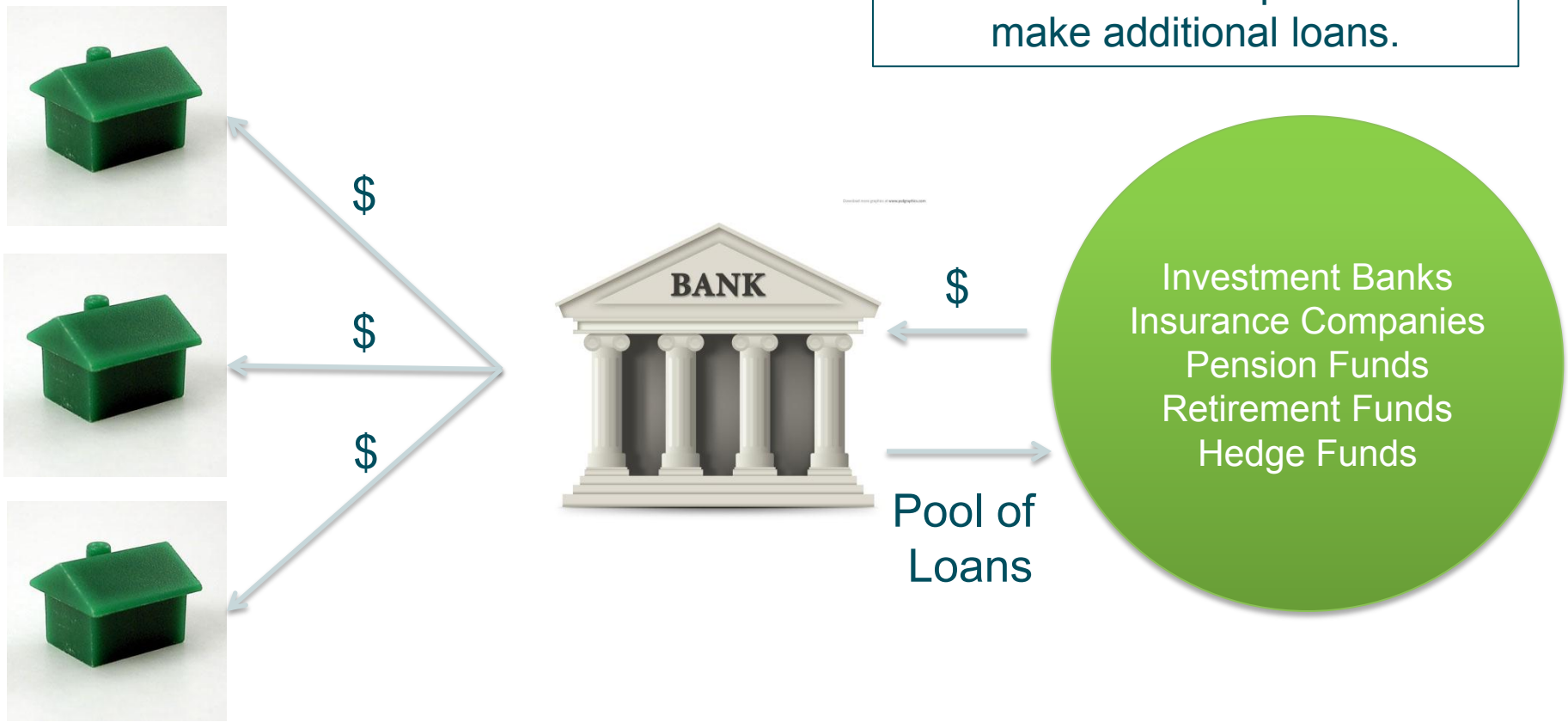
***Combined, these investors have $ trillions of investment capacity.***

Non-institutional entities such as Fannie Mae may also be secondary markets capital providers.

# Primary and Secondary Market Roles

Primary Market—Financial institution funds customer loans

Secondary Market—Institutional investors purchase customer loans from financial institution. Financial institution positioned to make additional loans.



# Presentation Outline

# Program-Sponsored Financing: What Problem are You Solving?

Capital markets in the U.S. are large, sophisticated, and mature. **Financing may not be the key barrier** for many customers. Key questions about EE financing's potential remain:

1. Is **EE under-valued by lenders and investors**?
2. For which customers is **access to attractive capital a key barrier to broader EE uptake?**
3. Are **novel financing tools and capital sources needed** to overcome EE's unique barriers?
4. **Can attractive financing deliver energy savings** at **lower cost** than other financial incentive strategies?
5. Can **regulatory issues** be resolved?

# Summary of Working Group Opportunities

These five key questions about financing's potential raise **five areas of opportunity for working group activities**. The questions, opportunities to answer them, and potential working group activities are summarized in the next several slides. Each is discussed in more detail in the Appendix.

| Question | Question | Question | Question | Question |
|---|---|---|---|---|
| 1. Is EE under-valued by lenders and investors? | 2. For which customers is access to attractive capital a key barrier to broader EE uptake? | 3. Are novel financing tools and capital sources needed to overcome EE's unique barriers? | 4. Can attractive financing deliver energy savings at lower cost than other strategies? | 5. Can regulatory issues be resolved? |
| ⬇ | ⬇ | ⬇ | ⬇ | ⬇ |
| **Opportunity** | **Opportunity** | **Opportunity** | **Opportunity** | **Opportunity** |
| 1. Facilitate EE Financing Performance Data Collection and Access | 2. Identify Specific Financing Gaps and Program Targeting Opportunities | 3. Support Testing the Efficacy of Novel Financing Tools and Capital Sources | 4. Identify Opportunities to Test Financing's Ability to Deliver Program Leverage | 5. Identify Opportunities to Facilitate Resolution of Regulatory Issues |

# 1. Is EE under-valued by lenders and investors?

**Issue—Lack of Financing Performance Data**

Summary: Today, lenders and investors do not, in general, recognize EE financing's performance benefits relative to other financial products due to a lack of sufficient data to conduct rigorous quantitative analysis of financial product historical performance.

Investments in EE often reduce (or stabilize) the operating costs of homes and businesses. **By reducing or stabilizing energy expenditures, EE improves "customer balance sheets."**

- These **balance sheet improvements may improve the performance of financing for EE relative to financing for other improvements** or uses (i.e., if a customer has more money on hand, they may be better positioned to repay financing).
- **Early evidence suggests that the performance of EE financing may be substantially different** (e.g., lower delinquencies and defaults) than the performance of other types of financing. This may **warrant designating EE financing as a new investment "asset class"** if additional data support these promising results**.**
- This **"asset class" designation might yield:**
  - **Superior financing terms** (e.g., lower interest rates, longer duration)
  - **More accessible financial products** (e.g., broader underwriting)
  - **Increase in capital supply** (e.g., secondary markets access)
- **In the absence of performance data, investors tend to assume that lending risk is high** and require more security, restrict underwriting, and deploy capital at high interest rates and short financial product terms.

# 1. Is EE under-valued by lenders and investors?

**Opportunity—Facilitate EE Financing Performance Data Collection and Access**
Summary: Better data will help program administrators, policymakers, lenders, and investors evaluate whether EE financing has unique performance benefits relative to other "asset classes."

## Summary of Potential Working Group Data Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **1. Facilitate EE Financing Performance Data Collection and Access** | **1a. Data Taxonomy**. Develop and disseminate a list of data fields for program administrators to collect across EE financing programs. |
| | **1b. Data Collection Protocols.** Develop and disseminate protocols for data collection and protection of this data. |
| | **1c. Performance of Federally Supported Financing Tools.** Explore development of regular reporting on the performance of federally-supported mortgages (e.g., FNMA, USDA, VA, FHA) on energy-efficient properties (e.g., ENERGY STAR®) relative to their overall mortgage portfolios. |
| | **1d. Data Library**. Explore the development of a national data library that could collect, process, maintain, and make data available to various parties. |

These potential working group activities are discussed in detail in Appendix A.

# 2. For which customers is access to attractive capital the key barrier to broader EE uptake?

**Issue—Some Customers Lack Access to Attractive Capital**

Summary: The financing needs of different customers within and across market segments vary—as do the opportunities for responsibly filling gaps in the availability of attractive private capital. Today, these financing gaps are often poorly identified and EE financing programs are often not targeted specifically at filling these gaps.

- **Many customers have access to attractive capital** today (e.g., home equity lines of credit, savings in the bank).
- However, **specific customer segments (and sub-segments) may face barriers in accessing attractive credit—or credit at all.**
- **In some cases, access to attractive capital may improve as the economy recovers and asset valuations rise**, enabling customers to rely on asset-based financing to fund capital improvements. **In other cases, there may be other non-cyclical barriers.**
- For example, middle income single family households*:
  - Have tended to rely more on home-secured debt than other income segments, but lost more home equity (as a percent of value) than higher income households in recent years.
  - Are less likely to qualify for unsecured credit than higher income households.
  - There may be good reasons (e.g., lack of creditworthiness) that private capital is not available (or is very expensive and short-term) to some of these households, and it remains unclear whether credit, or more attractive credit, can be responsibly extended to these households for EE improvements.

*Source: "Delivering Energy Efficiency to Middle Income Single Family Households." Lawrence Berkeley National Laboratory. Visit middleincome.lbl.gov for more detail

# 2. For which customers is access to attractive capital the key barrier to broader EE uptake?

**Opportunity—Identify Specific Financing Gaps and Program Targeting Opportunities**

Summary: Better understanding of specific financing gaps within and across customer segments will help program administrators, policymakers, lenders, and investors target EE financing initiatives to filling those gaps.

## Summary of Potential Working Group Program Targeting Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **2. Identify Specific Financing Gaps and Program Targeting Opportunities** | **2a. EE Financing 101.** Develop and disseminate overview of existing financing gaps, program targeting opportunities and program design considerations for policymakers, program administrators and financial institutions and investors. |
| | **2b. Credit Enhancement.** Develop and disseminate overview of the range of credit enhancements and financing gaps that credit enhancements can be used to fill. |

These potential working group activities are discussed in detail in Appendix A.

# 3. Are novel financing tools and capital sources necessary to overcome EE's unique barriers?

**Issue—EE may have unique barriers for which traditional financing tools and capital sources are ill-suited**

Summary: Today, substantial uncertainty remains around the efficacy and attractiveness of many novel financing tools and capital sources to customers, investors, and policymakers. There is also uncertainty about best practices for responsibly deploying these tools, many of which require public or utility regulator approval and/or financial support.

- In some cases, novel financing tools or capital sources designed specifically to overcome EE's unique barriers may catalyze increases in EE deployment.
- Some of these tools may be appropriate as "bridges" to future markets in which EE financing's performance is better reflected in private sector financial product interest rates, terms, and underwriting (see Opportunity 1). These bridge tools may help to overcome barriers such as:
  1. Unattractive interest rates and short loan terms (e.g., OBF, PACE, credit enhancements, rate recovery bonds)
  2. Lack of customer credit access (e.g., OBF, PACE, credit enhancements, rate recovery bonds)
- Other tools may provide novel long-term solutions to—or catalyze innovation to address—more fundamental challenges, such as:
  1. Split incentives (e.g., OBF, PACE)
  2. Balance sheet treatment (e.g., ESA, MESA)
  3. Lack of confidence in energy savings (e.g., ESA, MESA, Insurance)

# 3. Are novel financing tools and capital sources necessary to overcome EE's unique barriers?

**Opportunity—Support Testing the Efficacy of Novel Financing Tools and Capital Sources**

Summary: Novel financing tools and capital sources may be effective in delivering attractive, accessible financing that meets the unique characteristics and needs of EE projects.

Summary of Potential Working Group Novel Financing Tools and Capital Sources Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **3. Support Testing the Efficacy of Novel Financing Tools and Capital Sources** | **3a. On-Bill Financing (OBF).** Develop and disseminate resources that highlight on-bill financing's potential benefits and key design issues that may pose challenges to implementation. Engage stakeholders to discuss and design "best-in-class" solutions to these issues. |
| | **3b. Other Emerging Models.** Develop and disseminate resources on the potential catalytic benefits of other emerging models such as the use of rate reduction bonds, new energy savings insurance and guarantee products and EE "as a service" delivery models. The working group could also convene stakeholders to advance the development and deployment of these promising approaches. |
| | **3c. Green Banks and Energy Investment Partnerships.** Develop and disseminate resources that highlight the motivations for creating these entities, the range of public-private partnerships (PPPs) that have been deployed or are under consideration. Engage stakeholders to advance the deployment of these PPPs and to share lessons learned and innovative ideas. |

These potential working group activities are discussed in detail in Appendix A.

# 4. Can attractive financing drive demand at lower cost than other financial incentive strategies?

**Issue—Insufficient Leverage of Public and Ratepayer Funds to Meet Energy Savings Goals**
Summary: Today, lack of customer demand for EE is the primary barrier to customer EE adoption in most markets. There is a paucity of data about the extent to which EE financing can drive customer demand—and do so at lower cost than other demand-creation strategies (e.g., rebates, tax credits). Without better evidence for EE financing's demand creation potential, substantial uncertainty remains about financing's ability to deliver leverage of public and ratepayer funds.

**Many states and utility regulators are adopting aggressive EE targets**. Programs are increasingly targeting higher-cost, multi-measure energy improvements to existing buildings and facilities to achieve these goals. **Current program budgets fall short of investment levels necessary to meet targets**. For example in California:

| CA Building Sector* | Investment Needed | Program Funding |
|---|---|---|
| Residential | At least $50 billion | ~$3 billion (over 10 yrs) |
| Commercial | At least $20 billion | ~$2 billion (over 10 yrs) |

Financing has been put forward as a **way to stretch public or ratepayer dollars further by leveraging private capital**…often with the idea that programs will move from rebates to market rate financing and create a **self-sustaining market** that does not require public investment.

* Estimates based on Harcourt, Brown and Carey's "Energy Efficiency Financing in California: Needs and Gaps." 2011.

# 4. Can attractive financing drive demand at lower cost than other financial incentive strategies?

**Opportunity—Identify Opportunities to Test Financing's Ability to Deliver Program Leverage**
Summary: Financing may be effective at amplifying the impact of limited public and ratepayer funds.

## Summary of Potential Working Group Testing Financing's Leverage Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **4. Identify Opportunities to Test Financing's Ability to Deliver Program Leverage** | **4. Research Agenda for Financing.** Convene stakeholders around DOE's forthcoming report, "Testing the Limits of Energy Efficiency Financing—A Research Agenda" to facilitate rigorous testing of the opportunities and limits of financing—and sharing of lessons learned across programs. |

This potential working group activity is discussed in detail in Appendix A.

# 5. Can regulatory challenges and opportunities be addressed?

**Issue—Regulatory Challenges Dampen Deployment of Innovative EE Financing Models**
Summary: Today, the uncertainty caused by a range of regulatory issues is dampening the deployment and scale-up of a range of EE financing programs and models. Without additional regulatory certainty, these issues will continue to inhibit market development.

EE financing poses unique risks and opportunities for customers and policymakers. This unique profile has created a range of regulatory issues whose positive resolution could catalyze an increase in EE deployment and EE financing innovation. Opportunities for resolving these issues exist at a range of regulatory scales, including among:

- State utility regulators
- State and federal banking regulators
- Federal accounting regulators

# 5. Can regulatory challenges and opportunities be resolved?

**Opportunity—Identify Opportunities to Facilitate Resolution of Regulatory Issues**
Summary: Greater clarity is needed regarding the regulatory treatment of EE financing initiatives in several contexts.

Summary of Potential Working Group Resolving Regulatory Issues Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **5. Identify Opportunities to Facilitate Resolution of Regulatory Issues** | **5a. (State Utility Regulators) Financing Initiative Disjunction From EE Program Cycles.** EE financing initiatives have unique characteristics relative to other EE initiatives that are typically funded with ratepayer monies. Existing regulatory protocols may need to be adjusted to accommodate these characteristics. The working group could convene stakeholders to address these issues. |
| | **5b. (State Utility Regulators) Financing Initiative Resource vs. Non-Resource Treatment.** Differing stakeholder perspectives on the role of EE financing raise issues about the extent to which EE financing initiatives should be subject to EE cost-effectiveness testing and how their impacts should be measured and credited. The working group could convene stakeholders to address these issues. |
| | **5c. (Banking Regulators) Community Reinvestment Act (CRA) and EE Treatment.** Financial institutions have expressed interest in investing CRA funds in EE projects, but have indicated that lack of regulatory guidance on whether they would receive CRA credit for these investments currently prevent them from doing so. The working group could convene stakeholders to address this issue. |
| | **5d. (Banking Regulators) Credit Enhancement Treatment.** There is substantial uncertainty among financial institutions as to whether banking regulators value credit enhancements in evaluating a financial institution's financing portfolio risk. The working group could convene stakeholders to address this issue. |
| | **5e. (Accounting Regulators) Accounting Treatment of Innovative EE Financing Models.** In the non-residential sector, it may be appropriate to treat several innovative financing models (e.g., ESA/MESA, PACE) as operating expenditures rather than capital expenditures for accounting purposes. It is unclear how forthcoming accounting rule changes will impact the accounting treatment of these structures. The working group could convene stakeholders to address this issue. |

These potential working group activities are discussed in detail in Appendix A.

# Presentation Outline

# Appendix A
# Detailed Description of Potential Working Group Activities

# Summary of Working Group Opportunities

These five key questions about financing's potential raise **five areas of opportunity for working group activities**. The questions, opportunities to answer them and potential working group activities summarized in the next several slides. Each is discussed in more detail in the Appendix.

| Question | Question | Question | Question | Question |
|---|---|---|---|---|
| 1. Is EE under-valued by lenders and investors? | 2. For which customers is access to attractive capital a key barrier to broader EE uptake? | 3. Are novel financing tools and capital sources needed to overcome EE's unique barriers? | 4. Can attractive financing deliver energy savings at lower cost than other strategies? | 5. Can regulatory issues be resolved? |
| ⬇ | ⬇ | ⬇ | ⬇ | ⬇ |
| **Opportunity** | **Opportunity** | **Opportunity** | **Opportunity** | **Opportunity** |
| 1. Facilitate EE Financing Performance Data Collection and Access | 2. Identify Specific Financing Gaps and Program Targeting Opportunities | 3. Support Testing the Efficacy of Novel Financing Tools and Capital Sources | 4. Identify Opportunities to Test Financing's Ability to Deliver Program Leverage | 5. Identify Opportunities to Facilitate Resolution of Regulatory Issues |

# 1. Is EE under-valued by lenders and investors?

**Issue—Lack of Financing Performance Data**

Summary: Today, lenders and investors do not, in general, recognize EE financing's performance benefits relative to other financial products due to a lack of sufficient data to conduct rigorous quantitative analysis of financial product historical performance.

Investments in EE often reduce (or stabilize) the operating costs of homes and businesses. **By reducing or stabilizing energy expenditures, EE improves "customer balance sheets."**

- These **balance sheet improvements may improve the performance of financing for EE relative to financing for other improvements** or uses (i.e., if a customer has more money on hand, they may be better positioned to repay financing).
- **Early evidence suggests that the performance of EE financing may be substantially different** (e.g., lower delinquencies and defaults) than the performance of other types of financing. This may **warrant designating EE financing as a new investment "asset class"** if additional data support these promising results**.**
- This **"asset class" designation might yield:**
  - **Superior financing terms** (e.g., lower interest rates, longer duration)
  - **More accessible financial products** (e.g., broader underwriting)
  - **Increase in capital supply** (e.g., secondary markets access)
- **In the absence of performance data, investors tend to assume that lending risk is high** and require more security, restrict underwriting, and deploy capital at high interest rates and short financial product terms,

# 1. Is EE under-valued by lenders and investors?

**Opportunity—Facilitate EE Financing Performance Data Collection and Access**
Summary: Better data will help program administrators, policymakers, lenders, and investors evaluate whether EE financing has unique performance benefits relative to other "asset classes."

## Summary of Potential Working Group Data Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **1. Facilitate EE Financing Performance Data Collection and Access** | **1a. Data Taxonomy**. Develop and disseminate a list of data fields for program administrators to collect across EE financing programs. |
| | **1b. Data Collection Protocols.** Develop and disseminate protocols for data collection and protection of this data. |
| | **1c. Performance of Federally Supported Financing Tools.** Explore development of regular reporting on the performance of federally-supported mortgages (e.g., FNMA, USDA, VA, FHA) on energy-efficient properties (e.g., ENERGY STAR) relative to their overall mortgage portfolios. |
| | **1c. Data Library**. Explore the development of a national data library that could collect, process, maintain, and make data available to various parties. |

# Recommendation 1a: Develop Data Taxonomy

| Objective | Recommendation Summary |
|---|---|
| **1. Facilitate EE Financing Performance Data Collection and Access** | **1a. Data Taxonomy.** Develop and disseminate a list of data fields for program administrators to collect across EE financing programs. |
| | **1b. Data Collection Protocols.** Develop and disseminate protocols for collection and protection of this data. |
| | **1c. Performance of Federally Supported Financing Tools.** Explore development of regular reporting on the performance of federally-supported mortgages (e.g., FNMA, USDA, VA, FHA) on energy-efficient properties (e.g., ENERGY STAR) relative to their overall mortgage portfolios. |
| | **1d. Data Library.** Explore the development of a national data library that could collect, process, maintain, and make data available to various parties. |

- Collection of consistent and standardized EE financing performance data is essential to establishing whether financing for EE outperforms financing for other uses, the magnitude of the outperformance, and factors (e.g., energy savings) that influence this performance.
- The working group can develop and disseminate a data taxonomy that includes a list of data fields (and definitions for that data) in the following categories:
  - Customer characteristics
  - Project and property characteristics
  - Financial product characteristics
  - Project energy performance
  - Financial product performance

# Recommendation 1b: Data Collection and Protection

| Objective | Recommendation Summary |
|---|---|
| **1. Facilitate EE Financing Performance Data Collection and Access** | **1a. Data Taxonomy.** Develop and disseminate a list of data fields for program administrators to collect across EE financing programs. |
| | **1b. Data Collection Protocols.** Develop and disseminate protocols for collection and protection of this data. |
| | **1c. Performance of Federally Supported Financing Tools.** Explore development of regular reporting on the performance of federally-supported mortgages (e.g., FNMA, USDA, VA, FHA) on energy-efficient properties (e.g., ENERGY STAR) relative to their overall mortgage portfolios. |
| | **1d. Data Library.** Explore the development of a national data library that could collect, process, maintain, and make data available to various parties. |

- In addition to standardizing the data that is collected, it is important for EE programs to obtain customer data permissions and to develop plans for assembling data in a way that enables analysis of the nexus of project energy performance and financing performance—and to do so in a consistent way across programs.
- The working group could provide program administrators with specific guidance and model language for customer data permissions as well as data collection, storage and dissemination protocols.

# Recommendation 1c: Performance of Federally Supported Financing Tools

| Objective | Recommendation Summary |
|---|---|
| **1. Demonstrate the EE Financing Performance Value Proposition** | **1a. Data Taxonomy.** Develop and disseminate a list of data fields for program administrators to collect across EE financing programs. |
| | **1b. Data Collection Protocols.** Develop and disseminate protocols for collection and protection of this data. |
| | **1c. Performance of Federally Supported Financing Tools.** Explore development of regular reporting on the performance of federally-supported mortgages (e.g., FNMA, USDA, VA, FHA) on energy-efficient properties (e.g., ENERGY STAR) relative to their overall mortgage portfolios. |
| | **1d. Data Library.** Explore opportunities for streamlining the availability of data to a range of stakeholders (e.g., investors, researchers, policymakers). |

- A range of federal or federally supported entities operate mortgage programs (e.g., Fannie Mae, Freddie Mac, USDA, VA, FHA). It is reasonable to assume that a number of these mortgages are on ENERGY STAR homes (or homes that have participated in existing public- and ratepayer-funded EE programs. It would be quite valuable to understand how mortgages on these EE properties perform relative to the broader pool of mortgages that these entities hold or guarantee.
- This information could be used to deliver data to private lenders that might encourage them to take EE into account in their underwriting
- The working group could describe to federal officials the type of regular reporting on their mortgage portfolios that would be useful in helping private lenders to assess the extent to which financing for EE properties outperforms financing for other properties.

# Recommendation 1d: Data Library

| Objective | Recommendation Summary |
|---|---|
| **1. Demonstrate the EE Financing Performance Value Proposition** | **1a. Data Taxonomy.** Develop and disseminate a list of data fields for program administrators to collect across EE financing programs. |
| | **1b. Data Collection Protocols.** Develop and disseminate protocols for collection and protection of this data. |
| | **1c. Performance of Federally Supported Financing Tools.** Explore development of regular reporting on the performance of federally-supported mortgages (e.g., FNMA, USDA, VA, FHA) on energy-efficient properties (e.g., ENERGY STAR) relative to their overall mortgage portfolios. |
| | **1d. Data Library.** Explore opportunities for streamlining the availability of data to a range of stakeholders (e.g., investors, researchers, policymakers). |

- Opportunities that the working group could explore for streamlining the availability of data include (but are not limited to) the development of a national data library and the coordination of data access protocols across states and utility regulators.

# 2. For which customers is access to attractive capital the key barrier to broader EE uptake?

**Issue—Some Customers Lack Access to Attractive Capital**

Summary: The financing needs of different customers within and across market segments vary—as do the opportunities for responsibly filling gaps in the availability of attractive private capital. Today, these financing gaps are often poorly identified and EE financing programs are often not targeted specifically at filling these gaps.

- **Many customers have access to attractive capital** today (e.g., home equity lines of credit, savings in the bank).
- However, **specific customer segments (and sub-segments) may face barriers in accessing attractive credit—or credit at all.**
- **In some cases, access to attractive capital may improve as the economy recovers and asset valuations rise**, enabling customers to rely on asset-based financing to fund capital improvements. **In other cases, there may be other non-cyclical barriers.**
- For example, middle income single family households:
  - Have tended to rely more on home-secured debt than other income segments, but lost more home equity (as a percent of value) than higher income households in recent years.
  - Less likely to qualify for unsecured credit than higher income households.
  - There may be good reasons (e.g., lack of creditworthiness) that private capital is not available (or is very expensive and short-term) to some of these households, and it remains unclear whether credit, or more attractive credit, can be responsibly extended to these households for EE improvements.

Source: "Delivering Energy Efficiency to Middle Income Single Family Households." Lawrence Berkeley National Laboratory. Visit middleincome.lbl.gov for more detail

# 2. For which customers is access to attractive capital the key barrier to broader EE uptake?

**Opportunity—Identify Specific Financing Gaps and Program Targeting Opportunities**

Summary: Better understanding of specific financing gaps within and across customer segments will help program administrators, policymakers, lenders, and investors target EE financing initiatives to filling those gaps.

## Summary of Potential Working Group Program Targeting Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **2. Identify Specific Financing Gaps and Program Targeting Opportunities** | **2a. EE Financing 101.** Develop and disseminate overview of existing financing gaps, program targeting opportunities, and program design considerations for policymakers, program administrators, and financial institutions and investors. |
| | **2b. Credit Enhancement.** Develop and disseminate overview of the range of credit enhancements and financing gaps that credit enhancements can be used to fill. |

# Recommendation 2a: EE Financing 101

| Opportunity | Recommendation |
|---|---|
| **2. Identify Specific Financing Gaps and Program Targeting Opportunities** | **2a. EE Financing 101.** Develop and disseminate overview of existing financing gaps, program targeting opportunities and program design considerations for policymakers, program administrators and financial institutions and investors. |
| | **2b. Credit Enhancement.** Develop and disseminate overview of the range of credit enhancements and financing gaps that credit enhancements can be used to fill. |

- Policymakers and program administrators, in some cases, lack a detailed understanding of specific barriers to the delivery of attractive private sector capital to EE markets and how financial institutions operate. Similarly, financial institutions and investors are not experts on the value proposition (and risks) of EE financing and how EE programs work.
- The working group can develop and disseminate an overview of existing financing gaps, program-targeting opportunities, and program design considerations for these audiences to help decision makers evaluate which financing program options at their disposal might be most effective in achieving their goals.

# Recommendation 2b: Credit Enhancement

| Opportunity | Recommendation |
|---|---|
| **2. Identify Specific Financing Gaps and Program Targeting Opportunities** | **2a. EE Financing 101.** Develop and disseminate overview of existing financing gaps, program targeting opportunities and program design considerations for policymakers, program administrators, and financial institutions and investors. |
| | **2b. Credit Enhancement.** Develop and disseminate overview of the range of credit enhancements and financing gaps that credit enhancements can be used to fill. |

- Credit enhancement can take many forms and can be deployed to achieve a range of programmatic goals. For example, programs can take advantage of the strong balance sheets of utilities and governments (e.g., green banks, energy investment partnerships) to raise private capital for EE financing programs. Programs can also deploy specific credit enhancement tools (e.g., loan loss reserves, subordinated debt) to enhance the credit of specific loans or leases.
- In some cases, these credit enhancements may be deployed as temporary “bridges” until better data is available (see Opportunity 1). In other cases, these credit enhancements may be necessary over the long run to deliver capital that meets policymaker goals for accessibility and attractiveness.
- The working group can develop and disseminate fact sheets that describe the credit enhancement choices available to policymakers and program managers, the private financing concessions that credit enhancements can be used to achieve, and which credit enhancements may be most appropriate for different market sectors and program goals.

# 3. Are novel financing tools and capital sources necessary to overcome EE's unique barriers?

**Issue—EE may have unique barriers for which traditional financing tools and capital sources are ill-suited.**

Summary: Today, substantial uncertainty remains around the efficacy and attractiveness of many novel financing tools and capital sources to customers, investors, and policymakers. There is also uncertainty about best practices for responsibly deploying these tools, many of which require public or utility regulator approval and/or financial support.

- In some cases, novel financing tools or capital sources designed specifically to overcome EE's unique barriers may catalyze increases in EE deployment.
- Some of these tools may be appropriate as "bridges" to future markets in which EE financing's performance is better reflected in private sector financial product interest rates, terms, and underwriting (see Opportunity 1). These bridge tools may help to overcome barriers such as:
  1. Unattractive interest rates and short loan terms (e.g., OBF, PACE, credit enhancements, rate recovery bonds)
  2. Lack of customer credit access (e.g., OBF, PACE, credit enhancements, rate recovery bonds)
- Other tools may provide novel long-term solutions to—or catalyze innovation to address—more fundamental challenges, such as:
  1. Split incentives (e.g., OBF, PACE)
  2. Balance sheet treatment (e.g., ESA, MESA)
  3. Lack of confidence in energy savings (e.g., ESA, MESA, insurance)

# 3. Are novel financing tools and capital sources necessary to overcome EE's unique barriers?

**Opportunity—Support Testing the Efficacy of Novel Financing Tools and Capital Sources**

Summary: Novel financing tools and capital sources may be effective in delivering attractive, accessible financing that meets the unique characteristics and needs of EE projects.

Summary of Potential Working Group Novel Financing Tools and Capital Sources Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **3. Support Testing the Efficacy of Novel Financing Tools and Capital Sources** | **3a. On-Bill Financing (OBF).** Develop and disseminate resources that highlight on-bill financing's potential benefits and key design issues that may pose challenges to implementation. Engage stakeholders to discuss and design "best-in-class" solutions to these issues. |
| | **3b. Other Emerging Models.** Develop and disseminate resources on the potential catalytic benefits of other emerging models such as the use of rate reduction bonds, new energy savings insurance and guarantee products and EE "as a service" delivery models. The working group could also convene stakeholders to advance the development and deployment of these promising approaches. |
| | **3c. Green Banks and Energy Investment Partnerships.** Develop and disseminate resources that highlight the motivations for creating these entities, the range of public-private partnerships (PPPs) that have been deployed or are under consideration. Engage stakeholders to advance the deployment of these PPPs and to share lessons learned and innovative ideas. |

# Recommendation 3a: OBF

| Opportunity | Recommendation |
|---|---|
| **3. Support Testing the Efficacy of Novel Financing Tools and Capital Sources** | **3a. On-Bill Financing (OBF).** Develop and disseminate resources that highlight on-bill financing's potential benefits and key design issues that may pose challenges to implementation. Engage stakeholders to discuss and design "best-in-class" solutions to these issues. |
| | **3b. Other Emerging Models** |
| | **3c. Green Banks and Energy Investment Partnerships** |

- On-bill financing (OBF) is a mechanism for customers to finance EE and renewable energy (RE) improvements through their utility bills.*
- OBF has garnered increasing attention in recent years as a tool that can overcome a range of EE financing barriers (e.g., split incentives, long paybacks, customer credit access). Many variations of OBF have been deployed across the U.S. and several capital sources have been tapped for funding OBF financings.
- Typically, OBF is treated like all other utility charges and may subject customers to disconnection risk in the event of non-payment.
- This risk raises a host of program design issues that the working group could both highlight and convene stakeholders to resolve, such as:
  - Should OBF be structured as a loan or tariff?
  - Should OBF obligations be permitted to transfer from customer to customer? How?
  - Should expected bill neutrality or disclosure of expected bill impacts be required?
  - What specific protections for vulnerable customer classes might be appropriate?

*In some cases, OBF designates programs in which the source of capital is a public entity, utility, or utility ratepayers and on-bill repayment (OBR) is used to designate programs where the source of capital is third parties.

# Recommendation 3b: Other Emerging Models

| Opportunity | Recommendation |
|---|---|
| 3. Support Testing the Efficacy of Novel Financing Tools and Capital Sources | 3a. On-Bill Financing (OBF) |
| | **3b. Other Emerging Models.** Develop and disseminate resources on the potential catalytic benefits of other emerging models such as the use of rate reduction bonds, new energy savings insurance and guarantee products and EE "as a service" delivery models. The working group could also convene stakeholders to advance the development and deployment of these promising approaches. |
| | 3c. Green Banks and Energy Investment Partnerships |

- Several emerging models show promise in delivering catalytic improvements to our ability to finance EE projects and to use financing to drive innovative EE delivery models. Examples include:
  - **Rate reduction bonds**. These bonds are secured by all or a portion of utility customer public benefits charges and are a promising tool for raising low-cost private capital to EE loans, leases, and tariffs. EE financing program participants repay their loans (which are used to repay bonds)—to the extent these participant funds are not sufficient to repay the bonds, the public benefits charge is tapped.
  - **Energy savings insurance/guarantees**. Lack of confidence that energy savings will materialize is a barrier to both customer EE investment and investor willingness to consider energy savings in financial underwriting decisions. Outside of the energy service company (ESCO)-driven institutional EE market, project performance guarantees have been slow to develop. New energy savings insurance products targeted at enabling contractors to extend guarantees outside of the institutional sector show promise in increasing all stakeholders' confidence in project performance.
  - **Delivering EE as a service.** Rather than a customer financing a project, a third party (through an energy services agreement or managed energy services agreement) pays for the project, and bears the risk for project underperformance. Customers get "free" energy improvements, and in some cases, a share of the energy cost savings.
  - **Real estate investment trusts (REITs).** REITs may provide a valuable pathway to low-cost retail investment capital for a range of energy improvements.
- The working group could develop and disseminate resources on these emerging models and engage a range of stakeholders around opportunities to advance the development and deployment of promising approaches.

# Recommendation 3c: Green Banks and Energy Investment Partnerships

| Opportunity | Recommendation |
|---|---|
| 3. Support Testing the Efficacy of Novel Financing Tools and Capital Sources | **3a. On-Bill Financing (OBF)** |
| | **3b. Other Emerging Models** |
| | **3c. Green Banks and Energy Investment Partnerships (EIPs).** Develop and disseminate resources that highlight the motivations for creating these entities, the range of public-private partnerships (PPPs) that have been deployed or are under consideration. Engage stakeholders to advance the deployment of these PPPs and to share lessons learned and innovative ideas. |

- Green banks (or energy investment partnerships) are public-private financing entities that leverage public funding to support the development of innovative EE and RE financial products and an adequate supply of capital to them.*
- The working group could develop and disseminate resources that highlight policymaker motivations for creating these entities, the range of forms they have taken, and lessons learned to-date. The working group could also convene stakeholders to support the deployment of these public-private partnerships and to encourage the sharing of lessons learned and innovative ideas.

*Green banks need not be narrowly targeted to EE and RE. They can be leveraged to support a range of investments in projects targeting environmental sustainability and economic resilience such as green infrastructure improvements and environmental restoration projects.

# 4. Can attractive financing drive demand at lower cost than other financial incentive strategies?

**Issue—Insufficient Leverage of Public and Ratepayer Funds to Meet Energy Savings Goals**
Summary: Today, lack of customer demand for EE is the primary barrier customer EE adoption in most markets. There is a paucity of data about the extent to which EE financing can drive customer demand—and do so at lower cost than other demand-creation strategies (e.g., rebates, tax credits). Without better evidence for EE financing's demand creation potential, substantial uncertainty remains about financing's ability to deliver leverage of public and ratepayer funds.

**Many states and utility regulators are adopting aggressive EE targets for existing buildings**. Programs are increasingly targeting higher-cost, multi-measure energy improvements to achieve these goals. **Current program budgets fall short of investment levels necessary to meet targets**. For example in California:

| CA Building Sector* | Investment Needed | Program Funding |
|---|---|---|
| Residential | At least $50 billion | ~$3 billion (over 10 yrs) |
| Commercial | At least $20 billion | ~$2 billion (over 10 yrs) |

Financing has been put forward as a **way to stretch public or ratepayer dollars further by leveraging private capital**
…often with the idea that programs will move from rebates to market rate financing and create a **self-sustaining market** that does not require public investment

* Estimates based on Harcourt, Brown and Carey's "Energy Efficiency Financing in California: Needs and Gaps." 2011.

# 4. Can attractive financing drive demand at lower cost than other financial incentive strategies?

**Opportunity—Identify Opportunities to Test Financing's Ability to Deliver Program Leverage**
Summary: Financing may be effective at amplifying the impact of limited public and ratepayer funds.

## Summary of Potential Working Group Testing Financing's Leverage Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **4. Identify Opportunities to Test Financing's Ability to Deliver Program Leverage** | **4. Research Agenda for Financing.** Convene stakeholders around DOE's forthcoming report, "Testing the Limits of Energy Efficiency Financing—A Research Agenda" to facilitate rigorous testing of the opportunities and limits of financing—and sharing of lessons learned across programs. |

# Recommendation 4: Financing Program Leverage

| Opportunity | Recommendation |
|---|---|
| **4. Identify Opportunities to Test Financing's Ability to Deliver Program Leverage** | **4. Research Agenda for Financing.** Convene stakeholders around DOE's forthcoming report, "Testing the Limits of Energy Efficiency Financing—A Research Agenda" to facilitate rigorous testing of the opportunities and limits of financing—and sharing of lessons learned across programs. |

- Lawrence Berkeley National Laboratory is authoring a report laying out a financing research agenda and providing practical implementation guidance that will enable stakeholders to incorporate experimental design into financing programs to reduce the uncertainty around financing's role in delivering EE at scale.
- Examples of key issues include:
  - Elasticity of customer demand around interest rates
  - Efficacy of low-interest financing versus rebates in driving EE retrofits
  - Importance of streamlined loan underwriting and closing compared to low interest rates
  - Demand impact of packaging financing as a lease or energy services agreement rather than a traditional loan
- The working group could convene key stakeholders after the release of this report to identify priority issues and to identify opportunities for cross-program collaboration and coordination in setting up experiments that reduce uncertainty about financing's efficacy and ultimate potential to deliver program leverage. Every program need not re-invent the wheel—program administrators and policymakers can share lessons learned from their experience.

# 5. Can regulatory challenges and opportunities be addressed?

**Issue—Regulatory Challenges Dampen Deployment of Innovative EE Financing Models**
Summary: Today, the uncertainty caused by a range of regulatory issues is dampening the deployment and scale-up of a range of EE financing programs and models. Without additional regulatory certainty, these issues will continue to inhibit market development.

EE financing poses unique risks and opportunities for customers and policymakers. This unique profile has created a range of regulatory issues whose positive resolution could catalyze an increase in EE deployment and EE financing innovation. Opportunities for resolving these issues exist at a range of regulatory scales, including among:

- State utility regulators
- State and federal banking regulators
- Federal accounting regulators

# 5. Can regulatory challenges and opportunities be addressed?

**Opportunity—Identify Opportunities to Facilitate Resolution of Regulatory Issues**
Summary: Greater clarity is needed regarding the regulatory treatment of EE financing initiatives in several contexts.

## Summary of Potential Working Group Resolving Regulatory Issues Activities

| Opportunity | Potential Working Group Activities |
|---|---|
| **5. Identify Opportunities to Facilitate Resolution of Regulatory Issues** | **5a. (Utility Regulators) Financing Initiative Disjunction From EE Program Cycles.** EE financing initiatives have unique characteristics relative to other EE initiatives that are typically funded with ratepayer monies. Existing regulatory protocols may need to be adjusted to accommodate these characteristics. The working group could convene stakeholders to address these issues. |
| | **5b. (Utility Regulators) Financing Initiative Resource vs. Non-Resource Treatment.** Differing stakeholder perspectives on the role of EE financing raise issues about the extent to which EE financing initiatives should be subject to EE cost-effectiveness testing and how their impacts should be measured and credited. The working group could convene stakeholders to address these issues. |
| | **5c. (Banking Regulators) Community Reinvestment Act (CRA) and EE Treatment.** Financial institutions have expressed interest in investing CRA funds in EE projects, but have indicated that lack of regulatory guidance on whether they would receive CRA credit for these investments currently prevent them from doing so. The working group could convene stakeholders to address this issue. |
| | **5d. (Banking Regulators) Credit Enhancement Treatment.** There is substantial uncertainty among financial institutions as to whether banking regulators value credit enhancements in evaluating a financial institution's financing portfolio risk. The working group could convene stakeholders to address this issue. |
| | **5e. (Accounting Regulators) Accounting Treatment of Innovative EE Financing Models.** In the non-residential sector, it may be appropriate to treat several innovative financing models (e.g., ESA/MESA, PACE) as operating expenditures rather than capital expenditures for accounting purposes. It is unclear how forthcoming accounting rule changes will impact the accounting treatment of these structures. The working group could convene stakeholders to address this issue. |

# Recommendations 5a-b. Utility Regulators

| Opportunity | Recommendation |
|---|---|
| **5. Identify Opportunities to Facilitate Resolution of Regulatory Issues** | **5a. (Utility Regulators) Financing Initiative Disjunction From EE Program Cycles.** EE financing initiatives have unique characteristics relative to other EE initiatives that are typically funded with ratepayer monies. Existing regulatory protocols may need to be adjusted to accommodate these characteristics. The working group could convene stakeholders to address these issues. |
| | **5b. (Utility Regulators) Financing Initiative Resource vs. Non-Resource Treatment.** Differing stakeholder perspectives on the role of EE financing raise issues about the extent to which EE financing initiatives should be subject to EE cost-effectiveness testing and how their impacts should be measured and credited. The working group could convene stakeholders to address these issues. |
| | **5c. (Banking Regulators) Community Reinvestment Act (CRA) and EE Treatment** |
| | **5d. (Banking Regulators) Credit Enhancement Treatment** |
| | **5e. (Accounting Regulators) Accounting Treatment of Innovative EE Financing Models** |

- 5a. EE financing initiatives have unique characteristics relative to other EE initiatives that are typically funded with ratepayer monies. EE financing initiatives (e.g., credit enhancements, direct loans using ratepayer capital) align poorly with typical ratepayer-funded 2–4 year EE program cycles as loans and leases often have terms that extend beyond these short-term cycles and funds dedicated to EE financing are often expended and then returned to programs for re-use. Existing regulatory protocols may need to be adjusted to accommodate EE financing's unique attributes.
- 5b. Some stakeholders see EE financing as an enabling tool that is an overlay onto existing EE programs. Others see it as a "resource program" that can, on its own, deliver EE investment. These differing perspectives raise substantial issues about the extent to which EE financing initiatives should be subject to utility cost-effectiveness testing and how their impacts should be measured and credited.
- The working group could convene stakeholders to address both of these issues.

# Recommendations 5c-d. Banking Regulators

| Opportunity | Recommendation |
|---|---|
| 5. Identify Opportunities to Facilitate Resolution of Regulatory Issues | **5a. (Utility Regulators) Financing Initiative Disjunction From EE Program Cycles** |
| | **5b. (Utility Regulators) Financing Initiative Resource vs. Non-Resource Treatment** |
| | **5c. (Banking Regulators) Community Reinvestment Act (CRA) and EE Treatment.** Financial institutions have expressed interest in investing CRA funds in EE projects, but have indicated that lack of regulatory guidance on whether they would receive CRA credit for these investments currently prevent them from doing so. The working group could convene stakeholders to address this issue. |
| | **5d. (Banking Regulators) Credit Enhancement Treatment.** There is substantial uncertainty among financial institutions as to whether banking regulators value credit enhancements in evaluating a financial institution's financing portfolio risk. The working group could convene stakeholders to address this issue. |
| | **5e. (Accounting Regulators) Accounting Treatment of Innovative EE Financing Models** |

- 5c. The CRA requires financial institutions to direct capital toward activities they might not otherwise prioritize in low- and moderate-income communities, including housing and revitalization and economic development. Monies to satisfy CRA requirements may be available in several forms including tax credit investments, grants, and/or loans at lower than market-rate. It is unclear whether financial institutions can get CRA credit for making investments in EE projects—were credit given, it would support the flow of large pools of flexible capital into EE.
- 5d. Credit enhancements reduce financial institution risk. Yet, there is substantial uncertainty among financial institutions as to whether regulators value these credit enhancements when evaluation a financial institution's financing portfolio risk.
- Greater clarity on regulator perspectives on using EE to satisfy CRA requirements and the treatment of credit enhancements could help to reduce financial institution reluctance to participate in EE financing programs.

# Recommendations 5e. Accounting Regulators

| Opportunity | Recommendation |
|---|---|
| 5. Identify Opportunities to Facilitate Resolution of Regulatory Issues | **5a. (Utility Regulators) Financing Initiative Disjunction From EE Program Cycles** |
| | **5b. (Utility Regulators) Financing Initiative Resource vs. Non-Resource Treatment** |
| | **5c. (Banking Regulators) Community Reinvestment Act (CRA) and EE Treatment** |
| | **5d. (Banking Regulators) Credit Enhancement Treatment** |
| | **5e. (Accounting Regulators) Accounting Treatment of Innovative EE Financing Models.** In the non-residential sector, it may be appropriate to treat several innovative financing models (e.g., ESA/MESA, PACE) as operating expenditures rather than capital expenditures for accounting purposes. It is unclear how forthcoming accounting rule changes will impact the accounting treatment of these structures. The working group could convene stakeholders to address this issue. |

- Utility bills and property taxes are typically treated as operating costs for accounting purposes rather than capital costs.
- Because they assume the role of an "energy efficiency utility," it may be appropriate to afford the ESA and MESA "EE as a service" delivery models the same accounting treatment.
- Similarly, because PACE is a property tax, an operating cost accounting treatment may be appropriate.
- This accounting treatment is important because many companies prefer not to encumber their balance sheets with debt to pay for EE improvements (preferring, for example, to maintain balance sheet flexibility to address core threats and opportunities to their business models).
- The Federal Accounting Standards Board (FASB) is in the process of implementing new rules that may influence the balance sheet treatment of these models.
- Clarity from regulators on how these models should be treated for accounting purposes would help to increase market confidence.
- The working group could convene stakeholders to address this issue.

# Appendix B
# Interviewee List

# Capital Providers

| Organization | Sub-Category |
|---|---|
| Bank of America | Banks |
| Bank of Colorado | |
| Citibank | |
| Deutsche Bank | |
| Green Choice Bank (IL) | |
| Wells Fargo | |
| Community Investment Corp | CDFIs (non-profits lenders) and Foundations |
| Craft3 | |
| CRF | |
| Energy Finance Solutions | |
| Kresge Foundation | |
| Living Cities | |
| Opportunity Finance Network | |
| Elevations Credit Union | Credit Unions |
| Lake Trust Federal Credit Union | |
| North Carolina State Employees Credit Union | |

# Implementers/Project Developers

| Organization | Sub-Category |
|---|---|
| CB Richard Ellis | Commercial Building Owners |
| Equity Office | |
| Forest City | |
| Jones Lang LaSalle | |
| Cimetrics | Contractors/DSM Providers |
| Clear Result | |
| CSG | |
| EGIA | |
| Honeywell | |
| Lime Energy | |
| Next Step Living | |
| Solar City | |
| Ameresco | ESCOs |
| Johnson Controls | |
| NAESCO | |
| Trane | |
| Winn Development | |
| AEE | Others/Advocates |
| Bloomberg | |
| EGIA or GE Money | |
| Marsh McLelland | |
| Nevada | |
| NRDC | |

# Implementers/Project Developers (cont'd)

| Organization | Sub-Category |
|---|---|
| Abundant Power | Specialty Finance/Investors |
| Boston Financial Group | |
| Bostonia | |
| Fannie Mae | |
| Green Campus Partners | |
| Metrus | |
| Renewable Funding | |
| Transcend | |
| CAEATFA | State Programs |
| California Energy Commission | |
| CEFIA | |
| Colorado Governor's Energy Office | |
| Massachusetts Department of Energy Resources | |
| NYSERDA | |
| Omaha | |
| PA Keystone HELP | |
| The Michigan Energy Office | |
| Central Electric Power Cooperative | Utilities |
| Electric Cooperatives of South Carolina | |
| SCE | |
| Sempra | |
| United Illuminating | |

# Originator/Servicer

| Organization | Sub-Category |
|---|---|
| AFC First | Lease/Finance Companies |
| Amerifirst | |
| Ervin Leasing | |
| Municipal Leasing | |
| Paramount | |
| Power of Leasing | |
| Salsbury Hill Financial | |
| Sun West Mortgage | |
| Think Reel Green | |
| Viewtech | |
| WJ Bradley | |

# Accounting Firms and Utility Regulators

| Organization | Sub-Category |
|---|---|
| KPMG | Accounting Firms |
| Pricewaterhouse Coopers | |
| California PUC | Utility Regulators |
| Hawaii PUC | |

# Appendix C
# Background on Risk

# Typical Pricing: Residential

**Representative Pricing Build for Typical Unsecured Loan**

| | |
|---|---|
| Loan Amount | $8,500 |
| Loan Term: | 10 years |

**Interest Rate Build**

| | |
|---|---|
| Typical Bank Cost of 10-Year Funds: | 3% |
| Origination Costs: | 2% (to cover the one-time $400/loan) |
| Servicing Costs: | 2% ($10/loan/month) |
| Set Aside for Losses: | 3% (to cover the 1–3% annual losses) |
| Return: | 1% |
| Total Interest Rate: | 11% |

- Small loan size and need for low rates results in a very low per-loan yield for a lender; challenging for lenders to make money from residential loans.
- Because data does not exist, it is possible, but unlikely that a lender would be able to model the beneficial impact of an on-bill repayment collection feature.

# Typical Pricing: Commercial

**Loan Amounts:** Range from mini-micro ($5,000–$15,000) to micro ($15,000–$150,000) to small ($150,000–$300,000)

| | |
|---|---|
| **Loan Term:** | 10 years |
| **Typical Bank Cost of 10-Year Funds:** | 3% |
| **Origination Costs:** | 1% ($400/loan) |
| **Servicing Costs:** | 0.5% ($10/loan/month) |
| **Set aside for losses:** | 2.5% |
| **Return:** | 1% |
| **Total Interest Rate:** | 8% |

- Commercial pricing tends to vary by loan size.
- Loans for large office buildings/universities can total multi-millions of dollars.
- While loan amounts are greater for commercial, origination costs are greater as well. Consequently, small loans are not appealing.

# Risk: Definitions and Pricing

| Type | Description | Generic Price Build |
|---|---|---|
| Credit Risk | The borrower is unwilling or unable to repay the debt | Dependent on distribution of FICO scores but typically 1–3% |
| Operational Risk | Internal to the lender, unable to perform operational duties | ~ 1.0% for a new product |
| Counterparty Risk | The lender's counterparties (servicers, lockboxes, etc.) do not perform their duties | ~ 1.0% (based on rating of counterparties) |
| Contractor Performance Risk | Contractors' installations are unacceptable | Banks generally will not take this risk but will look to a counterparty. Note: finance companies take this risk with dealer loans by tightening management and processes |
| Energy Saving Performance Risk | The estimated savings do not materialize | Banks generally will not take this risk but will look to a counterparty |
| Interest Rate Risk | Interest rates decline during the loan term, borrower prepay their loans and the lender is left with cash that can only be re-lent but at lower rates | ~ 0.2–1.0% (depending on loan term and market conditions) |
| Regulatory Risk | Bank or other regulators disallow an activity or method | Banks would not pursue a business with substantial risk |
| Demand Risk | The risk that a new program does not produce the projected loan volume | This risk would be captured in a "premium" added to the price build, if the lender pursued the business |
| Uncertainty Risk | The risk of unpredicted outcomes occurring | This risk would generally be captured in a "premium" added to the price build |

# How to Reduce Residential or Commercial Interest Rates

The following table illustrates the impact of various efficiencies and credit enhancements.

| Pricing Element | Improvement | Potential Interest Rate Impact* |
|---|---|---|
| Credit Risk | 10% Credit enhancement | 1.0% |
| Origination | Standardize process | 0.5% |
| Servicing | On-bill servicing with shut-off | 0.25% |
| Loan size | Increase minimum loans size and/or aggregate loans in a fund | 0.50% |
| Total Impact | Combine all four changes | 2.25% |

*These represent a range; actual numbers may vary considerably, depending on individual market circumstances.

# Credit Risk—Residential

- **Lenders generally use credit scores to assess the credit worthiness of applicants.**
  - Lenders willingness to accept credits diminishes below 700 and falls dramatically below 680
  - Some mission-oriented lenders will accept credits around 600
  - Delinquency rates increase substantially as credits decline

- **The following slide illustrates the relationship between delinquency and credit score.**

# Credit Risk—Residential

Typical delinquencies by credit score...

| Percentile | % of People | Score | Delinquency Rate Projected |
|---|---|---|---|
| 2nd | 2% | 300-499 | 87% |
| 7th | 5% | 500-549 | 71% |
| 15th | 8% | 550-599 | 51% |
| 27th | 12% | 600-649 | 31% |
| 42nd | 15% | 650-699 | 15% |
| 60th | 18% | 700-749 | 5% |
| 87th | 27% | 750-799 | 2% |
| 100th | 13% | 800-850 | 1% |

Source: data provided by Experian Corporation 2011

# Credit Risk—Commercial

**Commercial credit analysis is more complex than consumer credit and relies on a combination of:**

- Credit scores of the business owners
- The businesses' payment history with its vendors
- The businesses' credit rating
- Bank balances and references
- Business environment
- Other factors

# Operational Risk

- The risk that a financial institution is unable to perform functions required under the program
- New programs present greater risk than existing programs, consequently lenders take on greater risk with new programs
  - One lender indicated that it underestimated the effort required to implement a program, investing more than 1,000 hours in setting up a program for the residential sector
- Uncertainty about loan volume further adds to lenders' operational risk

# Counterparty Risk

- The risk that counterparties (other lenders, partners, etc.) do not perform their obligation

- Examples include:
  - Program administrator fails to perform its duties
  - Servicer fails to forward borrower payments
  - Originator fails to repurchase non-compliant loans
  - Contractors fail to provide an acceptable installation
  - Contractor manager fails to comply with contractual representations and warrants

# Contractor Performance Risk

- Clean energy finance is generally considered a “purchase money” loan—the borrower is purchasing the clean energy improvements.
- In the event that the borrower is dissatisfied with the purchase (generally related to the contractors performance), the borrower frequently has recourse that may include or lead to non-payment.
- In the event of non-payment for contractor performance issues, the lender will be placed at risk.
- To mitigate this risk, lenders should provide a comprehensive contractor certification and management process, a costly undertaking requiring special expertize.

# Energy Saving Performance Risk

- The majority of commercial entities that perform EE projects do so to reduce operating costs.
- In the event that the projected savings are not achieved, the property owner will look to the installation contractor or the provider of energy saving insurance to be made whole.
- If the property owner is not satisfied with the result and believes that there is an alliance between the contractor and the lender, the property owner may choose to reduce or stop payment on the project.
- While the contracts most likely do not provide this as a remedy, it could result in a disruption in payment.

# Interest Rate Risk

- Interest rate is related to the term of fixed-rate investments, prepayment restrictions, and the volatility of the so-called yield curve (how rates react to market conditions).

- Lenders are exposed to less risk with shorter terms in relatively less reactive markets with restricted prepayment loans. (If a lender deploys capital at a fixed rate and rates decline, borrowers will seek to refinance, leaving the lender to reinvest its capital in a declining rate market.)

- However, longer terms reduce the monthly payment which results in greater monthly net cash flow.

# Regulatory Risk

**Forms of this risk could include whether regulators will:**

- Grant Community Reinvestment Act (CRA) credit to banks that participate in financing programs for EE
- Consider government or utility sponsored loss reserves in their review of financial institution assets
- View the high proportions of unsecured loans as exposing the lender to greater risk
- Apply greater scrutiny to the less well known counterparties, such as specialty energy providers
- Change capital reserve requirements

# Demand Risk

- Financial institution development of EE financing products and/or participation in EE finance programs often involves substantial internal costs (e.g., staff time, systems upgrades, marketing materials).
- In many cases, EE financing programs have experienced low customer participation (See Fuller, M. “Enabling Investments in Energy Efficiency.” 2009.).
- Low customer demand poses risks to financial institutions that they will not realize high enough loan volume to recoup their internal setup costs (and earn a profit).

# Uncertainty Risk

When entering a new and unproven market, financial institutions are typically aware that they may not have a full grasp on all risks associated with that market.

This uncertainty causes risk-averse financial institutions to avoid new markets and more risk-tolerant financial institutions to charge a premium for financial products relative to other proven markets with which they are more familiar.