LBNL- XXXX

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY

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

By Chris Kramer, Emily Martin Fadrhonc, Peter Thompson and Charles Goldman

Energy Analysis and Environmental Impacts Division

February 2015

This report was prepared by Lawrence Berkeley National Laboratory (LBNL) on behalf of the State and Local Energy Efficiency Action Network (SEE Action), and is available for download at https://www4.eere.energy.gov/seeaction/publication/accessing-secondary-markets-capital-source-energy-efficiency-finance-programs-program. LBNL's contribution to this report was supported by the Office of Energy Efficiency and Renewable Energy (Weatherization and Intergovernmental Programs Office) of the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

Accessing Secondary Markets as a Capital Source for Energy Efficiency Finance Programs: Program Design Considerations for Policymakers and Administrators was developed as a product of the State and Local Energy Efficiency Action Network (SEE Action), facilitated by the U.S. Department of Energy/U.S. Environmental Protection Agency. Content does not imply an endorsement by the individuals or organizations that are part of SEE Action working groups, or reflect the views, policies, or otherwise of the federal government.

This document was final as of February 27, 2015.

If this document is referenced, it should be cited as:

State and Local Energy Efficiency Action Network (2015). *Accessing Secondary Markets as a Capital Source for Energy Efficiency Finance Programs: Program Design Considerations for Policymakers and Administrators*. Prepared by: Kramer, C.; Martin Fadrhonc, E.; Thompson, P.; and Goldman, C. of Lawrence Berkeley National Laboratory.

FOR MORE INFORMATION

Regarding *Accessing Secondary Markets as a Capital Source for Energy Efficiency Finance Programs: Program Design Considerations for Policymakers and Administrators*, please contact:

Johanna Zetterberg
U.S. Department of Energy
johanna.zetterberg@ee.doe.gov

Name
U.S. Environmental Protection Agency
ng.brian@epa.gov

Regarding the State and Local Energy Efficiency Action Network, please contact:

Johanna Zetterberg
U.S. Department of Energy
johanna.zetterberg@ee.doe.gov

Acknowledgments

Accessing Secondary Markets as a Capital Source for Energy Efficiency Financing Programs: Program Design Considerations for Policymakers and Administrators is a product of the State and Local Energy Efficiency Action Network's (SEE Action) Financing Solutions Working Group.

The Financing Solutions Working Group is chaired by Bryan Garcia, Connecticut Green Bank, and Bruce Schlein, Citi. The federal staff leads for the Financing Solutions Working Group are Johanna Zetterberg, U.S. Department of Energy, and Brian Ng, U.S. Environmental Protection Agency.

This report was prepared by Chris Kramer, Emily Martin Fadrhonc, Peter Thompson, and Charles Goldman of Lawrence Berkeley National Laboratory under contract to the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, Weatherization and Intergovernmental Programs Office (WIPO), Lawrence Berkeley National Laboratory Contract No. DE-AC02-05CH1131.

The authors received direction and comments from many members of the Financing Solutions Working Group including the following individuals who provided specific input:

- Bryan Garcia (Clean Energy Finance and Investment Authority - CGB)
- Bruce Schlein (Citigroup)
- Jeff Pitkin (New York State Energy Research and Development Authority - NYSERDA)
- Patrick Shaughnessy (Pennsylvania Treasury)
- Cisco Devries and team (Renewable Funding)
- Adam Zimmerman (Craft 3)
- Philip Henderson (Natural Resources Defense Council)
- Curtis Probst (Rocky Mountain Institute)

We also received comments on a draft of this report from technical experts: John Byrne, Sean Kidney, Brandon Smithwood, Dan Pillemer, Matthew Brown, and Jesse Fulton.

We appreciate the support and guidance of Eleni Pelican, Ira Birnbaum, and Anna Garcia at DOE EERE WIPO and want to thank Dana Robson and Danielle Callaghan for technical support on report preparation.

Disclaimer

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor The Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or The Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, or The Regents of the University of California.

Ernest Orlando Lawrence Berkeley National Laboratory is an equal opportunity employer.

Definitions

Asset-backed Security	A financial security backed by loans, leases, or other assets
Bond	A debt instrument wherein an issuer (borrower) borrows funds from investors for a defined period of time at a set interest rate; bonds can be issued by corporations, governments, municipalities, and other organizations with bonding authority
Credit Rating Agency	Companies that provide investors with a third-party assessment of securities offered for sale and assign a rating to denote their assessment of credit risk of the securities
General Obligation Bond	A bond that is backed by the full credit and taxing authority of the issuing municipality, state, or jurisdiction
Interest Rate Buydown	An upfront cash payment that lowers or "buys down" the interest rate on a loan over its lifetime
Investment Grade	A bond rating that indicates high quality and low risk; BBB rating and above in Standard & Poor's rating system
Line of Credit	A type of debt instrument that allows a borrower to draw and repay funds "on demand" up to a set cap from a financial institution
Liquidity	A measure of how easily an asset can be bought or sold in a marketplace; more liquid assets are more easily sold
Municipal Bond	A bond issued by a municipality
Over Collateralization	A form of credit enhancement wherein the value of assets underlying (or collateralizing) a debt instrument exceed the value of the debt instrument (e.g., assets worth $150 collateralize a bond priced at $100)
Portfolio Sale	Transfer of ownership of a portfolio of loans from one financial institution to another
Revenue Bond	A bond commonly backed by the proceeds of the project for which funding is being sought (e.g., tolls for a bridge construction project)
Secondary Market	A market where products can be resold one or more times after their initial sale
Securitization	The process of aggregating a pool of assets (e.g., loans) and dividing them into one or more classes of tradable securities
Security	(1) a standardized financial instrument that represents some type of financial value; stocks and bonds are types of securities; (2) an asset or arrangement pledged as collateral to a loan
Subordinate Capital	Capital that has a later claim to pledged assets than senior capital; also a form of credit enhancement
Underwriting	In the context of loans, the process of due diligence performed on a borrower by a lender to determine eligibility to receive a loan
Yield	The income received on an investment, typically stated in annual terms and quoted as a percentage of the value of the investment

Acronyms

ABS	asset-backed security
CGB	Connecticut Green Bank
DOE	U.S. Department of Energy
EE	energy efficiency
ESCO	Energy Service Company
GEMS	Green Energy Market Securitization Program (Hawaii)
HELP	Home Energy Loan Program (Pennsylvania)
HERO	Home Energy Renovate Opportunity Program
MBS	mortgage-backed security
M-PIRE	Multifamily Property Improvements to Reduce Energy
NYSERDA	New York State Energy Research and Development Authority
PACE	property-assessed clean energy
QECB	Qualified Energy Conservation Bond
RGGI	Regional Greenhouse Gas Initiative
SANBAG	San Bernardino Associated Governments
SEC	U.S. Securities and Exchange Commission
WHEEL	Warehouse for Energy Efficiency Loans (Pennsylvania)
WRCOG	Western Riverside Council of Governments

Table of Contents

Acknowledgments ..... **iii**

Definitions ..... **iv**

Acronyms ..... **v**

Table of Figures ..... **viii**

List of Tables ..... **viii**

Executive Summary **1**
- Promise for Energy Efficiency Finance: Capital Supply and Cost of Capital 1
  - What Are Secondary Markets? 1
  - What is an Energy Efficiency Financing Product? 2
  - Specialized Energy Efficiency Products: Developing an Asset Class 2
  - Traditional Products Used to Finance Energy Efficiency: Recognizing and Rewarding Performance 2
- Energy Efficiency Programs: Secondary Market Approaches 3
  - Loan Portfolio Sales 4
  - Bond Sales 4
  - Revenue Bonds 4
  - Asset-Backed Securitizations 4
- Energy Efficiency Financing Program Design: Secondary Market Considerations 4
  - Interest Rates 4
  - Loan Terms 5
  - Underwriting Criteria 5
  - Security and Collection Mechanism 5
- Achieving a Transaction: Key Players, Their Concerns, and Potential Costs 5
- Considerations for Program Administrators 5
  - Alternative Approaches 7
  - Decision-Making Framework 7

1. Introduction **9**
- 1.1. What Are Secondary Markets? 9
  - 1.1.1. What is an "Energy Efficiency Financing Product"? 10
- 1.2. Promise for Energy Efficiency Finance: Capital Supply and Cost of Capital 11
  - 1.2.1. Specialized Energy Efficiency Products: Developing an Asset Class 11
  - 1.2.2. Traditional Products Used to Finance Energy Efficiency: Recognizing and Rewarding Performance 12
- 1.3. Secondary Markets for Energy Efficiency: Key Unknowns and Uncertainties 12
- 1.4. Report Organization 13

2. Energy Efficiency Programs: Secondary Market Approaches **14**
- 2.1. Transaction Structure 14
  - 2.1.1. Loan Portfolio Sales 14
  - 2.1.2. Bond Sales 16
- 2.2. Transaction Matrix 22

3. Energy Efficiency Financing Program Design: Secondary Market Considerations **25**
- 3.1. Interest Rates 25
- 3.2. Loan Terms 25
- 3.3. Underwriting Criteria 26
- 3.4. Security and Collection Mechanism 27
- 3.5. Summary 28

4. Achieving a Transaction: Key Players, Their Concerns, and Potential Costs **29**

4.1. Key Players 29
4.1.1. Loan Portfolio Sale to Single Secondary Market Investor 29
4.1.2. Loan Portfolio Sale to Consortium of Secondary Market Investors 29
4.1.3. Bond Sale 29
4.2. Investor Perspectives: Risk and Return 30
4.2.1. Investors in Portfolio Sales 30
4.2.2. Bond Investors 30
4.3. Credit Rating Agencies 31
4.4. Addressing Performance Risk 32
4.4.1. Addressing Risk through Information 32
4.4.2. Addressing Risks through Transaction Structuring 33
4.5. Costs of Risk Mitigation 34

5. Considerations for Program Administrators 37
5.1. Capital Supply 37
5.2. Cost of Capital 37
5.3. Balancing Near-Term and Long-Term Objectives 38
5.4. Alternative Strategies for Capital Replenishment 39
5.4.1. Public or Ratepayer Funds 39
5.4.2. Bonds not Tied to Project Revenues 39
5.4.3. Large Lenders or Local Lender Networks 40
5.5. Weighing the Alternatives 41
5.6. Decision-Making Framework 41

6. Conclusion 43

7. References 44

Table of Figures

Figure ES - 1: Approaches to the Timing of Secondary Market Considerations 6
Figure ES - 2: Framework for Considering Capital Supply Options 8

Figure 1: Schematic of Portfolio Sales of Energy Efficiency Loans....14
Figure 2: Schematic of Revenue Bond Sales Supported by Energy Efficiency Loans 16
Figure 3: Schematic of Asset-Backed Securitizations Supported by Energy Efficiency Loans 20
Figure 4: Schematic of a Typical Asset-Backed Securitization 30
Figure 5: Approaches to the Timing of Secondary Market Considerations 38
Figure 6: Framework for Considering Capital Supply Options....42

List of Tables

Table ES - 1: Summary of Selected Secondary Market Transactions of Energy Efficiency Loans 3
Table ES - 2: Weighing Capital Supply Alternatives 7

Table 1: Loan Portfolio Sales: Example Transactions....16
Table 2: Municipal Revenue Bonds: Example Transactions....18
Table 3: Asset-backed Securitization: Example Transactions 19
Table 4: Summary of Selected Energy Efficiency Secondary Market Transactions 23
Table 5: Securitization Credit Enhancements and Potential Costs to Program Administrators 35
Table 6: Weighing Capital Supply Alternatives 41

Executive Summary

Estimates of the total opportunity for investment in cost-effective energy efficiency in the United States are typically in the range of several hundred billion dollars (Choi Granade, et al., 2009 and Fulton & Brandenburg, 2012).[1,2] To access this potential, many state policymakers and utility regulators have established aggressive energy efficiency savings targets. Current levels of taxpayer and utility bill-payer funding for energy efficiency is only a small fraction of the total investment needed to meet these targets (SEE Action Financing Solutions Working Group, 2013). Given this challenge, some energy efficiency program administrators are working to access private capital sources with the aim of amplifying the funds available for investment.

In this context, efficient access to secondary market capital has been advanced as one important enabler of the energy efficiency industry "at scale."[3] The question of what role secondary markets can play in bringing energy efficiency to scale is largely untested despite extensive attention from media, technical publications, advocates, and others. Only a handful of transactions of energy efficiency loan products have been executed to date, and it is too soon to draw robust conclusions from these deals. At the same time, energy efficiency program administrators and policymakers face very real decisions regarding whether and how to access secondary markets as part of their energy efficiency deployment strategy.

In this dynamic environment, program administrators have several options. Many program administrators are focusing on growing demand for high-efficiency products and services to a level that will interest investors and are postponing active engagement with the secondary market. Some administrators are taking a longer view and are offering products today that are designed to ensure that secondary market capital will be available and well-priced in the future. Finally, some financing program administrators are replenishing capital using strategies that do not rely on a secondary market for energy efficiency loans.

This report is targeted at both (1) policymakers and program administrators who are less familiar with secondary markets and their significance in the energy efficiency context, as well as (2) those that are more familiar with these concepts and may be actively considering secondary market strategies.

Promise for Energy Efficiency Finance: Capital Supply and Cost of Capital

What Are Secondary Markets?

In the energy efficiency context, the primary capital market refers to initial financing of a loan between a customer and a lender. A credit union that makes a five-year loan to finance a small business' heat pump replacement and lighting upgrade is a primary investor.

The secondary market, then, refers to the resale of one or more loans to a new (secondary) investor. If demand for energy efficiency upgrades is high, the credit union in our example might make 100 similar loans and then decide to sell these loans to another investor. The sale frees up the credit union's capital, allowing it to make (originate) new loans. The sale also gives investors that are interested in financing energy efficiency loans access to 100 existing projects.

A secondary market transaction can be as simple as the sale of a single loan from a primary lender to an investor. In mature secondary markets—such as those for car loans or home mortgages—transactions are more

---

[1] Choi Granade, et al. (2009) estimated that $520 billion of cost-effective energy efficiency is untapped and Fulton & Brandenburg (2012) estimate $279 billion of cost-effective energy efficiency. By comparison, asset-backed securitizations, one component of the U.S. bond market, are valued at $2 trillion (Sifma, 2012).

[2] Other financial experts have noted that the need for prodigious amounts of capital for energy efficiency may only arise if solutions can be found to boost the "low level of effective demand," which is "only likely to be addressed through strong regulatory requirements, retail consumer engagement strategies and/or other significant non-financial interventions" (Fulton & Brandenburg, 2012).

[3] While there is no single definition of the energy efficiency market "at scale," for our purposes, we take "at scale" to mean that total investment in energy efficiency is sufficient to meet policy goals and also begins to approach estimates of funding required to achieve all cost-effective energy efficiency.

sophisticated. Mature secondary markets often rely on highly standardized loan products and involve the packaging of multiple loans into tradable instruments. In these markets, high volume, the standardization of underlying loans, and the tradable nature of secondary market instruments can lead investors to require lower returns, which translate to lower interest rates for primary borrowers.

What is an Energy Efficiency Financing Product?

Most consumers have choices when deciding how to finance an energy efficiency upgrade: they might use a credit card, take advantage of a utility-sponsored loan program, take out a personal loan, or put the upgrade onto their home equity line of credit. These options can be divided into two broad categories: specialized energy efficiency financing products and traditional products.

- *Specialized products* are loans or other financing products specifically intended to fund energy efficiency improvement projects. They may carry unique features that are conducive to energy efficiency lending, such as extended terms or the ability to make payments via a utility bill. These products are often supported by a utility or governmental sponsor. Examples include PACE (property-assessed clean energy) financing, program-sponsored energy efficiency loans, and on-bill products.
- *Traditional products* are conventional financing options that can be used to fund a range of purchases, including energy efficiency. Examples include credit cards, home equity lines of credit, and personal unsecured loans.

This paper focuses on specialized products. More research is needed to determine the level of energy efficiency that is financed through specialized versus traditional products, as well as the potential to leverage traditional products to encourage more energy efficiency uptake. While mature traditional products likely make up the majority of financed energy efficiency investments today, some energy efficiency advocates have suggested that developing a mature market for specialized products may help bring down financing costs and offer other advantages, leading to increased penetration of these products. The optimal mix of traditional and specialized products remains an open question that may likely evolve over time as the energy efficiency services industry matures.

Specialized Energy Efficiency Products: Developing an Asset Class

An efficient secondary market for energy efficiency products is more likely to develop if (1) investors become familiar with specialized energy efficiency loan products; (2) originators successfully create tradable energy efficiency-backed instruments; and (3) some degree of standardization occurs.[4] This could make more, lower-cost capital available, which would translate into lower interest rates for consumers. If consumer demand increases in response to these lower interest rates, total energy efficiency investment and savings would increase, moving the market closer to the vision of energy efficiency "at scale."[5] If specialized energy efficiency loans outperform comparable loans over time, investors could view the loans as a distinct asset class and could reward energy efficiency products with even lower interest rates, which could further boost customer adoption.

Traditional Products Used to Finance Energy Efficiency: Recognizing and Rewarding Performance

Mature secondary markets already exist for credit card debt, mortgages, and other traditional financing products and, presumably, the benefits of a secondary market have already been realized. The challenge for traditional products, then, is not developing a secondary market but rather (1) determining whether financing products used to fund energy efficiency outperform products used for other purchases; and (2) encouraging lenders to reward

[4] It is also possible that multiple asset classes could develop (e.g., PACE-backed energy efficiency securities, on-bill backed energy efficiency securities).

[5] Traditionally, demand for energy efficiency loans has been relatively low, even at below-market interest rates, unless loans are coupled with other programmatic support including strong marketing, technical assistance, and financial incentives (e.g., rebates). See Fuller et al (2010) "Driving Demand for Home Energy Improvements" and SEE Action (2014) "Financing Energy Improvements on Utility Bills: Market Updates and Key Program Design Considerations for Policymakers and Administrators" for discussion.

that performance with preferential terms. Modifying existing traditional financing tools to accommodate energy efficiency can also play a role in driving the energy efficiency market to scale. Program administrators and policymakers should track progress in this area and may wish to support traditional products as complements or as an alternative to specialized energy efficiency products.

Energy Efficiency Programs: Secondary Market Approaches

The secondary market for specialized energy efficiency products is relatively immature. Existing pools of capital (e.g., primary lender capital, utility or other public capital) have been largely sufficient to meet demand in most programs. In some cases, program administrators have chosen to tap secondary markets and a handful of transactions of specialized energy efficiency products have occurred. The ten secondary market transactions profiled in Chapter 2 have occurred within the past five years (or are still pending) and represent a total volume of just over $400 million (see Table ES - 1).

Table ES - 1: Summary of Selected Secondary Market Transactions of Energy Efficiency Loans

Transaction Short Name	Transaction Type	Issuer (Type)	Juris-diction	Date of Transaction	Market Sector	Size
Craft 3-Self-Help	Portfolio Sale	Craft 3 (Private)	OR	December 2013	Residential	$15.7M
Keystone HELP	Portfolio Sale	AFC First (Private)	PA	July 2013	Residential	$24M
NYSERDA	Revenue Bond	NYSERDA (Public)	NY	August 2013	Residential	$24M
Toledo PACE	Revenue Bond	Toledo Lucas-County Port Authority (Public)	OH	2012-2013	Commercial	$16.5M
Connecticut C-PACE	Revenue Bond	Public Finance Authority (Public)	CT	May 2014	Commercial	$30M
Delaware SEU	Revenue Bond	Delaware SEU (Quasi-public)	DE	July 2011	Public/ Institutional	$73M
HERO PACE I	Asset-Backed Security	WRCOG (Quasi-public)	CA	February 2014	Residential	$104M
HERO PACE II	Asset-Backed Security	WRCOG and SANBAG (Quasi-Public)	CA	October 2014	Residential	$129M
WHEEL	Asset-Backed Security	WHEEL SPV (Private)	Multiple (TBD)	TBD	Residential	TBD, targeting $100M
Kilowatt	Asset-Backed Security	Kilowatt (Private)	Multiple (TBD)	TBD	Residential	TBD, targeting $100M+

Thus far, most secondary market transactions that are supported by cash flows from underlying energy efficiency assets (loans) have either involved sales to a small group of private investors or have been structured with very strong security or significant credit enhancement.[6] There has also been little standardization of energy efficiency

[6] We focus on secondary market transactions of energy efficiency loans observed to date, specifically those secondary market approaches that are supported by underlying cash flows from primary loans or other financing arrangements, as opposed to repayment through taxes, surcharges, or other more general obligations. We draw this distinction because, in the long term, secondary market strategies that are supported by the underlying economics of individual transactions may be better equipped to accommodate growth in scale.

finance products between programs—underlying assets for these deals range from on-bill loans to tax assessments to unsecured loans. Two primary transaction structures have been observed: loan portfolio sales and bond sales, which are further categorized as revenue bonds or asset-backed securitizations.

Loan Portfolio Sales

A loan portfolio sale involves the direct transfer of ownership of one or more loans from the original lender to one or more investors. In this approach, loans are not packaged into tradable instruments. A portfolio sale is typically the most straightforward route to secondary market capital, due to its simple structure and limited need for specialized third-party advisors. Loan portfolio sales are likely to be cost effective when a relatively small volume of loans has been amassed (e.g., $50 million or less). One challenge with a loan portfolio sale is finding a buyer who may be willing to hold loans until maturity.

Bond Sales

Bonds attract a wider range of investors by packaging the cash flows from energy efficiency loans into tradable, liquid instruments. The greater liquidity of bonds may also lead to lower interest rates over time. However, bonds often carry higher upfront transaction costs due to the involvement of specialized legal and financial advisors and the costs of registering securities for issuance to the public. Thus, bond sales are typically appropriate for larger volumes of loans (e.g., $50 million and up).

Revenue Bonds

Revenue bonds are issued by a municipality or other public or quasi-public entity and are backed by designated revenue streams. In the energy efficiency context, the designated revenue streams are cash flows from underlying energy efficiency loans. Revenue bonds are scalable as demand grows—as long as underlying assets (e.g., new energy efficiency loans) exist to support bonds, additional revenue bonds may be issued.

Asset-Backed Securitizations

Asset-backed securitizations (ABS) are bonds that are created by aggregating a pool of loans and dividing it into tradable portions (securities). Asset-backed securitizations may be pursued by any type of bond issuer, public or private, and are a way of raising bond capital that is supported by project revenues. Executing an asset-backed securitization is a complicated process involving many specialized parties. As a result, upfront costs are relatively higher than other approaches. However, asset-based securitizations may appeal to a more diverse array of potential investors because of their liquid nature and multi-tiered structure, which may eventually lead to lower interest rates. Asset-backed securitizations also provide a pathway to a larger total pool of capital, which may help ensure that the investment needs of the energy efficiency services sector can be met as demand grows.

Energy Efficiency Financing Program Design: Secondary Market Considerations

Program administrators have a range of motivations for offering financing programs, from encouraging more projects and deeper savings, to expanding access to capital for under-served customer market segments, to incentivizing new technologies. To meet these policy goals, program administrators may offer tailored design features, including below-market interest rates, extended financing terms, non-traditional underwriting criteria, or novel security and collection mechanisms.

Interest Rates

Many energy efficiency financing programs offer below-market interest rates to consumers in order to expand participation or encourage deep retrofits. However, below-market interest rates may not be attractive on their own to secondary market investors. Program administrators offering below-market rates may receive lower proceeds from a secondary market sale than expected or may need to offer credit enhancement, at their own expense, to compensate investors. Alternatively, program administrators can respond by offering interest rates more in line with investors' current expectations.

Loan Terms

In order to lower monthly payments to participating customers or more closely match loan payments to energy savings, program administrators may choose to offer longer loan terms than would be available in the private market. Secondary market investors are likely to view these longer terms as a source of risk and may expect an additional return or other forms of risk mitigation in exchange. If this tradeoff is not considered at the program design stage, it may lead to unexpected costs in order to attract secondary market investors at a later time.

Underwriting Criteria

To expand access to capital to underserved market segments and customers, some program administrators choose to loosen traditional underwriting metrics (e.g., FICO scores, debt to income ratios, borrower income, property value, payment history) or adopt alternative underwriting criteria (e.g., utility bill repayment history). However, for most secondary market investors, there is still insufficient history to understand how well alternative underwriting criteria can be relied upon to predict loan performance. Thus, until sufficient performance data exist, secondary market investors are likely to view expanded or alternative underwriting criteria as an additional source of risk for which they must be compensated.

Security and Collection Mechanism

Secondary market investors are likely to offer lower interest rates for secured loans than unsecured loans because secured loans offer some type of collateral asset (e.g., the resale value of a home) as a backup for any shortfalls in loan payments. However, offering unsecured loans may support important finance program or policy objectives (e.g., streamlining of application processes, providing access to those without home equity). Program administrators should take these considerations into account and decide whether they are significant enough to justify the potential difference in pricing.

Program administrators may also be interested in testing novel program design features, such as the PACE mechanism or on-bill loans, and whether they can obtain lower costs of capital for secondary market transactions based on PACE or on-bill mechanisms. Program administrators need to be aware that these novel security mechanisms are still being evaluated by lenders, investors, and other participants in the secondary market and may cause increased scrutiny or require credit enhancement.

As the above discussion illustrates, the program design objectives of administrators may not always overlap with the interests of potential secondary market investors. Program administrators can alter program design features to respond to secondary market investors' preferences, although this may affect programmatic or policy goals. Alternatively, program administrators can preserve innovative design features but offer risk-reduction mechanisms or discounted sale terms to investors. Program administrators should be aware of and prepared for tradeoffs on these issues if they consider secondary market investments. As the basic data needed to assess the risk and performance characteristics of energy efficiency loans accumulates, investor and program administrators' perspectives may come more into alignment, making these tradeoffs less pronounced.

Achieving a Transaction: Key Players, Their Concerns, and Potential Costs

It is important for program administrators that choose to pursue secondary market capital to understand key players, their concerns, and the steps required to achieve a direct portfolio sale or securitization. Understanding potential investors' concerns can help explain (1) what types of information they may require about the assets for sale, and (2) the types of credit enhancement they may seek to ensure the soundness of their investment. Chapter 4 discusses these players and explores two options for mitigating perceived risk to investors in energy efficiency loans: providing access to detailed information and structuring the transaction to include credit enhancements.

Considerations for Program Administrators

Secondary markets for specialized energy efficiency loans can potentially offer a way of solving specific challenges with regard to capital supply and capital cost. Program administrators should consider how those needs factor into

their overall programmatic objectives and then decide how secondary markets may help them address these issues.

As a first step, program administrators should examine their existing and projected levels of financing activity as well as any anticipated capital supply constraints. If capital is likely to become a constraining factor in program sustainability, then designing a program that will attract secondary market investors may present a viable solution.

Another major rationale for targeting secondary markets is to lower the cost of capital. A mature secondary market for energy efficiency loans could offer lower interest rates than those currently available. Policymakers and program administrators that are considering secondary markets as a way to lower the cost of capital should consider the "all-in" costs of these types of transactions.

Figure ES – 1 provides an illustration of two different ways in which program administrators might think about when to factor secondary markets into their program design considerations. In the "supply-focused" approach, the program administrator focuses on secondary markets at the early stages of a program life-cycle in anticipation of a future need to access secondary market capital. This approach may facilitate future secondary market transactions, although it may require expensive forms of credit enhancement to reassure investors until they grow comfortable with the performance of the underlying assets. It may also entail earlier standardization of loan products in line with the needs of secondary market investors, which may or may not align well with other programmatic objectives. In contrast, in the "demand-focused" approach, the administrator focuses primarily on more immediate programmatic objectives (e.g., driving consumer adoption of energy efficiency) while deferring program design choices that could facilitate secondary market transactions.

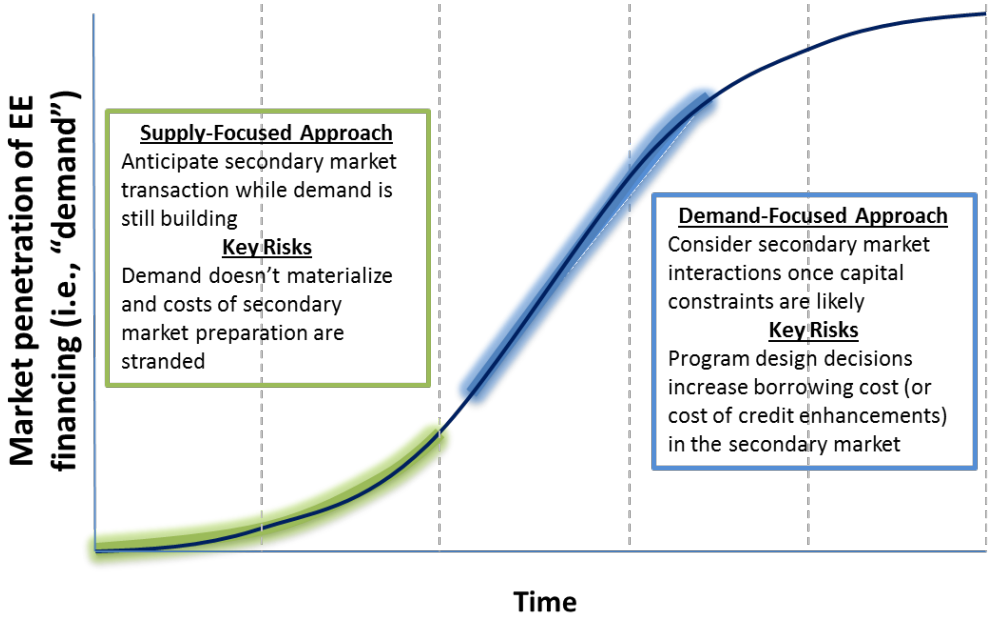


Figure ES - 1: Approaches to the Timing of Secondary Market Considerations

In the long run, it is likely that secondary market investors will play an important role in supporting energy efficiency investments. Attracting secondary market capital will be easier if investors are already familiar with energy efficiency loans. This may require building a demonstrated performance history over several years. With this in mind, some program administrators may choose to take the long view and establish products today that are designed to ensure that secondary market capital will be available and well-priced in the future.

Alternative Approaches

It is also important to acknowledge that alternative strategies exist which may help program administrators achieve their objectives with respect to capital supply and cost of capital. Alternative strategies can be broadly grouped into four categories (see Chapter 5 for examples of each approach):

1) Public or ratepayer funds,
2) Bonds that are not directly tied to project revenues;
3) Large lenders or local lender networks; and
4) Non-energy loan products.

Table ES - 2 compares these various capital supply options on several features such as cost of capital, size of capital supply, and other considerations. In general, ratepayer funds and bonds backed by ratepayers or taxpayers have lower costs of capital but are more constrained in terms of capital supply. In contrast, options that provide greater supply capacity also tend to correlate with higher capital costs. Proponents of secondary market strategies for energy efficiency financing maintain that a mature secondary market will bring down these costs over time.

Table ES - 2: Weighing Capital Supply Alternatives

	Cost of Capital	Size of Capital Supply	Considerations
Ratepayer/Public Funds	**Low Cost** Funding is flexible	**Volume is limited by policy goals** and willingness to invest tax/ratepayer dollars	Rate/taxpayer funds are unlikely to be sufficient to achieve all available EE; public models do not "educate" the capital market about EE assets
General Obligation Bonds or Ratepayer-Backed Bonds	**Low Cost** due to high ratings and authority to levy taxes or surcharges	**Varies but not limitless.** Bonding capacity and political will may limit capital availability	Costs are shifted onto taxpayers or ratepayers; municipal or SBC approaches do not "educate" the capital market about EE assets
Local Lender Network / Large Lenders	**Moderate Cost** Some flexibility, within commercial norms	**Varies** by number and type of lender(s)	Local lenders / large lenders flexibility and interest in EE will vary widely; this approach does not "educate" the capital market about EE assets
Secondary Markets	**High all-in costs at present, may decrease over time;** costs will follow credit rating	**Very large potential supply,** especially for investment grade securities	Secondary markets for EE are evolving and upfront costs of administration, setup and credit enhancement should be factored into decision making

Decision-Making Framework

Figure ES - 2 provides a framework in the form of a "decision tree" that is designed to assist program administrators thinking through issues related to accessing secondary markets compared to other options to meet capital supply needs. Finance programs that anticipate a near-term capital supply constraint should consider secondary markets as one potential option for capital replenishment. For these programs, the choice of capital supply may depend on the availability of other options and the extent to which program design constraints and potential costs of secondary market approaches can be reconciled with other programmatic objectives. Programs that are less capital constrained at present but anticipate longer-term capital supply needs may choose to establish financing options that could facilitate secondary market investments at a later stage. Finally, program administrators that are experiencing relatively low levels of consumer demand in their finance program(s) may be better served with more flexible sources of capital. These program administrators should be aware that current

program design choices using flexible capital sources may impact the ease with which they are able to access secondary market investments in the future.

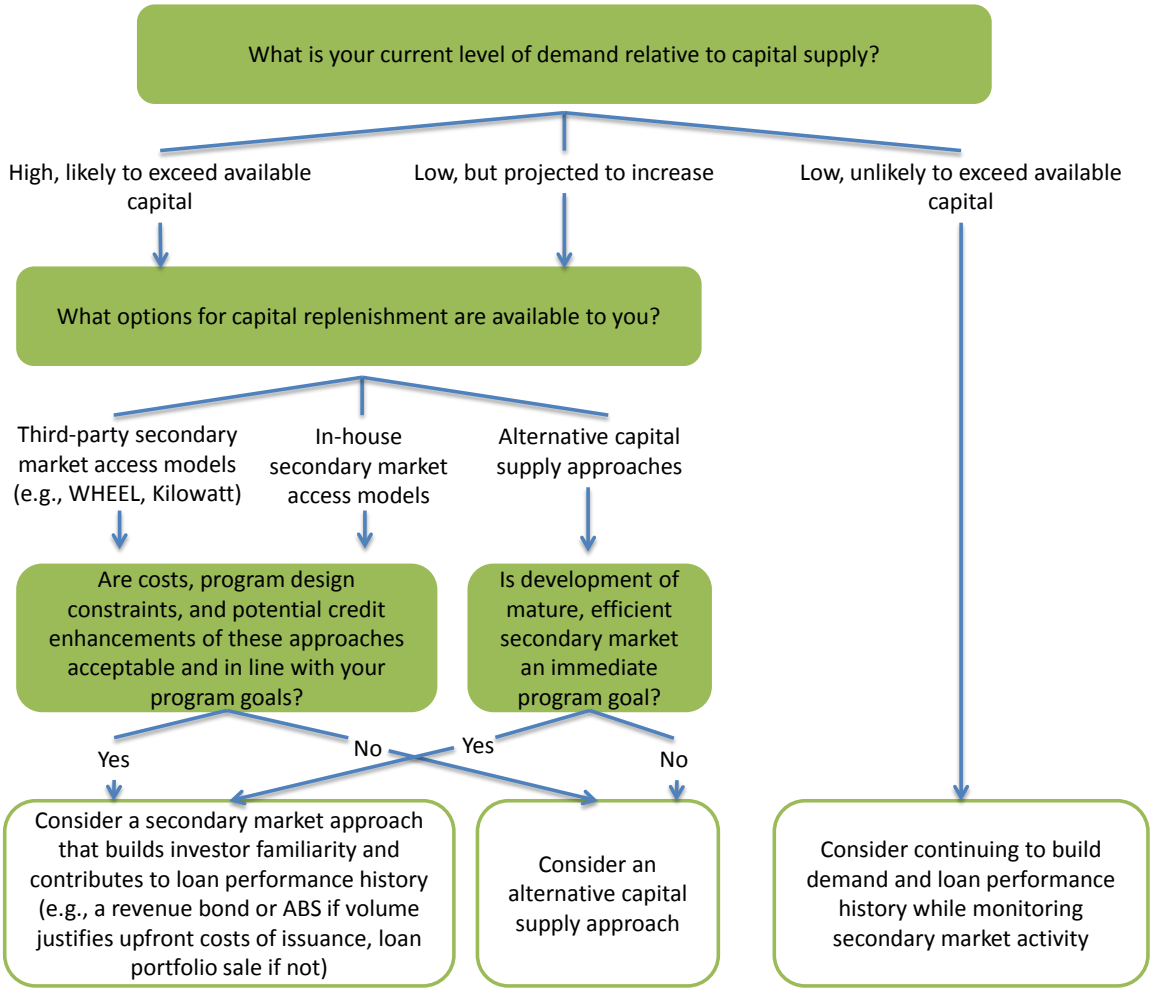


Figure ES - 2: Framework for Considering Capital Supply Options

1. Introduction

Estimates of the total opportunity for investment in cost-effective energy efficiency in the United States are typically in the range of several hundred billion dollars (Choi Granade, et al., 2009 and Fulton & Brandenburg, 2012).[7,8] To access this potential, many state policymakers and utility regulators have established aggressive energy efficiency savings targets. Current levels of tax payer and utility bill payer funding for energy efficiency is only a small fraction of the total investment needed to meet these targets (SEE Action Financing Solutions Working Group, 2013). Given this challenge, some energy efficiency program administrators are working to access private capital sources with the aim of amplifying the funds available for investment.

In this context, efficient access to secondary market capital (defined below) has been advanced as one important enabler of the energy efficiency industry "at scale."[9] Secondary markets for energy efficiency have been the subject of media articles (Lacey, 2014), expert roundtables (Smithwood & Hodum, 2013), policy papers (Milford, et al., 2014), and industry conferences (Bernard, 2014). Secondary markets have been described as "the future of energy efficiency financing," (Smithwood & Hodum, 2013) and the key to unlocking billions in energy efficiency investments and shifting the industry toward a paradigm of private sector investment (Lacey, 2014).

Despite this attention, the question of what role secondary markets can play in bringing energy efficiency to scale is largely untested. Only a handful of transactions of energy efficiency loan products have been executed to date, and it is too soon to draw robust conclusions from these deals. At the same time, energy efficiency program administrators and policymakers face very real decisions regarding whether and how to access secondary markets as part of their energy efficiency deployment strategy.

This report is targeted at both (1) policymakers and program administrators who are less familiar with secondary markets and their significance in the energy efficiency context as well as (2) those that are more familiar with these concepts and may be actively considering secondary market strategies. The report aims to address the needs of both audiences by examining both general and more technical topics. This report can be read in its entirety or readers may choose to review only those sections most relevant to their situation, interests, and needs. Section 1.4 offers guidance on how to navigate the document.

The analysis in this report is based primarily upon research and interviews with key actors involved in secondary market sales of energy efficiency investments (see Chapter 2 for summary of these transactions).[10] This report is based on activity observed to date; assessments of secondary markets for energy efficiency are likely to evolve over time as the market matures.

1.1. What Are Secondary Markets?

In the energy efficiency context, the primary capital market refers to initial financing of a loan between a customer and a lender. A credit union that makes a five-year loan to finance a small business' heat pump replacement and lighting upgrade is a primary investor.

The secondary market, then, refers to the resale of one or more loans to a new (secondary) investor. If demand for energy efficiency upgrades is high, the credit union in our example might make 100 similar loans and then decide

[7] Choi Granade, et al. (2009) estimated that $520 billion of cost effective energy efficiency is untapped and Fulton & Brandenburg (2012) estimate $279 billion of cost effective energy efficiency. By comparison, asset-backed securitizations, one component of the U.S. bond market, are valued at $2 trillion (Sifma, 2012).

[8] Other financial experts have noted that the need for prodigious amounts of capital for energy efficiency may only arise if solutions can be found to boost the "low level of effective demand," which is "only likely to be addressed through strong regulatory requirements, retail consumer engagement strategies and/or other significant non-financial interventions" (Fulton & Brandenburg, 2012).

[9] While there is no single definition of the energy efficiency market "at scale," for our purposes, we take "at scale" to mean that total investment in energy efficiency is sufficient to meet policy goals and also begins to approach estimates of funding required to achieve all cost-effective energy efficiency.

[10] The ten transactions we profile offer a thorough exploration of secondary market activity of specialized energy efficiency loans observed to date. However, we realize that not every transaction is represented.

to sell these loans to another investor. The sale frees up the credit union's capital, allowing it to make (originate) new loans. The sale also gives investors who are interested in financing energy efficiency loans access to 100 existing projects.

A secondary market transaction can be as simple as the sale of a single loan from a primary lender to an investor. In mature secondary markets—such as those for car loans or home mortgages—transactions are more sophisticated. Mature secondary markets often rely on highly standardized loan products and involve the packaging of multiple loans into tradable instruments.

One important secondary market product, the asset-backed security (ABS), emerged in the 1970s and 1980s. An asset-backed security is a bond that is backed by assets that produce regular income, such as a portfolio of loans that generates monthly payments. The process of aggregating those assets and transforming them into tradable portions is known as securitization. Securitization is very common in the mortgage industry and has also been used for other forms of debt, including car loans, student loans and credit card debt.[11]

Secondary markets connect originators of financial products (e.g., retail banks) with investors who have large amounts of capital to deploy (e.g., pension funds and insurance companies). Originators increase their ability to fund new loans by trading long-term assets for cash from secondary market investors. Investors gain access to a large number of investment-ready assets without having to perform their own loan originations. The market as a whole benefits by connecting investors best suited to providing capital to a given product at scale, which may ultimately lead to more efficient and lower-cost financing. Access to secondary markets has played a key role in the development of large volumes of low-cost credit for mortgages, car loans, student loans, and credit cards.

1.1.1. What is an "Energy Efficiency Financing Product"?

Most consumers have choices when deciding how to finance an energy efficiency upgrade: they might use a credit card, take advantage of a utility-sponsored loan program, take out a personal loan, or put the upgrade onto their home equity line of credit. These options can be divided into two broad categories: specialized energy efficiency financing products and traditional products.

- *Specialized products* are loans or other financing products specifically intended to fund energy efficiency improvement projects. They may carry unique features that are conducive to energy efficiency lending, such as extended terms or the ability to make payments via a utility bill. These products are often supported by a utility or governmental sponsor. Examples include PACE (property-assessed clean energy) financing, program-sponsored energy efficiency loans, and on-bill products.
- *Traditional products* are conventional financing options that can be used to fund a range of purchases, including energy efficiency products or services. Examples include credit cards, home equity lines of credit, and personal unsecured loans.

This paper focuses on specialized products. More research is needed to determine the level of energy efficiency that is financed through specialized versus traditional products, as well as the potential to leverage traditional products to encourage more energy efficiency uptake. While mature traditional products likely make up the majority of financed energy efficiency investments today, some energy efficiency advocates have suggested that developing a mature market for specialized products may help bring down financing costs and offer other advantages, leading to increased penetration of these products. The optimal mix of traditional and specialized products remains an open question that may likely evolve over time as the energy efficiency services industry matures.

[11] Securitization is only one way to sell debt onto the secondary market. In fact, for lower volumes of loans, it may be more cost-effective to simply sell the loan portfolio as a whole to an investor or financial institution.

1.2. Promise for Energy Efficiency Finance: Capital Supply and Cost of Capital

The potential value and benefits of a mature, efficient secondary market can be illustrated by examining one of the largest existing secondary markets: the secondary market for mortgages in the United States.[12] The secondary mortgage market is large, complex, involves several government-backed agencies, and has been shaped by multiple policy and regulatory influences. Before the emergence of a secondary market, only lenders who were willing to hold mortgages to maturity would originate loans. The supply of mortgages was therefore limited by the number of willing lenders—in some communities, this might be a single lender making only as many loans as its own capital could support. The limited supply of mortgages and lack of competition between originators meant higher interest rates for borrowers.

Over time, a secondary market developed that connected primary lenders to many willing mortgage investors. Access to secondary investors meant that primary lenders no longer needed to hold mortgages to maturity. This allowed them to originate more loans and increased the overall supply of mortgage capital. At the same time, the popularization of mortgage-backed securities (MBS)—pools of multiple mortgages packaged into larger bonds—allowed secondary investors to purchase tradable portions of debt that could be held to maturity or sold to another investor later.[13] Investors valued the ability to easily trade these MBS, known as liquidity, and offered lower interest rates as a result. Moreover, increasingly standardized mortgage contracts and underwriting criteria gave investors confidence that one MBS was similar to another, which reduced transaction and due diligence costs.

Eventually, the increase in market size (volume), the tradable (liquid) nature of mortgage-backed assets, and the standardization of mortgages into a distinct asset class led to lower interest rates for mortgage borrowers. In the energy efficiency context, a similar narrative could lead to development of a mature, efficient secondary market that would (1) provide energy efficiency financing programs with a sustainable and reliable source of capital, capable of meeting almost any conceivable level of demand; and (2) lead to lower costs of capital (i.e., borrowing costs). This narrative would primarily affect specialized energy efficiency products, which could emerge as a unique asset class available to secondary investors.[14]

1.2.1. Specialized Energy Efficiency Products: Developing an Asset Class

A mature secondary market for energy efficiency products is more likely to develop if (1) investors become familiar with specialized energy efficiency loan products; (2) originators successfully create tradable energy efficiency-backed instruments; and (3) some degree of standardization occurs.[15] This could make more, lower-cost capital available, which would translate into lower interest rates for consumers. If consumer demand increases in response to these lower interest rates, total energy efficiency investment and savings would increase, moving the market closer to the vision of energy efficiency "at scale."[16] Furthermore, if specialized energy efficiency loans outperform comparable loans over time, investors, realizing this, could reward energy efficiency products with even lower interest rates. This would further lower borrowing costs and, again assuming sufficient demand, could further boost adoption.

---

[12] Our discussion of the secondary mortgage market is not meant to imply that lessons learned in this area can be directly translated to the energy efficiency context.

[13] Mortgage-backed securities are a subset of asset-backed securities.

[14] This development would have less impact on traditional products used for energy efficiency since, for the most part, mature secondary markets already exist for these products.

[15] It is also possible that multiple asset classes could develop (e.g., PACE-backed securities, on-bill backed securities)

[16] Traditionally, demand for energy efficiency loans has been low, even at near-zero interest rates, unless loans are coupled with strong marketing, large incentives, and other programmatic support. See Fuller et al (2010) "Driving Demand for Home Energy Improvements" and SEE Action (2014) "Financing Energy Improvements on Utility Bills: Market Updates and Key Program Design Considerations for Policymakers and Administrators" for discussion.

1.2.2. Traditional Products Used to Finance Energy Efficiency: Recognizing and Rewarding Performance

Mature secondary markets already exist for credit card debt, mortgages, and other traditional financing products and, presumably, the benefits of a secondary market have already been realized. The challenge for traditional products, then, is (1) determining if traditional financing products used by consumers to fund energy efficiency investments outperform products used for other purchases, and (2) encouraging lenders to reward that performance with preferential terms. Modifying existing financing tools to accommodate energy efficiency can also play a role in driving the energy efficiency market to scale. Early progress is evident: after successful pilots, Fannie Mae's Multifamily Property Improvements to Reduce Energy (M-PIRE) mortgage product, which allows for inclusion of energy and water cost savings in underwriting calculations, has been formalized and offered more broadly. M-PIRE loans may eventually be packaged into a "green MBS" offering (Henderson, 2014).[17] Program administrators and policymakers should track progress in this area closely and may wish to support traditional products as complements or as an alternative to specialized energy efficiency products.

1.3. Secondary Markets for Energy Efficiency: Key Unknowns and Uncertainties

The secondary market for specialized energy efficiency products is immature at present. In many cases, existing pools of capital (e.g., primary lender capital, utility or other public capital) have been largely sufficient to meet demand from existing efficiency programs. In some cases, program administrators have chosen to tap secondary markets and a handful of transactions of specialized energy efficiency products have occurred. The ten secondary market transactions profiled in Chapter 2 have occurred within the past five years (or are still pending) and represent a total volume of just over $400 million.

Given the limited number of secondary market transactions for energy efficiency to date, key questions remain regarding the potential impact of secondary markets for energy efficiency financing. Aside from general questions regarding the level of demand for specialized energy efficiency products, it is unclear whether energy efficiency will eventually be treated by investors as a distinct asset class that tends to outperform other comparable loans.[18] If this theory can be proven by tracking the performance of energy efficiency investments over time, then energy efficiency investments might receive better terms than comparable consumer loans, which could lead to a lower cost of capital from secondary market investors. However, questions remain as to the degree to which early adoption by largely creditworthy customers has driven strong observed performance to date. If the market for energy efficiency expands to a broader cross-section and the performance of energy efficiency investments begins to mirror other asset types, then a performance-related cost advantage may not materialize.

The timeframe over which cost advantages will materialize is also unknown. In the short run, secondary markets may not always represent the lowest cost of capital, particularly when transaction costs and credit enhancements are taken into account. Primary capital providers (e.g., networks of local banks and credit unions) may accept lower rates of return with less external loss protection and lower transaction costs. To compete on cost, secondary markets for energy efficiency may need to achieve large enough volumes to spread out the fixed costs of transaction structuring while reducing investors' perceived risks.

---

[17] Internationally, several groups are working actively to issue green residential mortgage backed security (RMBS). See http://www.climatebonds.net/files/uploads/2014/06/CB-Green-Building-Summary_Final.pdf for more information on green mortgage securitization and http://www.frbsf.org/community-development/files/cdir_vol10issue1-Integrating-Energy-Efficiency-into-Mortgage-Financing.pdf for more on Fannie Mae's M-PIRE mortgage product.

[18] The appropriate comparable loan type will vary depending on the type of energy efficiency financing product in question (e.g., PACE assessments might be compared to mortgages while unsecured energy efficiency loans might be compared to other consumer loans). Theoretically, outperformance could be due to the profiles of typical energy efficiency customers or the additional cash flows that result from energy savings.

1.4. Report Organization

The remainder of this report is organized into four sections. Chapter 2 defines secondary markets specifically in the context of energy efficiency and provides a typology of energy efficiency-related secondary market transactions. Chapter 3 describes a series of program design choices that may be important for program administrators to consider as they weigh the pursuit of secondary market capital against other program objectives and highlights tradeoffs and potential solutions. Chapter 4 provides a technical look at the perspectives of key actors (e.g., rating agencies) in secondary market transactions and summarizes their views on approaches to address risks associated with purchasing energy efficiency loans. Finally, Chapter 5 offers a roadmap to help program administrators think through how and when secondary markets may fit in with their broader programmatic goals and objectives and compares secondary markets as a capital source with various alternatives that may serve near-term capital needs and facilitate other programmatic objectives. Appendices A and B profile two of the transactions discussed in Chapter 2 (Craft 3-Self-Help and WHEEL) and Appendix C offers additional detail on credit enhancement.

2. Energy Efficiency Programs: Secondary Market Approaches

In this chapter, we focus on secondary market transactions of energy efficiency loans observed to date, specifically those secondary market approaches that are supported by underlying cash flows from primary loans or other financing arrangements, as opposed to repayment through taxes, surcharges, or more general obligations. We draw this distinction because secondary market strategies that are supported by the underlying economics of individual transactions may be better equipped to accommodate growth in scale.

We also present a typology of secondary market transactions that is primarily dependent on two key factors: the transaction structure and the type of secondary investor. Transaction structures include (1) portfolio sales, which involve the direct transfer of ownership of a pool of loans, and (2) bond sales, which constitute packaging a pool of loans and dividing it into tradable securities.[19] Bond sales are further categorized into revenue bonds and asset-backed securities, each of which is discussed below.

THE VALUE OF LIQUIDITY

Liquidity refers to how easily an asset can be bought or sold in a marketplace. Stocks that are actively traded on exchanges are examples of highly liquid assets, while homes and antique cars are illiquid assets. Less common assets are more illiquid than common assets and may be less desirable as a result.

Investors will assess an asset's "liquidity risk"—the risk that the asset cannot be bought or sold quickly—when making their purchase decisions and may increase required yields (interest rates) for less liquid assets.

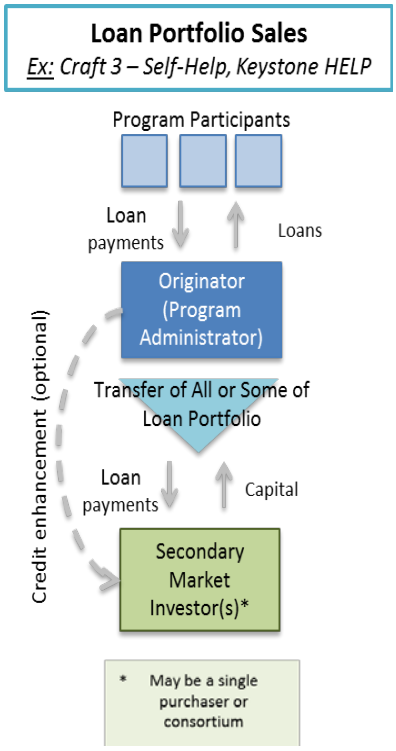


Figure 1: Schematic of Portfolio Sales of Energy Efficiency Loans

2.1. Transaction Structure

Secondary market transaction structures can be broken down into direct loan portfolio sales and bond sales. Each of these structures is described in more detail with a focus on key elements such as cost, complexity, and suitability to various programmatic objectives.

2.1.1. Loan Portfolio Sales

A loan portfolio sale involves the direct transfer of ownership of one or more loans from the original lender to another investor (see Figure 1).[20] Table 1 summarizes the two loan portfolio sale transactions observed to date.

A loan portfolio sale is typically the most straightforward route to secondary market capital and is likely to be cost effective when a relatively small volume of loans has been amassed. In essence, a willing buyer or buyers is all that is needed. Transaction structures are generally less complicated as they do not involve the creation of tradable securities or the formation of any new legal entities. Servicing arrangements can be simplified by allowing the original lender to continue collecting payments as a loan servicer, whereas third-party servicers are generally needed to collect bond payments.

The roles of third parties (e.g., lawyers and investment bankers) are usually more limited in loan portfolio sales and sales do not need to be evaluated by credit rating agencies. These factors make loan portfolio sales one of the more economical options for accessing secondary market capital. However,

[19] For example, in a loan portfolio sale, ownership of the loans may be transferred from the original lender to the purchaser, though payments may still be made to the original capital provider through a servicing arrangement. By contrast, in a bond sale, the original lender may continue to be the loan holder, but the cash flows they receive may be pledged to bond investors.

[20] Customer payments may still be made to the original lender, if the lender continues to act as a loan servicer, but the actual obligation after the transfer is owned by the purchaser.

loan portfolio sales do not contribute to the creation of a mature, efficient secondary market that is based on tradable, liquid securities.

A major challenge in a loan portfolio sale is finding a buyer that is interested in purchasing and holding a large pool of energy efficiency loans for an extended time period (see sidebar "the Value of Liquidity).[21] Finding a buyer with enough long-term capital that is not already deployed in a comparably economical investment may not always be an easy task (see the "Craft 3 and Self-Help" sidebar for a discussion of a portfolio sale to a single investor).

Given the challenges of finding a single buyer, another option is to seek out a consortium of loan portfolio purchasers who can each provide capital in exchange for a share of the loans. The consortium approach enables the participation of multiple investors that can each invest a portion of the capital needed to facilitate a sale (see the "Keystone HELP" sidebar for an example of a portfolio sale to a consortium). While this approach may be easier than locating a single buyer for the loan portfolio, it can add complexities to the transaction (e.g., support from a specialized investment banking firm or formation of a new legal entity).

CRAFT3 AND SELF-HELP: LOAN PORTFOLIO SALE TO SINGLE INVESTOR

In December 2013, Craft3 completed a portfolio sale of its residential energy efficiency loans to Self-Help Credit Union. Craft3 wished to free up its capital to make new loans, and Self-Help had both capital in need of deployment and a mission-driven desire to facilitate energy efficiency lending (specifically on-bill repayment). This transaction demonstrated that even a relatively simple secondary market transaction—a portfolio sale to a single investor—can still be time consuming, as it took approximately one year to complete. Due to its novelty, the transaction required significant credit enhancement and not all loans were sold (see Appendix A).

KEYSTONE HELP: LOAN PORTFOLIO SALE TO A CONSORTIUM

Pennsylvania's Keystone HELP (Home Energy Loan Program) completed a loan portfolio sale to a consortium when, after several years of activity, the Pennsylvania Treasury elected to sell a portion of its portfolio to reduce concentration in a single asset class and to replenish capital. A group of banks each invested a portion of the capital needed to buy Keystone's portfolio of residential energy efficiency loans. The sale involved the formation of a new legal entity, or special purpose vehicle, to which the loans were actually transferred. The banks made a joint loan to that entity, which allowed it to purchase the loans and the lenders were repaid from the payments the entity received from customers. In this sense, the transaction somewhat resembled a bond sale, and it has been referred to as a "hybrid" between a loan portfolio sale and a bond sale.

[21] While some bond investors may also be looking for long-term, predictable cash flows, those cash flows are seen as less risky if they are more easily tradable in the case of a downturn.

Table 1: Loan Portfolio Sales: Example Transactions

	Craft 3 - Self-Help	Keystone HELP
Transaction Date	December 2013	January 2013
Seller (Type)	Craft3 (Private)	Pennsylvania Treasury (Public)
Market Sector of Underlying Loans	Residential	Residential
Transaction Structure	Portfolio Sale	Portfolio Sale
Size	$15.7M	$24M
Investor Type	Single purchaser	Consortium
Secondary Market Investor(s)	Self-Help	Fox Chase, WSFS Bank, National Penn
Primary Capital	Craft 3 funds	Treasury funds

2.1.2. Bond Sales

Bond sales can also take various forms, such as municipal revenue bonds or asset-backed securitizations. Bonds attract a wider range of investors by packaging the cash flows from energy efficiency loans into tradable, liquid instruments.[22] This arrangement allows investors that do not typically lend directly to individual borrowers (e.g., pension funds and insurance companies) to participate by providing up-front capital in exchange for cash received over time. The greater liquidity of bonds may also lead to lower interest rates over time. However, bonds often carry higher upfront transaction costs, so are typically appropriate for larger volumes of loans.[23]

2.1.2.1 Private Placements and Public Offers

Both revenue bonds and asset-backed securities may be issued as a private placement or a public offer. Private placements are sales directly to qualified institutional investors (e.g., insurance companies, pension funds).[24] While most bond sales must be registered with the U.S. Securities and Exchange Commission (SEC), private placement transactions are exempt from many of these requirements.

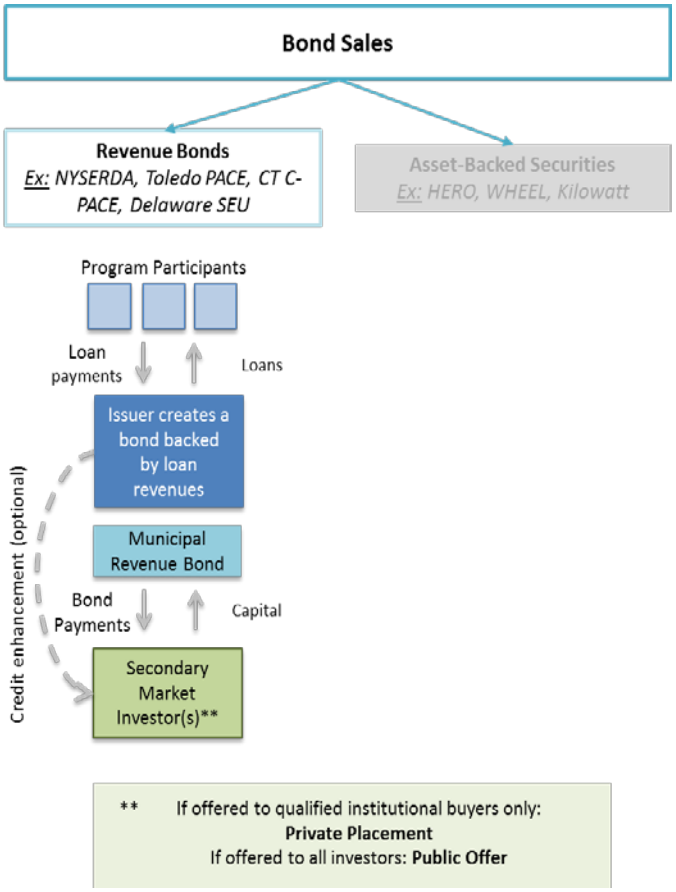


Figure 2: Schematic of Revenue Bond Sales Supported by Energy Efficiency Loans

[22] Loans, as structured, are not highly liquid investments, given that they represent long-term obligations that place the lender in an ongoing relationship with the customer, typically over a number of years. Individual lenders may be constrained in the amount of capital they have available to tie up in these types of arrangements.

[23] Concerns about the potential to offload holdings (if necessary) are assuaged by the division of bond issuances into small, tradable instruments, the collective value of which roughly equates to the value of the expected underlying cash flows. More complex bond offerings (e.g., asset-backed securities) may attract an even wider investment pool by fragmenting rights to those cash flows and selling them in batches that mirror the interests of different types of investors.

[24] For more information on qualified institutional investors, see the Internal Revenue Service's "Regulation D" http://www.sec.gov/answers/rule506.htm

The transaction costs of private placements may be lower than public offers, because of less extensive due diligence requirements, lower legal costs, and exemption from some SEC registration requirements. However, while upfront transaction costs of private placements may be lower than publicly offered bonds, required yields to investors are typically higher in the private placement market, as private bonds are less liquid and often cannot be traded for at least a year after purchase (Advantus Capital, 2013).[25] The private placement market is smaller in terms of total capital availability, constituting only about 5% of the bond market (Advantus Capital, 2013). By contrast, a public offering is made available to all investors and can be broadly advertised. Publicly offered bonds may offer lower interest rates due to the larger pool of investors and higher liquidity of the public market (i.e., bonds do not need to be held for a certain period of time). Public offerings generally require third-party underwriters and typically must be reviewed by an independent rating agency and registered with the SEC. If underlying volume is relatively small, the additional transaction costs may not always outweigh the potential for lower interest rates available in the public bond market. Program administrators may choose to pursue publicly offered bond issuances as a way of demonstrating their commitment to long-term objectives (e.g., opening up the energy efficiency market to the widest possible array of private investors).

NYSERDA MUNICIPAL REVENUE BONDS FOR RESIDENTIAL LOANS

In August 2013 NYSERDA issued $24 million of taxable municipal bonds to replenish a pool of capital initially funded by an allocation of New York's share of auction proceeds from the Regional Greenhouse Gas Initiative (RGGI). The revenues from the residential loans were pledged to repay the bondholders and NYSERDA also received a guarantee from a partner state agency, the New York Environmental Facilities Corporation, which agreed to make up for any shortfall from the loans. This feature largely allayed any rating agency or investor concerns about the predictability of the underlying project revenues, which had a relatively short history and were structured as both direct and on-bill repayments from residential customers. Ultimately, the guarantee helped NYSERDA receive the highest possible rating from a credit rating agency, leading to a relatively low cost of capital.

DELAWARE'S SUSTAINABLE ENERGY UTILITY MUNICIPAL REVENUE BONDS FOR ESCO PROJECTS

The Delaware Sustainable Energy Utility issued $72.5 million in tax-exempt municipal revenue bonds in July 2011 to support ESCO (Energy Service Company) projects (McGee, 2011). This deal raises interesting questions about the amount of support needed to facilitate municipal bond issuances that are tied only to underlying project revenues. In Delaware, the agencies managing the buildings agreed to an unconditional obligation to cover their portion of the bond obligations, regardless of any issues with the ESCO payments, which themselves were backed by an energy savings guarantee. While this arrangement did not equate to a general obligation of the state, it did significantly reduce investor reliance upon the project revenue streams.

2.1.2.2Revenue Bonds

Revenue bonds, which can be offered either privately or publicly, are one capital replenishment option for a publicly administered finance program (or privately administered program that partners with a public or quasi-public agency). Revenue bonds are issued by a municipality or other public or quasi-public entity and are backed by designated revenue streams, which, in the energy efficiency context, are cash flows from underlying energy efficiency loans (see Figure 2).[26] Table 2 summarizes selected examples of revenue bonds supporting energy efficiency loan programs.

[25] Advantus Capital's analysis suggests that the difference may be approximately 20–60 basis points.

[26] The transactions described in this section were structured as revenue bonds. Traditionally, revenue bonds are backed by revenues for essential services (e.g., tolls or fees). In the energy efficiency context, revenue bonds are backed by repayment of the underlying loans which is linked, at least conceptually, to cost avoidance. Perhaps because of this less common revenue source, the transactions described include additional credit enhancement (i.e., bond investors have extra assurance, beyond the performance of the underlying assets, that they will be repaid).

The link to designated revenues distinguishes revenue bonds from other types of municipal bonds, such as general obligation bonds, which are backed by the full faith and credit of the issuing jurisdiction and are typically repaid through various kinds of taxes.[27] Revenue bonds may be more scalable as the energy efficiency market grows, compared to general obligation bonds. As long as underlying assets (energy efficiency loans) exist to support bonds, additional revenue bonds may be issued. By contrast, public entities can only issue general obligation bonds up to a designated "cap."

Municipal revenue bonds have been used in all market sectors—residential, commercial/industrial, and public/institutional—to access secondary market capital for energy efficiency projects, though only to a limited extent. These issuances, as early proofs of concept, are characterized by unique risk-mitigation features (see "Delaware's Sustainable Energy Utility" and "NYSERDA Municipal Revenue Bonds" sidebars for two examples).

Municipal revenue bonds have also been used to raise capital for PACE programs. In some jurisdictions, individual PACE projects have been aggregated into larger municipal bonds that are tied to the payments from underlying projects. In the commercial sector, examples of this model include the Toledo-Lucas County Port Authority and the Connecticut "C-PACE" program (see Table 2 for more detail on these transactions). PACE bond issuances have not generally relied upon a guarantee to back up their revenue streams, which is likely due to the strong security inherent to the PACE structure (see Chapter 4).

Table 2: Municipal Revenue Bonds: Example Transactions

	NYSERDA	Toledo PACE	Connecticut C-PACE	Delaware SEU
Transaction Date	August 2013	2012-2013	May 2014	July 2011
Seller (Type)	NYSERDA (Public)	Toledo Lucas-County Port Authority (Public)	Public Finance Authority - conduit (Public)	Delaware SEU (Quasi-public)
Market Sector of Underlying Loans	Residential	Commercial	Commercial	Public/Institutional
Transaction Structure	Municipal Revenue Bonds (QECB)	Municipal Revenue Bonds (QECB)	Municipal Revenue Bonds	Municipal Revenue Bond
Size	$24M	$16.5M	$30M	$73M
Investor Type	Public Offer	Private Placement	Private Placement	Public Offer
Secondary Market Investor(s)	Many, including impact investors	Not reported	Clean Fund, CGB	Many
Primary Capital	RGGI funds	Municipal revenue bonds	Municipal revenue bonds	ESCO contracts

In the public/institutional market sector, municipal revenue bonds have also been used to facilitate ESCO projects, although such projects are more often funded using general obligation bonds.

[27] There are often legislative limits on the aggregate amount of general obligation bonds that a jurisdiction may issue, as increasing a jurisdiction's total debt burden may impact its credit rating and could also mean increasing constituent tax burdens. Municipal revenue bonds can potentially avoid these limits, as they are tied only to the revenue that supports them.

2.1.2.3 Asset-Backed Securities

Asset-backed securitizations are bonds that are created by aggregating a pool of loans and dividing it into tradable portions (securities) [see "The HERO Bond Sale" sidebar for an example and Figure 3 for detail]. Asset-backed securitizations may be pursued by any type of bond issuer and are a way of raising bond capital that is supported by project revenues. Table 3 summarizes asset-backed securitizations observed to date in the energy efficiency market

Asset-backed securities are typically divided into separate pools called tranches that vary in terms of repayment schedules and priorities (e.g., some tranches may be paid later and absorb losses if remaining funds fall short) and are sold separately with their own credit ratings.[28] Subordinate tranches with lower ratings typically offer higher yields.[29] The process of creating and selling separate tranches of securities can be important in attracting different types of investors with different risk and reward preferences. This feature allows asset-backed securitizations to cater to the broadest possible investor base, which may increase liquidity, capital availability, and scalability.

THE HERO BOND SALES: PACE-BASED ASSET BACKED SECURITIZATIONS

Western Riverside Council of Governments (WRCOG) and San Bernardino Associated Governments (SANBAG), quasi-public agencies in Southern California, have completed the only asset-backed securitizations in the energy efficiency arena, a $104 million issuance in February 2014 and a $129 million issuance in October 2014. These bond issuances were backed by a pool of municipal PACE bonds that were established to fund residential energy efficiency projects through the Home Energy Renovate Opportunity (HERO) program, administered by Renovate America. These transactions received AA ratings from a credit rating agency, even though the issuance was sold in a private placement. Nonetheless, this transaction may represent a first step in an evolution toward publicly offered asset-backed securities that can broaden the investor base for the energy efficiency industry.

Table 3: Asset-backed Securitization: Example Transactions

	HERO PACE I	HERO PACE II	WHEEL (forthcoming)	Kilowatt (forthcoming)
Transaction Date	February 2014	October 2014	TBD	TBD
Seller (Type)	WRCOG (Quasi-public)	WRCOG and SANBAG (Quasi-Public)	WHEEL SPV (Private)	Kilowatt (Private)
Market Sector of Underlying Loans	Residential	Residential	Residential	Residential
Transaction Structure	Asset-Backed Securitization	Asset-Backed Securitization	Asset-Backed Securitization	Asset-Backed Securitization
Size	$104M	$129M	TBD, targeting $100M	TBD, targeting $100M+
Investor Type	Private Placement	Private Placement	Public Offer	TBD
Secondary Market Investor(s)	Not reported	Not reported	TBD	TBD
Primary Capital	Limited obligation improvement bonds	Limited Obligation Improvement Bonds	Citibank/Pennsylvania Treasury line of credit	Citibank line of credit

[28] Tranches are also possible in municipal revenue bond issuances, but are much less common.

[29] In the case of energy efficiency programs, some of the additional yield may be sacrificed to more senior investors in order to attract them to the transaction.

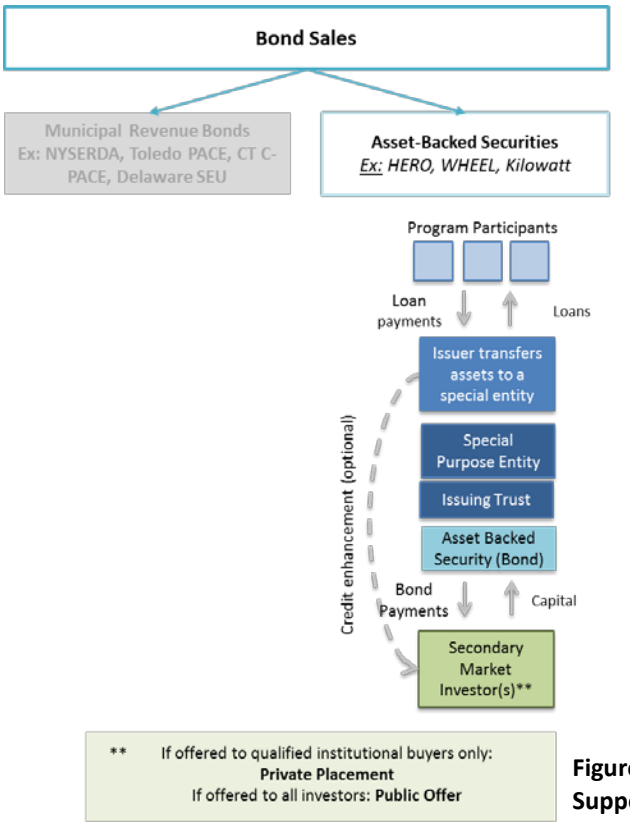


Figure 3: Schematic of Asset-Backed Securitizations Supported by Energy Efficiency Loans

Executing an asset-backed securitization is a complicated process involving many specialized parties (see Chapter 4 for more detail and text box "In-House vs Third-Party options for discussion on how to approach this complexity). As a result, upfront costs are relatively higher than other approaches. However, their liquid nature and multi-tranched structure makes ABS appealing to the largest pool of investors.

The sidebar, "Paths to Asset-Backed Securitizations," explores options available to programs interested in an ABS approach.

POTENTIAL PATHS TO ASSET-BACKED SECURITIZATIONS: THE WHEEL AND KILOWATT MODELS

Two corporate entities, Renewable Funding, with its Warehouse for Energy Efficiency Loans (WHEEL), and Kilowatt Financial, are building toward privately led asset-backed securitizations (see Appendix B for more detail on WHEEL). Both of these entities have received initial capital from private lenders that is used to originate unsecured residential energy efficiency loans and "warehouse" them until sufficient volume is reached to justify an asset-backed securitization (ABS).

In the WHEEL model, Renewable Funding requires participating efficiency finance programs to adhere to certain minimum loan standards and also to contribute capital, which absorbs potential losses and protects investors. By contrast, Kilowatt Financial offers its own financing products with purely private money to customers and selectively utilizes program capital to further reduce rates to end consumers. These different approaches can be attributed to different theories about how to attract investors. WHEEL will attempt to bring in investors by (1) standardizing the underlying loans to make them easier to analyze, and (2) including credit enhancement in the form of subordinate capital. Kilowatt Financial's strategy is to treat unsecured energy efficiency loans more like other types of unsecured consumer debt (e.g., student loans) and facilitate the application of traditional rating agency analytical methods, which can account for a wide range of underlying credit profiles.

In either model, achieving an asset-backed securitization of unsecured residential energy efficiency loans may be expensive, at least initially. In the WHEEL model, these costs are mostly absorbed by the subordinate capital contributed by program administrators. Kilowatt Financial's model depends less on program capital and instead hopes to use proprietary analysis of historical loan data to offer compelling rates to consumers.

IN-HOUSE VERSUS THIRD-PARTY APPROACHES TO BOND SALES

By opting into existing third-party bond sale programs (e.g., WHEEL, Kilowatt Financial), program administrators can outsource most of the activities involved in achieving a secondary market transaction. For example, The Energy Programs Consortium and the National Association of State Energy Officials are supporters of WHEEL and wish to offer this option to program administrators. By contrast, in-house, self-designed bond sales, such as the HERO or NYSERDA transactions, require a program administrator to complete (or contract for) all tasks required to execute the sale.

Third-party providers are likely to assess an additional administrative fee in some form. Program administrators should consider these fees against the time and resource requirements of a self-designed approach. Program administrators should also be aware of any program design constraints that may be imposed if they rely on a third-party approach (e.g., underwriting criteria, interest rates to participants) and judge if those criteria are in line with program goals.

When deciding between an in-house or third-party model, program administrators should consider internal resources and capabilities, administrative costs, and the relative importance of flexibility in program design. Program administrators may wish to revisit this decision occasionally, as market conditions evolve and third-party offerings mature.

2.1.2.4 Comparing Municipal Revenue Bonds and Asset-backed Securities

Program administrators should consider the relative merits of municipal revenue bonds and asset-backed securitizations. Both options may be possible, assuming that the efficiency financing program is administered by or can partner with a public entity or affiliate that can act as an issuer of municipal bonds.[30]

The primary advantages of municipal revenue bonds are their relative simplicity and lower transaction costs. Municipal bond structures tend to avoid a multi-tranche format and frequently offer a single, fixed-rate obligation to all investors. Overall, legal and investment banking fees are generally lower in a municipal bond issuance.[31] Rating agency fees are usually lower and the rating methods and processes for municipal revenue bonds tend to be more straightforward.[32] For example, NYSERDA indicated that it encountered barriers in its first unsuccessful attempt to obtain a rating for its portfolio of efficiency loans because the transaction was initially analyzed as an asset-backed securitization and insufficient performance data of the pledged loans was available to support an ABS structure. The NYSERDA deal was eventually issued as a municipal bond with credit enhancement (Pitkin, Green Jobs Green New York Program, 2014).

However, there may be other programmatic reasons to pursue asset-backed securitizations. Asset-backed securitizations generally offer access to a more diverse array of potential investors, given their multi-tranche structure, and arguably provide a pathway to a larger total pool of capital.[33]

---

[30] Public entities can issue municipal bonds on behalf of private entities for private purposes, known as "private activity bonds." While private activity bonds are generally taxable, certain building types and uses may qualify for tax exemption or federal subsidies, such as those available under the qualified energy conservation bond program.

[31] There is generally no need for the formation of a special purpose vehicle to which the underlying assets are sold or for a third-party trustee to oversee such a legal entity (see Chapter 4 for more detail).

[32] This is likely due in part to the fact that public jurisdictions have historically repaid their debts more consistently than the wide range of private entities that may seek to issue rated asset-backed securities. Municipal revenue bond rating analysts tend to focus more on the characteristics of a jurisdiction—including the possibility of jurisdictional bankruptcy, given legal uncertainty as to whether a jurisdiction's general creditors may have rights to municipal bond revenues. By contrast, analysts of asset-backed securitization generally focus more on repayment risks, transaction structures, and credit enhancements. See KNN Public Finance (2012) for more on this comparison.

[33] Issuances of municipal revenue bonds and asset-backed securities, not including mortgages, are roughly comparable on an annual basis, at $189 billion in each market in 2013. With mortgages included, however, the asset-backed securitization market is much larger, with total issuances in the range of $2 trillion (Sifma, 2014).

2.2. Transaction Matrix

Table 4 summarizes the basic features of all transactions described in this chapter. To our knowledge, a similarly comprehensive summary of secondary market transactions backed by energy efficiency financing products has not been compiled previously. These transactions are relatively recent with the oldest occurring in 2011. As a result, there is relatively little experience to assess the performance of efficiency loan portfolios in secondary markets.

These early transactions have generally been small compared to the typical size of a regular bond issuance (which is often $100 million or more). A range of primary capital sources supported initial loan activity, and underlying loans made in all market sectors (residential, commercial, and public/institutional) have successfully been sold in secondary market transactions. Secondary investors in energy efficiency loans range from single, mission-driven purchasers to multiple buyers from the public bond market. Transactions that pursued credit ratings were rated highly, perhaps in part due to substantial credit enhancement features, which most transactions, rated or un-rated, required to move forwards.

Given that each of these transactions differs in terms of liquidity, transaction features, and market conditions at the time of issuance, direct yield comparisons cannot be made. Moreover, the level of credit enhancement and other factors can have a significant impact on the overall cost of capital beyond the yield shown in Table 4.

Table 4: Summary of Selected Energy Efficiency Secondary Market Transactions

	Craft 3 Self-Help	Keystone HELP	NYSERDA	Toledo PACE	Connecticut C-PACE	Delaware SEU	HERO PACE I	HERO PACE II	WHEEL (forthcoming)	Kilowatt (forthcoming)
Date	December 2013	January 2013	NYSERDA	Toledo PACE	Connecticut C-PACE	Delaware SEU	February 2014	October 2014	TBD	TBD
Size	$15.7M	$24M	August 2013	2012-2013	May 2014	July 2011	$104M	$129M	TBD	TBD
Transaction Type	Portfolio Sale	Portfolio Sale	Revenue Bond (as QECB)	Revenue Bond	Revenue Bond	Revenue Bond	ABS	ABS	ABS	ABS
Seller (Type)	Craft3 (Private)	PA Treasury (Public)	NYSERDA (Public)	Toledo Lucas-County Port Authority (Public)	Public Finance Authority - conduit (Public)	Delaware SEU (Quasi-public)	WRCOG (Quasi-public)	WRCOG and SANBAG (Quasi-public)	WHEEL SPV (Private)	Kilowatt (Private)
Primary Capital Source	Craft 3 funds	Treasury funds	RGGI funds	Municipal revenue bonds	Municipal revenue bonds	ESCO contracts	Limited Obligation Improvement Bonds	Limited Obligation Improvement Bonds	Citibank/ Pennsylvania Treasury line of credit	Citibank line of credit
Market Sector of Underlying Loans	Residential	Residential	Residential	Commercial	Commercial	Public/ Institutional	Residential	Residential	Residential	Residential
Investor Type	Single purchaser	Consortium	Public Offer	Private Placement	Private Placement	Public Offer	Private Placement	Private Placement	Public Offer	TBD
Investor(s) if Known	Self-Help	Fox Chase, WSFS Bank, National Penn	Many, including impact investors	Not reported	Clean Fund, CGB	Many	Not reported	Not reported	TBD	TBD
Rating	n/a	n/a	AAA/Aaa	Unrated	Unrated	AA+	AA	AA	TBD	TBD
Yield*	5.99%	6%	3.2%	Not reported	Not reported	3.7%	4.75%	3.99%	TBD	TBD
Average Maturity	20 years	4 years	7 years	Not reported	Not reported	Not reported	11 years	11 years	TBD	TBD
Credit Enhance-ment (see Chapter 4 for definitions)	Reserve Account, Partial Guarantee	Sub-ordination	Loan Guarantee	Reserve Account	Sale at discount	Appropriations-backing (guarantee)	Over-collateralization (3%), Liquidity Reserve (3% growing to 7%), Excess Spread (4%)	Over-collateralization, Liquidity Reserve (3% growing to 7%), Excess Spread (4%)	Sub-ordination (~20%)	TBD

** Yield to investors. Note that effective cost of capital to issuers may be lower than yield in the case of QECBs, which receive an interest rate subsidy.*

3. Energy Efficiency Financing Program Design: Secondary Market Considerations

In this chapter, we discuss program design features that may affect the ease with which programs can access secondary market capital, including interest rates, underwriting criteria, collateral, and collection mechanisms. Program administrators that pursue secondary market capital may confront tradeoffs that arise due to secondary market investors' expectations and priorities.[34]

3.1. Interest Rates

Many energy efficiency financing programs offer below-market interest rates to participants in order to expand participation or encourage deep retrofits.[35] However, these below-market interest rates may not be attractive, on their own, to secondary market investors. Early experiences suggest that secondary market investors may expect energy efficiency loan products to offer competitive, market-rate returns, even if the underlying loans were offered to program participants at sub-market rates.[36] This has meant that programs either receive lower proceeds than expected from a secondary market sale or must offer credit enhancement, at their own expense, to compensate investors. Program administrators could also respond by offering interest rates more in line with investors' current expectations.

This dynamic is illustrated by the WHEEL program, which is designed to meet secondary market investors' expectations (see Appendix B). WHEEL's base interest rate to participants is 9.99% for a ten-year unsecured loan. This interest rate assumes that program administrators contribute, on average, a 20% match as subordinate capital. Administrators can contribute additional program capital if they wish to further lower the interest rate to participants, but there is a cost to the program administrator associated with this approach. Because WHEEL relies on standard loan terms offered at rates that are intended to be attractive to secondary investors, interest rates offered to participants may be higher than program administrators would prefer in their program design.

3.2. Loan Terms

In order to lower monthly payments to participating customers or more closely match loan payments to energy savings, program administrators may choose to offer longer loan terms than would be available in the private market. While a typical consumer loan term might be five to ten years at double-digit interest rates, energy efficiency financing programs have offered similar loan products with fifteen-year terms for mid- to high-single digits.[37] Some program administrators have judged that the risks of extending financing over this longer term are justified because of the potential benefits of longer loan terms (e.g., additional uptake, deeper retrofits).[38]

Secondary market investors may view these longer terms as a source of risk and might expect additional return or other forms of risk mitigation. In the Craft3 loan portfolio sale to Self-Help, Craft3's underlying loans were fifteen-year semi-secured residential loans (see Appendix A).[39] As the loans had already been made, Craft3 could not

[34] Throughout this section, we discuss secondary investors as a group for purposes of simplification. Secondary market investors are as diverse as primary lenders and have a range of profit motivations, mission objectives, and attitudes towards risk.

[35] Below-market interest rates can be offered using program or public funds or through a risk reduction arrangement with a private capital provider (e.g., a loan loss reserve). In either case, lower returns on capital or the cost of credit enhancements are implicitly justified by the policy objectives of the program.

[36] Administrative costs of secondary market transactions can also increase the interest rate offered to participants. Loan loss reserves or other credit enhancements can bridge this gap but are not without cost. Program administrators offering subsidized interest rates should consider the magnitude of this interest rate gap and be aware of the potential costs of closing it (see Chapter 4).

[37] For example, see Wells Fargo personal line of credit rates at https://www.wellsfargo.com/personal_credit/products/options/unsecured_line

[38] Program administrators may also have access to a source of capital that allows for this flexibility.

[39] Craft3's loans were secured by a second lien on some properties, but challenges with data collection and reconciliation limited the value of this security feature.

increase interest rates to existing participants and chose to offer risk reduction mechanisms to address Self-Help's perception of the risk on these long-term loans.

Program administrators should be aware of how secondary market investors may view longer loan terms, especially for unsecured products. Longer-lived loans will be exposed to multiple economic cycles, which may impact loan performance. If this tradeoff is not considered at the program design stage, it may lead to unexpected costs in order to attract secondary market investors at a later time.

It is also worth considering the relative importance of longer loan terms to customers and their effectiveness in driving demand. Some program administrators that offer a range of loan terms have noted that many consumers often prefer short- or medium-term products. For example, in Connecticut's Smart-E loan program, approximately 40% of borrowers choose a five-year loan, the shortest of several available loan terms (State of Connecticut, 2014). The benefit of offering longer terms should be assessed in light of tradeoffs and costs that could arise when taking long term loans to the secondary market.[40]

3.3. Underwriting Criteria

To expand access to capital to underserved market segments and customers, some program administrators choose to loosen traditional underwriting metrics (e.g., FICO scores, debt to income ratios, borrower income, property value, payment history, and more) or adopt alternative underwriting criteria (e.g., utility bill repayment history). Programs can also take a hybrid approach, combining expanded traditional criteria with alternative ones (SEE Action Financing Solutions Working Group, 2014).

An increasing number of efficiency finance programs are using expanded or alternative underwriting criteria (SEE Action Financing Solutions Working Group, 2014). However, for most secondary market investors, there is still insufficient history to understand how well alternative underwriting criteria can be relied upon to predict loan performance. Until sufficient performance data exist, secondary market investors are likely to view expanded or alternative underwriting criteria as an additional source of risk for which they must be compensated.

In the Craft3 and Self-Help example, Craft3's program design included both expanded underwriting criteria (i.e., customers with FICO scores as low as 590 could qualify for loans) and alternative underwriting criteria (e.g., utility bill payment history). Given the unproven performance of on-bill efficiency loans, Craft 3 anticipated the need for credit enhancement to facilitate a secondary market sale. Indeed, Self-Help decided to exclude some loans from the sale, including those made to individuals with credit scores of 620 or below. Self-Help's decision reduced the size of the asset sale and required Craft3 to keep some portion of the loan portfolio on their balance sheet.[41] While the number of loans below Self-Help's cut-off was small, other programs may reach more customers with a broader range of credit profiles, particularly as energy efficiency expands beyond early adopters.

NYSERDA's securitization of its Green Jobs Green New York loan portfolio offers a similar example of a proactive, hybrid approach to this issue. At the outset of its program, NYSERDA created two types of loans products: Tier 1 loans based on traditional underwriting criteria, and tier 2 loans based on expanded underwriting criteria. NYSERDA's intention was to securitize only the tier 1 loans, which most secondary market investors found acceptable. Then, as investors became more comfortable with the performance of all loans, NYSERDA planned to blend both tier 1 and tier 2 loans into future securitizations (Pitkin, Green Jobs Green New York Program, 2014). In its first secondary market sale, NYSERDA included only the tier 1 loans.

Program administrators may want to consider and assess the potential benefits of a preemptive tiered approach. A program with multiple loan products (i.e., a tiered system) may have higher set-up and ongoing administrative costs, but this approach may also reduce time and cost during a secondary market sale. The tradeoff of pursuing a

[40] Initially, Craft3 offered 20-year loans, but reduced the maximum term to 15 years to make them more salable, after customers turned out to be less interested than expected in long-term financing.

[41] Not all loans were excluded for FICO score reasons (see Appendix A).

tiered approach is that riskier assets are isolated and not supported by better performing assets. This segregation may compromise program administrators' goals to increase access to capital to a range of borrowers.

Secondary market investors also typically require very consistent application of underwriting criteria as these investors are one step removed from the initial underwriting process. This may reduce a program administrator's flexibility in considering applicants for a financing program who fall just shy of eligibility criteria. Program administrators looking toward secondary markets should bear this in mind if programmatic goals call for serving customers who may not be sufficiently creditworthy for secondary market investors.

3.4. Security and Collection Mechanism

Secondary market investors will also tend to price secured and unsecured loans differently, based on perceived differences in risk. Secondary market investors are likely to consider secured loans more attractive than unsecured loans because they offer some type of collateral asset (e.g., the resale value of a home) as a backup for any shortfalls in loan payments.[42]

Offering unsecured loans may support important finance program or policy objectives. For example, unsecured loans tend to require less paperwork and can often be approved more easily, can be extended to customers who may not have any home equity or other collateral, and may be attractive to those customers that do not want to place a lien on their property. Program administrators should take these policy considerations into account and decide whether they are significant enough to justify the potential difference in pricing between the two loan types.

Program administrators may also be interested in testing novel program design features, such as the PACE mechanism or on-bill loans.[43,44] Placing a senior lien on a property (PACE) or invoking the threat of utility disconnection in the event of nonpayment (on-bill) may offer additional certainty to secondary market investors that they will be repaid. Program designers may wish to test whether they can obtain lower costs of capital for secondary market transactions based on PACE or on-bill mechanisms.[45]

PACE and on-bill mechanisms introduce new parties into the loan process in the role of bill collector: the municipality or their designated representative (PACE) and the local utility (on-bill mechanisms). Secondary market investors may view these new parties as a source of uncertainty and risk, especially when those parties are responsible for collecting and distributing payments. There may also be differences in collection practices that require additional effort to reconcile (e.g., utility bills or property taxes may be collected on a different cycle than secondary market investors expect).

These novel security mechanisms are still being evaluated by lenders, investors, and other participants in the secondary market. PACE, with its senior lien for the energy efficiency lender, is generally regarded as investor friendly. While initial transactions indicate good appetite for PACE bonds, it remains to be seen if secondary market investors will rally behind the PACE mechanism at scale.[46]

---

[42] Most specialized energy efficiency financing products are variations on unsecured loans.

[43] Note that we use the terminology from SEE Action Financing Solutions Working Group, 2014 to discuss on-bill programs.

[44] PACE is based on a longstanding concept of a property tax assessment, so in more accurately thought of as the application of a long-standing public finance tool to a new type of project (energy efficiency improvements).

[45] These structures may be attractive for other reasons; on-bill repayment mechanisms are sometimes used as marketing tools because they allow customers to compare utility bill savings directly with loan payments on one bill. These structures, when they involve utility shut off as a consequence of non-payment, have faced opposition from consumer advocates in some jurisdictions.

[46] Some early evidence suggests that the amount of credit enhancement that investors require for PACE bonds may be less than other types of bonds, though this is based only a very small number of transactions. For example, investors in the residential PACE bond issued by the Western Riverside Council of Governments in Southern California advanced as much as 97% of the value of the loans, whereas investors in the unsecured WHEEL structure are expected to advance only 80%, meaning they will require more expected revenue to cover the amount they are owed. Long-term success of PACE bonds is predicated on ongoing consumer demand, resolution of regulatory uncertainties, and ongoing interest from secondary investors.

Similarly, until more information about the risk-reducing impact of on-bill payment and potential utility disconnection is available, the benefits of on-bill mechanisms from an investor perspective remain unclear. For example, NYSERDA originally consulted a rating agency for an opinion on a portfolio of both unsecured loans versus loans that were paid through an on-bill mechanism (with threat of disconnection). The rating agency felt that only the unsecured loans were eligible for securitization and declined to rate the on-bill loans.[47]

3.5. Summary

Program administrators have a range of motivations for offering financing programs, from encouraging more projects and deeper savings, to expanding access to capital, to incentivizing new technologies. To meet these policy goals, program administrators may offer below-market interest rates, extended financing terms, non-traditional underwriting criteria, or novel security and collection mechanisms. These objectives may not always overlap with the interests of potential secondary market investors, who may expect higher returns, discounted valuation, or risk-reduction mechanisms in exchange for investing in unfamiliar products with novel design features.

Program administrators can alter program design features to respond to secondary market investors' preferences, although this may affect programmatic or policy goals. Alternatively, program administrators can preserve design features but offer risk reduction mechanisms or discounted sale terms to investors. In reality, most cases fall in between these two extremes. There are many innovative, hybrid approaches along this continuum, and the best options available to program administrators will be highly context-specific. Program administrators should be aware of and prepared for tradeoffs on these issues if they consider secondary market investments. As the basic data needed to assess the risk and performance characteristics of energy efficiency loans accumulates, investor and program administrators' perspectives may come more into alignment, making these tradeoffs less pronounced.

[47] This was likely in part because on-bill loans were paid last in the event of a partial payment, and in part because the threat of disconnection is not a well understood security mechanism. In addition, the on-bill loans had less of a history (having been launched later by the program), and may have been more challenging to compare to other programs.

4. Achieving a Transaction: Key Players, Their Concerns, and Potential Costs

It is important for programs that choose to pursue secondary market capital to understand the key players in a secondary market transaction, their concerns, and the steps required to achieve a direct portfolio sale or securitization. In this chapter, we discuss these issues and also offer insights into the perspectives of potential purchasers, who act as the ultimate counterparty in the sale of a program's financial assets. Understanding potential investors' concerns can help explain what types of information they may require about the assets for sale, as well as the types of credit enhancement they may seek to ensure the soundness of their investment. We also discuss the costs of some of these mechanisms, which program administrators should be aware of and factor in when contemplating secondary market strategies.

4.1. Key Players

The players in a secondary market transaction will vary depending on the transaction structure and the specifics of the particular sale. Typical participants in a loan portfolio sale and bond sale are described below.

4.1.1. Loan Portfolio Sale to Single Secondary Market Investor

A direct portfolio sale can usually be facilitated directly between the purchaser(s) and the seller (i.e., the program administrator). For example, the sale from Craft3 to Self-Help (see Appendix A) was negotiated directly between these two parties. Such negotiations may still be complex and may involve lawyers, accountants, and investment advisors to analyze and help structure the transaction. In fact, Self-Help indicated that its purchase of Craft3's loans was one of the more complicated undertakings in the organization's history.[48]

4.1.2. Loan Portfolio Sale to Consortium of Secondary Market Investors

Loan sales to a consortium of secondary market investors may be more complex. For example, in the Keystone HELP sale to a group of commercial banks, an investment bank worked on behalf of the program administrator to facilitate the transaction and the transaction included several additional steps. A special-purpose entity was formed to which the loans were transferred and the bank consortium provided a loan to that special-purpose entity which effectively paid for the sale.[49] This type of secondary market transaction is a hybrid between a loan portfolio sale and a securitization.

4.1.3. Bond Sale

Bond sales are generally more complicated transactions that involve more parties than a direct portfolio sale. Bond sales can take various forms, including municipal revenue bonds and asset-backed securitizations. Bonds attract a wider range of investors by packaging the cash flows from energy efficiency loans into tradable, liquid instruments.

In many bond sales, investors typically deal directly with a bond underwriter, who purchases the energy efficiency loans from the originator (i.e., the program administrator), packages them, and sells them to investors.[50] A contingent of specialized lawyers, investment bankers, and credit rating agency representatives are usually involved. These parties ensure that the transaction is structured in a way that is acceptable to the seller and purchaser(s), that risk is properly evaluated and mitigated where necessary, and that there are sufficient buyers for the newly issued securities.

---

[48] Note that loan sales occur routinely in other consumer finance sectors when loans are highly standardized—the lender and the investor both are familiar with all aspects of the loan product, the documentation, the credit reporting, property types, remedies, loan servicing, etc.

[49] After the sale to the new legal entity was complete, the banks were repaid on their loan from revenues received by the special purpose entity on the original loans to customers.

[50] As discussed in Chapter 2, this may not be the case in a private placement transaction.

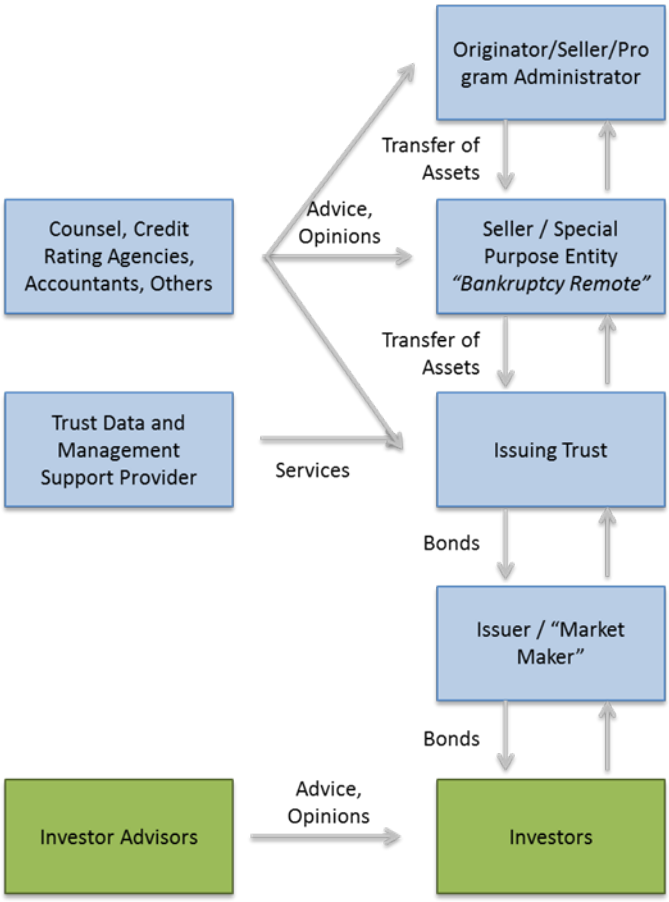


Figure 4: Schematic of a Typical Asset-Backed Securitization

An asset-backed securitization involves additional parties and typically requires the creation of a new special-purpose entity and the transfer of assets to this entity (See Figure 4).

4.2. Investor Perspectives: Risk and Return

Because a secondary market transaction cannot go forward without investors, it is critical to understand what potential buyers may look for when energy efficiency loans or asset-backed securities are offered for sale. Fundamentally, all investors in loan portfolios and bond sales are looking for a rate of return that corresponds with the riskiness of the asset. However, different types of investors have different priorities and approaches to how they deploy their funds. Understanding these perspectives can help shed light on the processes and structuring requirements that may be involved in secondary market transactions.

4.2.1. Investors in Portfolio Sales

Investors in loan portfolio sales are likely to hold loans until maturity. These types of investors can be difficult to find; for example, Craft3 spent considerable time searching for a buyer before entering into negotiations with Self-Help. Self-Help happened to have a pool of capital on its balance sheet that it was looking to deploy and was also a mission-driven lender willing to invest the time and effort to perform its own due diligence on the portfolio, without the benefit of an independent credit rating. While this confluence of circumstances was fortuitous for Craft3, it may be difficult to find a counterparty with both a pool of long-term capital and the willingness to perform lengthy due diligence.

In a loan portfolio sale, it may be easier for sellers to communicate directly with buyers about the historical performance of a loan portfolio and answer questions, which could help reduce perceived risks. However, potential buyers who must perform their own due diligence may feel less confident about their ability to assess risks accurately, which may lead to more conservative transaction parameters or additional credit enhancement. In the Craft3 sale, Self-Help required a complete transfer of Craft3's loan loss reserve alongside the loan portfolio, as well as a significant increase in the total amount of loss reserve funds. This was in part because Self-Help was unfamiliar with energy efficiency loans and unsure of their performance risks (see Appendix A).

4.2.2. Bond Investors

One of the key advantages of executing a bond sale is that the new securities created should be suitable for many types of investors. Different investor types generally prefer different types of securities (e.g., in terms of time to maturity or seniority of repayment and associated return). By dividing up the cash flows from underlying loans, bonds (particularly asset-backed securitizations) can be structured to meet investors' varying needs.

In terms of risk, investors in a bond sale may look to the type of transaction to assess performance. Municipal revenue bonds tend to be associated with stable returns and strong performance, based upon the credit profiles of

public sector institutions.[51] Asset-backed securities offer varying levels of risk and potential return, depending on how the bond in divided into tranches. When assessing risk, bond investors may also look to credit enhancements included in a bond offering, which can provide a cushion to absorb losses.

In the case of publicly offered issuances, investors often look first to the assessment of an independent credit rating agency to provide information on the relative risk of investing in a particular security. Given the key role of credit rating agencies, it may be nearly as important for a seller to understand their perspective as to understand investor concerns.

4.3. Credit Rating Agencies

Credit ratings provide one way for investors to quickly analyze the suitability of an asset for their investment portfolio and can be viewed as a minimum requirement for most publicly offered bonds and some private placements. Ratings are typically given on a scale from A to C (with various incremental notations depending on the rating agency) and indicate the credit quality of a bond. These ratings will influence the borrowing cost for the seller and therefore impact overall program costs (see "Credit Ratings and Borrowing Costs" sidebar for an example). Achieving an "investment grade" rating can reduce borrowing costs and increase the pool of potential investors, as many investors are required by policy or regulation to invest primarily in investment-grade assets. [52]

Potential buyers use a credit rating to help determine whether they wish to purchase a bond and, if so, what yield they will require.[53] Bond sellers rely on credit ratings to set borrowing costs and to give buyers confidence that the securities for sale have been reviewed and audited by a neutral third party.[54] Credit ratings can be issued for any type of bond, and the specifics of the ratings process depends on the type of security being issued. Municipal revenue bond rating analysts tend to focus more on the characteristics and creditworthiness of an issuing jurisdiction, even when project revenues provide the primary source of repayment. For asset-backed securities, agencies will

CREDIT RATINGS AND BORROWING COSTS

Credit ratings correlate closely with observed borrowing costs (interest rates). The table below shows the average interest rate (yield) for 10-year corporate bonds in the industrial sector as of March 2014. Lower ratings generally correlate with higher yields (all else equal), although the absolute yield levels and spreads between different average rating categories will vary with market conditions.

Rating	Yield (10-yr)
Aaa/AAA	3.15%
Aa1/AA+	3.27%
Aa2/AA	3.38%
A1/A+	3.42%
A2/A	3.45%
A3/A-	3.5%
Baa1/BBB+	3.62%
Baa2/BBB	3.88%
Baa3/BBB-	4.05%
Ba1/BB+	4.38%
Ba2/BB	5.21%
B1/B+	6.03%
B2/B	6.86%
B3/B-	7.68%
Caa/CCC+	8.51%

Individual bonds of the same rating and maturity may have slightly different yields (interest rates), but in general bonds of the same rating, type, and maturity will have similar funding costs. Note that borrowing costs increase more quickly for sub investment grade bonds (Baa3/BBB- and below).

Source: Adapted from Reuters Corporate Bond Spread Tables (3/28/2014) available online at http://www.bondsonline.com/Todays_Market/Corporate_Bond_Spreads.php

[51] Whether cash flows on municipal bonds are protected from the general creditors of a bankrupt jurisdiction remains an open legal question.

[52] Investment grade on the Standard and Poors rating scale is BBB or above.

[53] In practice, credit ratings also play a role in setting the yield (interest rate); bonds of a certain rating can be expected to achieve similar interest rates.

[54] In some cases, sellers may have the option to obtain a preliminary credit rating that is not made public, which allows the seller to assess their likely borrowing cost and make adjustments if not in line with expectations.

develop their ratings based the expected performance of the underlying assets and any risks posed by the servicer that manages the loan portfolio. The due diligence process involves a data review to determine that loan terms and conditions and underwriting standards have been consistently applied and documented. The rating agency will also consider any contractual arrangements involved in the underlying loans, including, if applicable, novel collection mechanisms (e.g., PACE, on-bill).

The rating may also depend on the quality of loan servicing and administration systems in place, including risks of data inaccuracies, the quality of data recording, and fund transfer systems. As these administrative activities are usually performed by a servicing company, the rating agency will assess that company's financial standing and may require a back-up servicer to be on call in case the primary servicer should experience a service interruption. For example, in its bond sale, NYSERDA added a back-up servicer to help reduce perceived administrative risks and achieve a higher rating. Unless a program administrator has already invested in sufficiently sophisticated loan administration systems, there may be additional costs associated with upgrading to investors' expectations.

4.4. Addressing Performance Risk

The level of performance risk that a transaction may entail is of paramount concern to both investors and credit rating agencies. Sellers must be prepared to undertake two fundamental steps to address this risk: (1) providing adequate information that will help investors and rating agencies assess the magnitude of various risks; and (2) structuring a transaction in ways that mitigate risks to investors.

4.4.1. Addressing Risk through Information

Access to complete, credible, and reviewable data is important for any potential purchaser or rating agency. Much of the information that secondary market investors will require is similar across all investor classes, although credit rating agencies and institutional bond investors may be more conservative in their assumptions or require greater levels of detail.[55] For example, a long and detailed loan history can help demonstrate the performance of the underlying loans, leading to a more favorable rating, better pricing, and a faster sale. Key data categories include repayment history, the credit profile of borrowers, and default and charge off rates, which can provide insights on how the portfolio may perform over time.[56] Ideally, sellers will be able to demonstrate the loan performance over a time period comparable to the time-to-maturity of the assets being sold. If they are unable to do so, potential purchasers may make conservative assumptions about the expected future performance of these assets.

In situations in which historical performance data is limited, investors may use data from comparable investments as a proxy. However, rating agencies may take a conservative viewpoint regarding the comparability between energy efficiency loan programs. For example, in its securitization, NYSERDA originally provided the rating agency with data from two similar loan products, both of which exhibited strong performance. However, the rating agency was not persuaded to use this information in its judgment of the expected future performance of NYSERDA's loans.

The need to present a loan data history is one of the key rationales that can motivate program administrators to establish loan products today. Some program administrators anticipate that demand will grow to a level at which secondary market capital will be needed and they reason that this capital will be easier to access if the program can present a sufficiently lengthy and robust data history to rating agencies and secondary market investors.[57]

Sellers should also be prepared to provide extensive information on other aspects of the assets offered for sale, specifically product structuring and administration, history and management of the program, origination and underwriting procedures, rates of prepayment, and payment methods and servicing arrangements. Ultimately, the

[55] In the case of publicly offered bonds, specific information requirements are documented in U.S. Securities and Exchange Commission disclosure regulations, which may require both up-front and ongoing disclosures.

[56] For more information on the types of data that is collected and how that data is used, see "Energy Efficiency Finance Programs: Use Cases to Define Data Needs and Guidelines" (SEE Action).

[57] A similar rationale is sometimes put forward to inform loan product structuring. Some experts have argued in favor of structuring on-bill repayment programs to mirror utility billing as closely as possible, so that rating agencies may be more likely to compare the payment history of these programs with the performance of traditional utility payments (SEE Action Financing Solutions Working Group, 2014).

potential purchaser will need to be confident that payments will continue to be made and appropriately disbursed and that adequate procedures will be in place to collect any payments that are missed.

Investors may also request information on liquidity risk (e.g., the total volume of similar bonds in the marketplace, historical trading activity and other factors that might impact the ability to trade the bonds in the future).

4.4.2. Addressing Risks through Transaction Structuring

Structuring the transaction to mitigate perceived risks is a key opportunity for sellers to address the concerns of secondary market investors and rating agencies.

4.4.2.1 Addressing Risk in a Loan Portfolio Structure

In a loan portfolio sale, one option to address risk is to place certain parameters on the types of loans that will be sold, rather than selling the entire loan portfolio. For example, Craft3 agreed to retain any loans that had become delinquent within the first year (see Appendix A). Another option is to sell loans at a discount (i.e., for less than the net present value of the cash flows), which does not address risk directly, but may recalibrate expected returns with the buyer's perceived level of risk. A third alternative is to provide some form of credit enhancement to the buyer, such as a loss reserve account or a guarantee. Multiple risk mitigation options can be combined in any given transaction.

4.4.2.2 Addressing Risk in a Bond Structure

Some types of bond transactions, such as asset-backed securitizations, address certain risks through their basic structure. A primary benefit of an asset-backed securitization is that the underlying assets become "bankruptcy-remote," meaning they will not be affected if the issuer were to enter bankruptcy (see Figure 4). This is achieved by placing the assets into a separate legal entity called a special-purpose vehicle, which removes them from the balance sheet of the transaction sponsor (Figure 4).[58] However, placing the assets in a bankruptcy-remote structure does not address the risk of non-performance of the loans, which is a primary concern for investors.

To address loan non-performance risk, credit enhancements can be built into a bond sale to reduce risks to investors, achieve a higher credit rating, and thus lower borrowing costs. However, these features have the potential to increase programmatic costs. The magnitude of those costs will depend at least in part on the perceived risk of the underlying loans. We next describe some key forms of credit enhancement, followed by a discussion of potential costs.

Credit Features of a Municipal Revenue Bond

In a municipal revenue bond transaction, the most common structural elements used to address certain risks are debt service coverage ratios and cash reserve funds. Debt service coverage ratios require that the amount of revenue expected from the underlying loans exceed the amount owed to bond investors by a specified percentage. The larger the debt service coverage ratio, the more comfortable investors will feel about the investment, all else equal. However, larger ratios also mean that less up-front capital is received from bond investors to replenish existing funds. Thus, over time, one metric to watch in energy efficiency municipal revenue bond issuances is whether the required debt service coverage ratios decline as more transactions take place. Cash reserve funds are another common form of security that accompanies municipal revenue bond issuances. These reserve funds may be funded up-front or built up over time.

[58] In the context of corporate debt, this process may allow the securitized assets to receive a higher credit rating than other corporate bonds issued by the sponsor. As a result, securitization is often thought of as one way to obtain a relatively low cost of capital. Whether securitization also provides a lower price as compared to entirely separate capital sources, however, may depend on the details of the particular transaction and the various other options available.

Credit Features of an Asset-Backed Securitization

In asset-backed securitizations, investors often request (or require) credit enhancements to provide further assurance regarding the transaction.

Internal Credit Enhancement

Certain types of credit enhancement, such as subordination, overcollateralization, and excess spread, are considered internal, because these structures affect the form of the transaction but do not involve layering on of an outside credit enhancement source like a reserve account or guarantee. These credit enhancements are summarized briefly here (see Appendix C for more detail).

- **Subordination.** Loss protection for senior investors through subordination is a key form of credit enhancement in any securitization. Subordinated capital is placed in a first loss position to protect more senior investors. In established markets, subordinated investors typically demand higher returns, given their increased exposure to risk. In an energy efficiency context, the program administrator often plays the role of the subordinated investor and the return received may be well below the market rate in order to increase the yield to senior investors.
- **Overcollateralization.** Overcollateralization involves offering debt to investors in an amount that is less than the total value of underlying loans (e.g., selling $100 million of bonds backed by $110 million of loans). This strategy assures investors that the income received from loans will be sufficient to cover the amount owned to bondholders, even if there are losses (assuming losses do not exceed the amount of the overcollateralization).
- **Excess Spread.** Excess spread is the difference between interest income collected from underlying loans and interest owned to bond investors. The left over amount acts as a safeguard in case of unforeseen losses.
- **Reserve Account.** Reserve accounts are liquid accounts pledged to cover losses to "make investors whole." If the reserve account is funded through the transaction itself, it is considered an internal credit enhancement.

External Credit Enhancement

Credit enhancements that are funded from outside sources, such as cash reserves and guarantees, are referred to as external credit enhancement and can be layered onto a securitization to further protect senior investors. Guarantees are a common external credit enhancement. A number of other external credit enhancements are possible (e.g., insurance or letters of credit from a bank that can be used to reimburse investors if there are shortfalls) and may be implemented in future securitizations of energy efficiency loans.

4.5. Costs of Risk Mitigation

It is important for program administrators to be aware of the potential costs associated with these various credit enhancement mechanisms and to account for this when assessing the total costs of securitization.[59] Table 5 provides a hypothetical example for each type of credit enhancement, including potential costs to program administrators.

[59] Costs of risk mitigation are typically borne by the seller or bond issuer. In more mature markets, sellers may be compensated for these costs through relatively high expected returns. For example, if a seller in a mature market acts as a subordinate capital provider, they will generally expect to receive a higher rate of return on their investment than the senior capital provider, in order to compensate for their additional risk.

Table 5: Securitization Credit Enhancements and Potential Costs to Program Administrators

Type of Credit Enhancement	Hypothetical Example	Potential Cost of Hypothetical Example	Considerations
Overcollateralization	A $100M pool of loans backs $90M of bond issuances	Up to $10M maximum, although likely that once bondholders are repaid, additional payments will accrue to the program administrator, reducing this cost	Reduces capital received by program administrator by the amount of overcollateralization
Subordination	A program administrator contributes $10M of subordinate capital and investors contribute the remaining $90M for a $100M pool of loans	$10M up-front cost with potential returns net of credit losses	Assuming losses do not exhaust the subordinate capital, a return will still be earned on the investment. Size of return will depend on deal terms and actual performance
Excess Spread	A $100M pool of loans paying 6% interest is securitized into $100M of bonds paying 4% yield to senior investors	Depends on performance. The different in interest rates may accrue to the program administrator if not used to compensate senior investors for losses	Diverting excess loan revenue prevents it from being used for new originations or other programmatic purposes until senior investors are fully repaid
Reserve Account	A $10M loss reserve fund is established backing a $100M pool of loans	Up-front cost of $10M. Ultimate cost will depend on losses experienced, return received, and opportunity cost of funds set aside	Returns earned on funds held in reserve accounts may be low if funds are kept in safe, liquid accounts that can be easily called upon to cover losses
Guarantee	A public agency offers a full guarantee against a sale of $100M of loans	If public agency is the program administrator, costs will depend on losses experienced. If public agency is a partner, costs to program administrator will depend on agreement to protect or compensate guarantor	Guarantees can be full or partial; investors will consider assets and credit worthiness of the guarantor to assess the value of the guarantee. Investors will require full access to financial information of the guarantor to make this determination

The secondary market for energy efficiency loans is relatively immature and transactions observed to date have required relatively costly forms of risk mitigation. For example, program administrators may be asked to commit subordinate capital but accept lower returns than senior investors in order to attract senior investors into the structure, as in the WHEEL program.[60] In the NYSERDA case, risk mitigation funds were pledged to the guarantor rather than to the investors, but those funds were significant, totaling approximately $8.5 million (or more than

[60] In the WHEEL structure, program administrators are expected to earn an annual return of approximately 4% on their subordinate capital contribution while senior investors funding the warehouse line are currently earning a return of approximately 13%. The rate of return to senior bond investors will not be known until the first securitization is complete, but it is expected to be above the rate earned by participating programs.

30% of the amount owed to investors).[61] The cost of setting aside funds in the form of cash reserves is somewhat difficult to quantify given that it will depend in part on actual losses experienced. However, the opportunity costs may be considerable, as cash reserves are typically set aside in accounts that earn minimal returns and program administrators are prevented from using them for other programmatic purposes.

[61] These funds came from the federal Better Buildings grant that NYSERDA receive to facilitate its energy efficiency financing programs.

5. Considerations for Program Administrators

Secondary markets can potentially offer a way of solving specific challenges with regard to capital supply and capital cost. Program administrators should consider how those needs factor into their overall programmatic objectives and then decide how secondary markets may help them address these issues.

In this chapter, we compare secondary market options with other alternatives that could potentially meet existing capital supply needs and provide a framework to help program administrators think through the timing of secondary market strategies and other options for meeting capital needs. Note that we do not discuss traditional products that can be used to finance energy efficiency; rather, we limit our discussion to specialized energy efficiency products (see Chapter 1 for definitions).

5.1. Capital Supply

As a first step in assessing the importance of targeting secondary markets, program administrators should examine their existing and projected levels of financing activity as well as any anticipated capital supply constraints. If capital is likely to become a constraining factor in program sustainability, then designing a program that will attract secondary market investors may present a viable solution.

Currently, many efficiency finance programs exhibit relatively low customer participation rates. Driving customer demand may present a more immediate challenge than securing an adequate supply of capital.[62] Some administrators facing customer demand challenges have chosen to use flexible capital to offer low interest rates, long loan terms, or less restrictive underwriting criteria in order to build demand for programs, even if those choices have not necessarily been tailored to the perspectives of secondary markets investors. Over the long term, some program administrators may shift their focus toward secondary markets once customer demand has been more firmly established. The potential tradeoff is that reaching secondary markets in the future may be more challenging if programs do not factor them in today.

Even with relatively low participation rates, program administrators may need to consider ways of replenishing capital if their existing capital source is constrained, or if they anticipate capital constraints in the future. For example, both NYSERDA and Keystone HELP faced capital constraints around the time that they executed secondary market transactions. In each case, the initial capital source used was limited: NYSERDA began with a designated allocation of Regional Greenhouse Gas Initiative (RGGI) funds while Keystone HELP had access to a limited pool of funds from the State Treasury. The initial choice of a primary capital source may correlate directly with the importance of secondary markets in the future.

5.2. Cost of Capital

Another major rationale for targeting secondary markets is to lower the cost of capital. In the long run, a mature secondary market for energy efficiency loans could offer lower interest rates than currently available. Moreover, some secondary market investors (e.g., pension funds and insurance companies) tend to seek out longer-term assets that promise steady returns as opposed to riskier high-yield securities. These types of investors may be a good fit for achieving certain programmatic objectives, such as offering cash-flow-positive financing with longer terms and lower rates.

Policymakers and program administrators that are considering secondary markets as a way to lower the cost of capital costs should consider the “all-in” costs of these types of transactions. At present, secondary market sales of energy efficiency loans may carry significant transaction costs. For example, NYSERDA indicated that the up-front costs of its bond issuance exceeded $1 million on a bond that totaled $24.3 million (Pitkin, 2014). Moreover,

[62] Participation rates can range from 0.1% to upwards of 5-10% of a targeted market (SEE Action Financing Solutions Workgroup, 2014). Participation rates can vary by sector (e.g., large C&I may only need a few transactions before volume is sufficient) and volume and participation rates can vary by improvement type (e.g., single measure vs. whole-house).

required yields on energy efficiency bonds may be higher than for other types of bond issuances, although it is reasonable to expect that these costs may decline over time with more deals. The potential amount of credit enhancement needed to make a secondary market transaction viable should also be considered part of the all-in cost of capital (see Chapter 4).

5.3. Balancing Near-Term and Long-Term Objectives

In the long run, it is likely that secondary market investors will play an important role in supporting energy efficiency investments. Attracting secondary market capital will be easier if investors are already familiar with energy efficiency loans. This may require building a demonstrated performance history over several years. With this in mind, some program administrators may choose to take the long view and establish products today that are designed to ensure that secondary market capital will be available and well-priced in the future.

Figure 5 provides an illustration of two different ways in which program administrators can think about when to factor secondary markets into their program design considerations. In the "supply-focused" approach, the program administrator focuses on secondary markets at the early stages of a program life-cycle in anticipation of the need to access a supply of secondary market capital in the future. This approach may facilitate future secondary market transactions, although it may require expensive forms of credit enhancement to reassure investors until they grow comfortable with the performance of the underlying assets. It may also entail earlier standardization of loan products in line with the needs of secondary market investors, which may or may not align well with other programmatic objectives. In contrast, in the "demand-focused" approach, the administrator focuses primarily on more immediate programmatic objectives (e.g., driving consumer adoption of energy efficiency) while deferring program design choices that could facilitate secondary market transactions.

These two approaches may provide a useful conceptual framework, although they need not be mutually exclusive. For example, NYSERDA's program design choice of a two-tiered loan portfolio may explicitly recognize that some loans are more likely than others to be well-suited to secondary market sales. Moreover, certain risk-mitigation strategies, such as NYSERDA's partnership with a state agency guarantor, may facilitate a wider range of program design choices (e.g., offering both direct-bill and on-bill loan options) while still attracting secondary market investors.

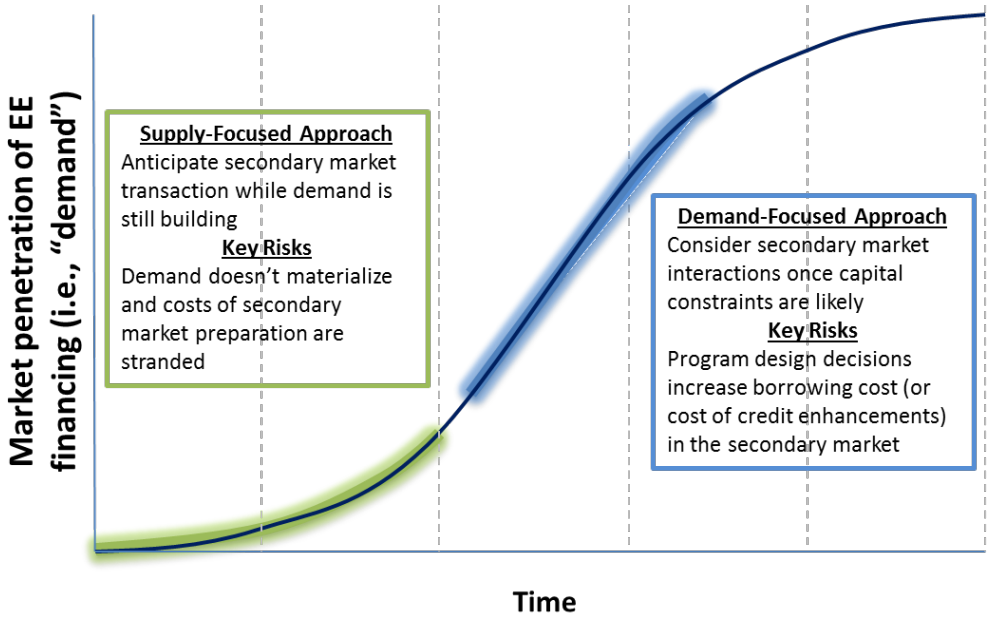


Figure 5: Approaches to the Timing of Secondary Market Considerations

5.4. Alternative Strategies for Capital Replenishment

It is also important to acknowledge that alternative strategies exist which may help program administrators achieve their objectives with respect to capital supply and cost of capital. One of the key factors in determining whether program administrators pursue secondary market transactions may be whether these alternatives could work better overall.

Alternative capital replenishment strategies can be broadly grouped into four categories: (1) public or ratepayer funds; (2) bonds that are not directly tied to project revenues; (3) large lenders or local lender networks; and (4) non-energy loan products. A wide variety of options exists within each of these broad categories. However certain common features make it possible to compare each one as a group to secondary market strategies.

5.4.1. Public or Ratepayer Funds

For a number of financing programs, particularly in their initial phases, the use of public or ratepayer dollars may sufficiently cover programmatic capital needs while allowing for the flexibility to set loan interest rates and terms in ways that are primarily aimed at building demand (or meeting other programmatic objectives). However, one challenge of this approach is that public and ratepayer funds tend to be constrained, meaning they may need to be replenished if a program is successful in spurring participation. Ironically, the more that programs are able to drive demand by offering flexible rates and terms in the short term, the more challenging or expensive it may be to replenish their funds using private capital. Private capital providers often require higher rates of return and stricter underwriting criteria than public or utility programs (funded by ratepayer dollars). If those rates and terms are not in place at the outset, capital providers may charge a premium in order to fill the gap between perceived risk and expected return.

Nonetheless, some program administrators may project that their participation rates are unlikely to scale in the short term without attractive rates and terms that flexible capital can provide. Under these circumstances, one option may be to offer reduced rates and attractive terms in early stages to build demand and increase program awareness, while shifting toward market rates and terms in the future as participation grows. Program administrators that follow this path may still choose to maintain attractive rates and terms for certain program participants in order to achieve programmatic priorities (e.g., promotion of comprehensive upgrades or elicit participation from hard-to-reach customers).

5.4.2. Bonds not Tied to Project Revenues

A number of jurisdictions are using non-revenue bonds to pursue energy efficiency improvements and other clean energy investments. In recent years, hundreds of millions of dollars have been raised in this fashion. Given this level of activity, non-revenue-based bond issuances may be worth considering as a near-term source of energy efficiency financing capital.[63,64]

5.4.2.1 General Obligation Bonds

Public and quasi-public agencies can raise funds for energy efficiency loan programs by issuing municipal bonds. General obligation bonds, backed by the full faith and credit of the municipality, typically receive very favorable ratings and enjoy correspondingly low borrowing costs, due to the strong credit profiles and taxing authority of most issuing jurisdictions. Costs of capital may be further reduced if proceeds are used to support public or certain qualifying private activities. However, issuance of these types of bonds may be restricted in order to maintain the credit rating of the jurisdiction and minimize tax burdens.

---

[63] See "Bonds and Climate Change: The State of the Market in 2014," available online at http://www.climatebonds.net/files/files/-CB-HSBC-15July2014-A4-final.pdf for a discussion of the emerging "green bond" market.

[64] Qualified Energy Conservation Bonds (QECBs) are a special case that fall partly into the category of "bonds not tied to project revenues." Several programs (e.g., St. Louis Saves, Boulder Housing Partners) have issued QECBs that are not backed by existing loans. However, QECBs can also be created as bonds that are tied to revenues from an existing pool of loans. For example, the NYSERDA transaction discussed in Chapter 2 was structured as a QECB. For more information on QECBs and their diverse applications, see the Energy Program Consortium's various reports, available at http://www.naseo.org/financing-resources-qecb.

General obligation bonds have most often been used to provide financing for public sector performance contracting programs, such as energy service agreements between ESCOs and state agencies. There have also been examples of general obligation bonds funding other types of environmentally-focused lending programs, such as state revolving funds for clean water infrastructure investments. For example, approximately $12 million of a recent $100 million "green bond" issuance in Massachusetts (a general obligation bond aimed at funding environmental improvements) went toward a state fund that makes low or no-interest loans to cities and towns for water project (Massachusetts Treasury, 2013). Thus far, there are few examples of general obligation bonds being issued to capitalize energy efficiency financing programs that target facilities and buildings that are privately-owned. However, this approach could potentially be used in the future, although the bonds would potentially be higher cost if the interest payments were considered taxable and the approach might require statutory authorization.

5.4.2.2 Ratepayer-Backed Bonds

Another approach that may be worth considering is the Green Energy Market Securitization (GEMS) program that the state of Hawaii is currently implementing. Hawaii has issued bonds that will be repaid through a surcharge on all customers' bills across all sectors. These bonds are similar to "stranded asset bonds" (also known as "rate reduction bonds") that have been used for a number of years to help support the costs of operating certain utility assets. Hawaii is the first state to use the proceeds to fund an energy efficiency loan program.[65] By applying the mandatory charge to all utility customers, GEMS creates a very secure income stream that may be attractive to investors, potentially resulting in a low cost of capital.

Hawaii plans to take advantage of this competitively priced capital source to support an attractive on-bill financing program.[66] Revenue from the on-bill loans will cover administrative costs and support new loan originations, but will not be used to repay bond investors, who will be repaid only from the broad-based ratepayer charge. Hawaii policymakers have referred to this model as the "democratization" of energy efficiency as it is meant to spread financing costs across the full ratepayer base. However, replicating this approach on a broad scale may require convincing customers that do not participate in the loan program of its advantages in light of the additional charge on their bills.

5.4.3. Large Lenders or Local Lender Networks

At present, many efficiency finance programs have not yet reached activity levels that exceed the capital supply limits of potential primary lending partners, such as banks and credit unions. Large lenders may be able to fund significant volumes before becoming capital constrained. While smaller institutions may be more limited individually, some program administrators have established networks or clearinghouses of primary lending institutions that collectively have met larger capital demands.

GEOSmart Financing Clearinghouse is one example of a network of primary lenders coordinated by the Electric and Gas Industry Association. The program provides a central source of financing options from multiple primary lenders, partnering with manufacturers, distributors, and contractor networks throughout the country. Rates on these products vary, and some may be considered high (Bernard, 2014). Nonetheless, the collective amount of capital available through the clearinghouse is considerable, and the program recently announced that cumulative lending volume for efficiency and solar installments had exceeded $1 billion (EGIA, 2014).

Establishing and working with a network of community banks and credit unions is another option for deploying large amounts of capital. By bringing together multiple institutions, states can take advantage of the relatively low costs of capital typically offered by local lenders while increasing capital supply through the establishment of a distributed network. Massachusetts provides a leading example with an annual volume through its HEAT Loan program on the order of $100 million through a network of approximately 60 local institutions (Phillips G. , 2013). Lenders offer 4.99% loans over seven years, which are bought down to 0% by the state's utilities, who offer the

[65] Connecticut took a similar approach in 2004 in issuing bonds to support its energy efficiency programs, but the proceeds were not specifically allocated to financing programs.

[66] The projected cost of capital is slightly over 3%, though the actual rate will not be known until the transaction is completed.

loan as part of their whole-house improvement program. Despite the relatively high volume, the collective lender network has not faced capital constraints thus far and loans have not needed to be resold on the secondary market.[67] However, within the network, some individual lenders have stopped making energy efficiency loans as a result of volume constraints, although the program administrator indicated that other lenders have been able to step in to meet capital needs (Phillips G. , 2014).

5.5. Weighing the Alternatives

Table 6 provides a summary of these various capital supply options. In general, ratepayer funds and bonds backed by ratepayers or taxpayers have lower costs of capital but are more constrained in terms of capital supply. In contrast, options that provide greater supply capacity also tend to correlate with higher capital costs. Proponents of secondary market strategies for energy efficiency financing maintain that a mature secondary market will bring down these costs over time.

Table 6: Weighing Capital Supply Alternatives

	Cost of Capital	Size of Capital Supply	Considerations
Ratepayer/Public Funds	**Low Cost** Funding is flexible	**Volume is limited by policy goals** and willingness to invest tax/ratepayer dollars	Rate/taxpayer funds are unlikely to be sufficient to achieve all available EE; public models do not "educate" the capital market about EE assets
General Obligation Bonds or Ratepayer-Backed Bonds	**Low Cost** due to high ratings and authority to levy taxes or surcharges	**Varies but not limitless**. Bonding capacity and political will may limit capital availability	Costs are shifted onto taxpayers or ratepayers; municipal or SBC approaches do not "educate" the capital market about EE assets
Local Lender Network / Large Lenders	**Moderate Cost** Some flexibility, within commercial norms	**Varies** by number and type of lender(s)	Local lenders / large lenders flexibility and interest in EE will vary widely; this approach does not "educate" the capital market about EE assets
Secondary Markets	**High all-in costs at present, may decrease over time;** costs will follow credit rating	**Very large potential supply,** especially for investment grade securities	Secondary markets for EE are evolving and upfront costs of administration, setup and credit enhancement should be factored into decision making

5.6. Decision-Making Framework

Figure 6 provides a framework in the form of a "decision tree" that is designed to assist program administrators thinking through issues related to accessing secondary markets compared to other options to meet capital supply needs. Finance programs that anticipate a near-term capital supply constraint should consider secondary markets as one potential option for capital replenishment. For these programs, the choice of capital supply may depend on the availability of other options and the extent to which program design constraints and potential costs of secondary market approaches can be reconciled with other programmatic objectives. Programs that are less capital constrained at present but anticipate longer-term capital supply needs may choose to establish financing options that could facilitate secondary market investments at a later stage. Finally, program administrators that are experiencing relatively low levels of consumer demand in their finance program(s) may be better served with more flexible sources of capital. These program administrators should be aware that current program design choices using flexible capital sources may impact the ease with which they are able to access secondary market investments in the future.

[67] Other states that have implemented similar models include Connecticut and Michigan.

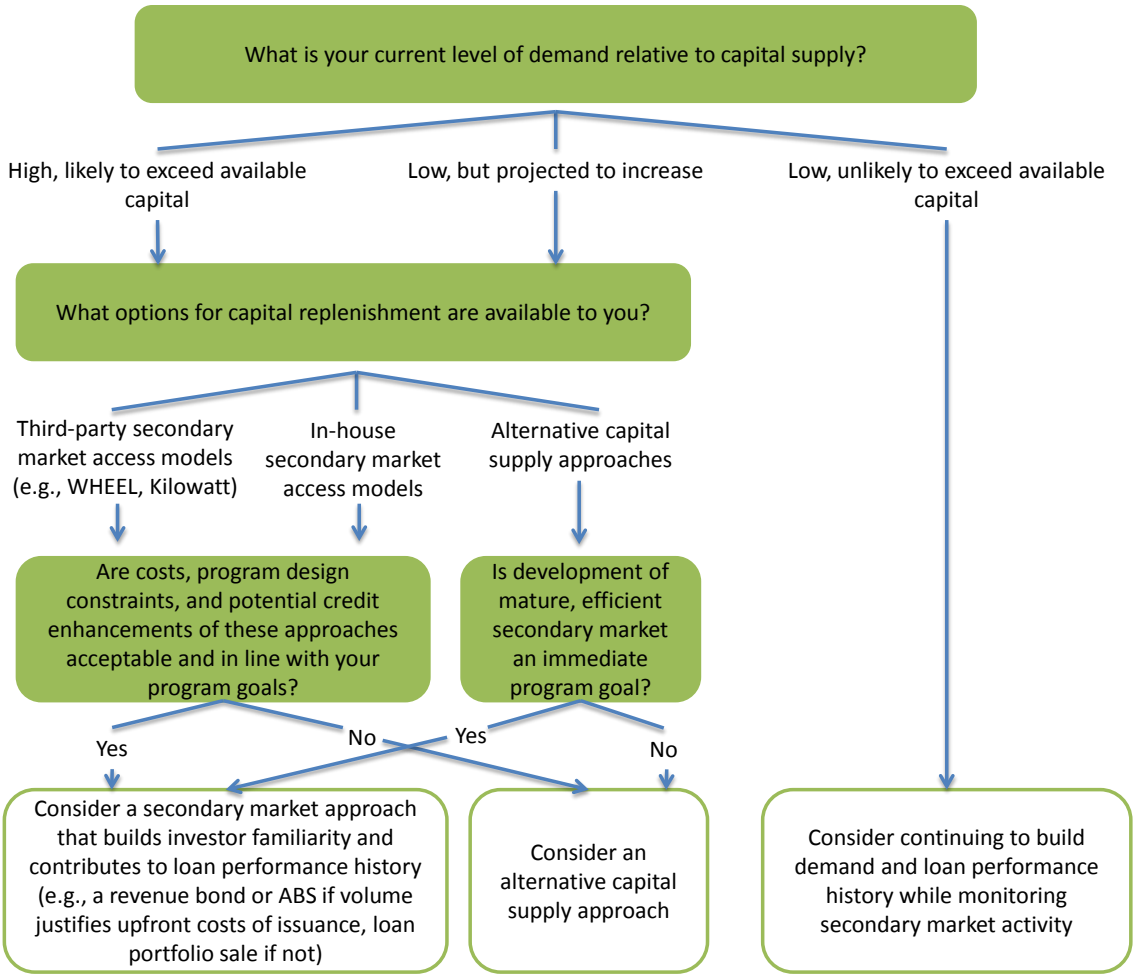


Figure 6: Framework for Considering Capital Supply Options

6. Conclusion

Estimates of the total investment opportunity for energy efficiency in the United States are typically in the range of several hundred billion dollars (Choi Granade, et al., 2009) (Fulton & Brandenburg, 2012). Banking experts project that this level of investment could be too large for bank balance sheets and will require secondary market capital to fully take advantage of investment opportunities in the energy efficiency sector and provide a way to bridge this gap.[68]

The most fundamental benefit offered by secondary markets is the supply of a relatively low-cost, virtually limitless capital source to meet any conceivable future demand for energy efficiency financing. The ability to access secondary market capital may also allow for a cap or reduction in the amount of ratepayer or public funding used to support energy efficiency programs.

Currently, total energy efficiency financing volume has not yet reached the scale typically seen in securitized, secondary market transactions (e.g., mortgages, credit card debt). However, recognizing the potential longer-term need to tap into secondary market sources, some program administrators have chosen to design or participate in programs today that are aimed at building volume, demonstrating performance, bolstering investor familiarity, and increasing market liquidity, which will likely reduce secondary market transaction costs over the longer term.

Two main types of secondary market mechanisms have been observed: loan portfolio sales and bond sales (including municipal revenue bonds and asset-backed securitization). A range of other approaches also exist for fulfilling capital supply needs, including public or ratepayer capital, bonds backed by taxpayers or ratepayers, and primary lenders or lender networks. Program administrators should weigh these options along with secondary market approaches in terms of capital supply capacity, cost of capital and effects on program design choices that may impact other programmatic objectives. Potential program design implications include changes or limitations on interest rates offered to participants, loan terms, underwriting criteria, and security or collection mechanism (e.g., on-bill and PACE programs).

To mitigate risk to secondary market investors, some energy efficiency program administrators have built risk mitigation strategies into their transactions. These include overcollateralization/subordination, sale at a discount, loan guarantees, and cash reserves. These risk mitigation strategies have associated costs that will be borne by the seller and may increase interest rates offered to participants or potentially dampen future lending activity, or both. Program administrators should understand these structures well and balance their costs against the benefits of potentially attracting secondary market capital at a lower required yield.

As a first step in considering secondary market strategies, program administrators should examine their existing and projected levels of financing activity as well as any constraints on the level of activity that current capital sources and other available options can support. If capital is likely to become a constraining factor in program sustainability, then designing a finance program that will attract secondary market investors may present a solution.

As secondary markets expand, attracting capital will be easier if secondary market investors and other market actors are familiar with energy efficiency as an asset class. This is likely to require building a demonstrated performance history for efficiency loans over a multi-year period. With this in mind, some programs with relatively low current participation rates may choose to take the long view and establish products today that are designed to ensure that secondary market capital will be available and well-priced in the future.

[68] Choi Granade, et al., 2009 estimated that $520 billion of cost effective energy efficiency is untapped and Fulton & Brandenburg, 2012 estimate $279 billion of cost effective energy efficiency. By comparison, asset-backed securitizations, one component of the U.S. bond market, is valued at $2 trillion (Sifma, 2012).

7. References

Advantus Capital. (2013). *Private Placement Bonds: Shedding Light on a Valuable Alternative.* Advantus Capital. Retrieved from https://www.advantuscapital.com/public/acm/Private%20Placement%20Bonds-A%20Valuable%20Alternative.pdf

Bernard, J. (2014). ACEEE Conference Lessons Learned. *ACEEE Financing Forum.*

Choi Granade, H., Creyts, J., Derkach, A., Farese, P., Nyquist, S., & Ostrowski, K. (2009). *Unlocking Energy Efficiency in the U.S. Economy.* McKinsey & Company.

EGIA. (2014, March 3). *EGIA's GEOSmart Sustainable Financing Solutions Surpasses $1 Billion in Funded Energy Efficiency and Solar Loans.* Retrieved from EGIA: http://www.egia.org/downloads/pressRelease/EGIA_PressRelease20140227.pdf

Fuller, M., Kunkel, C., Zimring, M., Hoffman, I., Lindgren Soroye, K., & Goldman, C. (2010). *Driving Demand for Home Energy Improvements.* Lawrence Berkeley National Lab. Retrieved from http://drivingdemand.lbl.gov/reports/lbnl-3960e-print.pdf

Fulton, M., & Brandenburg, M. (2012). *United States Building Energy Efficiency Retrofits: Market Sizing and Financing Models.* The Rockefeller Foundation and DB Climate Change Advisors.

Henderson, P. (2014, December 22). Senior Financial Policy Specialist, Natural Resources Defense Council (NRDC).

KNN Public Finance. (2012). *Financing Feasibility Analysis for Property Assessed Clean Energy (PACE) Programs.* KNN Public Finance. Retrieved from http://www.drivecms.com/uploads/sonomacountyenergy.org/Municipal%20Resources/Document%20Library/Feasibility%20Studies/FeasibilityAnalysis_SecondStagePACEFinancings.pdf

Lacey, S. (2014, May 14). Creating Investor-Ready Efficiency. *Green Tech Media*. Retrieved from http://www.greentechmedia.com/articles/read/ensuri-investor-ready-efficiency-the-industry-cant-just-be-a-bunch-of-cowbo

Massachusetts Treasury. (2013). *Mass Green Bonds: Quarterly Investor Impact Report.* Massachusetts Treasury. Retrieved from http://www.massbondholder.com/sites/default/files/files/QE%20August%202014%20Green%20Report(1).pdf

Milford, L., Saha, D., Muro, M., Sanders, R., & Rittner, T. (2014). *Clean Energy Finance Through the Bond Market: A New Option for Progress.* Brookings-Rockefeller Project on State and Metropolitan Innovation.

Phillips, G. (2013). Distributed Lending as a Model for Energy Efficiency Financing . *ACEEE National Conference on Energy Efficiency as a Resource.* Denver: ACEEE. Retrieved from http://aceee.org/files/pdf/conferences/eer/2013/6A-phillips.pdf

Phillips, G. (2014, September 25). AESP Making Dollars and Sense of Energy Efficiency Financing.

Pitkin, J. (2014, February 14).

Pitkin, J. (2014). Green Jobs Green New York Program. *Institute for Energy Economics and Financial Analysis .* Retrieved from http://policyintegrity.org/documents/PITKINPanel7B_2014.pdf

SEE Action Financing Solutions Working Group. (2013). *Using Financing to Scale Up Energy Efficiency.* Retrieved from https://www4.eere.energy.gov/seeaction/system/files/documents/financing_workplan_recommendations.pdf

SEE Action Financing Solutions Working Group. (2014). Financing Energy Improvements on Utility Bills: Market Updates and Key Program Design Considerations for Policymakers and Administrators. SEE Action.

SIFMA. (2014, October 6). *Statistics*. Retrieved from http://www.sifma.org/research/statistics.aspx

Smithwood, B., & Hodum, R. (2013). *Power Factor: Institutional Investors' Policy Priorities Can Bring Energy Efficiency to Scale.* Ceres. Retrieved from http://www.ceres.org/resources/reports/power-factor-institutional-investors2019-policy-priorities-can-bring-energy-efficiency-to-scale

State of Connecticut. (2014, October 6). *Connecticut Statewide Energy Efficiency Dashboard*. Retrieved from http://www.ctenergydashboard.com/Public/PublicRESLoanFinancing.aspx

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

Appendix A. Selling an Energy Efficiency Loan Portfolio in Oregon: Resale of the Craft 3 Loan Portfolio to Self-Help Credit Union

Under the Clean Energy Works (CEW) program, Craft3 developed a loan product that widened access to financing for homeowners, offered long-term funding, and collected repayments through the customer's utility bill. The program's success led Craft3 to pursue the sale of the loan portfolio to both mitigate its own risks and replenish funds for lending. This sale breaks new ground for energy efficiency finance and is notable as it was completed even with many novel program design elements. It replenished Craft3's program capital and uncovered some valuable lessons that may facilitate future transactions. However, the lack of data history and the unproven nature of the loan portfolio meant that Craft3 had to limit the risk of losses to Self-Help, the purchaser of the portfolio. It remains to be seen whether this experience will pave the way for more sales of on-bill energy efficiency loan portfolios. This case study illustrates how certain program design decisions can sometimes both facilitate programmatic objectives and possibly present challenges for the sale of a portfolio of energy efficiency loans.

Creating a Portfolio of Energy Efficiency Loans

Craft3 started lending in partnership with the Clean Energy Works (CEW) program in 2009, and by December 2013 had amassed a portfolio of approximately $21.3 million in loan assets. The loans were made to owner-occupied single-family homes for energy efficiency upgrades that met the CEW program requirements. The loans are collected through the homeowners' utility bill and secured with a subordinate mortgage lien on the property or a UCC 1-A filing on the improvements.[1] Loans in the portfolio vary in term and size, but Craft3 originally established a cap of $30,000 over a maximum of 20 years.[2] The program aims to expand access to capital, and therefore is open to customers with FICO scores as low as 590 who may not be able to obtain attractive financing elsewhere.[3]

KEY PLAYERS

Renewable Funding is a privately-owned finance company that focuses on finance and program design for building retrofits. Along with operating the WHEEL program, they also operate PACE, secured loans, and On-Bill Programs.

Pennsylvania Treasury is responsible for administering over $120 billion of public funds. They also operate some finance policy initiatives that benefit Pennsylvania residents (e.g., the Keystone HELP energy efficiency loan program).

Energy Programs Consortium includes a number of national associations that seek to coordinate state and federal energy policy and program development.

The on-bill repayment feature of the program is primarily used as a collection mechanism, as there is no threat of utility service termination should borrowers fail to make debt service payments.[4] Interest rates for the program are low (5.99%) despite the low credit thresholds and the long funding terms (e.g., consumer financing is rarely offered beyond 10-year terms without a first lien on a property). The program is supported by a loan loss reserve funded primarily with an American Recovery and Reinvestment Act (ARRA) grant received by the City of Portland through the Department of Energy's Better Buildings Neighborhood Program, which covers Craft3 for losses of up to 10% of its on-bill loan portfolio.[5]

[1] The loan is collected by the utility that provides the home's primary fuel used for space heating and cooling.

[2] Since March 2014, new loans have been restricted to 15-year terms and are only secured against the UCC 1-A filing on the improvements.

[3] The program uses a combination of traditional and innovative underwriting methods. A traditional credit score check is performed and utility repayment history is examined. For more information see the previous Clean Energy Policy Brief *Alternative Underwriting Criteria – Using Utility Bill Payment History as a Proxy for Credit: Case Study on Clean Energy Works Oregon*, LINK.

[4] When a loan becomes 90 days delinquent, the utility removes the loan from the bill and Craft3 is responsible for any future collections on that loan.

[5] The 10% loan loss reserve is funded from several sources: ARRA funds, utility customer funds, State and City funding, foundations, and other sources.

Motivation for the Sale

Craft3 had anticipated the need to eventually sell its loan portfolio when it started to lend under the CEW program. The long terms of the loans presented a risk for the organization, as its own funding sources (which it used to make loans to program participants) were typical of a CDFI (community development financial institution) with terms between 5 to 10 years. Offering 20-year loans from funding sources with much shorter terms created a mismatch in the terms of its assets and liabilities (see sidebar). Craft3 took a calculated risk in offering these long-term loans, anticipating that it would be able to refinance its current funding when necessary or sell its portfolio of loans and use the proceeds to pay any debt service due.

THE RISK OF ASSET-LIABILITY MISMATCHES

A material mismatch of the funding terms of assets and liabilities presents a risk for a lender when its own funding sources have a shorter term than the assets (here, the on-bill loans). Simply put, Craft3 was not scheduled to be paid back by borrowers in time to repay its own debts. For a CDFI, it is unusual to obtain financing beyond a 10-year term. In order to offer the most flexible options for customers and potentially match energy savings to repayment obligations, Craft3 chose to take a risk and offer loans that had longer terms than its own funding sources. To meet the obligation of its own debt, Craft3 needed to be able to refinance its own credit facilities, sell the loan portfolio, or manage any shortfalls from its equity.

With limited available funds, Craft3 needed additional funding to meet future demand for the program and could have obtained additional funding on similar terms to its existing funds (5-10 years). However, this would have increased its exposure to the risks of mismatched assets and liabilities. For Craft3, selling the portfolio could replenish its funding for lending, ameliorate its asset liability mismatch risk, and help it establish a relationship with a longer-term capital partner. [6]

Finding a Secondary Market Partner

In early 2012, following a strong two-year period of demand for loans through the CEW program, Craft3 actively started to look for a financial institution to purchase the loan portfolio. Craft3 enlisted the help of several industry consultants to identify possible partners and quickly faced the reality that commercial banks had limited interest in purchasing the portfolio. The relatively young age of the portfolio, novel program design features, and a lack of property valuation data made the assessment of risk exposure challenging for commercial banks. [7] It became clear to Craft3 that it would need to find an organization with an aligned mission that was motivated to break new ground for energy efficiency financing, and willing to take on a considerable due diligence effort to complete this transaction.

In late 2012, Craft3 staff attended an industry conference looking to find an organization interested in purchasing the loan portfolio. They had previously had informal conversations with Self-Help about a possible sale of the loan portfolio, and discussions at the conference suggested that the timing might then be right as Self-Help was looking for opportunities to deploy capital. Self-Help found itself with additional liquidity following several acquisitions and mergers since 2008 and was also expanding its secondary markets programs. The environmental, job creation, and workforce benefits of the CEW program and Craft3's focus on making financing broadly accessible meant that a purchase of the loan portfolio provided an opportunity to deploy the available capital within the scope of Self-Help's mission. Furthermore, Self-Help was attracted by the unique opportunity to support the development of on-bill clean energy financing markets.

[6] CDFIs often raise capital from a mix of commercial banks, foundations, and public sources, typically with funding terms of less than 10 years.

[7] Novel design features included the on-bill collection mechanism and the longer term funding that was only secured by a subordinated mortgage lien. Craft3 also did not have information on the valuation of the property, nor the details of other liens on the property, which made it difficult to assess the value of the subordinated mortgage lien for potential portfolio purchasers. As such, Self-Help viewed these loans as essentially unsecured.

Self-Help is a regulated depository institution and the capital it was seeking to deploy was from its general pool of depository funds.[8] This meant that the deal had to meet the requirements of a regulated and federally insured depository institution. For Craft3, completing a transaction with a regulated depository institution provided an opportunity to: (1) understand the requirements and underwriting rigor associated with a market-rate transaction, and (2) demonstrate to other regulated entities the viability of investing in energy efficiency loans.

Structuring the Deal

Finding a motivated partner proved crucial for the ultimate success of this transaction as the deal took over a year to complete and involved significant time and staff resources from both parties. It took a significant amount of time to finalize the contractual agreements that governed the on-bill repayment mechanism because they involved multiple parties and impacted the ultimate flow of principal and interest payments.[9]

Another key challenge was the relatively short loan history for participants in the CEW program and the reality that there were few comparable loan portfolios from which to estimate likely performance. Self-Help had to find loan performance comparators from other industries to develop an expectation of loan performance for the portfolio. They used unsecured consumer loans as the comparable portfolio as they realized the limited value that subordinated mortgage liens would have in a foreclosure, and were unable to assess the potential value of the lien in the absence of property valuation data or first mortgage amounts.[10] Furthermore, Self-Help was not able to quantify any additional value of the on-bill collection mechanism from a risk standpoint. Self-Help also excluded some portions of the portfolio from the transaction to mitigate risk and meet regulatory demands.[11] Exclusions included:

- Loans from borrowers with FICO scores below 620;[12]
- Any loan that had ever been more than 60 days delinquent;[13] and
- Loans repaid on the bills of one of the collecting utilities, with which a contractual agreement had not yet been finalized.

Following these exclusions, Self-Help agreed to purchase 74% of the total value (principal balance) of the loans in the Craft3 portfolio. The purchased portfolio included 1,251 loans with a total outstanding value of $15.7 million, which was approximately the price paid for the portfolio. Most loans in the purchased portfolio had 20-year terms and ranged in size from $769 to $29,761 with an average loan size of about $12,500. Self-Help also sought protection against the risk of portfolio losses, in view of its obligations as a regulated depository institution and in light of the loans being considered essentially unsecured.

[8] A regulated depository institution is a financial institution that is legally allowed to accept monetary deposits from consumers and provides insurance on those deposits, subject to regulation. Credit Union deposits, like Self-Help's, are insured by the National Credit Union Administration (NCUA).

[9] One challenge was that the loans used a simple interest calculation and followed the utility bill payment schedule, which was very different from standard mortgage loans that accrue compound interest. Since the utilities can change the due date of payments at will because of the contractual agreements, certain loans could look delinquent even if the customer had made the payment on time. Self-Help and Craft3 have had to accommodate for these significant differences in monthly principal and interest reporting and reconciliations.

[10] Craft3 did not collect information on the property value or the amount of the first mortgage; thus, Self-Help was unable to determine loan to value (LTV) ratios of the loans. It was therefore difficult to assume that there would be value in a subordinated mortgage lien. Where the subordinated mortgage lien does add value is that the note would appear in any future title searches. Any subsequent lender would see the loan on the property and likely ensure that it is paid off before providing a new mortgage.

[11] Some of the exclusions are similar to conditions that may be seen in related secondary markets, such as mortgage investments, where Self Help has experience.

[12] This minimum credit score is still low relative to standard loan product underwriting that often features a minimum credit score of 680.

[13] One challenge encountered from the on-bill repayment process is that, due to timing differences between the Craft3 administration system and the utility reporting cycle, loans can appear delinquent when they are not. Craft3 and Self-Help have come to understand this and adjusted the purchase exclusion as necessary. Typically, secondary market transactions for home lending exclude any loans that have been 30 days delinquent in the last 12 months.

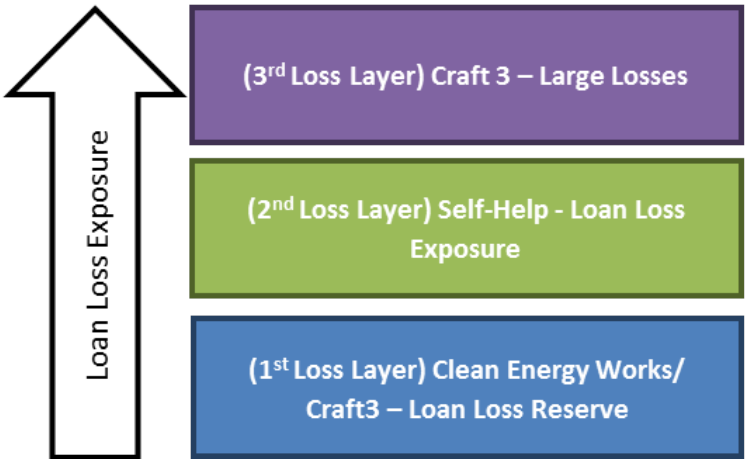


Figure A - 1: Hierarchy of Loan Risk Following the Transaction

The final transaction was structured to mitigate those risks by transferring all existing loss reserves to Self-Help and layering on several additional elements described in more detail below. In exchange, Self-Help agreed to pay approximately the face value (or "par value") of the loans.[14] Craft3 agreed to purchase back any loans that became delinquent within the first 12 months of the loan being originated, which helped mitigate any risks associated with its original underwriting and address Self-Help's concern that loans that became delinquent in this period would be more likely to default in the future.[15]

The transaction can be thought of as a hierarchy of loan loss exposure (see Figure A-1):[16]

1. Initial losses are covered by a loan loss reserve (LLR) held in a cash account by Self-Help. The reserves are comprised of the original loan loss reserve provided by CEW for the program from ARRA funds, and an additional amount provided by Craft3 to facilitate the transaction. The additional reserves consist of proceeds from the sale that were essentially held back to cover losses.[17] Together, these reserves are pledged as loss protection until Self-Help becomes comfortable that the risk of losses is sufficiently low for the funds to be released.[18]
2. Self-Help is then exposed to loan losses as owners of the portfolio. However, their losses are limited in scale by the third loss layer.
3. Craft3 has provided a full guarantee against losses that exceed a certain level (large losses) through full recourse to its balance sheet. This was provided to mitigate the risk of major shifts in performance of the portfolio arising over time from catastrophic events (e.g., a major economic downturn). It also served to mitigate a specific legislative risk identified by Self-Help: the obligation on the utilities to collect the repayments was created through state legislation and not contractually with Craft3. This lack of contractual control over the collection mechanism presented a remote, yet material, risk to Self-Help that a legislative change might alter collection payments.[19] The protection against large losses proved to be critical to enable the transaction to go ahead from Self-Help's perspective.

[14] By purchasing the portfolio at face value, or "at par", the purchase price is equal to the principal outstanding on the loans and Self-Help is scheduled to get a return equal to the interest rate on the loans. This interest rate (5.99%) is low for unsecured consumer credit. The layers of risk mitigation reduced the risk of loss to a level where Self-Help was satisfied with the balance of risk and return and agreed to purchase the portfolio "at par". Without the risk mitigation, Craft3 may have had to sell the portfolio at a discount to the "par value" to increase the scheduled return to a level typically seen for unsecured consumer credit.

[15] Repurchase clauses are common for certain other types of secondary market transactions, such as mortgage sales. Originators may be required to repurchase underperforming loans that do not meet certain representations and warranties regarding due diligence during underwriting. Typically, originators are protected from repurchase risk after a fixed period, such as 12 or 36 months.

[16] While the parties were willing to share the overall structure, they refrained from disclosing certain details of the risk mitigation structure (e.g., specific dollar amounts) due to proprietary considerations.

[17] These proceeds are held in an account at Self-Help, though they are treated as part of Craft3's balance sheet.

[18] Self-Help expects to review the status of these reserves with Craft3 approximately every two years. Craft3 and CEW have agreed independently from Self-Help that the CEW funds would be released first.

[19] In 2009, the Oregon Legislature passed HB 2626, known as the Energy Efficiency and Sustainable Technology Act (EEAST). The legislation compels investor-owned utilities (IOU) to offer On-Bill Repayment. An IOU that wants to opt out of the program needs a waiver from the Oregon Public Utilities Commission (PUC). While this risk is remote, a legislative change could alter collection payments.

Finally, Craft3 made changes to its portfolio administration to meet the requirements necessary for a regulated financial institution. Those included, but were not limited to, shortening the transition of a loan from delinquency to default status and ensuring that data collection standards were sufficient to provide reports on a monthly basis.

Conclusions

Craft3 developed an innovative financial product designed to overcome the perceived barriers to financing energy efficiency measures. It widened access to financing for homeowners, offered long-term funding, and collected repayments through the customer's utility bill. The program's loan volume led Craft3 to pursue the sale of the loan portfolio to both mitigate its own risks relating to mismatches of assets and liabilities and replenish its funds for additional lending. The successful sale breaks new ground for energy efficiency finance and is notable as it was completed with many novel program design elements. Table A-1 describes how some of the program design features impacted the transaction and may be relevant for other program administrators considering the impact of design features on their own program.

Table A - 1: Analysis of how Craft3/CEW design features impacted the transaction

On-bill collection of the loans	The on-bill repayment of the loan was a key factor in attracting Self-Help to this transaction. Self-Help was interested in assessing (and hopefully demonstrating) that on-bill loans with long-term performance data represent a low risk and can be re-sold. However, for the purposes of this transaction, Self-Help was unable to quantify any credit-enhancing benefit of the on-bill collection mechanism, and the loans were thus assessed as being unsecured loans. The complex and novel contractual framework of the on-bill repayment mechanism added additional time and due diligence costs to the transaction.
Subordinate mortgage lien	The subordinate mortgage lien provided little financial value to the portfolio purchaser, as Self-Help assumed that it was unlikely to ever be exercisable. The lack of current property value data and the amount of the first mortgage also meant that they were unable to establish loan-to-value ratios and assess the potential residual value in the case of a property foreclosure.[20] However, Self-Help would not have been able to purchase these loans without the security provided by the UCC 1-A fixture filing, which ensured that the loans would show up during a title search and therefore have to be paid or modified at the time of a refinance or property sale.
Loan loss reserve	The transfer of the existing loan loss reserve, along with additional reserves from proceeds held back, helped facilitate the sale of the loans at par value. However, the transfer also prevented Craft3 from using the existing loan loss reserve to cover additional originations until the funds are released by Self-Help.
Long-term loans	The long-term lending presented Craft3 with a risk of mismatched asset and liability terms. To Self-Help, this presented a greater risk of default as the loans may be outstanding through a number of economic cycles. Additional credit enhancements were needed to execute the transaction due to this risk. Craft3 has since modified its loan terms, offering a maximum 15-year term in order to facilitate future secondary market transactions.
Loan terms and alternative underwriting criteria	The program used a combination of traditional and innovative underwriting methods. Craft3 then provided loans at low interest rates over a long term with only a subordinated mortgage lien. These program design decisions were made to attract customers and expand the customer base in a market that has struggled to drive demand. However, Self-Help assessed the transaction as the purchase of an unsecured loan portfolio that would typically have a higher level of return. Self-Help required a significant amount of risk mitigation from Craft3 and CEW in order to purchase the portfolio at approximately par value and mitigate risks in accordance with its status as a regulated depository institution.

[20] In March 2013, Craft3 made the decision to switch from securing the loans with real property liens to UCC 1-A fixture filings, which have much fewer regulatory requirements (e.g., no need for documentation of flood insurance on the property).

Craft3's engagement with the administration systems of a regulated depository institution provided them with valuable experience and prepares them for future portfolio sales. Exposure to the data collection standards, reporting systems, documentation, and servicing platforms facilitated changes to their own processes that will make any future transactions easier. Craft3 has also started to adapt their loan product to the needs of their customers and with a view to further loan portfolio sales in the future. Subsequently, they reduced the term of their loans to a maximum 15-year term. This has, in part, been due to the strong demand for the 10-year loan product from other lenders in the marketplace. Reducing the maximum loan term allows Craft3 to make future loan portfolios more attractive for sale while still offering a financial product that overcomes financing barriers for energy efficiency. Craft3 also ceased filing subordinated mortgage liens, based in part, by their experience in this transaction.

Self-Help's experience helps prepare it for on-bill loan portfolio purchases going forward. Spending time understanding the relationship between all the actors in the on-bill mechanism and the contractual agreements that govern their roles and obligations was critical as these could impact the monthly loan payments or a workout situation in some way. Finding a mission-oriented counterparty proved critical to the success of the transaction. However, it does highlight a challenge for other program administrators as these willing counterparties may be difficult to find until the risks and long-term performance of on-bill loans are well understood by the financial community.

The details of the deal itself reflect the reality that the on-bill repayment mechanism and long-term loans not secured by a first mortgage lien are considered by many lenders to be novel assets with uncertain value. The lack of performance history data for this loan type and the unproven nature of the portfolio meant that Craft3 and CEW had to limit the risk of losses to Self-Help in order to complete the transaction. It remains to be seen whether this experience will pave the way for further sales of on-bill energy efficiency loan portfolios with a more complete transfer of loan loss exposure. Program administrators may find that they need to take significant, and potentially costly, steps to mitigate risks in these transactions until the risks and returns of energy efficiency loans with on-bill repayment are better understood by financial institutions through demonstrable performance data.

It is clear from this experience that efficiency program goals may not always overlap with the interests of prospective purchasers of loan portfolios. For example, program administrators may place value on offering long-term, on-bill unsecured loans with expanded underwriting criteria. Potential financial partners may perceive additional risk in these features, and either seek a discount in the purchase price or require the seller to mitigate the risk of losses. Some program design decisions may not fit into a "standardized" loan product that is currently well-understood by the financial market; however, it may be important for program administrators to take these risks in order to create new products that better enable the deployment of energy efficiency. In doing so, they will start to develop the performance data needed for financial institutions to properly assess the impact of these program features on the risk and performance of the loan assets. These tradeoffs need to be carefully considered as policy makers and program designers contemplate both the ability of program features to attract customers and meet program goals, and also the viability of longer-term sources of capital for efficiency financing programs.

Appendix B. Reaching the Bond Market with Energy Efficiency Loans: The Warehouse for Energy Efficiency Loans[1]

Accessing the bond market may offer energy efficiency finance programs a reliable, scalable, and low-cost source of capital. The Warehouse for Energy Efficiency Loans (WHEEL) is a public-private partnership that is working to overcome the challenges to accessing the bond market by standardizing loan features and aggregating loans across multiple states and programs. Program administrators that wish to participate in WHEEL can either align an existing program, including the loan product, to the WHEEL requirements or they can support the launch of a new program administered directly by the WHEEL partnership. In either scenario, the participating program administrator must commit to providing a credit enhancement in the form of subordinated capital. Those program administrators that are considering participation in WHEEL should evaluate whether the standardized loan products (3-, 5-, 7- or 10-year unsecured loans) meet the needs of their stakeholders. They should also evaluate alternatives that may provide sufficient scale for their needs at lower or equivalent cost. Even if alternative approaches can offer outcomes that have comparable or lower costs in the short term, program administrators and sponsors may choose to participate in the WHEEL initiative because they want to support WHEEL's long-term vision and objectives (to provide access to low cost private capital and the ability to scale to meet almost any level of demand).

Accessing the Bond Markets?

Accessing the bond market offers energy efficiency finance programs the possibility of a reliable, scalable, and low-cost source of capital. This may become important if energy efficiency finance programs grow to the point of needing large volumes of private capital to support their activities. Established credit products (e.g., home mortgages, car loans, and credit card debt) use bond markets to supply the funding capacity needed to meet demand. Banks and finance companies originate these loans and then package them as secure, low-risk debt assets (bonds) that pay a moderate return over time. This is known as securitization. Assets backed by energy efficiency loans should be well suited to the needs of large bond investors such as pension funds and insurance companies, as these loans tend to be short to intermediate in tenure, and the assets can be structured to be low-risk. By replicating the securitization model used by established credit products, a sustainable source of capital could be made available to energy efficiency programs.

However, using the bond market as a source of capital is challenging for a new and developing class of debt. Bond investors are looking for assets with well-documented performance so they can calibrate and price the riskiness of those assets. A lack of performance history for energy efficiency loans will, in itself, represent a risk to investors. Furthermore, while the financing costs (i.e., interest rates) from bond issuances may be low, the transaction costs and ongoing servicing costs of securitized loans can be high. A large volume of loan-backed assets with similar characteristics needs to be generated to ensure that those fixed costs can be spread to minimize the impact on the overall cost of capital. The Warehouse for Energy Efficiency Loans (WHEEL) is designed to provide programs with a route to the bond market by standardizing loan features, aggregating loans across multiple programs, and collecting data on loan performance. WHEEL's first securitization, which according to WHEEL administrators is anticipated in Q2 2015, will provide valuable feedback from investors and may reveal lower investor interest rate requirements than originally anticipated.

The Warehouse for Energy Efficiency Loans (WHEEL)

WHEEL has been set up to act as a loan aggregator that 'warehouses' loans until they can be securitized and sold to secondary market investors (see sidebar). The WHEEL concept can be traced back to the Pennsylvania Treasury's efforts to attract private capital to their unsecured residential energy efficiency loan program (i.e., Keystone HELP). The Pennsylvania Treasury had initially funded Keystone HELP with treasury funds supported by a

[1] This case study reflects information available as of Q4 2014. The WHEEL program is actively developing in response to program and investor reception; for the most up-to-date information, see www.renewfund.com/wheel.

loan loss reserve from the Pennsylvania Department of Environmental Protection. The low cost of treasury funds, along with the loan loss reserve, enabled the Keystone HELP program to provide inexpensive unsecured loans to their customers.

The program proved popular, with approximately $40 million of projects funded in three years. In order to continue to offer the program, the Pennsylvania Treasury decided to look for a more sustainable source of capital that could expand beyond investments of public funds. They saw loan portfolio sales as a possible opportunity to access private funds to replenish their program capital. The program achieved an initial sale of a portfolio of 4,700 loans for $31.3 million to a consortium of local banks (Fox Chase Bank, WSFS Bank, and National Penn Bank). However, in the long term, the Pennsylvania Treasury wanted a model that could be replicable and scalable and decided that accessing the bond market would meet these objectives.

Together with the National Association of State Energy Officials (NASEO) and Energy Programs Consortium, the Pennsylvania State Treasury developed the WHEEL concept as a way to recapitalize their Keystone HELP program. WHEEL would need an administrator, and in 2011 Renewable Funding, a finance company based in Oakland, California, specializing in energy efficiency financing models, took on the task of developing WHEEL. Renewable Funding worked with Citigroup Global Markets (Citi) and the Pennsylvania Treasury to structure a warehouse facility that would provide administrators of energy efficiency loan programs with the ability to leverage their funds with private capital and ultimately securitize the loans funded by the warehouse line.

LOAN AGGREGATOR/WAREHOUSE

A loan aggregator uses an available capital source such as a line of credit (a warehouse facility) to fund loans with similar characteristics and hold them temporarily in a warehouse. The purpose of the aggregator is to generate a portfolio of sufficient scale to make securitization and sale to secondary investors cost-effective. Scale is desired for several reasons:

a. Transaction costs of securitization are significant. Ratings agency, legal, and banking fees add a material cost to transactions. Spreading those costs over a larger asset pool reduces the impact on overall interest rates offered to consumers.
b. The cost of ongoing servicing of securitized assets can be material so is better spread across a large pool of assets to reduce the impact on the overall interest rates.
c. A degree of scale is needed to attract bond investors in order to minimize the administrative costs per loan of analyzing the investment and to create familiarity with the asset amongst bond investors to make trading of the assets easier.

How WHEEL Works

WHEEL is designed to enable multiple programs to participate; and the more programs that participate, the more cost effective the securitization becomes. Program administrators that wish to participate must align their program to the WHEEL requirements and commit to providing credit enhancement in the form of subordinated capital. Participating programs must offer an unsecured loan product with maximum repayment periods of ten years. This straightforward product type is required by WHEEL as it enables investors to easily and accurately assess risk and avoid uncertainty associated with novel program design features (e.g., collecting the loans on utility bills). Along with prescribed loan parameters, programs must align their underwriting processes, minimum eligibility criteria, and data collection protocols to the WHEEL requirements. Consistency is needed to enable rating agencies and investors to assess the loan portfolio and reduce the variability in expected performance.

WHEEL's standardized data collection protocols are designed to capture the information needed to establish energy efficiency loans as a stand-alone asset class. WHEEL collects loan performance data that is familiar to investors as well as two key pieces of information that identify the loan as an energy efficiency loan. First, they record the energy efficiency measures that are being funded, ensuring that they are on an approved list. Second, they check that the installation has been performed by a contractor qualified by the program. Building off the existing Keystone HELP portfolio, it has been possible to compare the performance of the WHEEL loans to other forms of consumer finance. If the loans do out-perform other consumer loans, this pattern could ultimately lead to

lower financing costs to consumers and to participating programs (in the form of reduced program credit enhancement contributions).

The investment of program funds into subordinated capital in the WHEEL funding structure represents a minority of the total WHEEL loan funding (approximately 20%). This investment is designed to be repaid to the participating program with a moderate return if the loans perform as anticipated. However, as a junior investment, it is exposed to the most risk, and any losses experienced by the portfolio will reduce the amount of program funds that are returned. The program funds act as a credit enhancement for the remaining funding in the portfolio (i.e., the senior funding), as the full value of the program contribution must be exhausted before senior lenders are affected by loan losses. [2]

Figure B-1 illustrates how WHEEL will operate over time, as summarized below:

A - Loans are originated. Programs that participate in the WHEEL platform must use lending partners that have been vetted by capital providers and Fitch Ratings. Financial partners must be vetted to ensure that both the origination and servicing are performed to the standards required for securitization. To date, program administrators in Pennsylvania and Kentucky have chosen to use AFC First as the originator and servicer. AFC First and any future lending partners are responsible for underwriting the loans, including the application of WHEEL's eligibility criteria. The lending partner will initially fund the loans before selling the loans to WHEEL. Before WHEEL purchases the loans a series of checks are performed to ensure that the eligibility criteria have been correctly applied and documentation standards are met.

B – Loans are securitized. Once the pool of loans in WHEEL has reached critical mass, Renewable Funding will securitize the loan portfolio and sell the bonds to investors. Proceeds from the sale will be used to pay off the line of credit provided by Citi and the Pennsylvania Treasury, with the bonds taking on the senior position in the funding stack.[3]

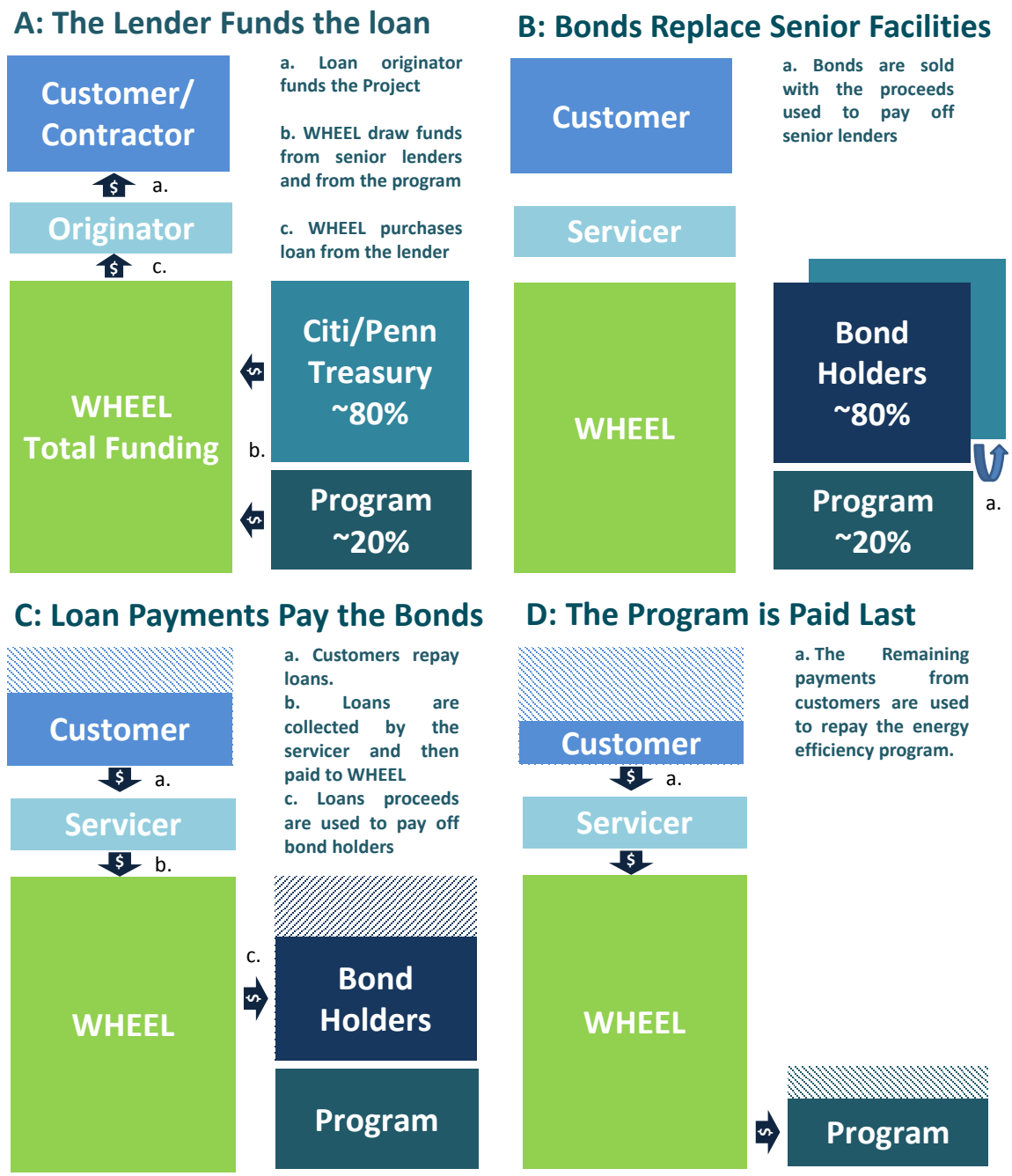
C – Loan repayments are used to pay down the bonds. The bond sale will be over-collateralized. Specifically, Renewable Funding will only sell bonds that are worth about 80% of the loan portfolio's outstanding value but will apply all of the asset repayments (after administrative costs) towards paying the bonds while the bonds are outstanding. Loan defaults would therefore have to be extraordinarily high (over 20%) for bond holders not to receive repayment. Overcollateralization is intended to help the bonds achieve a strong rating, which is expected to lower the cost of funds to WHEEL.

D – The program administrators will start to receive repayments on their investment after the bonds are paid down. The length of time that program administrator must wait before receiving repayments depends on the average loan term of the portfolio. With 10-year loans, this could be up to eight years after origination. In reality, the average term of the loans across a portfolio may be lower and many loans will repay early. As a result, Renewable Funding anticipates that programs will start to receive repayments five to six years after contributing to the portfolio.

[2] A contributing program's funds are utilized to directly support loans originated in that program's jurisdiction (i.e., losses impact the program in which they occur). If losses exceed a program's contribution of subordinate funds, then losses would impact other participants; however, this would only happen in the case of much higher than expected losses.

[3] The Pennsylvania Treasury acts as a senior lender in the warehouse line that is available to all programs, which is distinct from Pennsylvania's own subordinate program contribution.

Figure B - 1: How WHEEL works



The Cost of Participation

Energy efficiency program administrators should weigh the overall costs and benefits of participation in WHEEL. In the long term, the ability to access the bond market with its low cost of capital and large volumes of available funding may provide WHEEL with advantages compared to other primary lenders. However, in the short term, there may not be a significant cost advantage compared to alternative approaches. For example, many programs have successfully achieved significant leverage on program capital and low funding costs by providing credit

enhancements to local or mission-based lenders. These programs have not necessarily found it a challenge to meet the current levels of loan demand in efficiency finance programs.[4]

The cost difference between alternative approaches that do not rely on secondary markets and WHEEL may be particularly pronounced for the period of time before WHEEL's first securitization. Once completed, the WHEEL securitization will provide valuable feedback from secondary market investors that may allow WHEEL to modify the credit enhancing features of the program and potentially reduce costs to program participants. As of this writing, according to program administrator Renewable Funding, WHEEL's first securitization is pending and the platform has expanded to include Kentucky, Florida, Virginia, and New York. As additional states participate in WHEEL over time, it is anticipated that all participating states will benefit from reduced costs.

Despite the costs of participating in WHEEL during its early stages, states may choose to take the long view and enroll in WHEEL today with hopes of ensuring that secondary market capital will be available and well-priced in the future.

Energy efficiency financing programs typically offer attractive financial products with the hope of increasing program participation or encouraging deeper retrofits for more energy savings. WHEEL's project partners are working together to address the challenge of allowing participating programs to offer attractive financing while also providing sufficient income to sustain commercial returns for investors and a high quality servicing operation suitable for securitization. Comparable indicators suggest that commercial interest rates for unsecured financing products similar to WHEEL can be priced in the range of 12-14% or higher.[5]

In evaluating the total cost of participation, the program administrator should consider the following;

a. The amount of required investment into subordinated funding to achieve the WHEEL base interest rate.

WHEEL currently offers a base rate of 9.99%,[6] of which an estimated 4% is attributable to servicing costs. The 9.99% rate is achieved by using subordinate capital that is supplied by program administrators rather than commercially sourced. The amount of subordinated funding required from the program is calculated on a loan-by-loan basis and varies depending on the credit score of the individual customer. The minimum credit score accepted is 640. In practice, this is expected to lead to average program contributions of around 20%. At the 9.99% interest rate, program administrators can therefore achieve leverage on their program capital that enables five times the number of loans from their available program funds.[7] The trade-off for this leverage is the subordination of the funding, which will not be returned to the program administrator until the senior lenders are fully repaid (see Figure B-1). If loans perform as expected, the program funds will earn a moderate return (low single-digit risk-adjusted yield). However, this moderate rate is only a fraction of the expected returns that a commercial investor would likely require for providing funding with a similar risk exposure and therefore the subordinate investment from the program can be considered subsidized funding.

b. Additional optional interest rate buy-downs to achieve low interest rates.

Program administrators that want to further reduce the interest rate of the loans available through WHEEL are given the opportunity to buy down the interest rate. Interest rate buy-downs have been historically used by program administrators to reduce financing costs; however, they can also be relatively expensive. When a program administrator provides a buy-down, it pays the lender the additional return it

[4] For example, in Massachusetts the HEAT Loan program now sources approximately $100 million annually through a local lender network, with a cost of capital of 4.99% over seven years. However, some participating lenders have recently reported constraints on their ability to fund additional HEAT loans.

[5] Fannie Mae historically offered a similar product to states in this range, while some products offered by vendors through a clearinghouse supported by the Electric and Gas Industry Association have carried even higher rates.

[6] According to program administrator Renewable Funding, the WHEEL base rate could fall as much as 200 basis points, to 7.99%, after the first securitization, which Renewable Funding anticipates in Q2 2015. The new base rate will be announced in the second quarter of 2015.

[7] The remaining 80% of the funding is sourced initially from a line of credit from Citibank and the Pennsylvania Treasury, and ultimately, is planned to be funded by bond investors. By investing on 20%, a program administrator can achieve a leverage ratio of 5:1. For example, if WHEEL has $100 million of loans funded, approximately $20 million will have been funded by program administrators with the remaining$80 million from senior investors.

would have received at a higher market interest rate. Participants in WHEEL reported that the current buy-down methodology used in these early stages of WHEEL led to particularly high contributions on their part. They explained that the reason buy-downs are more expensive under WHEEL is that the amount needed to pay the difference between the interest rate offered by the program administrator in the EE finance program and the 9.99% interest rate over the life of the loan must be set aside in a secure and liquid account. This account earns very low returns but can be drawn upon every month to fill the gap between the program's below-market interest rate offered to customers and a market-based interest rate. By contrast, other programs typically calculate interest rate buy-downs on the assumption that the money paid to the capital provider can be reinvested and grown at the capital provider's required rate of return. Setting aside funds that earn a near-zero percent return can be substantially more expensive than paying a smaller amount that is allowed to grow. For example, on a $10,000, 10-year loan bought down from 9.99% to 5%, the difference in methodologies could translate into more than $1,000.[8] The precise difference depends somewhat on the interest rates available on highly liquid accounts; however, a substantial gap between the two approaches for calculating the cost of interest rate buy downs is still likely in most reasonable scenarios.

It should be noted however that WHEEL draws on the buy-downs over time as the funds are needed, which does potentially save money in the case of prepayments or defaults. If individual loans are repaid early or a borrower defaults, WHEEL is able to return any excess funds set aside for the buy-downs back to the program that provided them. Other programs that pay smaller buy-downs up front may eventually lose money in the case of prepayments or defaults, but some programs have implemented buy-down return agreements in the case of prepayments or other solutions that avoid this problem.

The total amount of funding that must be provided by program administrators for each loan may be relatively high once you consider the contribution to subordinated funding and the addition of an optional interest rate buy down. For example a program wishing to provide a 5% loan product through WHEEL could end up contributing around 50% of the value of the loan when interest rate buy-down and subordinate capital contributions are totaled. In this case, the initial leverage of program funds would only be 2:1.[9] The level of program contribution may seem high; however, it reflects the reality of using large-scale commercial capital for long-term unsecured lending products, particularly at this early stage of development. In some cases, these high program contributions may limit a program administrator's ability to originate new loans. For example, in July 2014 Pennsylvania stopped originating loans destined for warehousing in WHEEL, citing limits on funding available for subordinate capital contributions.[10]

Alternatives that offer more competitive funding may ultimately be limited in the long run if energy efficiency investments begin to approach their full potential. Furthermore, Renewable Funding anticipates that the program's design will be modified over time as opportunities arise to optimize benefits to participants, and that the costs of participating in WHEEL, and using commercial capital generally as a source for energy efficiency investments, will come down over time as it begins to play a more significant role in funding efficiency projects.

Fitting Program Goals into WHEEL

Beyond the financial cost of participation, program administrators that are considering participating in WHEEL should assess their ability to meet program objectives using the WHEEL financial product. Traditionally, program administrators will analyze market barriers and needs, establish program objectives, and then design a program with the tools and funding that they have available. Table B-1 presents some of the important program design considerations that program administrators should bear in mind when evaluating WHEEL as a financing option.

[8] The buy-down cost using the program rate would be just under $2,000, or almost 20% of the loan principal, whereas the cost using a near-zero rate would exceed $3,000, or 30% of the loan principal.

[9] In this case the program would be required to provide around 20% of the value of the loan as subordinated funding, with interest rate buy-downs being approximately 30% of the value of the loan. While the subordinated capital will be recovered and can be recycled, funds used to provide interest rate buy downs will not.

[10] States will have different limitations and opportunities given their particular circumstances, which may vary year to year.

Table B - 1: Program design considerations for participation in WHEEL

Program Feature	Program Design Considerations
Interest rate	A low interest rate is often considered key for programs seeking to encourage deep retrofits or high program participation. The relatively high WHEEL interest rate (currently 9.99%) reflects the use of unsecured market rate capital sourced from large-scale commercial investors. Reducing the interest rate to a low level may prove costly for programs, at least in the short term. If program administrators want to encourage comprehensive retrofits, they may consider offering different funding terms depending on how deep the retrofits are. For example, they could offer interest rate buy-downs for projects with multiple measures that achieve a minimum savings threshold (e.g., 10-20%). They could also tier the funding rate (with buy-downs) depending on the anticipated energy savings.
Maximum Loan Term	One popular program design for energy efficiency loan program administrators is to extend the tenure of the loans to ensure that the impact of the loan is bill neutral—that is, the total cost of the loan payment and future energy bill payment in a given period does not exceed the previous energy bill payment for a period of the same length.[11] The WHEEL loan is limited to 10 years in tenure and therefore, in many cases, bill neutrality may not be achieved. However, the WHEEL loan term is long for unsecured consumer lending, and attempting to extend terms out to greater lengths could impact the potential to securitize the loans, as well as the cost of funding available.[12] Program administrators that would prefer to offer longer loan terms to achieve bill neutrality might consider using alternative program designs with some form of security, a very robust credit enhancement, or a more flexible capital source.[13]
Unsecured vs. Secured Lending	The WHEEL initiative uses unsecured lending, which is typically the most expensive form of lending. Energy efficiency finance programs could obtain lower lending costs by using secured lending products that have lower risks for lenders. One tradeoff with secured financing programs is that some customers are unwilling or unable to provide security, so the reach of the financial product may be limited. Obtaining the form of security from the customer can also add processing time and potentially dampen demand.
Eligibility Criteria	WHEEL is able to provide loans to customers with FICO scores as low as 640. Program administrators that want to serve participants with lower credit scores will have to contribute a larger amount of subordinate capital to the loan pool, reducing program leverage. The reality is that program administrators are unlikely to be able to offer loans to customers with FICO scores much below 640 without using public or ratepayer funding or charging higher rates to cover the additional risks. Some programs attempt to widen access to finance through the use of alternative underwriting criteria (e.g., historical utility bill payment history). These alternatives may have success in widening origination. However, it is unclear whether commercial capital would be willing to accept these alternative approaches without charging a premium.

Designing a program will always require trade-offs. WHEEL may be well suited for program administrators with a goal of accessing commercial and sustainable sources of capital that are able to scale as demand for efficiency grows. Program administrators that are focused primarily on providing low-cost loans to help build customer demand or on addressing specific market gaps may want to assess the pros and cons of participating in WHEEL in the context of a broad range of available options.

[12] See www.keystonehelp.com for more detail and updated information on availability of WHEEL loans in Pennsylvania.
[12] See www.keystonehelp.com for more detail and updated information on availability of WHEEL loans in Pennsylvania.
[13] It has yet to be demonstrated that longer funding terms do result in increased participation or deeper retrofits.

Conclusions

WHEEL creates an opportunity for energy efficiency program administrators to leverage program funding and ultimately access the bond market. It is not the only route that program administrators can use to access private capital. For example, as an alternative, energy efficiency program administrators can establish a loan loss reserve that can be used by local lenders (e.g., Michigan Saves, Connecticut Green Bank). Program administrators also have used the credit standing of public bodies to raise low cost capital.

WHEEL differs from these models in its potential to scale to almost any size on the basis of project revenue streams. It is not limited by the carrying capacity of primary lenders' balance sheets or by fiscal and policy constraints that may restrict general obligation bonds or other types of guaranteed securities. As such, it may be a first step in identifying a long-term solution to the potential capital supply constraints that may arise as demand for energy efficiency products and services grows. By securing secondary market capital from institutional investors, it may also provide one of the least expensive available private capital sources once it has matured. However, these potential advantages come with trade-offs in the short-term. The effort to securitize loans dictates that participating program administrators will have less leeway to develop financial products tailored to the needs of their customer base, and that costs of participation may, at least initially, be higher than alternatives.

WHEEL has successfully signed up programs in Pennsylvania and Kentucky, and, according to Renewable Funding as of this writing, at least four additional state programs will join in 2015. The addition of new participants would allow WHEEL to spread transaction and administrative costs more thinly, and the results of WHEEL's securitization, anticipated in Q2 of 2015, will potentially lower costs to consumers or to future program participants. Once completed, WHEEL's securitization will break new ground, as the first issuance of rated bonds backed solely by unsecured energy efficiency loan assets.

As WHEEL recruits additional programs and completes multiple securitizations, the costs of participation will likely come down over time. These cost savings could come from two sources: reduced administration and servicing costs, and lower required investor yields. Currently, the overall administration and servicing costs account for up to 4% of the interest rate. High volumes will allow WHEEL to operate more efficiently and spread these costs over a larger loan pool. Loan and securitized asset performance data may also demonstrate that energy efficiency investments bear lower risks than comparable consumer lending products, ultimately leading to lower funding costs that can be passed on to program administrators and participating customers.

Program administrators that are considering participating in WHEEL in its early stages should evaluate whether the WHEEL loan product is able to meet the needs of their customers as well as objectives of their state's policymakers and regulators. They should also assess alternatives that may provide sufficient scale at a lower cost.

Appendix C. Credit Enhancement Options for Asset-Backed Securitizations

Credit Features of an Asset-Backed Securitization

In this appendix, we describe internal and external credit enhancement options that are often required (or requested) by investors as part of an asset-backed securitization.

Internal Credit Enhancement

Certain types of credit enhancement in a securitization structure, such as subordination, overcollateralization, and excess spread, are considered "internal." These credit enhancements relate to the structuring of the transaction but do not involve layering on of an outside credit enhancement source like a reserve account or guarantee.

Subordination

In a securitization transaction, cash flows are divided and sold in layers called tranches. Each tranche has its own credit rating and is associated with a different level of risk and return. Different types of investors invest in these different tranches. Investors in the senior tranches are protected from losses by the tranches below them, which are the first to absorb losses. Loss protection for senior investors through subordination of additional tranches is a key form of credit enhancement in any securitization. In established markets, subordinated investors typically demand higher returns, given their increased exposure to risk. In an energy efficiency context, the program often plays the role of the subordinated investor, and the return received may be well below the market rate in order to increase the amount that can be transferred to senior investors. The Connecticut commercial PACE (property-assessed clean energy) sale and the WHEEL structure represent examples in which the programs act as subordinate capital providers.

OVERCOLLATERALIZATION AND SUBORDINATION

Overcollateralization and subordination typically play related roles in a single securitization structure. For example, if a sale is 10% overcollateralized, bonds equivalent to only 90% of the total underlying pool of loans will be offered. The seller or a third-party equity holder may provide 10% subordinate capital to achieve the overcollateralization.

Overcollateralization

Overcollateralization involves offering debt to investors in an amount that is less than the value of the cash flows of the underlying loans. This strategy ensures investors that the income received will be sufficient to cover the amount that they are owed, even if there are losses. The amount of overcollateralization will vary. For example, the WHEEL program features a 20% overcollateralization, while the HERO PACE sale was only 3% overcollateralized and Connecticut's PACE bonds were 4% overcollateralized. These differences may be due in part to the difference in the strength of security on the underlying loans. The loans in the WHEEL structure are unsecured while PACE loans are highly secured through a senior tax lien. Investors may be more concerned about losses on unsecured loans and demand additional credit enhancement, which can be provided in part through overcollateralization.

Excess Spread

Excess spread is an additional form of internal credit enhancement and represents the amount of interest income left over after senior investors and administrative expenses are paid. This amount can be diverted into a cash reserve account to cover future losses or simply diverted to senior investors after it is received in order to make the investors whole. Excess spread that is used for these purposes is typically diverted away from payments to the most junior subordinated investors, which in an energy efficiency context may be the sponsoring program.

Reserve Account

Reserve accounts are a related form of credit enhancement that may be created to cover the risk of losses and may be funded with an up-front set-aside from the loan originator or from an external source. Externally funded reserve accounts are sometimes referred to as cash collateral accounts.

External Credit Enhancement

Credit enhancements that are funded from outside sources, such as cash reserves and guarantees, can be layered onto a securitization to further protect senior investors and are referred to as external credit enhancements. In a securitization transaction, externally funded cash reserves may represent a cost to the seller if the funds are used to protect senior investors from losses on existing loans rather than to cover losses of newly originated loans. While examples like this have not yet occurred in energy efficiency asset-backed securitizations, sellers such as Craft3 and NYSERDA have both pledged over externally funded reserve accounts in other types of secondary market transactions.[1]

Guarantees are one of the more common forms of external credit enhancement in the secondary market; Fannie Mae and Freddie Mac are the best known guarantors in the broader secondary market and provide guarantees on mortgage-backed securities. Guarantees have also been used in the energy efficiency loan context. For example, in the NYSERDA securitization, a separate state agency with a very strong credit rating provided a guarantee to investors that they would be paid regardless of the performance of NYSERDA's underlying loans.[2]

A number of other forms of external credit enhancement are possible and may be implemented in future securitizations of energy efficiency loans, such as insurance or letters of credit from a bank that can be used to reimburse investors in the case of any shortfalls.

[1] In NYSERDA's case, the external reserve account (funded by a federal Better Buildings grant) was actually pledged to the guarantor to cover any guarantee payouts, rather than directly to the investors.

[2] Unlike a cash reserve account, the guarantee to investors did not represent a direct cost to NYSERDA as it came from a state agency partner. However, the amount of collateral pledged by NYSERDA to the partner agency in order to obtain the guarantee was significant.