# A REVIEW OF ENERGY EFFICIENCY FINANCING IN RHODE ISLAND: MEMO ON FINDINGS

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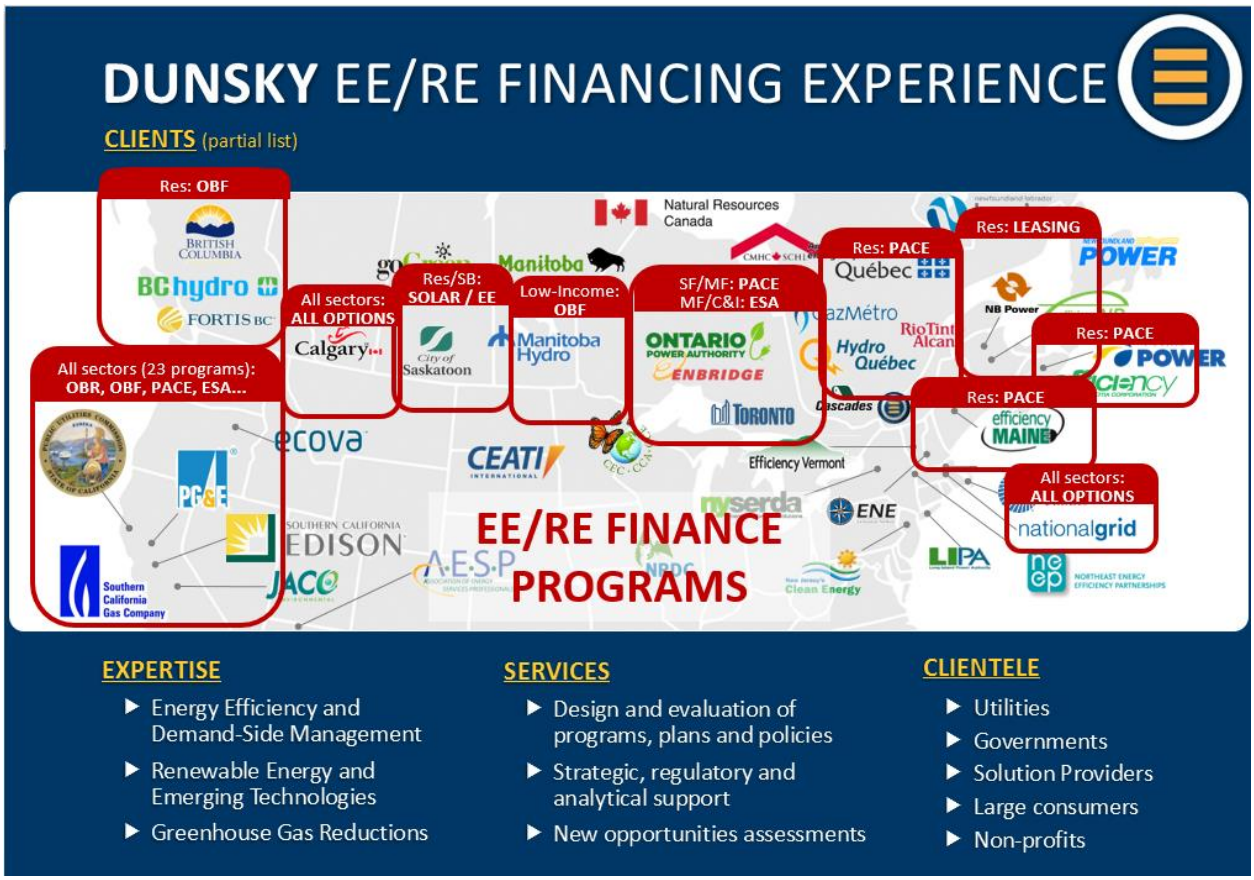
## ABOUT DUNSKY ENERGY CONSULTING

Dunsky Energy Consulting is a Montreal-based firm specialized in the design, analysis and implementation of energy efficiency and renewable energy programs and policies. Our clients include leading utilities, government agencies, private firms and non-profit organizations throughout Canada and the U.S. To learn more, please visit us at www.dunsky.ca.




## ACKNOWLEDGEMENTS

In preparing this report, we benefitted from the collaboration, insights and experience of the EERMC's Financing Stakeholder Committee. We are also thankful for the insights gained from our discussions with the staff and representatives of nearly a dozen other organizations, including The Office of Energy Resources, Commerce RI, and National Grid; and a variety of other stakeholders.

We remain solely responsible for any errors or omissions in this report.

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## GLOSSARY OF ACNRONYMS USED IN THIS REPORT

PACE – Property Assessed Clean Energy

OER – Office or Energy resources

EE – Energy Efficiency

RE – Renewable Energy

EERMC - Energy Efficiency and Resource Management Council

CGF – Capital Good Fund

OBF – On-Bill Financing

OBR – On-Bill Repayment

ERLF - Energy Revolving Loan Fund

SBC - Systems Benefit Charges

RGGI- Regional Greenhouse Gas Initiative

ARRA - American Recovery and Reinvestment Act

SF – Single Family

MF – Multi-Family

LCI – Large Commercial and Industrial

SB – Small Business

# INTRODUCTION

Dunsky Energy Consulting was engaged by the EERMC to study the current use of energy efficiency (EE) financing in Rhode Island, and to provide a high-level indication of where altering or expanding existing programs, or the addition of new programs, would increase the impact the EE financing.

The study sought to assist the Office of Energy Resources (OER) Financing Committee by achieving the following objectives:

- Define the purpose of an expanded focus on financing
- Clarify terminology related to financing
- Review how Rhode Island currently uses financing
- Learn what other jurisdictions have done regarding financing
- Discuss which financing methods make sense for Rhode Island
- Understanding the benefits and costs of financing
- Specifying how Rhode Island would smooth the way for expanded use of financing:
- Exploring wider financing opportunities:

The study involved two core activities: research into Rhode Island's financing programs through a review of published documentation and interviews with key stakeholders (program administrators, lenders and participants), as well as a series of four workshop discussions with the OER Financing Committee to guide the study and provide feedback on the findings.

During the study kick-off meeting with the Financing Committee, the following goals were established for the study:

- Maximizing cost-effective energy savings is a priority for Rhode Island, along with making connections to environmental and economic goals where impacts can be demonstrated:
    - Consider how to promote energy efficiency (EE) within the economy, without relying entirely on ratepayer monies (i.e. system benefit charges (SBC))
    - Distribute the investment of SBCs and increase the opportunities for cost effective savings across the economy and customer classes in an equitable and representative fashion.
- Financing should help reach all customer classes and facilitate the implementation of projects of greater scale, achieving deeper savings than is possible under incentives alone:
    - Support the shift in the economy toward cost effective EE savings
    - Build on EE investment opportunities in a maturing EE market: explore what is already being done well, and what can be more readily accessed through financing.

## CURRENT USE OF EE FINANCING IN RHODE ISLAND

Energy Efficiency (EE) financing has been offered in Rhode Island since the early 1990s, when National Grid's commercial On-Bill Financing (OBF) program was established. In 2011, the HEAT Loan was introduced in Rhode Island, extending financing to home owners through zero percent (0%) interest unsecured loans. Commerce RI also offers financing to help Rhode Island enterprises invest in EE upgrades of their facilities through the Energy Revolving Loan Fund (ERLF), although this program is focused more toward economic development than verified energy savings. In 2013, the state passed enabling legislation for a residential Property Assessed Clean Energy (PACE) program, which will further expand the financing options for homeowners, extending financing terms to up to 20 years.

These programs are supported through three sources of funds:

- Ratepayer money collected as part of the systems benefit charges (SBC) applied to electricity and natural gas utility bills within the state;
- Regional Greenhouse Gas Initiative (RGGI) funds, managed by the OER; and,
- Remaining American Recovery and Reinvestment Act (ARRA) funds, which are used for the ERLF and will be used to support the PACE program's loan loss reserve.

The table on the following page outlines the features of each EE and renewable energy (RE) financing program currently offered in Rhode Island, excluding privately offered financial products. In summary Rhode Island currently offers short to medium term, unsecured, zero percent (0%) interest loans into the residential, small business (SB), and large commercial and industrial (LCI), and municipal sectors. These loans are generally coupled with generous incentives, which cover as much as seventy percent (70%) of the total cost for commercial customers. Residential financing is delivered through third-party lenders who participate in the ratepayer supported HEAT Loan program, and similarly a third-party lender is being sought to provide the upcoming PACE program capital and administer the financing. For the commercial OBF programs, the capital is sourced from revolving funds established by National Grid using ratepayer funds.

While most market sectors are sectors are covered, Rhode Island's current EE financing offers appear to be limited in two important ways:

1. There are currently no long-term (10 years and longer) EE financing options of the type that can drive comprehensive EE retrofits. The forthcoming PACE program will provide long term financing in the residential market, but no option is yet slated for the commercial market.
2. The commercial sector financing programs are dependent on program funds derived from SBC and RGGI which may limit their capacity to deliver more or larger loans, as well as longer term financing.

The following sections will seek to highlight trends and process barriers that indicate where potential opportunities may lie to expand and increase the effectiveness of the state's EE financing offers.

**Table 1: Current Financing Programs in Rhode Island**

| Program | Sector | Administration | Financing Conditions | Complementary Program | Barriers Addressed | Performance |
|---|---|---|---|---|---|---|
| **HEAT Loan Program** | Residential<br>(Est. 2011) | National Grid with local banks and credit unions.<br>SBC Funds | 0% financing (bought down from 5%)<br>Up to 7 years<br>$2,000 minimum<br>$25,000 maximum | **Energy Wise**:<br>RISE administered audits and recommendations;<br>**NGrid HVAC programs**:<br>Prescriptive incentives | Affordable loans<br>First Cost<br>EE opportunities analysis | Since 2011: $13M<br>2,092 loans<br>Average: $6,600 |
| **Capital Good Fund (CGF)** (DoubleGreen® Weatherization Loan) | Moderate to Middle Income | National Grid with CGF - a community development financial institution (CDFI)<br>SBC Funds | 0% financing (bought down from 10%)<br>2-7 years<br>$10,000 maximum | **Energy Wise:**<br>RISE administered audits and recommendations**;**<br>**NGrid HVAC programs**:<br>Prescriptive incentives | Access to credit<br>Low credit scores<br>Access to needed HVAC and weatherization improvements | 31 loans by late 2014<br>$110,000 total<br>$3,500 average |
| **PACE Program** | Residential | Office of Energy Resources<br>ARRA funds | Secondary to Mortgage<br>Up to 20 years<br>Loan loss reserve | **Energy Wise:**<br>RISE administered audits and recommendations;<br>**NGrid HVAC programs:**<br>Prescriptive incentives<br>Commerce RI: Renewable Energy Fund | First cost barrier – especially solar<br>Secures loans through secondary lien and LLR. | N/A |
| **OBF** | Small Business<br>(<200kW) | National Grid<br>RGGI + SBC Funds | 0% financing<br>12-24 months<br>15% discount for immediate payment | SB EE Retrofit Program<br>Up to 70% incentives<br>(Direct install optional) | Lack of cash on hand<br>Administrative hassles<br>Affordability | 5,700 loans per year<br>$2,700 average<br>1.1% default rate<br>13.5% delinquency |
| **OBF** | LCI<br>(>200 kW) | National Grid<br>RGGI + SBC Funds | 0% Financing<br>12-24 months | Commercial Retrofit<br>Up to 70% incentives, typically on the order of 50% | Administrative hassles<br>Affordability | 664 loans totaling<br>$23M to date<br>$36,000 average |
| **ERLF** | C&I<br>(Est 2014) | Commerce RI<br>ARRA funds | 1%-3% interest<br>5-10 years<br>$500K maximum | NGrid commercial incentive programs | Access to capital | $2.1M in fund, but no applications as of Sept. 2014 |

## AVAILABLE DATA ON PROGRAM PERFORMANCE

A review of available program data from evaluation studies and other public sources was performed to identify indicators of Rhode Island's current financing program impacts. This was used to supplement performance data and information obtained from program administrators at National Grid and the OER.

Overall there was limited data available in publicly available reports regarding the specific performance of the EE financing programs or the incentive programs that they are associated with. Moreover, the financing program administrators contacted were only able to provide a portion of the information requested by during the study.[1] An overview of the program performance data that was made available is presented below.

### COMMERCIAL SECTOR FREE-RIDERSHIP STUDIES

Two commercial sector free-ridership studies have been produced[2] as part of National Grid's EE program evaluation cycle. The 2013 study posed questions specific to free-ridership in the OBF programs and the results are valuable to understanding the portion of OBF participants would not have carried out the EE improvements in the absence of the program.

**Table 2: Commercial EE Incentive Program Free-Ridership Rates by Utility Service**

| | Natural Gas | | Electric | |
|---|---|---|---|---|
| | **2011 Study** | **2013 Study** | **2011 Study** | **2013 Study** |
| **Small Business** | N/A | 3.4% | 2.7% | 10.2% |
| **C&I retrofit** | 15.9% | 22.4% | 15.1% | 19.1% |
| **Total (all programs)** | 14.6% | 23.2% | 15.3% | 18.1% |

In addition to the overall incentive program results in the above table, the 2013 report states that about one-quarter of customers received interest-free financing from National Grid that allowed them to pay for their portion of the project cost over time. Of these it was found that thirty percent (30%) of

[1] Reasons for partial provision of requested program performance results were not disclosed.

[2] Sources: 2011 Commercial and Industrial Programs Free-ridership and Spillover Study Final Report (Tetra Tech, 2012) and 2013 Commercial and Industrial Programs Free-ridership and Spillover Study Final Report (Tetra Tech, 2014)

respondents who received financing would have performed the work even if the financing had not been available. This is close to results seen for evaluations of the California OBF programs, which similarly offers 0% interest financing on top of generous incentives, where nearly three-quarters of those surveyed (72%) would not have been able to proceed with an energy-efficiency project were OBF not available.[3]

However, this report did not differentiate between the impact of financing and rebates, and did not publish results with a breakdown of respondents between LCI and small businesses. Moreover, during interviews performed as part of our research, two LCI customer contacts provided by National Grid indicated that 24 month loans did not influence their decision-making on EE improvements as the term matched their 2-year internal hurdle rates for investments. This could indicate the free-ridership rate is very high among the LCI customers, and lower among SB customers, but given the limited detail available in the 2013 free-ridership evaluation report it is difficult to confirm this conclusion.

## ENERGYWISE PROGRAM IMPACT EVALUATION STUDIES

The EnergyWise program includes a range of weatherization and EE upgrade measures. As part of the program, participants must agree to have an energy audit performed by RISE Engineering, the results of which then determine the EnergyWise and HVAC measures that are eligible for an incentive. EnergyWise is also the entry point for the HEAT loan program, and so tracking participation changes during the period the HEAT Loans have been offer may indicate HEAT's impact to drive new EE projects.

**Table 3: Energy*Wise* Residential Program Impact Evaluation Results**

| | 2008 | | | | 2010- + Q1,2 2011 | | | |
|---|---|---|---|---|---|---|---|---|
| | **Electricity (n)** | **Savings (kWh)** | **Natural Gas (n)** | **Saving (therms)** | **Electricity (n)** | **Savings (kWh)** | **Natural Gas (n)** | **Saving (therms)** |
| **Single Family** | 2,250 | 351* | 512 | 58 | 2,581 | 508 | 646 | 151 |
| **Multi-Family** | 207 | 4,526 | 11 | 130,263 | n/a | n/a | 27 | 48,824 (2010) |

* Weighted average E heat and NG heat

[3] California 2010-2012 On-Bill Financing Process Evaluation and Market Assessment (Cadmus 2012)

Two recent impact evaluations of the Energy*Wise* residential retrofit programs were available, the first covering 2008 and the second covering 2010 along with the first two quarters of 2011[4]. These give an indication of the average savings and participation rates among residential customers during those periods. However, the periods covered are prior to the establishment of the HEAT loan program, so it was not possible to determine the impact HEAT loans may have had on Energy*Wise* participation or the achieved savings per project. Moreover, these evaluation results may not include the impact of HVAC measures installed after the EnergyWise energy audit so the overall savings per project may not reflect the savings achieved by the HEAT Loansupported projects.

## NATIONAL GRID OBF REVOLVING FUND UTILIZATION DATA

Balance sheets for National Grid's revolving funds for commercial sector OBF programs are available in the 2014 and 2015 Energy Efficiency Plans. Moreover, National Grid provided annual loan volume data for the 2010 to 2014 period for this research (see appendix).

**Table 4: National Grid OBF Revolving Loan Fund Balances and Utilization Rates**

| | | LCI Funds | SB Funds |
|---|---|---|---|
| **End of 2013** | Fund balance ($ ,000) | 8,980 | 4,159 |
| | Unallocated ($ ,000) | 2,676 | 1,586 |
| | **Unallocated (%)** | **30%** | **38%** |
| **End of 2014** | Fund balance ($ ,000) | 13,980 | 4,159 |
| | Unallocated ($ ,000) | 7,794 | 2,452 |
| | **Unallocated (%)** | **55%** | **58%** |
| **2010-2014** | **Average Annual Loan Volume ($ ,000)** | **2,619** (4,121 in 2014) | **1,207** (1,330 in 2014) |

The available data suggests that Nation Grid carries a significant balance of unallocated funds in the OBF revolving funds. Through communication with National Grid staff it was indicated that this is ensure adequate liquidity to cover new loans in the early part of the following period. However, while the loan volumes are increasing in the LCI program over the period examined, reaching over $4M per year by 2014,

[4] EnergyWise 2008 Program Evaluation (Cadmus 2010) and Impact Evaluation for Impact Evaluation for Rhode Island Multifamily Rhode Island Multifamily Gas Program EnergyWise Gas Program EnergyWise (Program Year 2010) (Cadmus 2011)

both the LCI and SB revolving funds appear to have ended 2014 with an unallocated reserve significantly greater than the entire 2015 expected loan volume. This unallocated surplus would be expected to grow as repayments on outstanding loans are made throughout 2015. Regardless, National Grid has continued to add additional ratepayer money to the revolving funds in each of the past two years.[5]

It is noteworthy that the Revolving Loan Fund balance data is only available in the two most recent of National Grid's plans, and the reporting table format differs between the two years, limiting the reader's ability to track the revolving fund's year-over-year balance. Moreover, reporting does not include key metrics such as default rates and information on the types of measures most commonly included within the financing.

## COMMERCIAL LOAN REVOLVING FUND POTENTIAL FOR LONGER TERM LENDING

While the OBF revolving funds currently maintain significant end of year surpluses, extending the term lengths from 24 months to 5 years or longer could impact the funds' ability to supply the programs' capital needs. Indeed, starting in 2015 the LCI program will offer 5 year lending terms to customers, although it remains to be seen what portion of OBF loans will be for that term length.

Increased loan terms increase the revolving funds' capital needs in two ways:

1. By tying up the funds' capital in the loans for a longer period
2. By encouraging participants to take larger loans, as additional measures with longer pay-backs would achieve positive cash flow returns

The current revolving funds were analyzed to determine the impact that longer lending terms would have on the fund liquidity and balances. In Figure 1 below an annual loan volume of $3.5M for the LCI fund, and $2M for the SB fund was assumed, based on the average new loan volumes in 2012 and 2013. It was also assumed that all outstanding loans at the start of 2015 would be repaid over the first 2 years, and that subsequent loans would all be at the maximum term length (2, 5, and 8 years). A 2% default rate was applied to account for losses. In Figure 2 the funds were modeled under the same conditions, except that the annual loan volumes were increased 50% for the 5 year term, and 100% for the 8 year term to account for larger projects.

**2-5 year financing can be supported by the existing revolving funds**

The analysis indicates that the current fund balances are sufficient to support the existing 24 month term lengths in both funds, and that the LCI OBF fund should be able to support 5-year lending assuming that the average loan size does not increase. Given that even with increased loan sizes the 5 year lending

[5] In 2014 NG added $1M to the C&I Fund and in 2015 a further $4.5M will be added ($4M to finance electric measures, and $0.5M for natural gas measures)

balances for both the LCI and SB fund level out around a $5M deficit, it is possible that both OBF funds may be able to support 5-year lending provided they receive a moderate injection of additional funds.

**8 year financing (and longer) likely cannot be supported by the revolving funds**

For longer term lending to 8 years however, the fund balances are exhausted much faster and go much deeper into deficit, especially if larger loans are considered. Given that the resulting deficits may exceed the current total fund value, it is unlikely that the current OBF program and revolving fund model would be able to support financing of terms approaching and exceeding 8 years.

**Figure 1: Revolving Fund Balances for SB and LCI Assuming Constant Loan Volume**

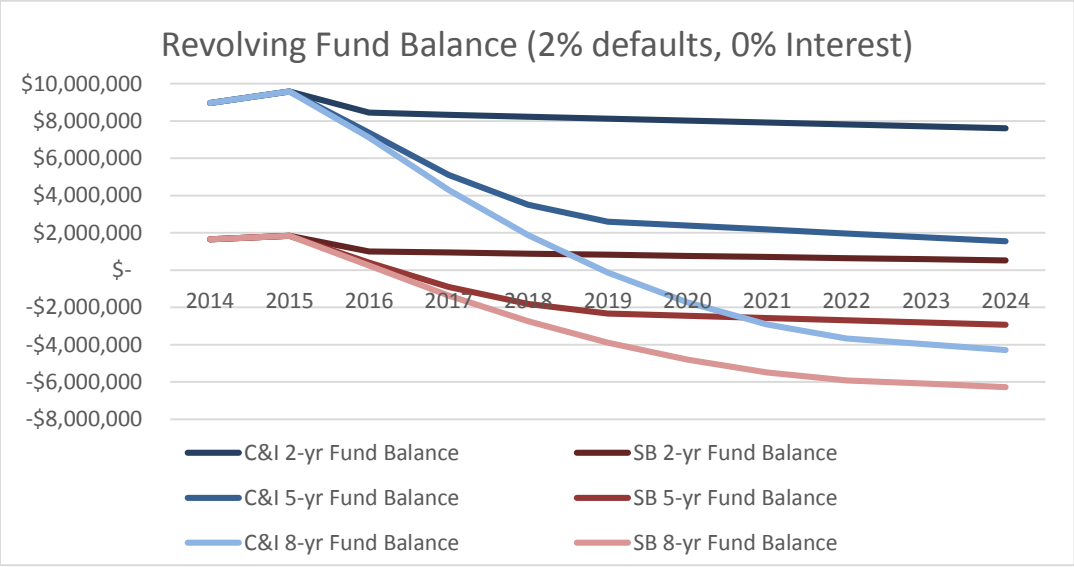
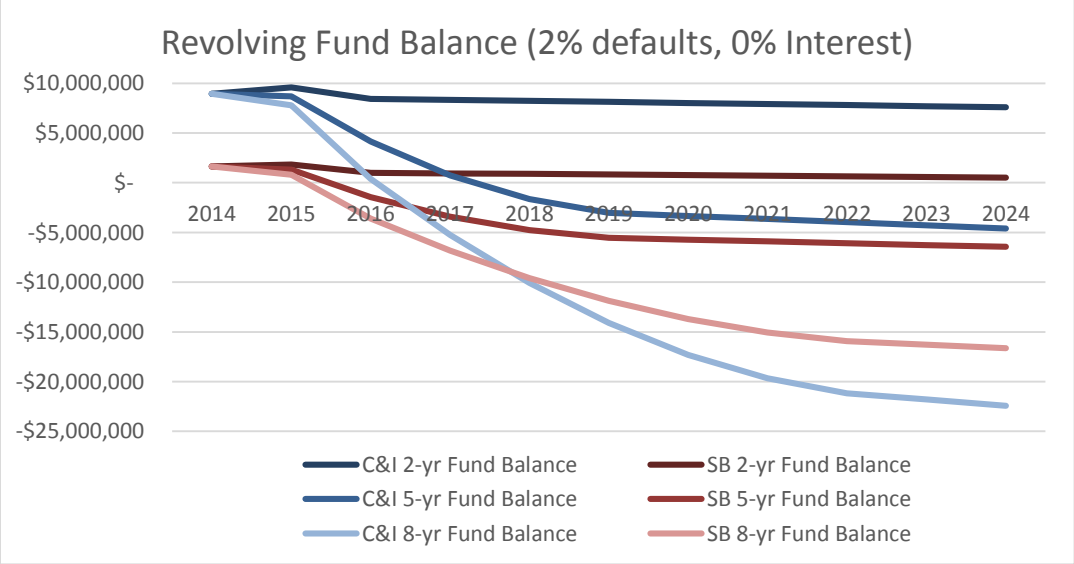



**Figure 2: Revolving Fund Balances for SB and LCI Assuming Increased Loan Volume**



## CONCLUSIONS DERRIVED FROM AVAILABLE PROGRAM DATA

Based on the limited data available on the existing financing program performance, a few important conclusions can be drawn that may help guide Rhode Island toward an increasingly effective use of financing resources.

1) **Limited financing program performance data appears to hinder assessment of the financing programs' fit under the Least Cost Procurement Requirement**

The limited measures and participation data available for EE financing make it difficult to assess the effectiveness of Rhode Island's financing programs. Establishing processes to collect the available program data may aid future efforts to determine the cost-effectiveness of financing programs, which in turn would indicate their fit under the Least Cost Procurement requirement. Two examples of reporting that would aid in assessing the existing programs include:

- An up to date EnergyWise program evaluation that can indicate if there has been increased uptake or deeper savings since the HEAT Loan program was offered.
- Comprehensive commercial program evaluation reports that include both incentives and financing costs on a par participant basis, as well as a per measure basis.

2) **Consistent annual reporting of the OBF revolving funds would aid the OER in tracking the use of the ratepayer funds allocated to these programs.**

An annual summary report on the use of revolving funds from the following year and projections for the upcoming year should be included in National Grid's Energy Efficiency Plan each year. This would increase transparency over the application and impact of the revolving funds. These reports should include, as a minimum:

- A clear and consistent balance sheet of the funds' unallocated funds, loan book, annual loan volume, loses to defaults, newly sourced funds
- The number of LCI and SB loans made in each year, and number of customers
- Estimated annual savings compiled from National Grid's loan application assessments

3) **Integrating financing program costs into the various incentive programs that they support may offer a first step to assessing the overall effectiveness of these interrelated programs.**

It would be a benefit to include financing costs and net savings when performing impact evaluations of National Grid's residential and commercial incentive programs as it would reveal the true cost for delivering these savings. This would be further of benefit if it covered multiples years prior to, and following 2015 to capture the impact the 5-year extend LCI OBF loan terms being offered starting in 2015.

## PROCESS AND ADMINISTRATIVE BARRIERS IN RI'S EXISTING EE FINANCING OFFER

Through interviews with program administrators, reviewing program materials and reports (as available) and interviews with stakeholders such as HEAT Loan lenders and LCI customers, we gathered information on the financing processes in place. Due to the limited resources available for this study, the interview process did not achieve the level of rigor typically associated with a formal process evaluation, but it did highlight some potential process barriers and structural challenges that may be confirmed and elaborated through future process evaluations.

### RESIDENTIAL LENDING

1) **HEAT loans may be putting pressure on participating financial institutions that may be causing lenders to hold back from promoting the program.**
    - A HEAT Loan lender indicated during an interview that the program was heavy (expensive) to administer, especially considering that they are limited to a 5% return.
    - Moreover, the 5% buy down and obligation to provide 0% interest loans leaves no room for eventual interest rate increases, which will further squeeze the lenders.
    - These factors together may lead lenders to avoid promoting HEAT loans, and may eventually limit their interest to renew the HEAT loan lending contracts in the next round.

2) **Middle-to-moderate income participants (60% - 120% AMI) may be largely missed by the current financing programs.**
    - It has been indicated that Heat Loan lenders' use of creditworthiness as their key underwriting criteria may be limiting HEAT Loan access to participants with higher annual median incomes. As a result there may be a gap between homeowners who earn more than the 60% of AMI and those (customers below 60% AMI are eligible for the no-cost direct-install (DI) program), and those who are considered creditworthy to receive HEAT Loans.
    - Providing 0% HEAT Loans to predominantly higher income participants, may be increasing incentive level disproportionally within the residential sector.
    - The Capital Good Fund (CGF) DoubleGreen® Weatherization Loan program is available for moderate-to-middle income customers who cannot access the free DI program, but by the time of writing only 31 loans had been made. It is possible that the HEAT Loan lenders are not referring unsuccessful HEAT Loan applicants to the CGF.

3) **Mandatory audit requirements are likely hindering HEAT Loan and CGF uptake, especially for emergency equipment replacement projects.**
    - Potential participants can wait longer than four weeks to have RISE audit performed on their property. This makes it difficult or impossible for customers seeking an emergency replacement of a failed boiler or HVAC system to access HEAT financing.

4) **The Residential PACE program, currently in development, seeks to address challenges related to RE project delivery and integrating messaging with the 0% HEAT loans.**[6]
    - There may be a marketing challenge to introduce the new PACE program which offers market rate financing alongside the 0% HEAT Loan program already in the market. For example, offering unsecured loans (HEAT) at rates significantly lower than the rates offered for secured lending (PACE) is generally considered to be contrary to typical financing industry practice.
    - The proposed PACE program payment schedule requires that contractors will only be paid upon project completion, which results in them carrying the cost and credit risk during project implementation. This may be particularly challenging for small renewable energy developers looking to leverage PACE-driven activity in the local marketplace.
    - OER staff indicated that there are limited internal resources to administer the program if it becomes highly successful. There may be other intergovernmental barriers which create additional administrative and programmatic challenges (i.e. alignment between PACE schedules and REF timelines, etc.)

## COMMERCIAL OBF PROGRAMS

1) **The 2-year maximum repayment terms may be limiting the effectiveness of the OBF programs.**
    - For LCI lending, there are indications that the availability of 24 month financing may have little impact on participants' investment decisions because this payback period is equal or close to typical commercial sector investment decision hurdle rates.[7]
    - The short term lending does not likely significantly impact the ability for most measures covered in the incentive program to achieve net positive cash flow.

2) **National Grid has some limitations in its ability to administer larger and longer term lending, which may limit the potential scope and impact of its existing OBF program model.**
    - National Grid indicated during interviews and the workshops that its OBF loan origination process does not have the tools to underwrite longer or larger commercial loans that may require credit-worthiness evaluation in commercial sector.
    - They also indicated that $15M represents the ideal revolving fund size for National Grid, and that significant further expansion may start to exceed their administrative capacity to deliver. The high portion of the funds that currently remain unallocated within the OBF revolving funds may be evidence of this limited administrative capacity to deliver loans.

[6] Please note that further development of the PACE program was paused in light of this pending study in order to integrate "lessons-learned" and/or to better leverage future PACE offerings with other EE and renewable programs enhanced by study results.

[7] In 2015 National Grid will allow up to 60 month tenors in its LCI OBF program.

- Finally, results from follow up interviews with National Grid representatives and private lenders suggests that National Grid would benefit from additional financial sector expertise to assist it in efforts to attract third-party capital to support further commercial sector financing.

## MUNICIPAL OBF LENDING

1) **The Current OBF program, which is capped at 24 month loans misses many of the big-ticket needs in municipal sector, such as boiler replacements, which would require 20 year repayments to achieve cash-flow positive returns from the energy savings.**
    - Institutional and municipal clients face a barrier when taking large EE improvement projects to their capital budgeting process, and are therefore limited to improvements that can be financed through operations budgets. OBF and OBR programs are an option for facilities managers to pay for EE improvements through their operating budgets. However, many of the needed EE measures in municipal facilities do not achieve cash-flow positive returns over a 2-5 year maximum loan term, and therefore cannot be included in the OBF program.

2) **The overall capital pool dedicated to municipal sector lending within National Grid's OBF program is insufficient to meet a significant portion of the sector needs.**
    - A National Grid EE program administrator focussed on the municipal sector indicated that the need across the state easily exceed $200M, while the OBF program allocates just $1M to this sector.

# EE FINANCING IN OTHER JURISDICTIONS

A jurisdictional scan of other financing programs from across North America was performed to identify examples that can shed light on Rhode Island's current use of EE financing. These examples were used to situate the performance of Rhode Island EE financing programs in comparison to other similar programs, to identify potential process, marketing and outreach improvements, and to highlight models that can fill gaps in the state's current financing offering.

For each of the three main program areas (Residential, Small Business and Large Commercial and Industrial) a comparison table is provided in the appendix that contrasts the various program elements between Rhode Island's financing programs and the example programs selected from other jurisdictions.

## RESIDENTIAL EE FINANCING PROGRAMS FROM OTHER JURISDICTIONS

A review of residential financing programs was carried out and the specific features of successful programs were compared to the features of Rhode Island's HEAT Loans.

### HOME ENERGY RENOVATION OPPORTUNITY (HERO) PACE (CA)

HERO was launched in 17 California communities in 2011, and expanded to over 100 communities by 2014. It offers both residential and commercial PACE financing, with loan maximums of $200,000 and $600,000 respectively, which is repaid through property taxes over terms of up to 20 years. The program is administered by third party partners, Renovate America for the residential program and Samas Capital for the commercial program. Key features of HERO include:

- The program is entirely self-sustaining through interest rates and fees charged to participants and lenders. No ratepayer money is used to support HERO, but projects are eligible for utility incentives.
- HERO has developed a powerful information system that facilitates quick processing of the user friendly application forms, which along with outreach and marketing have been identified as a contributing factor behind HERO's success.
- Underwriting of loans is not based on credit scores, but instead focusses on the property owner's mortgage payment history and debt ratio.
- A taxable municipal bond is created for each project and then sold to Renovate America, a large PACE provider for local governments
    - In February, 2014, the program announced that $104 million in AA- rated bonds were issued, secured by 5,890 PACE assessments levied on 5,627 properties located in Riverside County.

- Distributed generation projects make up approximately 35% of HERO residential project spending (the majority of these projects involve rooftop solar) while 65% of residential project spending was focussed on energy efficiency measures. This includes heating and cooling measures (30%), windows and doors (24%), insulation (6%) and other measures (5%).

## CLEAN ENERGY WORKS OREGON

Clean Energy Works began in 2009 as a pilot program run by the City of Portland. Funded through the U.S. Department of Energy and the State of Oregon, local governments, workforce investment boards and national foundations to support its efforts, it now operates as a state-wide not-for-profit that offers a one-stop program for whole-home energy upgrades. Funding from the State totals $10 million for the 2013-2015 period.

Homeowners can finance up to $30,000 through participating private lenders (such as credit unions and CDFIs), at a fixed interest rate for home energy efficiency retrofits for a variety of measures. Customers must achieve at least 15% energy savings to be eligible for the program.

Key features of the program include:

- A turnkey approach that integrates long term financing for up to 20 years with tiered EE incentives for deeper energy savings (including tax credits and rebates);
- Repayment options include on-bill or secured off-bill through Uniform Commercial Code-1 (UCC-1) filing or a lien on the property (in case of default, loan is taken off-bill and follows conventional collection procedure);
- A Loan Loss Reserve (LLR) to backstop the private lenders (note: in 2013 the private lenders agreed to halt further contributions to the LLR due to the extremely low delinquency and default rates (<1%));
- An audit is required to participate in CEWO, options include an online self-audit, or a free on-site audit and streamlined application process.

## SUMMARY SURVEY OF RESIDENTIAL PROGRAMS[8]

In 2014, Cadmus produced a report summarizing findings from research and interviews with over 15 EE financing programs. For residential programs, the following trends are observed from that report:

- Average loan values ranged from $5,000 up to $20,000, with two clusters, one around $5,000-$8,000 and another in the $12,000-$20,000 average loan range.

[8] Source: California Joint Utilities Financing Research: Existing Programs Review, the Cadmus Group, 2014

- Unsecured loan programs tend to offer shorter term (5-10 years), loans with smaller average values. Secured loan programs tend to offer longer term financing (10-20 years) with larger average loan values, and much larger maximum loan values.
- HEAT Loan programs are currently the only programs identified in the Cadmus study that offer 0% interest rate financing, another offers buy down to 2.5% and some others offer partial buy down, but most programs offer loans at market rates.

## COMAPRING THE COSTS OF INTEREST RATE BUY DOWNS AND LOAN LOSS RESERVES

LLRs are used in other jurisdictions as a credit enhancement tool that protects lenders from a portion of the projects' credit risk, and allows them to offer competitive rates. Given that many of the programs that apply LLRs and non-zero interest rates achieve high participation levels, and analysis was performed to assess the relative costs of and LLR and an interest buy down.

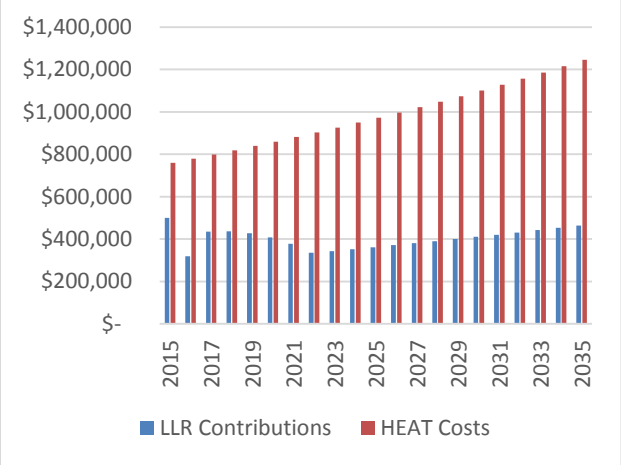
Currently the HEAT loan program applies a 5% interest rate buy down that allows credit unions to offer 0% unsecured loans to eligible home owners. LLRs typically hold 10% of the initial loan values in an escrow fund, that will pay out up to 90% of the lenders' losses when customers default on their loan.

The relative costs of these two ratepayer supported credit enhancement tools were assessed under various program conditions, the results of which are presented in the following tables and charts. The analysis started assumed a loan volume of $4M per year in 2015. A full explanation of the conditions under which the LLR and HEAT costs were assessed is provided in the appendix.

**Table 5: Ratepayer Costs for HEAT Loan and LLR Credit Enhancements**

| | NPV of Costs [9] |
|---|---|
| **HEAT (2% buy down)** | $5,736,000 |
| **HEAT (5% buy down)** | $15,571,000 |
| **HEAT (8% buy down)** | $25,405,000 |
| **LLR (1% default)** | $2,841,000 |
| **LLR (2% default)** | $5,326,000 |
| **LLR (5% default)** | $12,777,000 |

**Figure 3: LLR and HEAT Loan annual costs 2015-2035**




[9] This represents the total net-present value of program costs to rate payers for a program running from 2015 to 2035

Overall the analysis indicates that the 5% HEAT Loan interest rate buy-down is significantly more costly than an LLR would be covering the same loan volume. Based on this and the experiences gleaned from the jurisdictional scan indicated that:

- There may be a trade-off by switching to an LLR from 0% financing, as it could reduce program participation. However, from the scan of other jurisdictions there is no clear evidence that 0% financing is essential to drive participation in residential programs if an overall attractive financing offer provides a net positive return to the participant.
- An LLR can effectively backstop private lenders allowing them to offer unsecured loans at competitive rates.
- A reduced interest rate buy down matched with an interest rate buy down could provide HEAT lenders the security they need to offer competitive loans with interest rates that can float with market rates, at a lower cost per loan to ratepayers.

## FINDINGS AND RECOMMENDATIONS

1) **Consider integrating the HEAT Loan, Capital Good Fund program, and forthcoming PACE Program so that potential participants do not fall through the cracks.**

   CEWO provides an example of a residential program where the financing type is dependent on the project and the participant's financial profile. A similar approach could be applied in Rhode Island taking advantage of the EnergyWise program as an entry point for all EE financing, and backing it up with financial administration that directs participants to PACE, HEAT or CGF depending on their fit for each. For example, participants that are good credit risks, but have little equity in their homes may be better suited to HEAT, while participants with poor credit ratings, but significant equity in their homes would quality for PACE.

2) **There is little evidence that the HEAT Loan program's 0% interest financing is necessary to drive participation.**

   Both the CEWO and the HERO program offer non-0% financing, and have managed highly successful program uptake. Moreover the survey of 15 programs reveals that most offer little or no interest rate buy-down.

3) **Reducing friction and developing finance program tools can support program uptake and impact.**

   Offering easy to use on-line applications and pre-approval processes can help drive program uptake by make the programs easy to access for participants. Among these tools to consider is an alternatives "self audit" path that allows participants to quickly enroll in the program to perform emergency equipment replacements, without waiting for an available audit slot from RISE. This could be combined with a follow up audit that identifies further savings opportunities, and offers additional incentives and financing to carry them out.

## COMMERCIAL SECTOR EE FINANCING PROGRAMS FROM OTHER JURISDICTIONS

A range of example commercial programs from other jurisdictions were compared to Rhode Island's commercial financing programs to determine if there are strategies from elsewhere that can be applied.

### ENERGIZE CT – SMALL BUSINESS ENERGY ADVANTAGE

The Small Business Energy Advantage (SBEA) program provides cost-effective, turnkey energy-saving services for small commercial and industrial customers. With support from Energize Connecticut, the program provides financial assistance and guidance to enable energy savings.

- The program pays for energy assessments and covers up to half of project costs with tiered rebates. Note: An episode of depleted rebates has caused the program's uptake to drop to zero.
- The financing is attached to the meter, making it transferrable and available to tenants (80% of SBEA program participants are tenants)
- Turnkey approach and combined financing and incentives are key success elements of the program, providing almost immediate positive cash flow for the customers

### CALIFORNIA OBF PROGRAM

In 2010 the California Public Utilities Commission directed the Investor Owned Utilities (IOU) to offer on-bill financing to small businesses and institutional customers. The OBF program offers qualified non-residential business and taxpayer funded institutional customers and multifamily buildings interest-free loans ranging from $5,000 to $250,000 to make energy efficiency improvements. Participants in the program must have had an active account for two years prior to filing, and account must be in good standing.

Key findings from the process evaluation[10] of this program include:

- Program caps lighting projects to 20% of the total loan amount to encourage deep savings
- Customers are willing to pay a higher than interest rate if it returned net positive cash flow from savings, although it would be administratively heavy for PG&E to implement
- Many participants consider financing more influential than rebates in their decision to make EE improvements
- 3rd party financing would resolve lack of funds, but would be much more complex administratively – new on-bill repayment pilots are being developed and will rolled out in 2015 to test this model.
- The bill transferability model was particularly appealing to participants who rent their facilities

[10] California 2010-2012 On-Bill Financing Process Evaluation and Market Assessment (Cadmus, 2012)

- The program Disconnection has an uncertain benefit in reducing default rates compared to on-bill without disconnection

## COMMERCIAL PACE PROGRAMS

Commercial PACE programs have been established in 13 states, and a market of over $100M has been established to date (over 300 individual projects).[11] Commercial PACE offerings are often broad, including LCI, Multi-Family, Small Business and Residential sectors all under the same program (albeit with differing financing offers).

Lessons from other stats suggest that beyond simply establishing PACE legislation, organizational infrastructure is needed to make PACE successful. Success often requires:

- Establishing a central source of funds; 3rd party private or government pool
- Establishing a central PACE administrator (i.e. PACE Maine)
- A Large City that can tailor its own PACE Program and lead the way with a model other cities in the state can adopt.

## FINDINGS AND RECOMMENDATIONS

**1) Results from the SBEA program suggest that Rhode Island's Small Business OBF is delivering smaller projects, at a significantly higher relative cost to rate payers.**

The table below compares results from the two small business programs, including incentives and financing. While SBEA offers 48-month financing terms, which comes with a higher interest rate buy down cost than for Rhode Island's 24 month OBF financing, the lower incentive level results in the overall cost to the rate payers being lower. In both cases the programs require measures to achieve net positive cash flow to be included in the OBF. Rhode Island may benefit from digging deeper into the SBEA results and its own model to explore how incentives are set on a measure by measure basis, and if there are measures that would still pass the positive cash flow requirement at the lower incentive level but over longer term financing.

[11] Source: pacenow.org

**Table 6: Comparison of total project cost to rate payers in RI and CT SB programs**

| | National Grid SB OBF (2010 – 2014 results) | SBEA - CT Program |
|---|---|---|
| **Total loans** | $6,037,000 | $34,600,000 |
| **Number of Loans** | 2,666 | 4,075 |
| **Average Loan Size** | $2,265 | $8,490 |
| **Maximum Incentive** | 70% | 40% |
| **Average size of project** | $7,550 | $14,151 |
| **Total ratepayer cost per project** | **$5,533 (73%)** | **$6,965 (49%)** |

**2) Observations from other jurisdictions point out program elements that may support increased program uptake or impact.**

0% interest rate loans is common for the commercial OBF programs reviewed. Over the typically short lending periods, and alongside the high commercial incentive levels it typically does not appear to contribute significant additional burden to rate payer costs.

However, longer term financing through PACE programs offers financing at market rates and while projects may benefit from available utility incentives, commercial PACE programs themselves often do not rely on ratepayer support directly.

California's OBF program caps lighting contribution to 20% of the overall project cost to drive bundling of measures with lighting's low hanging fruit. This may provide a valuable strategy to drive the uptake of measures with marginal net returns, especially where longer term financing is available (5 years and longer)

## RECOMMENDED EE FINANCING STRATEGIES AND MODIFICATIONS

Based on the research presented above, a few key recommendations emerge that support three key objectives:

1) To ensure the sustainability of the financing programs by addressing key process barriers;
2) To fill gaps in the current EE financing offer and expand the resulting energy savings delivered by offering new financing options and accessing deeper savings; and
3) To increase the effective use of ratepayer money within the financing offers.

While these recommendations may point the way to some program modifications, as well as to the establishment of new programs, **the study does reveal some important qualities of the existing programs in Rhode Island that should be mentioned**. Overall the financing products currently available appear to:

- Cover most major market segments
- Offer attractive terms to customers
- Are well integrated with incentive programs
- Are delivered through effective partnerships using simple administrative processes.

As a result, **most of the programs have demonstrated significant participation rates and appear to be having an impact toward meeting the state's energy efficiency targets**. However, this analysis does not take into consideration opportunity costs in order to determine whether a different allocation of program resources might reach a larger audience with no additional cost to rate payers. Nor does this account for potentially high free-ridership rates in the existing programs, which may undermine their effectiveness.

It is also noteworthy to mention that the lack of financing program-specific performance reporting and evaluation studies may be hindering the administration of the programs and poses a challenge to designing new programs or updating existing programs. **The absence of detailed performance and evaluation data makes it difficult to determine if the financing programs in their current form are supported under the Least Cost Procurement requirement,** as it is not possible to assess their cost-effectiveness. Even basic data such as annual participation rates and measures supported is not published in a consistent or regular manner for the financing programs or the associated incentive programs. It is therefore recommended that Rhode Island consider establish a performance tracking and evaluation cycle for its financing programs that can support program modifications and strategies to optimise their impact and effectiveness.

## RESIDENTIAL SECTOR RECOMMENDATIONS

Overall, the residential sector is partially served by the HEAT Loan and Capital Good Fund programs and will benefit from the forthcoming PACE program. Integration of these programs to capture the greatest portion of viable applicants would likely help support EE measures uptake across the sector. We offer four key recommendations to support this goal.

**1) Consider evaluation processes that can provide information to improve the effectiveness of the HEAT, CGF and PACE programs.**

The residential financing programs do not appear to be included in Rhode Island's program evaluation cycle, and as a result there is little performance data available about the HEAT and CGF programs. The information typically contained within impact and process evaluations would greatly benefit an assessment of the HEAT Loan program, and would aid in designing any program adjustments.

- **A strategic evaluation is recommended to aid the integration of the PACE and HEAT Loan programs.** This should focus on key process elements of the HEAT program, using interviews with HEAT lenders, participants and program administrators. It would seek information on how HEAT Loans are currently serving the market, and would reveal important process issues that may be addressed through program modifications. Moreover, it would provide a basis to guide the integration of the HEAT loan and PACE programs, by helping to identify opportunities to create complementarity between the programs, or to established shared loan administration processes
- At the same time the **HEAT loan, CGF and PACE programs should be integrated into the EE program evaluation cycle**. Specific tasks to consider include:
    - Perform an EnergyWise program impact evaluation to see if there has been an increase in participation or project size and depth since HEAT loans were made available in 2011.
    - Include financing questions in future net-to-gross determination studies to determine free-ridership and spillover.
    - Consider a wrap-around impact evaluation for HEAT loan participants that include HVAC and EnergyWise measure impacts per loan. This can provide a program-wide cost effectiveness assessment based on the overall savings and combined incentive and financing costs.

**2) Develop processes to ensure that viable participants do not fall through the cracks between the financing programs**

While moderate to middle -income customers can access financing through the Capital Good Fund, the low uptake indicates that the program may not be marketed adequately. Moreover, audit requirements and application processes may be preventing potential participants from accessing the financing programs.

- **Improve processes for moderate to middle-income financing** by ensuring that the Capital Good Fund's underwriting criteria are not overly onerous. As a complementary step, HEAT lenders should be given the tools and required to refer refused HEAT applicants to the Capital Good Fund (and send credit assessment results).
- **Consider a self-audit option that allows customers who need emergency equipment replacement to access financing.** Maintain the links to the EnergyWise program for HEAT loans, but offer a quicker self-assessment auditing and streamline financing approval process for emergency projects, such as replacing burned out boilers. Keeping the audit requirements for non-emergency projects can help to nudge clients toward deeper savings, provide a QA/QC element to the process, and offer an opening to co-market the PACE and HEAT loans.
- **Work with HEAT lenders to broaden underwriting criteria** to increase acceptance rates for borderline applicants.

**3) Develop a clear strategy for PACE and HEAT to work together**

Offering PACE loans at market rates alongside 0% HEAT loans may pose a marketing challenge that could undermine the launch of the PACE program. However other programs, such as CEWO, have shown that when they are delivered through a complementary approach shorter term, unsecured loans can coexist alongside longer term secured loans (such as PACE) and that integrating the sales and marketing of the two can help customers access the type of financing most appropriate to their project and financial profile.

- **HEAT loan and PACE interest rates should be brought closer in line** (maximum 2%-3% interest difference) to reduce marketing discrepancy.
- **The underwriting criteria boundaries for PACE and HEAT loans could be brought as close together as feasible** so that as many applicants as possible can qualify for one or the other, thus ensuring most homeowners are given an EE financing opportunity. This will further support the recommendation to ensure that viable applicants do not fall through the cracks.
- **Explore options for PACE and HEAT Loans to share administration processes.** With the EnergyWise program acting as the front end for loan origination, the applicants could then be sent to the financing administrator(s) who can quickly identify whether the participant is better suited to an unsecured loan (i.e. for smaller projects, with shorter term paybacks, and for creditworthy applicants) or are more suited to the secure PACE loans (for larger projects with broad measure, and customers who have equity in their homes, but are not necessarily creditworthy themselves).[12]
- **Consider integrating Renewable Energy Fund incentives for solar into the PACE application process to streamline processes for participants.**

[12] CEWO actually allows the 3-rd party lender chose how to structure the financing during the application process.

**4) Re-evaluate the 0% interest rate for the HEAT Loan program**

The current 0% interest rate HEAT loans represent an equivalent value of 20% additional incentive to homeowners. This comes at significant expense to ratepayers, and tends to be directed toward creditworthy participants (who tend to have higher incomes and less debt). Moreover, the fixed 5% buy down and administrative process are putting pressure on the lenders to deliver HEAT loans.

- **Consider reducing the interest-rate buy down and letting the lenders set rates competitive to the market.** This will decrease pressure on the lenders when interest rate rise and allow them to cover more of their administration costs. It will also bring the HEAT loans more in line with PACE loans, facilitating integrated sales and marketing.
- **Keep 0% loans just for the moderate to middle income loans offered through the Capital Good Fund.** .
- **Consider covering the unsecured HEAT loans with an LLR**, by either expanding the PACE LLR or creating a dedicated LLR with the fund saved from reducing HEAT Loan buy-downs. This is significantly less costly than the current interest rate buy downs, and may offer a more attractive option for lenders, thus allowing them to keep HEAT loan interest rates competitive.

**Does Rhode Island need a Residential OBR Program?**

An OBR program could provide an option to customers who do not have a strong enough credit score to qualify for a HEAT Loan, and who do not have sufficient equity in their home for a PACE loan. However, considering Rhode Island's size, and the associated administrative limitations, along with the fact that PACE is itself still in development, it appears to be premature to introduce yet another EE financing product into the residential market.

Instead, once PACE and HEAT are both operating and their approaches have been integrated to the degree feasible, an evaluation may be performed to determine if there remains sufficient space to add a third program to the mix, or if there are simple ways to adjust the existing eligibility requirements to ensure almost all applicants have a financing option.

## COMMERCIAL SECTOR RECOMMENDATIONS

The commercial sector is served by National Grid's OBF program as well as Commerce RI's ERLF program. The OBF programs focus on short-term payback measures that are eligible for significant rebates. Overall the largest challenge in the commercial sector is to encourage larger projects with deeper savings, and to ensure that the financing packages offered actually impact participant's EE investment decision-making.

1) **Improve reporting and evaluation of OBF program and revolving funds and identify opportunities to encourage deeper savings to accompany longer term financing**
   - **Require National Grid to provide clear and consistent year-over-year reporting of the OBF balance sheet and use of funds.** There has been no ongoing public reporting of the OBF revolving fund since its establishment, making it difficult to follow the use, let alone impact, of the ratepayer money invested in the fund. Reporting should include annual participation rates, measures, deemed savings estimates and consistent annual reporting on the funds' loan book balance, new loans issued, loan repayments, unallocated funds (end of year balance) and default rates. It can be presented as part of the annual Energy Efficiency Plan,[13] or could be established as a stand-alone reporting requirement.
   - **Perform a strategic evaluation of the OBF program that can track the impact of expanding the LCI OBF terms from 24 months to 5 years.** This strategic evaluation should include a review of key loan origination, marketing and underwriting processes, as well as data gathering on the number and types of measures and estimated savings for the shorter and longer term financing options. A market assessment would further help to pave the way for successful roll out of 5 year terms, and may support the extension of 5 year terms to small business customers in addition to LCI.
   - **Integrate the OBF programs into the evaluation cycle to ensure that information is gathered to determine how they may support the Least Cost Procurement requirement.** This should entail: including OBF in the commercial program process evaluations; providing further details on financing in the commercial free-ridership assessments (such as a breakdown between sub-sectors); performing impact evaluations on the OBF program to generate an evaluation of the net savings per loan; and ultimately using this information to determine the cost-effectiveness of the combined incentives and financing package offered to National Grid's commercial customers. These evaluations will be then valuable in determining the appropriate mix of incentives and financing for the commercial sector programs.

[13] Current reporting in the Plan differs from year to year, and does not easily provide the reader with a clear understanding of how much unallocated finds and loans are being carried year over year.

**2) Consider developing long term (10-20 year) commercial financing options**

Rhode Island currently offers only short term financing of EE measures in the commercial sector (2-5 year terms). This may be limiting uptake of measures with longer term paybacks and with larger up-front costs. Other jurisdictions have shown some success with commercial PACE programs and specialized energy service agreement models. Moreover commercial on-bill repayment programs that access third-party capital are being tested, most notably in California where a range of pilots. Based its existing needs, and these experiences from elsewhere, Rhode Island may consider developing a long-term financing option for its commercial customers based on one of the three options listed below.

**Option 1) Expand PACE legislation to include commercial properties.**

- Many PACE programs focus on commercial properties or cover both commercial and residential sectors. These often engage specialized lenders for the commercial PACE programs to provide the capital and underwrite the financing. Rhode Island's existing PACE legislation could be expanded to cover commercial properties, but allowing them to apply a senior lien, as is typical for commercial PACE, and allowing one or multiple
- In parallel the OER should consider engaging in outreach to potential PACE lenders and participants to begin negotiating terms for their involvement in the program and assessing the market and possible program design features.

**Option 2) Engage National Grid and third-party lenders to establish a commercial OBR program**

- National Grid has expressed interest to access private capital to support its OBF programs. However it is unlikely that a 3rd party would allow National Grid to underwrite unsecured loans on their behalf unless National Grid was willing to cover some portion of the risk.
- An OBR program may offer a solution whereby the lenders would underwrite the loans, and National Grid would allow them to use their billing system. This offers a range of benefits to the lenders including reduced repayment friction, connection of the loan to the property and integration with existing EE incentives. To further increase lender interest, an LLR could be considered that would back-stop potential loses, allowing lenders to offer long term loans at competitive rates.
- Again, the initial steps would require outreach to lenders and customers to assess the level of market for and interest in the program and identify potential lender participants.

**Option 3) Establish a commercial LLR that can support the OBR program, or another form of longer term EE lending, possibly linked to an innovative energy services agreement model.**

- As a third model, Rhode Island could create an LLR to support longer term (10 years and longer) EE lending, and couple it to a specialized financial product offer by a private lender or lenders, use it support innovative lease or ESA models, or to backstop an OBR program (as in option 2 above). The LLR would replace the security offered by a PACE lien, or would be linked with an ESA contract or OBR process to create a combination that provide lenders with sufficient confidence to offer

long term financing at competitive rates. Ideally this could remain a unsecured, off balance sheet option.

- Two potential sources of funds for an LLR are to repurpose the ERLF and to carve some money out of the OBF revolving fund (or redirect future OBF money to the LLR first). At the time of writing the ERLF had not received applications for its latest program cycle, and the uptake for the program was uncertain. Moreover, the ERLF is not linked to specific state EE goals and targets and is not subject to energy savings evaluation or cost-effectiveness requirements.

**3) Consider other C&I sector innovations to attract ESCOs and private capita**

Given Rhode Island's status as an EE leader, Rhode Island should consider establishing innovative tools to encourage further private investment in efficiency. One promising model is the Metered Energy Efficiency Transaction Structure (MEETS) whereby the utility pays a 3rd party directly for verified energy savings in the targeted facility. This opens new avenues for ESCOs to carryout projects in private commercial buildings, and even provide a tool that can overcome the split-incentive barrier for leased spaces. The OER should consider entering into a discussion with National Grid with a view to implementing a MEETS or similar model.

## MUNICIPAL SECTOR RECOMMENDATIONS

Rhode Island's municipal sector is challenged to finance EE improvements where they compete with other deferred maintenance needs under their capital budgets. However, there is a need for major equipment upgrades and replacements, such as boilers and lighting systems, across the state. An additional challenge is that Rhode Island municipalities vary in their ability to raise affordable capital through bonds. These challenges may be addressed by the following recommendations:

**1) Consider establishing a central pool of funds for municipal sector financing through bonds issued by Clean Water Finance Agency (CWFA)**

- The CWFA has experience issuing bonds that support municipal infrastructure and improvement projects. This is coupled with its background lending money for municipal projects through mechanisms that suit the project needs. Moreover, by creating a central municipal sector pool, the CWFA may be able to streamline the process to access federal Qualified Energy Conservation Bonds through a single application, similar to the approach applied in Massachusetts, which could further reduce borrowing costs.
- The pool of capital created from the bonds could be used to offer financing to municipalities for specialized major equipment upgrades, such as a boiler replacement program or to purchase and upgrade street lighting to LED (an estimated $50M need in the state), leading to long term operational savings and improved municipal budgets.

**2) Establish long term EE financing mechanism that institutions can access through their operating budgets rather than their capital budgets.**

Institutional facility managers can typically control how they allocate their operations budgets, particularly when they are offered solutions to reduce their overall operating costs. However, capital budget decisions are typically made elsewhere in the administration, and as result EE improvement are frequently deferred year after year. Therefore offering financing solutions that can be delivered through operational budgets will streamline the approval process and increase uptake in targeted facilities.

- Creating an off-balance sheet mechanism, such as an OBR or specialized ESA product (such as that used by the RENEW program[14] or California's Low-Income Investment Fund (LIIF)) that extends for up to 20 years would offer municipalities a mechanism to access the financing they need. The product could benefit from National Grid's technical underwriting skills for EE measures to ensure that the projects offer real, verified energy bill savings over their lifetime. A third party financial partner, which could be a private lender or the CWFA, would then be needed to provide the capital to the projects. The next step would be to establish an outreach process to explore what kind of structure and financial partner would be needed to establish this program.

[14] The RENEW program financing does not stay off the balance sheet, but through the energy savings insurance attached to its projects, it avoid impacting municipal debt ratings and limits.

## NEXT STEPS TOWARD IMPLEMENTING THE RECOMMENDATIONS

The recommendations in this report point to a range modifications that aim to improve the overall impact of Rhode Island's financing programs. However, due to the broad scope of this high-level study and the lack of available market or evaluation data for the existing programs, further exploration would be an important step needed to guide any specific programs and program design alterations.

1) **Perform a strategic evaluation to support new programs and program adjustments**

Due to a lack of process evaluation studies and program performance data, we recommend that an interim step be pursued to help guide potential adjustments to the financing programs. This would include:

- **Strategic evaluation of the HEAT Loan program** to support sseamless integration of residential products (HEAT, PACE, The Capital Good Fund). This would be a quick focused study that includes interviews with participants, lenders and program administrators, as well as collecting program performance data from National Grid, and lending conditions information from lenders. This could be performed within 3-6 months in parallel to the PACE program implementation, and would inform any design changes made to the HEAT Loan program to integrate it with PACE.

- **Commercial market assessment and OBF process evaluation** to determine OBR, PACE and LLR potential. This would entail interviews with participants and program administrators, as well as gathering detailed program data from National Grid. A deeper examination of potential studies and other EE market data, and interviews with private lenders would further support the assessment and identify the ideal model for long term commercial lending in Rhode Island.

2) **Prepare an evaluation and reporting framework for all financing programs to track effectiveness and impact.** The framework would aim to:

- Ensure regular and timely evaluation of financing programs

- Integrate into evaluation cycle for incentive programs (*e.g. Integrate HEAT loan evaluation into the EnergyWise/HVAC program evaluations)*

3) **Engage with specialized private lenders for long term commercial and municipal programs**

- Bring in expertise to assist OER and/or The Treasurer's Office to explore and negotiate options with private lenders for OBR, PACE etc.

- Explore solutions with specialized financing companies to find the delivery vehicle and what they can offer (such as RENEW, LIIF)

# APPENDIX

## OBF PROGRAM LOAN VOLUME AND FUND BALANCE DATA

National Grid provided the following loan volume data for the OBF programs. These results are not published in any publicly available or verified report.[15]

**National Grid LC&I Loans**

| Year | Loan Total | Applications | Average |
|---|---|---|---|
| 2010 | $ 1,707,828 | 35 | $48,795 |
| 2011 | $843,414 | 17 | $49,613 |
| 2012 | $2,833,498 | 84 | $33,732 |
| 2013 | $3,392,512 | 87 | $38,994 |
| 2014 | $4,121,076 | 75 | $54,948 |
| **Grand Total** | **$13,094,663** | **303** | **$43,217** |

**National Grid Small Business Loans**

| Year | Loan Amount | Applications | Average |
|---|---|---|---|
| 2010 | $803,783 | 397 | $2,025 |
| 2011 | $1,107,776 | 529 | $2,094 |
| 2012 | $1,261,427 | 587 | $2,149 |
| 2013 | $1,534,092 | 667 | $2,300 |
| 2014 | $1,330,120 | 486 | $2,737 |
| **Grand Total** | **$6,037,198** | **2,666** | **$2,265** |

[15] Notes: Customers can have multiple applications. Year based on when data was sent to billing system, participation year regarding kWh may vary

**2014 OBF Revolving Loan Fund Projections**

(Source: ENERGY EFFICIENCY PROGRAM PLAN FOR 2015 SETTLEMENT OF THE PARTIES, National Grid 2013)

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Table E- 10
National Grid
Revolving Loan Fund Projections

| | Large C&I Revolving Loan Fund | | |
|---|---|---|---|
| (1) | **Total Loan Fund Deposits Through 2013** | **$** | **8,979,678** |
| | **Estimated Outstanding Loan Balance** | | |
| (2) | Total Value of Disbursed Loans [1] | $ | 3,026,711 |
| (3) | 2013 Repayments from loans[2] | $ | (1,477,874) |
| (4) | **Total** | **$** | **1,548,837** |
| | **Projected Fund Status, Year End 2013** | | |
| (5) | Estimated Outstanding Loan Balance Total | $ | 1,548,837 |
| (6) | Committed Loans | $ | 4,754,205 |
| (7) | Uncommitted Funds[3] | $ | 2,676,637 |
| (8) | **Total** | **$** | **8,979,678** |
| | **Loan Funds Available in 2014** | | |
| (9) | Uncommitted Funds | $ | 2,676,637 |
| (10) | 2014 Repayments from from loans[4] | $ | 3,181,830 |
| (11) | 2014 Finance Budget[5] | $ | 1,000,000 |
| (12) | **Total Available for Loans in 2014** | **$** | **6,858,467** |
| (13) | **Projected Total Loan Fund Deposits Through 2014** | **$** | **9,979,678** |

Notes

| | Small Business Revolving Loan Fund | | |
|---|---|---|---|
| (1) | **Total Loan Fund Deposits Through 2013** | **$** | **4,158,972** |
| | **Estimated Outstanding Loan Balance** | | |
| (2) | Total Value of Disbursed Loans[1] | $ | 3,126,662 |
| (3) | 2013 Repayments from loans[2] | $ | (2,290,153) |
| (4) | **Total** | **$** | **836,509** |
| | **Projected Fund Status, Year End 2013** | | |
| (5) | Estimated Outstanding Loan Balance Total | $ | 836,509 |
| (6) | Projected Loans[3] | $ | 1,736,949 |
| (7) | Uncommitted Funds | $ | 1,585,514 |
| (8) | **Total** | **$** | **4,158,972** |
| | **Loan Funds Available in 2014** | | |
| (9) | Uncommitted Funds | $ | 1,585,514 |
| (10) | 2014 Repayments from from loans[4] | $ | 1,655,863 |
| (11) | 2014 Finace Budget | $ | - |
| (12) | **Total Available for Loans in 2014** | **$** | **3,241,378** |

Notes

**2015 OBF Revolving Loan Fund Projections**

(Source: ENERGY EFFICIENCY PROGRAM PLAN FOR 2015 SETTLEMENT OF THE PARTIES, National Grid 2014)

Table E- 10
National Grid
Revolving Loan Fund Projections

| | Large C&I Revolving Loan Fund | | | Small Business Revolving Loan Fund | |
|---|---|---|---|---|---|
| (1) | **Total Loan Fund Deposits Through 2014** | **$ 9,979,678** | (1) | **Total Loan Fund Deposits Through 2014** | **$ 4,158,971** |
| (2) | Current Loan Fund Balance | $ 6,589,633 | (2) | Current Loan Fund Balance | $ 2,706,972 |
| (3) | Projected Loans by Year End | $ 2,857,696 | (3) | Projected Loans by Year End | $ 2,079,995 |
| (4) | Projected Repayments by Year End | $ 1,325,791 | (4) | Projected Repayments by Year End | $ 1,075,073 |
| **(5)** | **Projected Year End Loan Fund Balance** | **$ 5,057,728** | **(5)** | **Projected Year End Loan Fund Balance** | **$ 1,702,050** |
| (6) | Fund Injection | $ 4,000,000 | (6) | Fund Injection | $ - |
| **(7)** | **Projected Loan Fund Balance, January 2015** | **$ 9,057,728** | **(7)** | **Projected Loan Fund Balance, January 2015** | **$ 1,702,050** |
| **(8)** | Projected Repayments throughout 2015 | $ 2,091,744 | **(8)** | Projected Repayments throughout 2015 | $ 1,577,534 |

## PROGRAM COMPARISON TABLES

| Residential | HEAT Loam Program (RI) | HERO (Residential) PACE (CA) | Clean Energy Works Oregon (OR) |
|---|---|---|---|
| **Loan size / measures** | • $25,000 loan maximum<br>• Covers range of HVAC (including oil boilers) and weatherization equipment | • $5,000 - $200,000 Loans<br>• Extensive measure list, overlapping IOU incentive lists<br>• Non-energy measures permitted | • $1,000- $30,000 loans<br>• Whole home measures resulting in 15-30% energy savings: tiered to loan size<br>• Windows allowed on projects with 30%+ energy savings<br>• Solar not included<br>• Non-energy improvements eligible up to 50% of total cost |
| **Interest rates, terms and conditions** | • **0% interest loans unsecured** (5% buy down by NG, 10% buy down for moderate income)<br>• 7 year maximum tenor<br>• Non-transferable | • **5.95%-8.25% interest rates**<br>• 20 year maximum tenor<br>• Transferable upon sale<br>• HERO assessments are subordinate to property taxes and *pari-passu* with mortgages upon default. | • **3.75% - 5.99% interest rate**<br>• Rates reduced by 0.25%-0.5% for automatic bill payment<br>• 20 year maximum tenor<br>• 100% of project costs eligible<br>• Non-transferable upon sale |
| **Performance** | • $13.8M since 2011<br>• 2092 loans<br>• **average loan size $6,600** | • $104M in loans<br>• 5,890 PACE assessments<br>• **$18,300 average**<br>• 3% delinquency rate | • $33.4M in loans<br>• 2,633 projects: 2011-2014<br>• **$12,700 average loan**<br>• 0%-2% delinquency rates |
| **Eligibility, Underwriting and Security** | • 3rd party lenders do their own underwriting, **based on creditworthiness** of the applicant | • **Mortgage plus HERO financing cannot exceed 90% of the property value**<br>• Considers mortgage payment, tax bill payment and bankruptcy history. | • On bill or secured off-bill through UCC filing<br>• 590 Minimum FICO score, 750 average<br>• **Lender chooses appropriate loan type** based on applicant profile (secured vs unsecured)<br>• In case of default, loan taken off-bill for collection |
| **Administration** | • RISE delivers audits for no cost<br>• Linked to EnergyWise and HVAC program incentives | • Renovate America administers residential HERO program<br>• Non-utility program, unregulated | • Must receive free energy audit, however, self-audit option available<br>• Integrates incentives and tax rebates in turn-key administration (up to $2,000 for 15% energy savings) |
| **Source of Funds** | • **Interest rate buy down sourced from SBC** – single upfront payment.<br>• 3rd party lenders provide loan capital | • WRCOG (Local Government) issues bonds to fund the program.<br>• **Programs 100% self-supporting** | • **Private lenders with LLR provided by Energy Trust Oregon** – 10% of loans up to 2013, after 2013 no more LLR required by lenders<br>• Lender claims 90% of losses from LLR |

| Small Business | Small Business OBF Program (RI) | Energize CT – SBEA (CT) | NYSERDA Small Business Financing (NY) |
|---|---|---|---|
| **Loan size / measures** | • **$2,700 per loan average**<br>• Lighting, refrigeration, EMS<br>• No gas measures usually included | • $500 to $100,000 maximum loan (cap depends on peak demand)<br>• **$8,500 average loan**<br>• Lighting, HVAC, custom, refrigeration, compressed air | • Covers total project cost, less incentives. (Includes lighting, HVAC, insulation, water heaters etc.)<br>• OBR option or Participation Loan<br>• NYSERDA provide 50% of the principal at 0% interest **up to $50,000** ($5,000 per unit in MF) |
| **Interest rates, terms and conditions** | • **0% interest**<br>• 24 months maximum tenor<br>• 15% further discount for making full up-front payment<br>• Incentives cover up to 70% of costs | • **0% (buy down from 6.3%)**<br>• 48 Months<br>• Incentives cover 30%-50% depending on the number of measures. | • **Half of lenders' market rates for Participation Loans**.<br>• Financing for up 15 years<br>• **2.5% interest on OBR financing** (maximum $50,000 total)<br>• Incentives up to 70% of project costs from IOUs. |
| **Performance** | • **Default rate approximately 1.1%**<br>• Late/delinquent payment= 13.5%.<br>• Closure rate 2013-14: 67%<br>• 50/50 split between 24 month and single payment (15% discount) | • 98% of SBEA participants took financing (2012-13)<br>• 94% of applicants qualify<br>• **Less than 1% default rate**<br>• Served 25% of SB customers since year 2000<br>• 1,696 participants in 2013, 20,400 kWh savings per participant | • $515,500 loan book in small commercial 2014<br>• $2,942,000 in Multi-Family<br>• Of a budget of $10M for these two sectors |
| **Eligibility, Underwriting and Security** | • Peak demand up to 200kW - 300kW<br>• Look at bill payment history | • 10kW to 200kW peak demand<br>• **Tenants eligible** | • Peak demand up to 100-110 kW<br>• Considers business history, credit score, bankruptcy over past 5 years and existing liens<br>• Debt service coverage ratio > 1.2 |
| **Administration** | • Delivered through RISE Engineering<br>• No-cost audits<br>• Direct Install option | • IOU administered: UI and CL&P<br>• No-cost audits<br>• Direct Install option | • NYSERDA provides pre-approval based on contractor quotes is available.<br>• 3rd party Lender must approve loan terms and conditions and collecting repayments<br>• Requires energy audit: at no cost for eligible businesses |
| **Source of Funds** | • **NG revolving Fund – sourced from SBC and RGGI** | • **CT EE Fund provides interest rate buy down and LLR** (up to 100% coverage based on review)<br>• IOU provides loan capital | • **NYSERDA 50% from its $37M Revolving Loan Fund** ($27M earmarked for Residential)<br>• 3rd party lender the rest |

| Large Commercial | LCI OBF Program (RI) | CPUC OBF (CA) | Michigan Saves: Business Energy Fund | C-PACE |
|---|---|---|---|---|
| **Loan size / measures** | • 543 unique billing accounts and 664 loans totaling $23,711,901<br>• **Average of $35,709 per loan.** | • $100,000 maximum loan<br>• **$27,700 average size**<br>• 20% maximum for lighting measures<br>• Includes Natural Gas measures | • $250,000 maximum<br>• **$21,300 average size**<br>• List of prescriptive measures<br>• Equipment that is demonstrated as cost-effective by a comprehensive audit with modeling is eligible for financing. | • Broad list of eligible measures: HVAC, boilers, fuel switching, lighting, controls, water conservation, envelope, renewable energy<br>• No maximum loan size, projects listed as high a $2M in value |
| **Interest rates, and terms** | • **0% interest loans**<br>• 12 month and 24 month term. (extended to 5 yrs) | • **0% Interest loans**<br>• 5 year tenor (10 year for public facilities)<br>• Incentives up to 70% | • **5.9% minimum interest rate**<br>• Up to 5 year tenor | • Incentives cover 25%-30% typically<br>• 100% of project eligible for financing<br>• **Rate project dependent, 5%-6%**<br>• 20 year maximum tenor |
| **Eligibility, Underwriting and Security** | • **Large Commercial and Institutions**<br>• Based on bill payment history.<br>• 200-300 kW and higher peak load customers | • **Small and large commercial (15%), and Institutions**<br>• Renters eligible<br>• Utility bill payments history | • No information available on underwriting or application history | • **Commercial, Industrial and Multi-family**<br>• Positive cash flow in year 1<br>• Considers, LTV ratio, business profitability, debt service ratio, and liabilities to net worth ratio.<br>• CEFIA exposure not to exceed 35% of property value |
| **Administration** | • No-cost audits<br>• Incentives cover 50% - 70% of costs | • Small and large commercial (15%), and Institutions | • No audit necessary, but program can link with audit results<br>• Program authorized contractors | • CEFIA administers program<br>• 3rd party technical review of project required |
| **Source of Funds** | • **Ratepayer funded** through NG revolving fund | • **Ratepayer funded** | • **LLR provided by Michigan saves**<br>• Ervin Leasing acts as a full service lender, and offers financing for all eligible improvements | • **Uses $10M in RGGI Funds, with CEFIA warehousing to repackage loans**<br>• C-Pace qualified 3rd-party lenders can do direct lending |
| **Performance** | • $3.8M in average loan volume 2013 and 2014<br>• Average 67% closure rate | • Near 0% delinquency<br>• $16M in loans since 2010 | • 67 loans for $1.8M in 2011-12<br>• No defaults to date<br>• Approximately 80% of the loans obtained through BEF have been bought down to 1.99%. through a food service incentive. | • 85% of C&I market is now covered within municipalities that have adopted C-PACE<br>• Projects typically achieve 35%-45% energy savings |

## HEAT LOAN AND LLR RATE PAYER COST ANALYSIS

The LLR was modelled to be maintained at a 10% of the annual loan book balance, and covering 90% of lender losses due to loan defaults. An annual 0.25% fund management fee was applied, and the LLR balance was assumed to generate a return of 1.5% in interest.

For NPV analysis a discount rate of 2.5% was applied to match the background inflation rate. While this is considered low relative to the opportunity cost of capital, it was considered appropriate as alternative uses of the ratepayer funds would themselves not likely generate direct financial returns to the programs.

Table 7 below shows the overall cost of interest-rate buy downs for a range of financing products, under a range of potential conditions. An overall trend is apparent wherein the NPV of the cost of the buy-down relative to the loan principal increases significantly with the magnitude of the buy down, and even more so with the term of the loan. These results indicate that the current cost of the HEAT loans is significant (19% of principal for a 7 year term loan) and that to offer extended terms for HEAT loans would be costly. The smaller interest buy-downs associated with the WHEEL programs and NYSERDA small business lending are much less costly, but do not buy the rate down to 0%, but instead buy down the rates by 2%-3% to make the products competitive with secured lending such as mortgages.

Figure 4 below shows the growth in the overall HEAT loan book and the associated LLR balance, assuming that the loan book covered by the LLR starts in 2015, and grows that $4M in new loans are generated each year, and that all loans are for the full 7-year term. A default rate of 2% was applied and the annual new loan values were increased to match a 2.5% background inflation rate. Table 5: Ratepayer Costs for HEAT Loan and LLR Credit Enhancements

| | NPV of Costs |
|---|---|
| **HEAT (2% buy down)** | $5,736,000 |
| **HEAT (5% buy down)** | $15,571,000 |
| **HEAT (8% buy down)** | $25,405,000 |

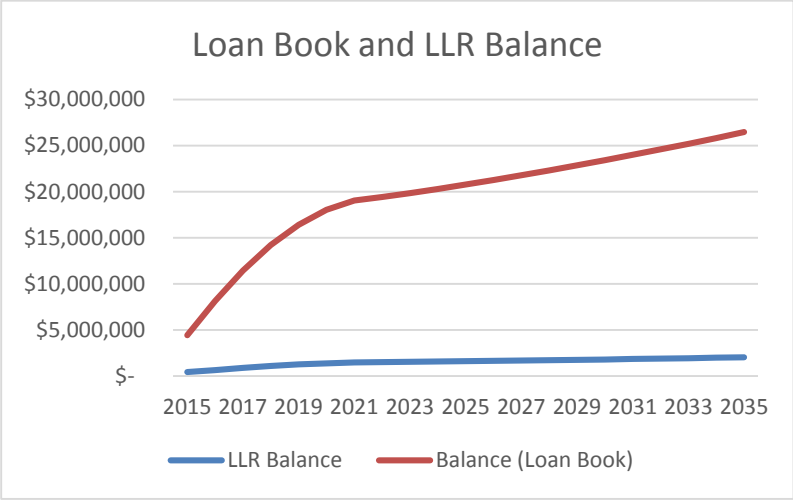
| | |
|---|---|
| **LLR (1% default)** | $2,841,000 |
| **LLR (2% default)** | $5,326,000 |
| **LLR (5% default)** | $12,777,000 |

Figure 3 below compares the annual injection of funds needed to maintain the LLR at 10% of the HEAT loan book, compared to the cost of a 5% HEAT loan interest rate buy down.

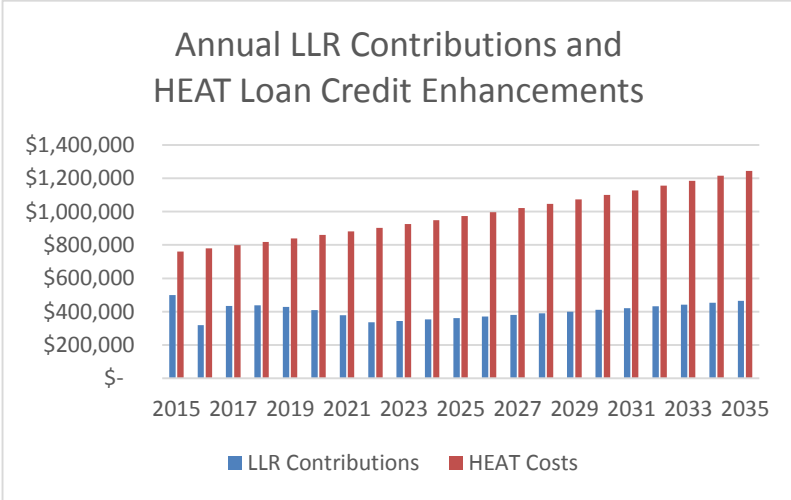
### Table 7: Net Costs of Interest Buy-Downs for Various EE Loan Products

| | HEAT (Max. loan) | HEAT (Avg. loan) | HEAT (15 year) | Nat. Grid SB (Avg. loan) | Nat. Grid SB (Extended) | Nat. Grid SB (Long term) | WHEEL (10 year) | WHEEL (15 year) | WHEEL (20 year) | Energize CT SBEA | NYSERDA (SB loans) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Loan Principal | $ 25,000 | $ 6,600 | $ 15,000 | $ 2,700 | $ 4,050 | $ 5,400 | $ 20,000 | $ 25,000 | $ 25,000 | $ 8,491 | $2,749 |
| Term (years) | 7 | 7 | 15 | 2 | 5 | 8 | 10 | 15 | 20 | 4 | 15 |
| Interest Rate Buy Down | 5.0% | 8.0% | 5.0% | 6.3% | 6.3% | 6.3% | 3.0% | 3.0% | 3.0% | 6.3% | 2.5% |
| Annual Payment before buy down | $ 4,320 | $ 1,268 | $ 1,445 | $ 1,479 | $ 969 | $ 880 | $ 2,345 | $ 2,094 | $ 1,680 | $ 2,467 | $ 222 |
| Annual Payment after buy down | $ 3,571 | $ 943 | $ 1,000 | $ 1,350 | $ 810 | $ 675 | $ 2,000 | $ 1,667 | $ 1,250 | $ 2,123 | $ 183 |
| Annual Net Benefit | $ 749 | $ 325 | $ 445 | $ 129 | $ 159 | $ 205 | $ 345 | $ 427 | $ 430 | $ 345 | $ 39 |
| Buy Down as % of Principal | 21% | 34% | 45% | 10% | 20% | 30% | 17% | 26% | 34% | 16% | 21% |
| Buy Down as % of Principal (NPV) | 19% | 31% | 46% | 9% | 18% | 24% | 11% | 11% | 11% | 15% | 9% |
| NPV of Net Interest Buy Down | $ 4,756 | $ 2,062 | $ 6,939 | $ 248 | $ 740 | $ 1,301 | $ 2,188 | $ 2,714 | $ 2,733 | $ 1,296 | $ 246 |

### Figure 4: Loan Book and LLR Balance ($4M in new loans per year)




### Figure 5: LLR and HEAT Loan annual costs 2015-2035

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