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STATE AND LOCAL RESOURCES FOR A CLEAN ENERGY FUTURE
Winter 2016

Technical Assistance to State and Local Governments

ENERO. GOV
Office of Energy Efficiency & Renewable Energy

State & Local Spotlight
August 2016

Clean Energy News and Events for State and Local Leaders
A monthly update from EERE's Weatherization and Intergovernmental Programs Office (WIP) for state, local, and K-12 officials featuring resources to advance successful, high-impact, and long-lasting clean energy policies, programs, and projects.

State & Local News
DOE Releases Updated Draft Guidelines for Residential PACE Programs, Open for Public Comment
The U.S. Department of Energy (DOE) announced new partnerships and resources that will bring the benefits of energy efficiency and renewable energy to more states and communities, including an updated draft of guidelines for residential Property Assessed Clean Energy (PACE) programs. DOE is seeking stakeholder input on the draft, Best Practice Guidelines for Residential Financing Programs, which focuses on best practices for program design, including consumer and program compatibility of PACE with other energy efficiency programs and services, minimum contractor requirements, performance standards, and evaluation of program outcomes.

Featured Blog
Residential PACE Adds Market Value for Home Energy Upgrades
EERE's Deputy Assistant

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State and Local Resources for a Clean Energy Future

What you will find:

• Targeted opportunities for impact in your jurisdiction

• Key resources from each of the four action areas

• Information on initiatives and resources in renewable power, sustainable transportation, and energy-saving homes, buildings, and manufacturing from across EERE
Current Practices in Efficiency Financing:
An Overview for State and Local Governments

Greg Leventis, Emily Martin Fadrhonc, Chris Kramer, and Charles Goldman, Lawrence Berkeley National Laboratory

Presentation for DOE WIP
November 17, 2016
Overview

- Objectives
- Comprehensive framework
- Traditional vs. Specialized
- Role of Financing in improving EE Value
  Proposition
Objectives
Objectives

- Provide solid background and broad context to help state and local governments:
  - Participate in discussions of on-bill and PACE
  - Choose which financing products to include in a Green Bank
  - Make decisions about starting a new financing program or modifying an existing program
  - Understand the benefits and tradeoffs for all customer-facing financing products used for energy efficiency
  - Identify market barriers and financing solutions in all market sectors

- Provide an easy-to-use framework to think about the larger context of energy efficiency finance and the relative merits of different products in each sector
Poll I
Poll 2
Comprehensive framework
Comprehensive framework

- Report organizes financing products into Traditional and Specialized products available to consumers to pay for energy efficiency projects

- **Traditional**: Common financing products used everyday to pay for a range of goods and services:
  - Unsecured loans
  - Secured loans
  - Leases

- **Specialized**: Financing products designed specifically to address barriers to efficiency:
  - On-bill loans
  - Property Assessed Clean Energy (PACE)
  - Savings-backed arrangements (ESPC, ESA)
Comprehensive framework

Typology of financing products used to pay for efficiency

- EE Financing
  - Traditional
    - Loans
      - Unsecured
        - Banks/Financial Institution Loans
        - Manufacturer/Vendor Loans
        - Credit Cards
      - Secured
        - Secured by Real Estate
        - Secured by Equipment
        - Residential
        - Commercial
    - Operating Leases
    - Secured by Equipment
  - Leases
    - Capital Leases
    - Tax-Exempt Leasing
  - Specialized
    - On-Bill Financing
    - On-Bill Repayment
    - C-PACE
    - R-PACE
    - Savings-Backed Arrangements
      - Performance Contracting (ESPC)
      - Service Agreements (ESA/MESA)
## Typology of financing products

<table>
<thead>
<tr>
<th>PRODUCT TYPE</th>
<th>2014 ACTIVITY ($M)</th>
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</thead>
<tbody>
<tr>
<td><strong>TRADITIONAL</strong></td>
<td></td>
</tr>
<tr>
<td>Unsecured loans</td>
<td>Unknown (likely over $100)</td>
</tr>
<tr>
<td>Secured loans</td>
<td>Unknown</td>
</tr>
<tr>
<td>Leases</td>
<td>Unknown (likely large)</td>
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<tr>
<td><strong>SPECIALIZED</strong></td>
<td></td>
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<tr>
<td>On-bill loans</td>
<td>$179</td>
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<tr>
<td>PACE loans</td>
<td>$267</td>
</tr>
<tr>
<td>Energy Savings Performance Contracts</td>
<td>$4,101</td>
</tr>
<tr>
<td>Energy Service Agreements</td>
<td>Unknown (likely very small)</td>
</tr>
</tbody>
</table>

*Source: Deason et al 2016.*
To date, specialized products may make up a small part of the market.

Source: Dunsky Energy Consulting, Opinion Dynamics
Traditional vs. specialized
Poll 3
Traditional: Unsecured loans

◆ DEFINITION:

- Loans for which lenders have no recourse to take possession of a borrower’s assets in case of nonpayment

◆ PROS AND CONS:

- Quick application processes; no collateral requirement (accessible to more borrowers)
- In the absence of a subsidy, generally carry higher interest rates than comparable secured loans (e.g., mortgages)

◆ EXPERIENCE:

- Often used for reactive measures (e.g., replacing HVAC unit when it breaks)
- Used by a range of program administrators—often at subsidized rates—reaching all market segments
- Total EE Market activity for unsecured loans likely very large
Traditional: Secured loans

**DEFINITION:**
- Loans for which lenders may take possession of a borrower’s assets in case of nonpayment

**PROS AND CONS:**
- Often offer lower interest rates than equivalent unsecured products since collateral can reduce lender losses
- Longer to execute with higher transaction costs than some other energy efficiency financing products
- Several distinct drawbacks for commercial and industrial customers

**EXPERIENCE:**
- Several federal government entities have offered secured loan programs (e.g., energy efficient mortgages—EEMs, which add energy efficiency project costs to a mortgage), but uptake has been modest
Traditional: Leases

◆ DEFINITION:

- Arrangements in which a lessor offers a lessee possession and use of an asset for a fixed period of time
- Two types: **operating leases** and **capital leases**
  - **Tax-Exempt Lease Purchase Agreement (TELP)**: type of capital lease often used to finance efficiency projects in MUSH sector

◆ PROS AND CONS:

- Faster turnaround, easier approval, lower transaction costs, and more flexible terms than secured loans or bond financing
- Debt limitations, although TELPs and (until 2018) operating leases may not have debt limit impacts

◆ EXPERIENCE:

- To date, most programmatic use of leasing for efficiency has been through TELPs used in the ESCO market
- Market activity for efficiency is unknown but likely large
Types of leases

- **Operating Lease**
  (aka true lease, tax lease)

- **Capital Lease**
  (aka finance, non-tax-oriented)

  - **Tax-exempt (TELP)**
    (aka municipal)
Specialized
Specialized: On-bill loans

◆ DEFINITION:

- Loans to utility customers that are repaid on the utility bill

◆ PROS AND CONS:

- Paying on the utility bill is familiar and convenient
- May allow transfer of loans to subsequent occupants, alternative underwriting (expands access), and may aim for cash-flow positive projects
- Start-up IT costs and ongoing administrative complexity can be significant

◆ EXPERIENCE:

- High volume programs offer below-market interest rates combined with either:
  - Allowing almost any “energy-related” improvements; or
  - Coupling with robust financial incentives and rebates
- Some programs operating since the 1970s; programs have loaned over $2B with default rates ranging from 0% to 3%
- In 2014, $179M in on-bill loans were made for electric efficiency
Specialized: On-bill loans

On-bill volume concentrated in five programs

- **Loan Volume ($)**
  - All others: $190M (10%)
  - TVA, MH, Alliant CT, SBEA, NG: $1.64B (90%)

- **Number of Participants**
  - All others: 18K (8%)
  - TVA, MH, Alliant CT, SBEA, NG: 215K (92%)

Source: SEE Action 2014
Specialized: PACE financing

◆ DEFINITION:
  - PACE is a loan made as a special assessment on a property, repaid through the tax bill

◆ PROS AND CONS:
  - Offers strong security, allowing long terms and lower rates
  - Transferable to incoming occupants; could be cash-flow positive; uses alternative underwriting
  - Regulatory challenges

◆ EXPERIENCE:
  - Rapid residential growth, but mostly in CA; over 80% of commercial projects are in CA, OH and CT
  - Uncertainty in the value of transferability, PACE’s ability to encourage deeper or very high efficiency projects, and in R-PACE’s regulatory status
  - Since 2009, PACE programs have extended over $2.3B in loans.* In 2014, PACE generated $267M in efficiency lending

*Source: PACE Nation
Specialized: PACE financing

CA residential PACE assessments 2009-2015

Source: Martin Fadrhonc et al 2016
Specialized: PACE financing

PACE investment by sector and end-use to mid-2016

- C-PACE
- R-PACE

Investment volume (B$)

- Water
- RE
- EE

Source: PACE Nation
Specialized: Savings-backed arrangements

DEFINITIONS:

- **Savings-backed arrangements**: Arrangements in which a service provider takes on performance risk. Two main types used: Energy Savings Performance Contracts (ESPC), and Energy Service Agreements (ESA) and Managed Energy Service Agreements (MESA)—a subset of ESAs:
  1. **ESPCs**: ESCOs directly contract with building owners to perform EE work; ESPCs often guarantee energy savings; financing is obtained separately
  2. **ESAs and MESAs**: ESA provider contracts with a building owner to oversee an ESCO’s work and to furnish project financing; often guarantees energy savings
Specialized: ESPC

◆ PROS AND CONS:

- Can minimize project performance risk for building owners and provide technical support and O&M
- Complex; for large projects; funding must be obtained from a third party

◆ EXPERIENCE:

- Most ESPC activity takes place in the public and institutional markets (e.g., federal/state/local government buildings, K-12 schools, universities/colleges)
- In 2014, ESPC represented $4.1B in investment electric efficiency, 85% of that year’s programmatic financing
- Since 1990, over $57B has been invested in efficiency through ESPC*

Specialized: ESPC

ESPC use by volume and sector

Specialized: ESA

◆ PROS AND CONS:

- Require no public funds and no up-front costs or O&M responsibility for building owners
- Can minimize project performance risk and utility bill price risk; some structures could potentially garner off-balance sheet treatment
- Some ESA providers raise capital by attracting investors to each project, which can add significant transaction costs and complexity

◆ EXPERIENCE:

- Complex, relatively new structures; currently not well understood in the marketplace
- Market activity for ESAs is unknown but likely modest to date
Specialized: ESA

A simplified ESA structure

- Customer
  - Energy savings as a service
  - Per negawatt hour payments

- ESA Provider
  - Capital
  - Repayment over Time
  - Contracted services (installation, O&M)
  - Up-front payment

- Investors
- ESCO
Role of financing products in improving the energy efficiency value proposition
Poll 4
Improving the energy efficiency value proposition: Barriers to Efficiency

- Access to Capital
- Cash Flow (customer focus on short paybacks)
- Customer Debt Limits
- Owner-Renter Split Incentives
- Occupancy Duration
- Application Process
## Improving EE value proposition

### Key to following slides

<table>
<thead>
<tr>
<th>MARKET SECTOR</th>
<th>FINANCING PRODUCT</th>
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<tr>
<td>Barrier not important enough to drive design of an EE program</td>
<td>This product does not address this barrier</td>
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<tr>
<td>Barrier may be relevant but not paramount in this sector</td>
<td>This product may address this barrier or somewhat addresses this barrier</td>
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<tr>
<td>Barrier may be especially important in this sector</td>
<td>This product is likely to be able to overcome this barrier</td>
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## Improving EE value proposition: Barriers to Efficiency by Market Sector

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<tr>
<th>MARKET BARRIER</th>
<th>SF General</th>
<th>SF Low-Mod Income</th>
<th>MF Affordable</th>
<th>MF Mkt rate</th>
<th>C&amp;I Small Bus.</th>
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<td>Owner-renter split incentives</td>
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### Improving EE value proposition

#### Barriers addressed by various financing products

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<tr>
<th>MARKET BARRIER</th>
<th>UN-SECURED</th>
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<th>LEASING</th>
<th>ON-BILL</th>
<th>PACE</th>
<th>SAVINGS-BACKED</th>
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Conclusion

◆ Decision makers need to understand the relative merits of both traditional and specialized financing product options open to consumers

◆ Different products may be more useful for certain market sectors and for overcoming particular barriers; policymakers should weigh the features of each product in light of their own jurisdiction’s needs

◆ Traditional financing products likely account for far more investment in efficiency than specialized products
  □ Need more quantitative data & a study on market activity to know with certainty

◆ Most programmatic efficiency financing efforts generate low annual lending volumes
Conclusion

- 2014 EE financing program loan volumes*
- Most EE financing program annual dollar volumes are relatively low

*ESPC excluded, Source: Deason et al 2016
Resources

◆ DOE State and Local Solutions Center: energy.gov/eere/slsc/state-and-local-solution-center


◆ Upcoming C-PACE research, will be posted here: https://emp.lbl.gov/projects/financing-energy

◆ Better Buildings Energy Efficiency Financing Navigator
Energy Efficiency Financing Navigator

Want to learn more? Contact Joe Indvik (jindvik@jdmgmt.com)
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