Accessing Secondary Markets to Stimulate Financing for Energy Efficiency Investments

May 27, 2015
Accessing Secondary Markets as a Capital Source for Energy Efficiency Finance Programs

Program Design Considerations for Policymakers and Administrators

March 10, 2015

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Co-authors: Peter Thompson, Charles Goldman
About SEE Action

• Network of 200+ leaders and professionals, led by state and local policymakers, bringing energy efficiency to scale

• Support on energy efficiency policy and program decision making for:
  • Utility regulators, utilities and consumer advocates
  • Legislators, governors, mayors, county officials
  • Air and energy office directors, and others

• Offers:
  • Guidance Documents
  • Trainings
  • Peer-to-peer dialogues
  • Technical Assistance

• Facilitated by DOE and EPA

The SEE Action Network is active in the largest areas of challenge and opportunity to advance energy efficiency
Key Barrier

*High up-front costs of EE improvements*: 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.

Focus Areas

- **Improve Data Access**. Improve data collection practices and access to quality data on energy efficiency financing product performance.
- **Improve Program Design**. Help energy efficiency financing program administrators align program strategies with customer needs, and share lessons learned from experiments in energy efficiency financing program design.
- **Support Effective Financing Tools**. Explore whether novel financing tools and capital sources are more effective than conventional ones in addressing the unique barriers of energy efficiency financing.
- **Clarify Regulatory Treatment of Financing**. Identify how state public utility commissions are treating financing initiatives under the regulatory framework, share successful approaches.
# Financing Solutions Working Group

## Co-Chairs
- **Bruce Schlein**
  Citi
- **Bryan Garcia**
  Connecticut Green Bank

## Federal Facilitators
- **Johanna Zetterberg**
  U.S. DOE
- **Brian Ng**
  U.S. EPA

## Technical Advisor
- **Lawrence Berkeley National Lab**

## Financial Institutions
<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>W. Robert Hall</td>
<td>Hall Associates Consulting, LLC</td>
</tr>
<tr>
<td>Peter Krajsa</td>
<td>AFC First Financial Corporation</td>
</tr>
<tr>
<td>Bill Jenkins</td>
<td>Deutsche Bank</td>
</tr>
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## Industry and Commercial Groups
<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don Gilligan</td>
<td>National Association of Energy Service Companies</td>
</tr>
<tr>
<td>Austin Whitman</td>
<td>First Fuel</td>
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## Regional, Research, and Advocacy Groups
<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tbody>
<tr>
<td>Casey Bell</td>
<td>American Council for an Energy Efficient Economy</td>
</tr>
<tr>
<td>Curtis Probst</td>
<td>Rocky Mountain Institute</td>
</tr>
<tr>
<td>Philip Henderson</td>
<td>Natural Resources Defense Council</td>
</tr>
<tr>
<td>Joel Kurtzman</td>
<td>Milken Institute – Center for Financial Innovations</td>
</tr>
<tr>
<td>Robert Sahadi</td>
<td>Institute for Market Transformation</td>
</tr>
<tr>
<td>Mark Wolfe</td>
<td>Energy Programs Consortium</td>
</tr>
<tr>
<td>Stuart DeCew</td>
<td>Yale Center for Business and the Environment</td>
</tr>
<tr>
<td>Brad Copithorne</td>
<td>Renewable Funding</td>
</tr>
<tr>
<td>Steven Klein</td>
<td>First Infrastructure, Inc.</td>
</tr>
<tr>
<td>Mary Schlaefer</td>
<td>Wisconsin Energy Conservation Corporation</td>
</tr>
<tr>
<td>Jennifer Weiss</td>
<td>Environmental Finance Center at UNC-Chapel Hill</td>
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## State /Local Government
<table>
<thead>
<tr>
<th>Name</th>
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<tr>
<td>Lorraine Akiba</td>
<td>Hawaii Public Utilities Commission</td>
</tr>
<tr>
<td>Janis Erickson</td>
<td>Sacramento Municipal Utility District</td>
</tr>
<tr>
<td>Sandy Fazeli</td>
<td>National Association of State Energy Officials</td>
</tr>
<tr>
<td>Greg Hale</td>
<td>Office of the Governor, State of New York</td>
</tr>
<tr>
<td>Jean Lamming</td>
<td>California Public Utilities Commission</td>
</tr>
<tr>
<td>Jeff Pitkin</td>
<td>NYSERDA</td>
</tr>
<tr>
<td>Paul Scharfenberger</td>
<td>Colorado Governor’s Energy Office</td>
</tr>
<tr>
<td>Mary Templeton</td>
<td>Michigan Saves</td>
</tr>
</tbody>
</table>
ENERGY EFFICIENCY FINANCING

Financing is one of several linked strategies to drive and enable customer demand for energy efficiency. Financing alone does not lead to energy savings, but it may be an effective tool for helping customers overcome the high up-front costs of a range of energy efficiency investments.

Guidance Documents from the Network

- Accessing Secondary Markets as a Capital Source for Energy Efficiency Finance Programs: Program Design Considerations for Policymakers and Administrators

Efficient access to capital from secondary markets—reselling energy loans to investors to replenish program funds—is being advanced as an important enabler of the energy efficiency industry "at scale." However, the role that secondary markets can play in bringing energy efficiency to scale is largely untested. Only a handful of secondary market transactions of energy efficiency loan products have been executed to date, and it is too soon to draw robust
Accessing Secondary Markets as a Capital Source for EE Financing Programs

• Objectives
  – Discuss how secondary markets have been used to date by energy efficiency financing programs and how they could be used in the future;
  – Identify program design issues that should be considered by program administrators when contemplating accessing secondary financial markets; and
  – Offer guidance and suggestions for program administrators and policymakers when considering how secondary market strategies fit into overall energy efficiency efforts

• Audience
  – Program administrators, especially those considering secondary market interactions
  – Interested stakeholders in the financial and related industries
Definitions

What are secondary markets?
- Any market in which a product is resold after its original sale
- In the EE context: Financial markets where EE loans can be sold to investors, either as single loans or as packages of loans divided into tradable instruments (bonds)

What are EE financing structures?

<table>
<thead>
<tr>
<th>Traditional Structures</th>
<th>Specialized Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Existing financing tools that can be used to finance EE (e.g., mortgages, credit cards)</td>
<td></td>
</tr>
<tr>
<td>• Secondary market already exists for these products</td>
<td></td>
</tr>
<tr>
<td>• Not the focus on this report; development of “green” versions of traditional structures (e.g., green bonds, green MBSs) are an important issue to track</td>
<td></td>
</tr>
<tr>
<td>• Tools tailored specifically to EE (e.g., PACE, on bill products)</td>
<td></td>
</tr>
<tr>
<td>• Newer strategies, intended to overcome EE-specific barriers (e.g., loan length, transferability)</td>
<td></td>
</tr>
<tr>
<td>• Secondary markets for these products are emerging</td>
<td></td>
</tr>
</tbody>
</table>
The Promise of Secondary Markets for EE Finance

What is the promise of a secondary market for specialized EE products?

**Greater Capital Supply**

Secondary market approaches that are based on underlying cash flows (repayments) of EE loans offer scalability—as long as new loans are originated, loans can be sold onward to investors.

Can accommodate very large demand for energy efficiency products and services.

Typically, high degree of standardization required for efficient secondary market access (not yet seen in EE).

**Lower Capital Cost**

May be lower in the long run (compared to current capital supply options) assuming sufficient scale and liquidity.

In the short run, secondary market capital’s “all-in” costs may be higher than alternatives due to transaction costs, liquidity issues, and market unfamiliarity with EE financing products.
Balancing Near-Term and Long-Term Objectives

• Over time, secondary markets can help solve challenges of capital supply and cost of capital; program administrators should consider how addressing those challenges factor into overall objectives

  – Some may choose to establish products today that are designed to ensure that secondary market capital will be available and well-priced in the future
  – Others may wait until demand builds to point at which capital is constrained, while designing programs to drive demand and meet other objectives

Supply-Focused Approach
Anticipate secondary market transaction while demand is still building

Key Risks
Demand doesn’t materialize and costs of secondary market preparation are stranded

Demand-Focused Approach
Consider secondary market interactions once capital constraints are likely

Key Risks
Program design decisions increase borrowing cost (or cost of credit enhancements) in the secondary market
Early Secondary Market Transactions of EE Loans

- Focus on transactions that are supported by repayments of underlying EE loans and not by more general obligations (e.g., ratepayer charges, taxes, fees)
  - These approaches offer greater scalability—as long as new loans are originated, secondary products can be offered to investors
- Three primary transaction structures:

  1. Loan Portfolio Sales
     - **Ex:** Craft 3 – Self-Help, Keystone HELP

  2. Bond Sales
     - 2A. Revenue Bonds
       - **Ex:** NYSERDA, Toledo PACE, CT C-PACE, Delaware SEU
     - 2B. Asset-Backed Securities
       - **Ex:** HERO, WHEEL, Kilowatt

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<table>
<thead>
<tr>
<th>Date</th>
<th>Size</th>
<th>Transaction Type</th>
<th>Seller (Type)</th>
<th>Primary Capital Source</th>
<th>Market Sector of Underlying Loans</th>
<th>Investor Type</th>
<th>Rating</th>
<th>Credit Enhancement</th>
<th>Seller (Type)</th>
<th>Primary Capital Source</th>
<th>Market Sector of Underlying Loans</th>
<th>Investor Type</th>
<th>Rating</th>
<th>Credit Enhancement</th>
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<tbody>
<tr>
<td>December 2013</td>
<td>$15.7M</td>
<td>Portfolio Sale</td>
<td>Craft 3 (Private)</td>
<td>Craft 3 funds</td>
<td>Residential</td>
<td>Single purchaser</td>
<td>n/a</td>
<td>Reserve Account, Partial Guarantee</td>
<td>Reserve Account, Partial Guarantee</td>
<td>Treasury funds</td>
<td>Residential</td>
<td>Consortium</td>
<td>AAA/Aaa</td>
<td>Appropriations backing (guarantee)</td>
</tr>
<tr>
<td>January 2013</td>
<td>$24M</td>
<td>Portfolio Sale</td>
<td>PA Treasury (Public)</td>
<td>Treasury funds</td>
<td>Residential</td>
<td>Consortium</td>
<td>n/a</td>
<td>Loan Guarantee</td>
<td>Loan Guarantee</td>
<td>Public Offer</td>
<td>Commercial</td>
<td>Public Offer</td>
<td>AA+</td>
<td>Over-collateralization (3%), Liquidity Reserve (3% growing to 7%), Excess Spread (4%)</td>
</tr>
<tr>
<td>August 2013</td>
<td>$24M</td>
<td>Revenue Bond (as QECB)</td>
<td>NYSERDA (Public)</td>
<td>RGGI funds</td>
<td>Residential</td>
<td>Private Placement</td>
<td>Unrated</td>
<td>Reserve Account</td>
<td>Reserve Account</td>
<td>Private Placement</td>
<td>Residential</td>
<td>Private Placement</td>
<td>AA</td>
<td>Over-collateralization , Liquidity Reserve (3% growing to 7%), Excess Spread (4%)</td>
</tr>
<tr>
<td>2012-2013</td>
<td>$16M</td>
<td>Revenue Bond</td>
<td>Toledo Lucas-County Port Authority (Public)</td>
<td>Municipal revenue bonds</td>
<td>Commercial</td>
<td>Public Offer</td>
<td>Unrated</td>
<td>Sale at discount</td>
<td>Sale at discount</td>
<td>Public Offer</td>
<td>Residential</td>
<td>Public Offer</td>
<td>TBD</td>
<td>Subordination (~20%)</td>
</tr>
<tr>
<td>May 2014</td>
<td>$30M</td>
<td>Revenue Bond</td>
<td>Public Finance Authority - conduit (Public)</td>
<td>Municipal revenue bonds</td>
<td>Commercial</td>
<td>Private Placement</td>
<td>AA+</td>
<td>Isuing Account, Partial Guarantee</td>
<td>Issuing Account, Partial Guarantee</td>
<td>Treasury funds</td>
<td>Commercial</td>
<td>Public Offer</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>July 2011</td>
<td>$73M</td>
<td>Revenue Bond</td>
<td>Delaware SEU (Quasi-public)</td>
<td>ESCO contracts</td>
<td>Residential</td>
<td>Private Placement</td>
<td>AA+</td>
<td>Isuing Account, Partial Guarantee</td>
<td>Issuing Account, Partial Guarantee</td>
<td>Treasury funds</td>
<td>Commercial</td>
<td>Public Offer</td>
<td>TBD</td>
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<tr>
<td>TBD</td>
<td>TBD</td>
<td>ABS</td>
<td>WHEEL SPV (Private)</td>
<td>Citibank/Pennsylvania Treasury line of credit</td>
<td>Residential</td>
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<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>Citibank line of credit</td>
<td>Residential</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
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</table>
Transaction Structures: Loan Portfolio Sale

- **Portfolio sales** are a straightforward route to secondary market capital
  - The roles of third parties (e.g., lawyers, investment bankers) are usually more limited
  - Typically do not require a credit rating
- May be challenging to find a buyer that is interested in holding a large pool of energy efficiency loans for an extended time period

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*May be a single purchaser or consortium*
**Transaction Structures: Bond Sales**

- **Municipal revenue bonds**
  - Debt issued by a municipality or other public agency; bond payments are guaranteed by designated revenues streams (not general taxes)

- **Asset-backed securitizations**
  - Debt offered by a specialized financial entity that is backed by a pool of revenue-generating assets (loans)

- **Public vs private placement**
  - **Private placements** are sales directly to “qualified institutional investors” and need not be registered with the SEC
  - **Public offers** are available to all investors
  - Transaction costs of private placements are typically lower than public offers, but cost of capital is higher
Asset-backed securitizations arguably provide a pathway to a larger total pool of capital (meet needs of larger number of investors).

May help further ensure that the investment needs of the energy efficiency industry can be met as demand grows.
Investor Perspectives: Addressing Risk

• Fundamentally, all investors will look for a rate of return that corresponds with the riskiness of the asset

• To address this risk/return tradeoff, sellers must be prepared to:
  1. **Provide information** to help investors assess risks of the sale and underlying loans
  2. **Structure transactions** to mitigate risks to investors (including offering credit enhancements)
Investor Perspectives: Addressing Risk

- **Provide information** to mitigate risk
  - Repayment history, the credit profile of borrowers, and default and charge off rates
  - Ideally, historical performance information available for entire tenure of the loans

- **Structure transaction** to mitigate risk, through credit enhancements

<table>
<thead>
<tr>
<th>Loan portfolio sale options</th>
<th>Bond sale options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale at discount</td>
<td>Required debt service coverage ratios</td>
</tr>
<tr>
<td>Sale of subset of all loans</td>
<td>Cash reserve funds</td>
</tr>
<tr>
<td>Loan loss reserves</td>
<td>Subordination</td>
</tr>
<tr>
<td>Guarantees</td>
<td>Excess spread</td>
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<tr>
<td></td>
<td>Overcollateralization</td>
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<td></td>
<td>Reserve account</td>
</tr>
<tr>
<td></td>
<td>Guarantees</td>
</tr>
</tbody>
</table>

Credit enhancements are not without cost and should be considered when deciding whether and when to pursue secondary market capital.
Program Design Considerations

Some program design features may be affected by the pursuit of secondary market capital

**Interest rates**

Potential mismatch between returns that secondary market investors may expect and below-market interest rates

**Terms and conditions**

Long loan terms may be important for programmatic reasons, but secondary market investors may view longer loan terms as risky
Underwriting criteria
Investors may view expanded or alternative underwriting criteria as an additional source of risk

Security and collection mechanism
Investors will price secured and unsecured loans differently
Program administrators may be interested in testing novel security features, which are not yet well understood by the secondary market but are attracting early interest from investors (esp. PACE)

Bottom Line: Program administrators should be aware of and prepared for possible tradeoffs on program design issues as a result of pursuing secondary market investment
Alternative Strategies for achieving capital supply and cost of capital goals include:

Public or ratepayer funds
- Direct loans

Bonds not tied to EE loan revenues
- General obligation bonds
- Ratepayer charge-backed bonds (e.g., Hawaii GEMS)

Lender networks
- e.g., Mass HEAT Loans

In the short run, these alternatives tend to offer lower costs.
In the long run, capital from these sources may be constrained.
Decision Support Tool for Program Administrators

What is your current level of demand relative to capital supply?

- High, likely to exceed available capital
- Low, but projected to increase
- Low, unlikely to exceed available capital

What options for capital replenishment are available to you?

- Third-party secondary market access models (e.g., WHEEL, Kilowatt)
- In-house secondary market access models
- Alternative capital supply approaches

Are costs, program design constraints, and potential credit enhancements of these approaches acceptable and in line with your program goals?

- Yes
  - Consider a secondary market approach that builds investor familiarity and contributes to loan performance history (e.g., a revenue bond or ABS if volume justifies upfront costs of issuance, loan portfolio sale if not)

- No
  - Consider continuing to build demand and loan performance history while monitoring secondary market activity

Is development of mature, efficient secondary market an immediate program goal?

- Yes
  - Consider an alternative capital supply approach

- No
**Summary**

- **The promise of secondary markets:** In the long run, secondary markets could offer a virtually limitless, low-cost capital source
  - However, current volume has not reached scale typical of secondary market transactions; 8 early transactions total just over $400M
  - Some program administrators choose to focus on secondary market strategies now, building a transaction history so that this capital supply source will be available when needed
  - Others make program design choices primarily to build demand today and meet other objectives
Summary

• **Two main types of secondary market mechanisms** have been observed in 8 early transactions: loan portfolio sales and bond sales (including municipal revenue bonds and asset-backed securitizations)
  – All early secondary market transactions have built risk mitigation strategies into their transactions, which are not without cost

• **Balancing short-term and long-term objectives**
  – Program administrators should weigh effects of secondary market orientation on program design choices (e.g., interest rates, security mechanisms, underwriting criteria)
  – As a first step in considering secondary market strategies, programs should examine their projected levels of financing activity, as well as their capital supply options and constraints, to determine when secondary markets may be needed
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1. About the Connecticut Green Bank
2. The Commercial Sector
3. The Residential Sector
4. Key Lessons Learned
The Connecticut Green Bank
Connecticut Green Bank Challenge: Mobilize Private Capital Investment in Clean Energy

...transitioning programs away from government-funded grants, rebates, and other subsidies, and towards deploying private capital... the Green Bank was established in 2011 to develop programs that will leverage private sector capital to create long-term, sustainable financing to support residential, commercial, and industrial sector implementation of energy efficiency and clean energy measures.
The Commercial Sector
Commercial Property Assessed Clean Energy (C-PACE)

- An innovative financing structure that enables commercial, industrial, and multi-family property owners to access financing for qualified energy upgrades and repay through a benefit assessment on their property tax.

- Private capital provides 100% upfront, low-cost, long-term funding.

- Repayment through property taxes.

- A senior C-PACE lien is put on the property and stays regardless of ownership.

- Fixed interest rates to customers of 5-6% (10-20 year terms).
C-PACE: First Securitization
Green Bank Originates & Aggregates

CT Green Bank

Financing Agreement
Lien
Lien
Lien
Lien
Lien
Lien
Lien

$30M total in underlying Benefit Assessments
C-PACE: First Securitization Structure of Issuance (May 2014)

C-PACE PORTFOLIO (VIA MUNIS)

- Sells 100% of Portfolio For Cash Payment + Class B & C Bonds (Bonds = 20% of Portfolio Value @ Bid Price)

PUBLIC FINANCE AUTHORITY (CONDUIT ISSUER)

- Class A Bonds Senior in Priority (Bonds = 80% of Portfolio Value @ Bid Price)

CT Green Bank

CLEAN FUND

(cost of capital ~ 6%)
C-PACE: Second Private Capital Raise (May 2015)

(cost of capital down to ~ 4.8% + full coverage of upfront Green Bank expenses + higher advance rate)
Residential EE Financing
CHIF and the CT Energy Efficiency Finance Company

Home Energy Solutions (HES) Residential Financing

- Originates loans for 1-4 unit owner- and investor-occupied properties for Eversource Energy loans
- Revolving loan funded using $12.5 million of CT Energy Efficiency Fund capital
- Unsecured loans, 0-9% rate, $1,000-$25,000
- Underwriting criteria:
  - Basic loan: 640-679 FICO requires ≤50% DTI, 680+ no DTI, up to 10-year term, optional on-bill payment
  - 0% insulation-only loan: utility pay history underwrite (no more than four 30-day late payments, no 60-day late payments), 3-year term, on bill required
- Generally 0.01%+- delinquency, one loan charge off to date
- On bill payment through Eversource roughly 50% of pool by loan volume
### Composition of HES Loans

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Aggregate Original Loan Amount</td>
<td>$13,574,855.54</td>
</tr>
<tr>
<td>Aggregate Remaining Principal Balance</td>
<td>$11,694,558.70</td>
</tr>
<tr>
<td>Number of Funded Loans</td>
<td>1,807</td>
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<tr>
<td>Average Original Principal Balance</td>
<td>$7,512.37</td>
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<tr>
<td>Average Remaining Principal Balance</td>
<td>$6,471.81</td>
</tr>
<tr>
<td>Average Interest Rate</td>
<td>3.37%</td>
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<tr>
<td>Interest Rate Range</td>
<td>0.00% to 9.25%</td>
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<tr>
<td>Average Original Term (months)</td>
<td>76.4</td>
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<tr>
<td>Average Remaining Term (months)</td>
<td>63.6</td>
</tr>
<tr>
<td>Original Term Range</td>
<td>36 to 144 months</td>
</tr>
<tr>
<td>Average FICO Score</td>
<td>740</td>
</tr>
<tr>
<td>Range of FICO Scores</td>
<td>584 to 829</td>
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<tr>
<td>Average DTI</td>
<td>39.4%</td>
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### FICO Score Composition

<table>
<thead>
<tr>
<th>FICO Score Range</th>
<th>Original Loan</th>
<th>% of Total (Reported)</th>
<th>Avg. Original</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>575-599</td>
<td>$16,280.00</td>
<td>0.1%</td>
<td>$8,140.00</td>
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<tr>
<td>600-624</td>
<td>$12,087.13</td>
<td>0.1%</td>
<td>$2,987.13</td>
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<tr>
<td>625-649</td>
<td>$209,340.04</td>
<td>1.8%</td>
<td>$9,925.42</td>
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<tr>
<td>650-674</td>
<td>$595,862.39</td>
<td>5.3%</td>
<td>$10,182.74</td>
<td>59</td>
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<tr>
<td>675-699</td>
<td>$1,550,294.28</td>
<td>13.7%</td>
<td>$11,506.47</td>
<td>134</td>
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<tr>
<td>700-724</td>
<td>$1,840,134.04</td>
<td>16.3%</td>
<td>$11,266.53</td>
<td>154</td>
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<td>725-749</td>
<td>$1,767,267.51</td>
<td>15.6%</td>
<td>$11,791.65</td>
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<td>750-774</td>
<td>$2,166,433.53</td>
<td>19.1%</td>
<td>$11,285.17</td>
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<td>775-799</td>
<td>$2,095,305.35</td>
<td>18.5%</td>
<td>$11,578.74</td>
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<td>800-824</td>
<td>$1,018,037.53</td>
<td>9.0%</td>
<td>$11,288.98</td>
<td>88</td>
</tr>
<tr>
<td>825-849</td>
<td>$48,522.76</td>
<td>0.4%</td>
<td>$12,800.00</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Reported:** $11,319,564.56 (83.4%) $11,491.94 (985)

**Total Unreported:** $2,255,290.98 (16.6%) $2,743.66 (822)

**Grand Total:** $13,574,855.54 (100.0%) $7,512.37 (1807)

### Interest Rate Composition

<table>
<thead>
<tr>
<th>Interest Rate</th>
<th>Original Loan</th>
<th>% of Total (Reported)</th>
<th>Avg. Original</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00%</td>
<td>$1,912,702.84</td>
<td>14.1%</td>
<td>$2,285.19</td>
<td>837</td>
</tr>
<tr>
<td>2.99%</td>
<td>$7,823,379.02</td>
<td>57.6%</td>
<td>$13,582.26</td>
<td>576</td>
</tr>
<tr>
<td>4.49%</td>
<td>$903,174.45</td>
<td>6.7%</td>
<td>$8,064.06</td>
<td>112</td>
</tr>
<tr>
<td>4.99%</td>
<td>$1,511,291.58</td>
<td>11.1%</td>
<td>$9,750.27</td>
<td>155</td>
</tr>
<tr>
<td>5.99%</td>
<td>$1,082,555.48</td>
<td>8.0%</td>
<td>$11,160.37</td>
<td>97</td>
</tr>
<tr>
<td>6.99%</td>
<td>$238,945.20</td>
<td>1.8%</td>
<td>$13,274.73</td>
<td>18</td>
</tr>
<tr>
<td>9.25%</td>
<td>$102,806.97</td>
<td>0.8%</td>
<td>$8,567.25</td>
<td>12</td>
</tr>
</tbody>
</table>

**Total:** $13,574,855.54 (100.0%) $7,512.37 (1807)
• Existing portfolio of $12,500,000 with 1,850+ loans (projected as of 3/1/15)
• Over-collateralization targeted at >80%, or approximately $10,000,000 facility
• Credit Enhancements:
  – CEEFCo Debt Service Reserve Fund of 10% of outstanding principal – fully funded
  – CT Green Bank loan loss reserve 10% of outstanding principal – fully funded
• Combined overall coverage >1.4:1.0

• Expected cost of capital < 4%
CEEFCo is a wholly owned, nonprofit subsidiary of the Connecticut Housing Investment Fund, which originates, underwrites, and services the portfolio.

Existing pool of loans as of transaction date used to secure new capital; pool's loan repayments used to pay back collateralized loan obligation.

Private Capital

Debt (~$10M)

$ from loan repayments

CEEFCo
(Blocked Account)

Debt Service Reserve – 10%

Eversource Loans

10% Guaranty

Connecticut Green Bank

Loan Agreements

Monthly Loan Payments

Existing Residential Loan Customers
Lessons Learned
Commercial vs. Residential: A Tale of Two Sectors

Residential:
• Well understood, diversified portfolio of credits is critical
• Broad pool of potential capital providers (i.e. banks, credit unions, etc.) willing to play, often with lower cost capital
• Energy savings irrelevant (from an underwriting perspective)

Commercial:
• Each credit requires close underwriting (even with PACE lien!)
• Lumpier portfolio and greater “touch” required can raise cost of capital
• Rapid evolution in sophistication and interest among capital providers

Both:
• Aggregation and scale is key
• Strength of primary market processes (both origination and underwriting) a major focus for private capital providers across the board
Thank you!

Ben Healey
Assistant Director, Clean Energy Finance
Connecticut Green Bank
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(860) 257-2882
Barrier: Upfront Cost

Cisco’s iPhone Bill
$119/ month
$1,428/ year
$28,560/ 20 years

Cisco’s Utility Bill
$129/ month
$1,548/ year
$30,960/ 20 years
We’ve Solved This Problem Before
WHEEL Overview

• The Warehouse for Energy Efficiency Loans is a turnkey financing platform that provides low-cost capital to homeowners for energy efficiency and water conservation improvements

• WHEEL includes:
  • Leverage of public capital with private institutional capital
  • Multi-state aggregation of loans to capture economies of scale and reduce risk
    • Leading to lower interest rates for borrowers
  • Private-sector driven marketing, QA/QC, and contractor oversight
    • Eliminating a state’s need to develop and implement its own program
  • Job creation and outcome reporting (data & analysis) provided to participating states
WHEEL Principles: Uniform Underwriting, Qualified Contractors & Qualified Projects

WHEEL delivers the benefits of capital markets and structured financing to the broadest possible population of borrowers via managed contractor networks. A solution for every type of home energy project: from emergency HVAC replacement to comprehensive retrofits with combined solar, water and energy efficiency improvements.

<table>
<thead>
<tr>
<th>Product</th>
<th>Credit/Description</th>
<th>Qualified Projects</th>
<th>Qualified Contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEEL Loan</td>
<td>• Unsecured personal debt</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 640+ FICO's</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Max DTI: 45%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Terms of 3, 5, 7 or 10 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• $1,000 - $20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Consumer rate: mid single digits*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*88% of homeowners don’t have a home equity line of credit. Across the country, most homeowners typically pay 13-18% interest to finance home energy and water improvements.
WHEEL meets the market where it is and creates a financial incentive for homeowners to choose the most efficient products rather than the cheapest products.

Inside the $50+ billion/year Home Energy Improvement Market

- HVAC $18 B
- Clothes Washers $7 B
- Windows Doors & Roofs $22 B
- Home Performance & Solar $2.9 B
WHEEL: Key Facts

- WHEEL launched in April 2014 with programs in PA and KY

- WHEEL is based on Pennsylvania’s Keystone HELP model
  - In 2006, Pennsylvania launched Keystone HELP, a residential energy efficiency financing program
  - Keystone HELP established uniform underwriting criteria, eligible measures and a managed network of contractors
  - So far Keystone HELP has deployed $100M and benefitted over 13,500+ homeowners

- WHEEL was added to revamped KHC energy improvement financing program
  - KY has funded over $1.2 million in loans with WHEEL so far

- In May of 2015, WHEEL plans to complete its first capital markets transaction and launch new programs in FL, IN, NY and VA
When loans financed by the Warehouse reach sufficient volume, we intend to issue debt backed by the loans to unaffiliated third party investors. This leads to the recapitalization of the warehouse.

All conforming loans originated in participating states are purchased by the Warehouse. On average, 80% of the purchase capital is provided by Citi and 20% is provided by the state sponsors.

Participating state partners agree to WHEEL standards that have been pre-vetted by ratings agencies and capital providers. Partner states also contribute "sponsor" capital which is leveraged at least 4 to 1.
WHEEL Impacts

WHEEL delivers excellent economic outcomes, including job creation, increased local investment and energy & water savings.

Projected Annual Impacts From Every $1M of Investment

- Leveraged Private Capital: $4 million
- Total Project Funding: $5 million
- Total Projects (@$8K each): 625
- Jobs Created: 100
- HHs Electricity Savings (MWHs): 750
- HHs Nat Gas Savings (therms): 40,000
- HHs Water savings (glss): 10,000,000
- CO2 reductions (MTons): 700

1 The basic WHEEL financing structure provides five to one leverage.
3 Savings estimates for electricity, natural gas, and water are on an annual basis
Thank You

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