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Credit Enhancement Strategies for Higher Efficiency Vehicles in Maine

Technical Report
August 2021

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Acknowledgments and Disclaimers

The views and opinions expressed in this report are solely those of the Margaret Chase Smith Policy Center and the individual authors. They do not represent those of Maine Department of Transportation or any other individual or organization that has provided information or assistance.

Executive Summary

Credit enhancements are a necessary, but not sufficient policy tool to expand access to clean, reliable vehicles. They are necessary because lower-income and historically disadvantaged groups have less access to low-cost financing. They are not sufficient in that credit enhancements alone, while helpful, are not likely to substantially increase the purchase of clean, reliable vehicles with a higher initial purchase price, but comparable or lower long-term cost of ownership.

We review two credit enhancement mechanisms: **loan loss reserves** and **interest rate buy-downs**.

Loan Loss Reserves

- Reduce the risk of lending to financial institutions through the creation of a reserve fund to cover participating financial institutions from large losses due to defaults
- Create a multiplier effect ranging from \$2-\$30 of loans available for every \$1 of public funds, depending on the risk tolerance of the financial institution

Case studies

- California Clean Vehicle Assistance (CVA) Program provides grants to low- and moderate-income individuals for the purchase of new or used hybrid and electric vehicles, as well as providing a lower-interest financing option through the LLR.
 - CVA has awarded over 4,000 grants and 93 loans procured through the LLR.
- California Capital Access Program (CalCAP)/California Air Resources Board (CARB) Heavy-Duty Vehicle Air Quality Loan Program utilizes a LLR to provide access to financing for heavy-duty trucks and trailers for small business owners.
 - Since the program's start, 29,883 loans have been made. In 2020 alone, loans through this program created 3,658 new jobs and saved 6,952 jobs.

Benefits

- Incentivize private investment into energy efficiency
- Greater flexibility in underwriting
- One-time, fixed cost to the funding partner

Challenges

- Limited deployment of LLR for consumer-focused higher efficiency vehicle LLR, which could cause lender hesitancy
- Consumer education and program uptake
- Individuals in target population may not qualify despite increased flexibility in underwriting criteria

Interest Rate Buy-Downs

- Encourage investment in energy efficiency improvements through the provision of below market rate loans
- Funding partner provides a payment to the financial institution for the difference between the market rate loan and the lower interest loan.

Case studies

- Vermont launched the Heat Saver Loan (HSL) pilot program in 2014, which uses an IRB to provide lower-interest loans for energy efficiency improvements of owner-occupied residences.
 - During the pilot program, 558 loans were generated, valued at \$6.05 million. \$932,931 was paid to the financial institutions for the IRBs.
- Following the pilot period, the HSL was made permanent and renamed the Home Energy Loan (HEL).
 - 2019 to 2020, 1,094 Home Energy Loans (HEL) were generated, valued at \$8.9 million. \$957,061 was paid to the financial institutions for the IRBs.

Benefits

- Increase the appeal of energy efficiency improvement loans through lower cost loans
- Leverage public capital to create multiplier effect

Challenges

- Buy-downs can be costly and require ongoing investment
- There may be more cost-effective credit enhancement mechanisms
- Lack of experience in IRB usage in higher efficiency vehicle loans may cause lender hesitancy

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Introduction

The transportation sector is responsible for 54% of Maine's greenhouse gas emissions (Maine Climate Council 2020). Maine Won't Wait, Maine's climate action plan, recommends the establishment of an incentive program for low- and moderate-income individuals to encourage the uptake of higher fuel efficiency light-duty vehicles (LDV) to reduce greenhouse gas emissions. An incentive program aimed at low- and moderate-income households, as well as historically disadvantaged communities, can help Maine better attain its climate goals and provide increased access to safer and more reliable vehicles.

One of the barriers to vehicle ownership or vehicle upgrades can be financing. National data shows that the majority of new vehicle purchases and about one-third of used vehicle purchases are financed (Zabritski 2021).¹ Without access to financing, purchasing a more expensive, higher efficiency vehicle, *which may result in savings over the life of the vehicle*, can be inaccessible for many (Klein 2020). Moreover, the percentage of prime and super-prime automotive loans (credit scores of 661-850²) has increased, to 62% of total loans, while the percentage of subprime and deep subprime loans (credit scores of 300-600) has decreased (Zabritski 2021). Given the Covid-19 pandemic and related recession, this may be evidence that credit scores have improved due to stimulus payments or, conversely, individuals with lower credit scores are choosing not to make automotive purchases using financing (Andriotis 2020). However, it could also be a signal that individuals with lower credit scores are being rejected for loans at a higher rate or not applying at all, due to feeling that they would be rejected (Federal Reserve Bank of New York 2021).

Financial institutions are more likely to deny financing or give unfavorable loan terms (including higher interest rates and shorter loan terms) to those with lower credit scores or high debt-to-income ratios, due to the associated risks. Credit enhancements, including interest rate buy-downs, loan guarantees, and loan loss reserves (LLR) are regularly used tools in energy efficiency programs to increase access to financing of identified groups by reducing risk to financial institutions while providing borrowers with more favorable loan terms. The combination of an incentive program and credit enhancements can make higher efficiency vehicles more accessible to Mainers and help Maine achieve its climate goals.

¹ Maine is likely to be similar, but this needs to be verified.

² Definitions of super-prime, prime, subprime, and deep subprime vary depending on the credit agency.

Loan Loss Reserves

Overview

Loan loss reserves are a type of credit enhancement frequently used to increase the amount of private capital available for lending through the reduction of risk to lenders. An initial investment, the reserve, is set aside in an escrow account to cover losses on loans due to non-payment (ACEEE 2017). This reserve is then leveraged to create additional capital available for lending (see the [Appendix](#) for a sample template of the establishment of a LLR fund). If a borrower defaults on their loan, the lender is repaid from the reserve, reducing the risk.

Leverage ratios, the ratio of loan funds to reserve funds, are predetermined by the financial institution and the funding partner (e.g., a state or local government). They vary based on the risk tolerance of the financial institution and the funding partner. Previous (and ongoing) energy efficiency programs have had leverage ratios from 2:1 to 30:1 (Gileo, Stickles, and Kramer 2016; Michigan Saves 2021; Office of Energy Efficiency & Renewable Energy 2014b). A higher leverage ratio provides more funds for lending but reduces risk protection. Conversely, a lower leverage ratio provides more risk protection, but may constrict lending. After implementation, the leverage ratio can be altered upon mutual agreement from the lender and the funding institution, such as with Michigan Saves, a nonprofit green bank that finances energy efficiency projects, that increased their leverage ratio after experiencing low default rates (ACEEE 2017).

Coverage ratios, the share of the losses on an individual loan that the reserve will cover, must also be established. This can either be set by the funding partner or negotiated between them and the financial institutions. These can range from 50-100%, though 80-100% is more common (U.S. Department of Energy 2010). Loss coverage is only guaranteed until the reserve is exhausted and all losses in excess of the reserve are borne by the financial institution. This loss sharing incentivizes high-quality loan origination and administration, as well as recoveries and collections (U.S. Department of Energy 2010).

Case Studies

Clean Vehicle Assistance Program

California's Clean Vehicle Assistance (CVA) program helps income-eligible Californians gain access to greener vehicles. This program provides grants for new or used battery electric (BEV), plug-in hybrid (PHEV), and hybrid vehicles, as well as for charging infrastructure or charging credits. Grants must be approved prior to the purchase of the vehicle.

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In addition to the grants, a LLR program provides a lower interest financing option for program participants (California Climate Investments 2021). At this time, Beneficial State Bank (BSB) is the sole financial institution in the program. Although over 4,000 grants have been awarded, uptake of the financing program has been low; only about 3% of grantees have chosen BSB as their lender (Koohestani and Macumber 2021). On average, loans issued by the financing program have had lower principal amounts and higher interest rates than those from other financiers (Koohestani and Macumber 2021).³ This may indicate that individuals who chose BSB as their lending partner may not have qualified for loans with other financial institutions, a benefit of the LLR.

California Capital Access Program (CalCAP)/California Air Resources Board (CARB) Heavy-Duty Vehicle Air Quality Loan Program

The CalCAP/CARB Heavy-Duty Vehicle Air Quality Loan Program, also known as the Truck Loan Assistance Program, helps small business owners gain access to financing for qualifying purchases (model year 2010 or newer heavy-duty trucks, as well as trailers and equipment warranties when purchased with an eligible tractor) through a LLR program (CalCAP 2020). For each loan made, 14% of the loan amount is deposited into the participating financial institution's LLR fund by the California Pollution Control Financing Authority (CPCFA), until \$500,000 in contributions have been made to the fund (CalCAP 2021b). Afterwards, the lender receives 10% of all new loans (CalCAP 2021b). In 2017, a fund recycling mechanism was implemented to allow the reclamation of LLR funds. After five years or the loan has reached maturity, whichever comes first, CPCFA can recapture the LLR funds from the financial institutions' LLR fund, which are then used to fund future loan enrollments. Since this change, over \$12.8 million have been recycled (CalCAP 2021b).

To be eligible, the applicant's business must be classified as a small business, with no more than 100 employees and ten heavy-duty vehicles, as well as having an annual revenue of \$10 million or less. The purchased vehicle must be registered in California (CalCAP 2020). Participants can borrow up to \$5 million (maximum interest rate of 20%), with maximum loan lengths of five years (CalCAP 2021a).

Since the program's inception in 2009, 29,883 loans have been made, worth \$1.9 billion. In 2020, 4,410 loans were made, valued at \$307 million, at a cost of \$26.5 million to the state (CalCAP 2021b). Default rates were relatively low in the earlier years of the program and have increased in recent years. From 2009 to 2016, the default rate was less than 6%, while

³ BSB's average loan amount was \$17,800, with an average APR of 7.22% (Koohestani and Macumber 2021). The average loan amount from other financial institutions was \$25,335 with an average APR of 3.6% (Koohestani and Macumber 2021).

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2017 to 2020 had default rates between 9.1-14.7% (CalCAP 2021b; 2018). In addition to increasing access to financing, this program has helped create and preserve jobs. In 2020, loans from this program created 3,658 new jobs and retained 6,952 jobs (CalCAP 2021b).

Benefits

Loan loss reserve funds can reduce lender hesitancy and incentivize private investment into the energy efficiency market, thereby increasing the available capital for lending. A 10:1 leverage ratio would produce \$10 million in capital to lend with a \$1 million initial investment.

As a result of the risk-sharing, there is greater flexibility in underwriting criteria. This can include (but is not limited to) extended loan terms, lower minimum credit scores, lower interest rates, and higher acceptable debt-to-income ratios (Borgeson, Zimring, and Goldman 2012; U.S. Department of Energy 2010). These are established through negotiation between the financial institution and the funding partner and can be outlined in a Request for Proposal (RFP) (see the [Appendix](#) for a sample RFP). This flexibility can increase access to financing and improve the attractiveness of lending to consumers.

The reserve for the loan loss fund is a one-time, known cost to the state or local government. The funding partner can choose to add funds if the reserve is drawn upon or to increase lending funds available, but that is not required. As funds are replenished by loan repayments, that money is returned to the LLR to make additional loans. In contrast, rebate and grant programs require ongoing funding for program support as funds are used.

Challenges

Currently, most LLR programs target energy efficiency improvements in homes and businesses or renewable electrical generation (mostly through solar panel financing). California's CVA is the only consumer-focused higher efficiency and zero-emission vehicle program utilizing a LLR. While this is an opportunity for Maine to be a leader in the field, this may cause hesitancy for lenders. This could be mitigated by beginning program implementation with a lower leverage ratio, to be increased after low delinquency rates have been realized.⁴

Additionally, consumer education and uptake of the program could be challenging. The majority of automotive financing is through indirect automotive loans. Indirect automotive

⁴ Default rates for energy efficiency LLR programs are typically very low. California PACE and Efficiency Vermont's Business Energy Loan have had no payouts from the LLR (California Climate Investments 2021; Energy Futures Group 2020). Michigan Saves has a 1.5% default rate (Michigan Saves 2021).

are loans applied for and procured through the dealership (FICO 2019). A LLR program would likely require borrowers to apply for financing separately from the purchase of the vehicle, such as with the CVA program. Moreover, policymakers may have to contend with opposition from automotive dealers, who may benefit from indirect automotive loans and the associated discretionary markup (Cooper 2019).

Consumer uptake has been a barrier for other LLR programs. From 2015 to 2020, Efficiency Vermont's Business Energy Loan processed 83 loans, a much lower than expected, which is attributed to faulty promotional measures (Energy Futures Group 2020). The EcoHouse Loan Program, in Indianapolis, also struggled with lower customer volume, despite employing a multitude of outreach strategies. They had greater success when messaging is focused on home upgrades, savings, and improved comfort, rather than employing green messaging (Zimring et al. 2011; 2012). Relevant messaging from trusted sources may improve program uptake and enrollment.

One of the benefits of LLR programs is increased credit access due to more lenient underwriting. Even with this increased leniency, some individuals still may not qualify due to low/no credit scores or other credit issues (e.g., bankruptcy, recent late loan payments, or an outstanding lien). This may disproportionately impact low-income individuals, who are more likely to have no credit scores than other individuals (Brevoort, Grimm, and Kambara 2015).⁵ Underwriting guidelines should be carefully negotiated, to ensure proper targeting of the program.

Interest Rate Buydown

Overview

In an interest-rate buydown (IRB) program, state or local governments partner with financial institutions to offer low-interest loans to consumers. At the time of the loan closing, the funding partners (state or local governments) make a one-time lump-sum payment to the financial institution. This payment is a subsidy for the lower interest rate loan, calculated as the difference between the return for a market rate loan and the lower interest loan, adjusted for the time value of money (Department of Energy 2016; McGuckin et al. 2011). IRBs can be used as a stand-alone program or can be combined with other credit enhancement mechanisms, like a LLR.

⁵ Income is not directly considered in the calculation of credit scores, though a 2018 FEDS Notes found moderate correlation between income and credit scores (Beer, Ionescu, and Li 2018).

IRBs can take two approaches: establish a target interest rate or buy down the interest rate by a set percentage. In the first method, the state or local government sets an interest rate for the program. The lenders are then paid the difference between the market rate and this interest rate. This discounted interest rate is typically between 0-6% (Austin Energy 2014; Brown, Wolfe, and Pietsch 2007; Hayes et al. 2011; James et al. 2014; Opinion Dynamics Corporation, Johnson Consulting Group, and Dunsky Energy Consulting 2012; Witkowski 2013). Conversely, the state or local government can buy down the interest rate by a set percentage, such as with the Milwaukee Energy Efficiency program, which buys down the interest rate by 2-3%, depending on the energy efficiency improvements being made (Driscoll et al. 2013). Regardless of the method being used, both approaches achieve the goal of making energy efficiency financing more affordable.

Case Studies

Thermal Energy Finance Pilot Program Heat Saver Loan (HSL)

In 2014, the Vermont Department of Public Service with the Clean Energy Development Fund, and Vermont Low Income Trust for Electricity (VLITE) launched the Thermal Energy Finance Public Program to help low-and moderate-income Vermonters improve the energy efficiency of their homes through increased access to financing (State of Vermont 2014; Vermont Department of Public Service 2016). The pilot program launched the Heat Saver Loan (HSL), which provided low-interest loans for the financing of energy efficiency upgrades through the use of interest rate buy-downs and a loan loss reserve.

Through this program, offered by two credit unions, individuals could apply for loans of up to \$35,000. Interest rates (0-4.99%) varied depending on household income and the loan period (up to 15 years). Owner-occupied buildings (both primary residences and vacation homes) with up to four units were eligible for the program (Vermont Department of Public Service 2016). HSLs could be used for heat pumps, high efficiency oil and propane boilers and furnaces, wood pellet furnaces and boilers, solar hot water systems, and weatherization upgrades.

Between November 2014 and September 2016, 249 loans were generated, valued at \$2.85 million. A total of \$479,672 was paid to financial institutions for IRBs, with an average IRB of \$1,927 (Vermont Department of Public Service 2016). Of the \$2.85 million generated in loans, 41.8% went to low income applicants, 37.7% went to moderate income applicants, and 20.5% of loan funds went to upper income applicants (Vermont Department of Public

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Service 2016).⁶ In total, 91% of the IRB went to low and middle income applicants. During this period of time, there were no loan defaults (Vermont Department of Public Service 2016).

Between September 2016 and the end of the pilot in December 2017, an additional 309 loans were generated, valued at \$3.2 million.⁷ Overall, \$453,259 was paid to the participating financial institutions for the buy-downs, with an average IRB of \$1,467 (Energy Futures Group 2020). From the start of the pilot program to 2020, there were 2 loan defaults (Energy Futures Group 2020). Following the pilot period, the program transitioned to a permanent program in 2018.

Efficiency Vermont Home Energy Loan

Following the success of the HSL, the program was transitioned from the Vermont Department of Public Service to Efficiency Vermont. Efficiency Vermont launched the Home Energy Loan (HEL) in August 2018 (Efficiency Vermont 2019). Like the HSL, the HEL used a combination of LLRs and IRBs to incentivize energy efficiency improvements.

HELs can be used for energy efficiency improvements of owner-occupied homes of one to four units. Eligible projects include heat pumps and heat pump water heaters, wood pellet boilers and furnaces, solar hot water heaters, and weatherization projects (Efficiency Vermont 2021c). Under Efficiency Vermont, the maximum loan amount was increased to \$40,000⁸ and a third financial institution was added, NeighborWorks of Western Vermont (Efficiency Vermont 2021c). Interest rates vary (0-6.99%) based on income and loan term (up to 15 years), with lower-income households choosing shorter loan terms receiving the best rates (Efficiency Vermont 2021a).

From 2019 to 2020, 1,094 HELs were generated, for a total of \$8,929,904 in loaned capital, at a cost of \$1,128,450 (\$957,061 in IRBs, \$171,389 in LLRs) (Efficiency Vermont 2020; 2021b). Over 70% of the loans dispersed went to low- and moderate-income applicants (Efficiency Vermont 2020; 2021b).

⁶ Low income is defined as household incomes that are less than 80% of median family income (MFI). Moderate income is 80-120% of MFI. Upper income applicants have household incomes greater than 120% of MFI (Vermont Department of Public Service 2016).

⁷ This time period is separated due to lack of data on loan allocations.

⁸ This will be reduced to \$20,000 on August 1st, 2021 (Efficiency Vermont 2021a).

Benefits

High interest rates on energy efficiency loans can cause consumers to underinvest in energy efficiency improvements (Gillingham, Newell, and Palmer 2009). IRB programs can be used to provide below-market rate loans, thereby increasing the appeal to consumers and incentivize investment in energy efficiency enhancements.

Like LLRs, IRBs leverage public capital to create a multiplier effect. A \$1 investment of public funds generates more than \$1 in investments of private capital. The HEL generated almost \$8⁹ in private financing for every dollar of public funds (Efficiency Vermont 2020; 2021b).

Challenges

IRBs provide lower interest loans that may be more attractive to consumers than market rate financing options. However, some programs have found the buy-downs too costly (Hayes et al. 2011; Kramer et al. 2015; Opinion Dynamics Corporation, Johnson Consulting Group, and Dunsky Energy Consulting 2012). Additionally, other mechanisms may be more efficient. One study by Borgeson et. al., using results from the Energy Upgrade California program, found that a 19% LLR could be created for the same cost as a 5.29% IRB (10 year loan term, 14.99% to 9.7%) (Borgeson, Zimring, and Goldman 2012). Single digit interest rates have been observed in LLR programs with reserves of 5-10% (Borgeson, Zimring, and Goldman 2012). Therefore, it may be possible to invest less money in a LLR and achieve the same interest rates as with an IRB, though this is an area that remains unsettled and likely depends on the specific program design and targeted demographic groups.

As with LLRs, lack of market familiarity with a consumer-focused higher efficiency and zero-emission vehicle IRB program could be a barrier to implementation. There are currently no IRB programs targeting this sector and could lead to lender hesitancy.

Conclusion

Since 1990, Maine's consumption of petroleum for transportation use has been on the rise, the only sector to see an increase in consumption during that time period (Maine Department of Environmental Protection 2020). Moreover, the fuel efficiency of Maine's on-road LDV fleet has not improved since 2015, despite advancements in fuel economy for all vehicle types (Rubin, Ballingall, and Brown 2021; Hula et al. 2021). Without a change, these will be barriers to achieving Maine's 2030 and 2050 greenhouse gas emissions reduction goals. The utilization of credit enhancements in a higher efficiency vehicle program may

⁹ This includes the cost of the IRBs and the LLR.

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incentivize investment into higher efficiency vehicles through increased accessibility and affordability of automotive financing for Maine people. Both LLRs and IRBs have been used to increase uptake of energy efficiency improvements, though there's been limited deployment in the transportation sector. Maine has the opportunity to become a leader in this space, while achieving their climate goals.

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Appendix

Additional Resources

[Sample Request for Proposal for Financial Institutions](#) (Office of Energy Efficiency & Renewable Energy 2014a)

[Sample template for a loan loss reserve fund](#) (Energy Efficiency and Conservation Block Grant 2010).